# VACUUM VALVES 2016



VACUUM VALVES 2016

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**A**

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

**B**

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

**C**

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

**D**

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

## E Angle valves, diaphragm valves

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

## F Special valves for accelerators / synchrotrons

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

## G Special valves for gases

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

## H Flange connections

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

## I

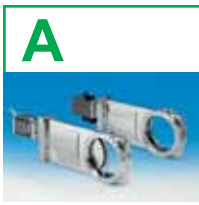
| Page | | |
|---|---|---|
| 270 | **Heaters** | to reduce deposition and pump-down times |
| 271 | **Coatings** | to reduce corrosion from aggressive processes |
| 272 | **Multi-valve modules** | for direct installation into the customer system, saves space and cost |

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


VAT is certified according to ISO 9001

VAT is a registered mark





















## A Gate valves, pendulum valves

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

## B Control valves

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

## C Transfer valves and doors for SEMI

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

## D Transfer valves and doors for FPD and PV

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

## E Angle valves, diaphragm valves

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

## F Special valves for accelerators and synchrotrons

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

## G Special valves for gases

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

# Valve series according to vacuum levels

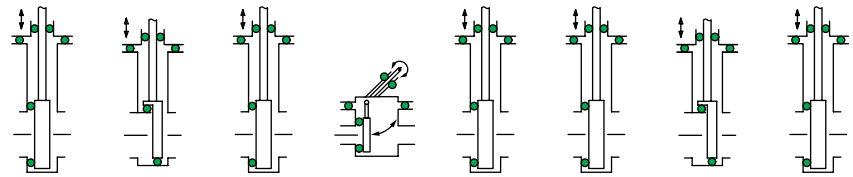
**Gate valves, transfer valves**
(free opening)

## Vacuum

**Valve series:** 01.2 | 02.4 02.7 | 06.0 06.6 | 06.8 | 08 | 12 | 15.0 | 19.0

Seal, feedthrough:
- FKM (Viton®)

> $1 \cdot 10^{-7}$ mbar



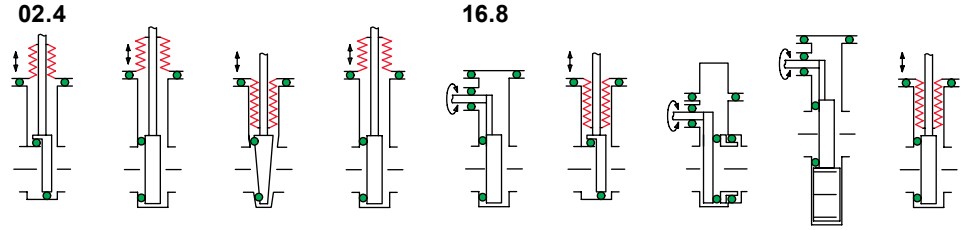
Actuator: H/P | P | P | P | H/P | H/P | P | P

## HV (high vacuum)

**Valve series:** 02.2 03.2 02.4 | 04.3 05.3 | 09 | 11 | 14.0/14.1 64.0 16.8 | 15.1 | 16.2 | 17.2 | 19.1

Seal, feedthrough:
- FKM (Viton®)
- Bellows

> $1 \cdot 10^{-8}$ mbar



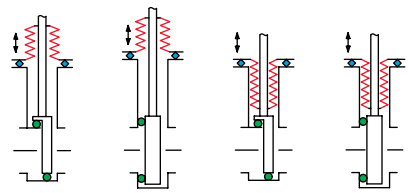
Actuator: P | P | H/P | H/P | H/P [3] P [4] | P | P | H/P | P

## UHV (ultra high vacuum)

**Valve series:** 01.0 17.4 | 10 | 15.2 | 19.2

Seal, feedthrough:
- FKM (Viton®)
- Metal
- Bellows

> $1 \cdot 10^{-10}$ mbar



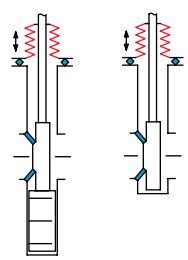
Actuator: H/P | H/P | P | P

## XHV (extreme UHV)

**Valve series:** 47 | 48

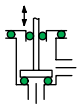
Seal, feedthrough:
- Metal
- VATRING
- Bellows

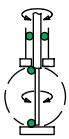
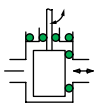
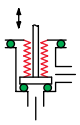
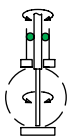
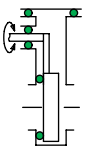
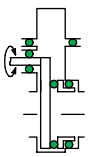
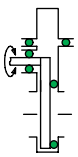
< $10^{-10}$ mbar

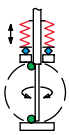
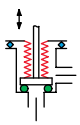


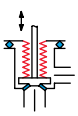
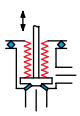
Actuator: P | H/P

| Angle / inline valves<br>Diaphragm valves<br>Vatterfly valves | Control valves |
|---|---|

| 22 | 24<br>29 [1] |
|---|---|
|  |  |
| H | H / P |

| 20.3<br>20.4 | 25 | 26<br>29 [2] | 61.2<br>61.5 | 64.2 | 65.0 | 65.2 |
|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |
| P | P | H/P/EM [5]<br>P [6] | M | M | M | M |

| 20.0<br>20.2 | 28 |
|---|---|
|  |  |
| H | H / P |

| 54 | 57 | 59 |
|---|---|---|
|  |  |  |
| H | H / P | H / M |

[1] Series 29, DN 100 – 160

[2] Series 29, DN 25 – 80

[3] Series 14.0, 14.1, 64.0
[4] Series 16.8
[5] Series 26
[6] Series 29

H Manual actuator
P Pneumatic actuator
M Motor
EM Electromagnetic actuator

# Valve series according to nominal diameters

| Nominal diameter mm | inch | Gate valves (free, circular passage) Flap valves linear | pendulum | Angle valves | Vatterfly valves Diaphragm valves | Control valves |
|---|---|---|---|---|---|---|
| | | Valve series | | | | |
| 10 | ⅜ | | | 24, 26, 57 | | |
| 16 | ⅝ | 01.2, 48 | | 24, 25, 26, 27, 28, 54, 57, 59 | 22 | 66.0 |
| 25 | 1 | 01.0, 01.2 | | 24, 25, 26, 27, 29 | 22 | 61.2, 66.0 |
| 40 | 1½ | 01.0, 01.2, 17, 48, 75, 77 | | 24, 25, 26, 27, 28, 29, 54, 57 | 22 | 61.2, 61.5, 66.0, 66.3 |
| 50 | 2 | 01.0, 01.2, 08, 09, 17 | | 24, 26, 29 | | 61.2, 61.5, 66.0, 66.3 |
| 63 | 2½ | 08, 09, 10, 11, 12, 14.1, 15, 17, 47, 48, 75, 77, 79 | 16.2 | 24, 26, 27, 28, 29, 54, 57 | 20.0, 20.2, 20.3, 20.4 | 61.2, 61.5, 64.2, 66.3 |
| 80 | 3 | 08, 09, 10, 11, 12, 14.1 | | 24, 26, 29 | 20.3, 20.4 | 61.2, 61.5, 64.2 |
| 100 | 4 | 08, 09, 10, 11, 12, 14.1, 15, 17, 47, 48, 75, 77, 79 | 16.2 | 24, 26, 27, 29, 57 | 20.0, 20.2, 20.3, 20.4 | 61.2, 61.5, 62, 64.2, 65.0, 66.3 |
| 160 | 6 | 09, 10, 11, 12, 14.1, 15, 17, 47, 48, 75, 77, 79 | 16.2 | 24, 26, 27, 29, 57 | 20.0, 20.2, 20.3, 20.4 | 61.2, 64.2, 65.0 |
| 200 | 8 | 09, 10, 11, 12, 14.1, 15, 17, 47, 48, 75 | 16.2 | 24 | 20.3, 20.4 | 61.2, 64.2, 65.0, 65.2 |
| 250 | 10 | 09, 10, 11, 12, 14.1, 15, 17, 48 | 16.2 | 24 | | 61.2, 64.2, 65.0, 65.2 |
| 320 | 12 | 10, 11, 12, 14.1, 17, 48 | 16.2 | | | 64.2, 65.0, 67 |
| 350 | 14 | | 16.2 | | | 64.2, 65.0, 67 |
| 400 | 16 | 14.0, 19, 64.0 | 16.2, 16.8 | | | 64.2, 65.0, 67 |
| 450 | 18 | | | | | 67 |
| 500 | 20 | 19 | 16.2, 16.8 | | | |
| 630 | 25 | 19 | | | | |
| 800 | 32 | 19 | | | | |
| 900 | 36 | 19 | | | | |
| 1000 | 40 | 19 | | | | |
| 1250 | 50 | 19 | | | | |
| 1600 | 63 | 19 | | | | |
| 2000 | 78 | 19 | | | | |

Sizes for valves with rectangular openings see

section C: series 02.2/03.2, 04.3/05.3, 07.6 pages 150–161
section D: series 02.4, 02.7, 06.0, 06.6, 06.8, 07.5, 07.8 pages 162–177

Other sizes on request

## Quality certification

**ISO 9001:2008, ISO 14001:2004**

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

**EC Declaration of Incorporation and Conformity**

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

**Inspection certificates**

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

**Special quality documents**

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

**Acceptance tests**

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

## CAD drawings

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

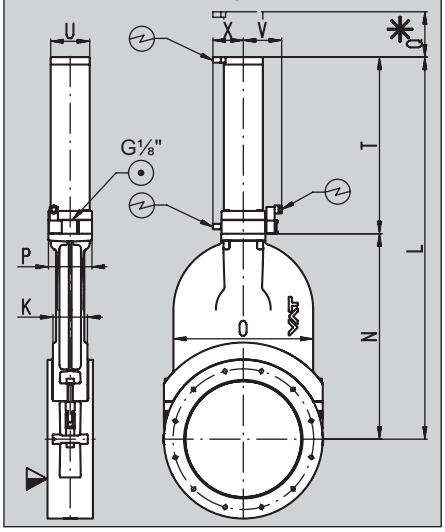
3D: STEP AP 203
2D: PDF

Further formats can be supplied on request.

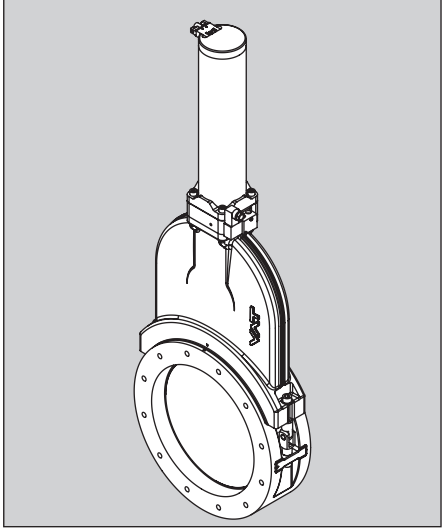
**Important!**
In order to ensure an optimum data exchange we ask you to let us know your current CAD system data when you request dimensional drawings or models.

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

Dimensional drawing




Model

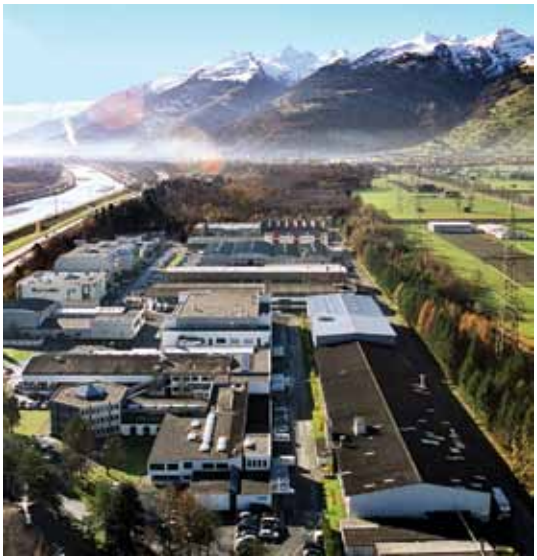


Ordering number:
Product-dimensional drawing / model

e. g. 12148-PA44-dimensional drawing

e. g. 12148-PA44-model

## INNOVATION



**Worldwide leader in vacuum valve technology**

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

The patented innovations include

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

## ENGINEERING





**7 specialized product groups**

with designers and product managers for

- designing customer specified valves
- continuous improvement of standard valves

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

## PARTS MANUFACTURING





**Industrial manufacturing according to ISO 9001**

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

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

- specialized production cells
- 26 000 $m^2$ production area
- FCKW-free cleaning
- 3D control

## VALVE ASSEMBLY

## INSPECTION



Our valves are

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

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

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

## GLOBAL SUPPORT



**Worldwide customer support**

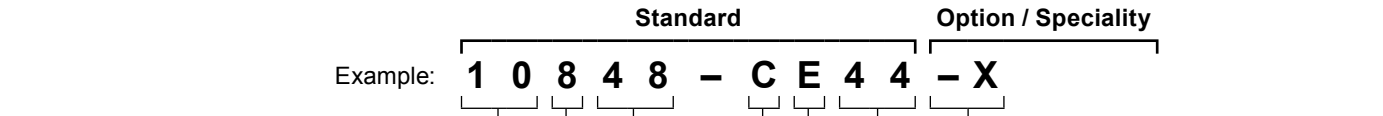
- VAT service centers in America, Asia, Europe
- VAT subsidiaries in Benelux, England, France, Germany, China, Japan, Korea, Singapore, Taiwan, USA
- Representatives in many other countries

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

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

## Ordering number

The ordering number of VAT products is composed as follows:




The ordering number of the standard valve is supplemented with the suffix «-X» if the desired product is not entirely in conformity with the standard product.

«-X» means an option or speciality which must be stated in clear words on the order (see example on next page).

**Actuator**
**Solenoid valve**
**Position indicator**
**Controller configuration**

(See details in the respective product section)

**Valve series number**

**Design version**

**Body material**

| | |
|---|---|
| A | Aluminum |
| H | Aluminium, hard anodized |
| E | Stainless steel |

**Nominal diameter**

| Code | mm | inch | Code | mm | inch | Code | mm | inch |
|---|---|---|---|---|---|---|---|---|
| 20 | 10 | ⅜ | 39 | 88 | 3½ | 52 | 400 | 16 |
| 24 | 16 | ⅝ | 40 | 100 | 4 | 54 | 500 | 20 |
| 28 | 25 | 1 | 44 | 160 | 6 | 56 | 630 | 25 |
| 32 | 40 | 1½ | 46 | 200 | 8 | 58 | 800 | 32 |
| 34 | 50 | 2 | 48 | 250 | 10 | 59 | 900 | 36 |
| 36 | 63 | 2½ | 50 | 320 | 12 | 60 | 1000 | 40 |
| 38 | 80 | 3 | 51 | 350 | 14 | 62 | 1250 | 50 |

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

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

**Flange type / Product type**

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

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

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

# Ordering procedure

**Valve selection**

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

**Ordering examples**

**Standard valve**

| | |
|---|---|
| Ordering text | UHV gate valve, solenoid valve 24 V DC |
| Ordering number | **10846-CE44** |

**Valve with option / speciality**

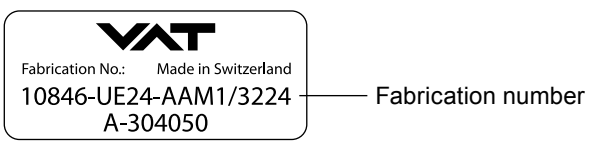
| | |
|---|---|
| Ordering text | UHV gate valve, solenoid valve 200 V / 60 Hz,<br>position indicator for 200 °C, special flanges |
| Ordering number | **10846-XE44-X**<br>**X = solenoid valve 200 V / 60 Hz, position indicator for 200 °C,<br>special flange according to attached drawing** |

**Spare parts, accessories, after sales service**

Please contact us.

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

Example:



# Series 01.0

## Main applications

General purpose valve for isolation in UHV or other demanding applications



## Ordering information

**Valve with manual actuator**
turning handle

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

with position indicator: 010 . . - . E0**8**

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

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

without solenoid valve, with position indicator: 010 . . - . E**2**1
with solenoid valve, with position indicator: 010 . . - . E**4**1 (specify control voltage)

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

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

without solenoid valve, with position indicator: 010 . . - . E**2**4
with solenoid valve, with position indicator: 010 . . - . E**4**4 (specify control voltage)

## Features

Body material: stainless steel

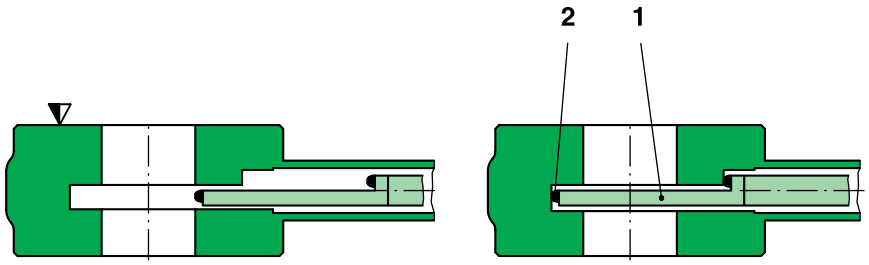
Modular design: see next page

Bellows sealed, unlubricated mechanism

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

MONOVAT system: see glossary

Functional principle




1 Gate 2 Gate seal ▼ Valve seat side

## Technical data

| | |
|---|---|
| Leak rate | |
| – Valve body | $< 5 \cdot 10^{-10}$ 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 on the gate | ≤2 bar |
| Differential pressure at opening | ≤30 mbar |
| Cycles until first service | 50000 |
| Temperature [1] | |
| – Valve body | ≤250 °C open, ≤200 °C closed |
| – Manual actuator | ≤250 °C |
| – Pneumatic actuator | ≤200 °C |
| – Solenoid valve | ≤ 50 °C |
| – Position indicator | ≤ 80 °C |
| Heating and cooling rate | ≤50 °C h$^{-1}$ |
| Material | |
| – Valve body | AISI 304 (1.4301), AISI 316L (1.4435) |
| – Gate | AISI 304 (1.4301) |
| – Bellows | AISI 316L (1.4435) |
| Seal | |
| – Bonnet | metal |
| – Gate | FKM (Viton®) |
| Feedthrough | bellows |
| Mounting position | any |
| Solenoid valve | |
| – Actuator with closing spring | 24 V DC, 9.0 W (others on request) |
| – Actuator double acting | 24 V DC, 5.4 W (others on request) |
| Position indicator: contact rating | |
| – Voltage | ≤250 V AC ≤50 V DC |
| – Current | ≤5 A ≤3 A |
| Valve position indication | visual (mechanical) |

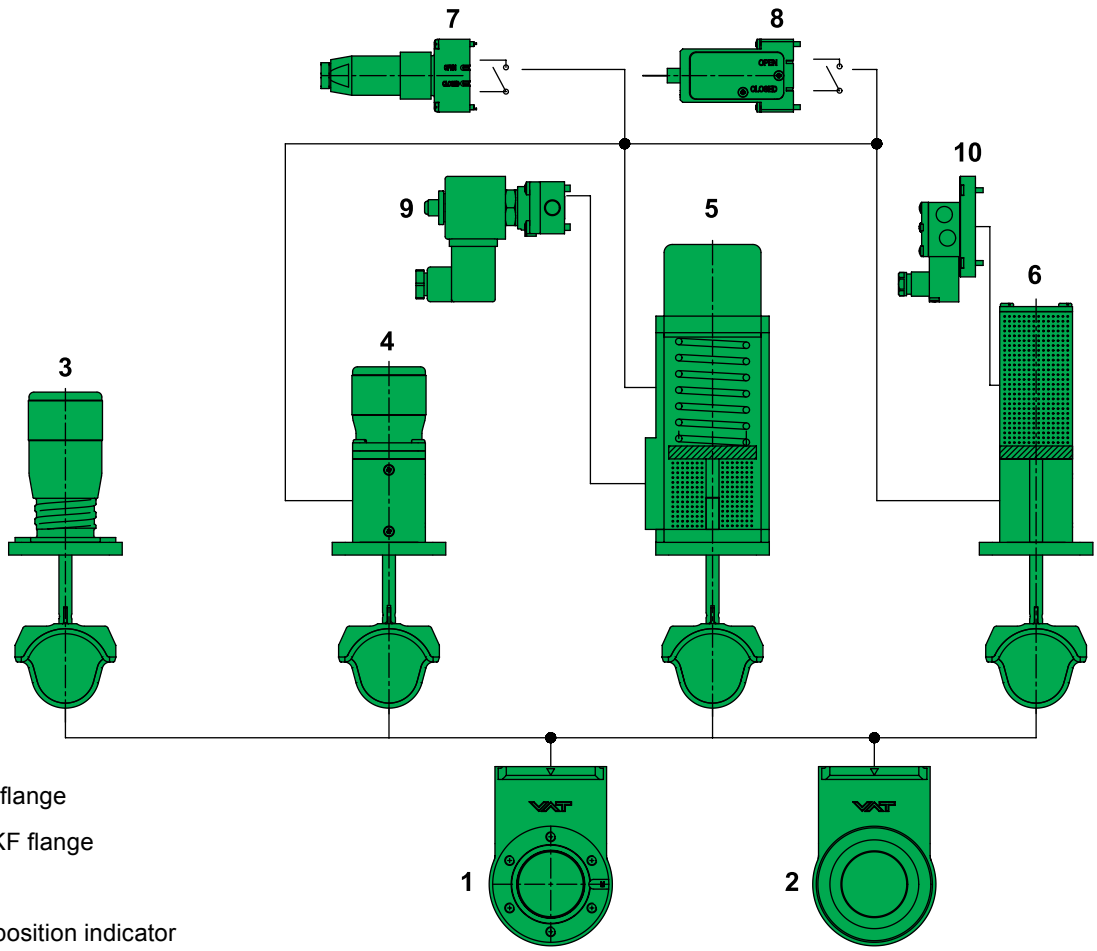
[1] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page

Continued Technical data

| DN (nominal I.D.) | | Standard flanges | Conductance (molecular flow) (depending on A-dimension and flange type) | | Valve with manual actuator: Turns per stroke | Valve with manual actuator: Weight | | Valve with pneumatic actuator: Compressed air min. – max. overpressure | | Valve with pneumatic actuator: Volume of pneumatic actuator | | Valve with pneumatic actuator: Closing or opening time | Valve with pneumatic actuator: Weight | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ISO-KF | CF-F | | | | | | | | | w. closing spring | | double acting | |
| mm | inch | | ls$^{-1}$ | ls$^{-1}$ | n | kg | lbs | bar | psi | l | ft$^3$ | s | kg | lbs | kg | lbs |
| 25 | 1 | See pages 19–21 | 38 | – | 5 | 1.5 | 3.3 | 5–7 | 73–102 | 0.1 | 0.004 | 0.7 | 4.2 | 9.26 | 2.2 | 4.85 |
| 40 | 1 ½ | | 160 | 220 | 5 | 1.5 | 3.3 | 5–7 | 73–102 | 0.1 | 0.004 | 0.7 | 4.2 | 9.26 | 2.2 | 4.85 |
| 50 | 2 | | 160 | – | 5 | 1.5 | 3.3 | 5–7 | 73–102 | 0.1 | 0.004 | 0.7 | 4.2 | 9.26 | 2.2 | 4.85 |

## Modular design




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

## Options

**Actuator**

– Solenoid valve for impulse actuation:
last valve position is maintained at power failure

– Solenoid valve separate, for external mounting

– Other solenoid valve voltage (standard: 24 V DC)

– Manual emergency operation on solenoid valve lockable

– Manual actuator with position indicator

– Bakeable position indicator with connection cable 0.3 m:
actuator bakeable to max. 200 °C, contact rating: ≤ 50 V AC / DC, ≤ 1 A

– Pneumatic actuator, single acting with opening spring (NO)

– Special bellows for 1 million cycles

**Valve**

– Customer specified flanges

– Insert version (without body, for integration into the vacuum system)

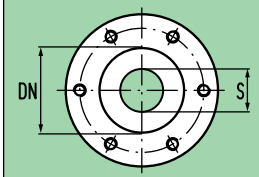
– Other sealing materials

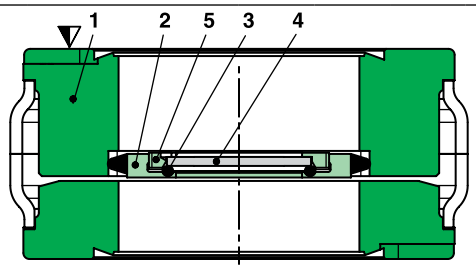
– With protective ring: see series 17

– Special gate for the installation of various foils or orifices

– Window in gate (Dia. 1):
window screwed into gate, window material: e. g. borosilicate, elastomer seal

Dia. 1




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



| | | | | |
|---|---|---|---|---|
| DN valve | mm<br>inch | 25<br>1 | 40<br>1 ½ | 50<br>2 |
| Optically free diameter «S» | mm<br>inch | 21<br>0.82 | 21<br>0.82 | 21<br>0.82 |
| Thickness of glass | mm<br>inch | 1.5<br>0.06 | 1.5<br>0.06 | 1.5<br>0.06 |

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

## Spare parts

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

## Accessories

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

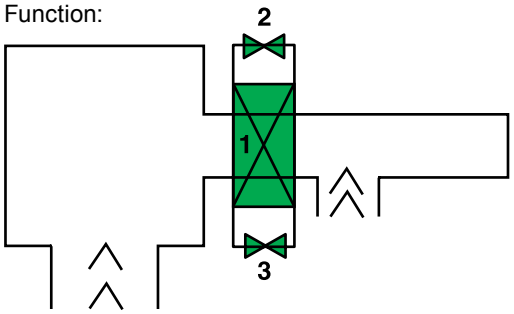
## Special versions

**for gas analysis**



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

Function:



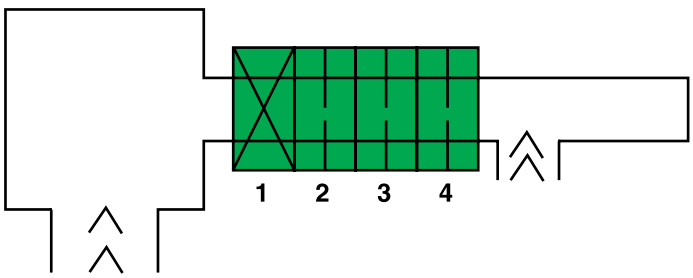

1: Vacuum-tight valve with manual or pneumatic actuator

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



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

Function:



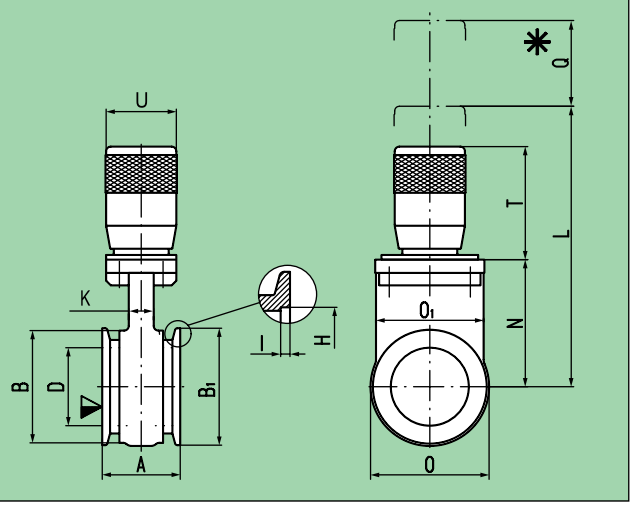

1: Vacuum-tight valve with manual or pneumatic actuator

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

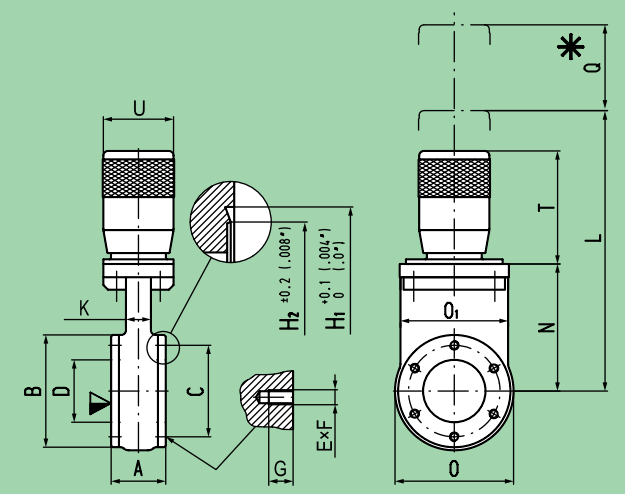
Details see pages 234 + 235.

# Dimensions

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

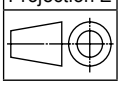



**Valve with manual actuator: turning handle**
DN 40 (1½") CF-F




▼ Valve seat side
✳ Required for dismantling

Projection E

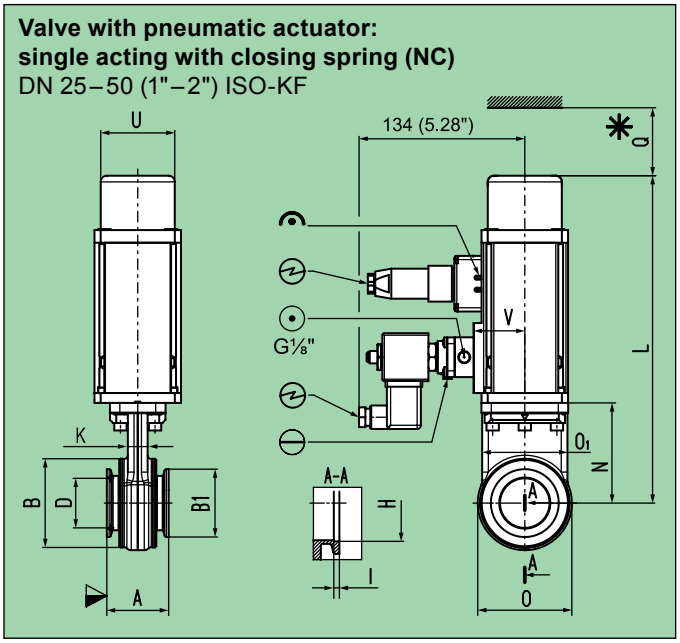


| DN | | 25 | 40 | 50 (ID 40) |
|---|---|---|---|---|
| | inch | 1 | 1½ | 2 (ID 1.57) |
| A | mm | 50 | 50 | 50 |
| | inch | 1.97 | 1.97 | 1.97 |
| B | mm | 72 | 72 | 72 |
| | inch | 2.83 | 2.83 | 2.83 |
| B1 | mm | 40 | 55 | 75 |
| | inch | 1.57 | 2.16 | 2.95 |
| D | mm | 25 | 40 | 40 |
| | inch | 0.98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

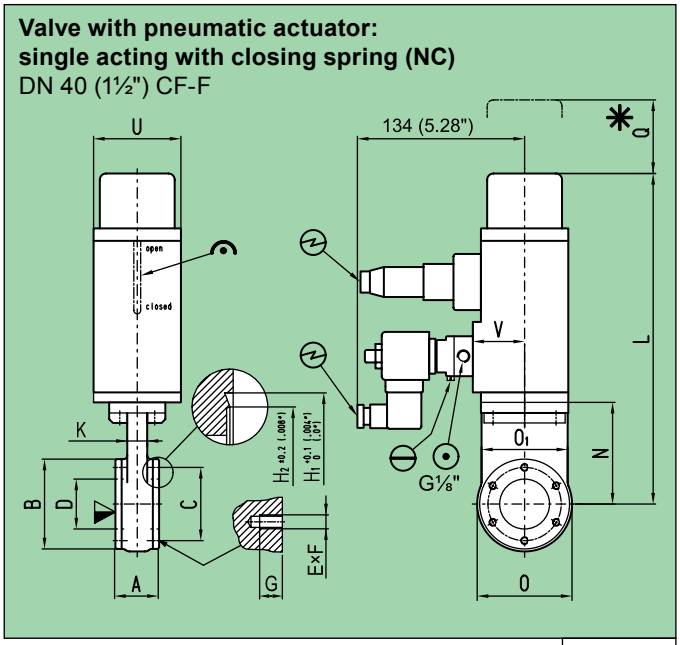
| DN | | 40 | | |
|---|---|---|---|---|
| | inch | 1½ | | |
| A | mm | 35 | | |
| | inch | 1.38 | | |
| B | mm | 72 | | |
| | inch | 2.83 | | |
| C | mm | 58.70 | | |
| | inch | 2.31 | | |
| D | mm | 40 | | |
| | inch | 1.57 | | |
| E × F | | 6 × M6 | | |
| | | 6 × ¼"-28 UNF | | |
| G | mm | 7 | | |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

## Dimensions

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

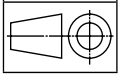



**Valve with pneumatic actuator:**
**single acting with closing spring (NC)**
DN 40 (1½") CF-F




▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⇆ Electrical connection
◠ Mechanical position indication
⊖ Emergency operation

Projection E

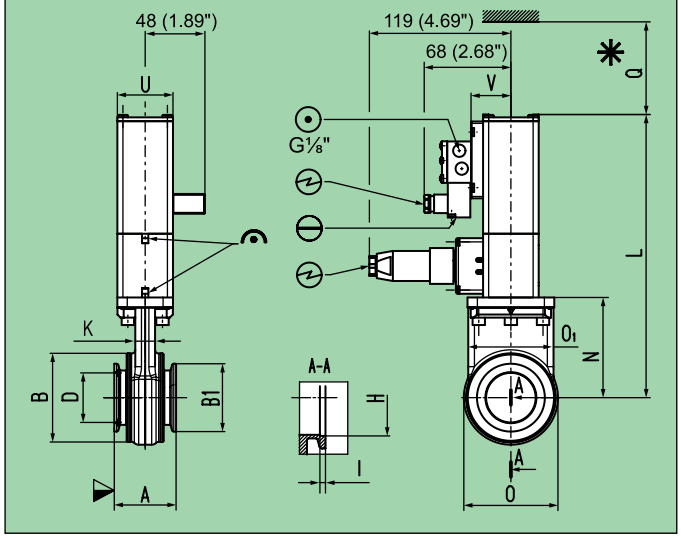


| DN | | 25<br>1 | 40<br>1½ | 50 (ID 40)<br>2 (ID 1.57) |
|---|---|---|---|---|
| A | mm<br>inch | 50<br>1.97 | 50<br>1.97 | 50<br>1.97 |
| B | mm<br>inch | 72<br>2.83 | 72<br>2.83 | 72<br>2.83 |
| B1 | mm<br>inch | 40<br>1.57 | 55<br>2.16 | 75<br>2.95 |
| D | mm<br>inch | 25<br>0.98 | 40<br>1.57 | 40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

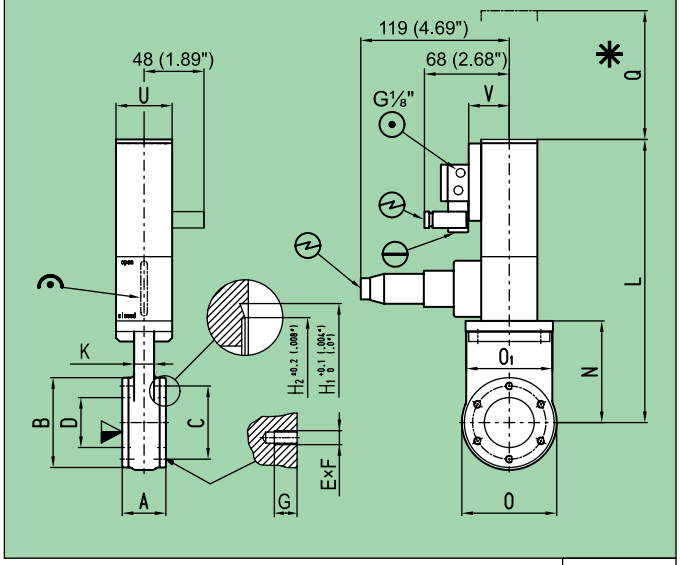
| DN | | 40<br>1½ | | |
|---|---|---|---|---|
| A | mm<br>inch | 35<br>1.38 | | |
| B | mm<br>inch | 72<br>2.83 | | |
| C | mm<br>inch | 58.70<br>2.31 | | |
| D | mm<br>inch | 40<br>1.57 | | |
| E × F | | 6 × M6<br>6 × ¼"-28 UNF | | |
| G | mm<br>inch | 7<br>0.28 | | |
| H1 | mm<br>inch | 48.30<br>1.90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

# Dimensions

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

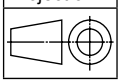



**Valve with pneumatic actuator: double acting**
DN 40 (1½") CF-F




▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⇆ Electrical connection
◠ Mechanical position indication
⊖ Emergency operation

Projection E



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

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

# Series 01.2

## Main applications

General purpose valve for isolation in vacuum applications



## Ordering information

**Valve with manual actuator**
toggle lever

| DN | | Ordering numbers |
|---|---|---|
| mm | inch | ISO-KF |
| 16 | ⅝ | 01224-KA06 |
| 25 | 1 | 01228-KA06 |
| 40 | 1½ | 01232-KA06 |
| 50 | 2 | 01234-KA06 |

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

| DN | | Ordering numbers |
|---|---|---|
| mm | inch | ISO-KF |
| 16 | ⅝ | 01224-KA14 |
| 25 | 1 | 01228-KA14 |
| 40 | 1½ | 01232-KA14 |
| 50 | 2 | 01234-KA14 |

without solenoid valve, with position indicator: 012 . . -KA**2**4
with solenoid valve, with position indicator: 012 . . -KA**4**4 (specify control voltage)

## Features

Body material: aluminum

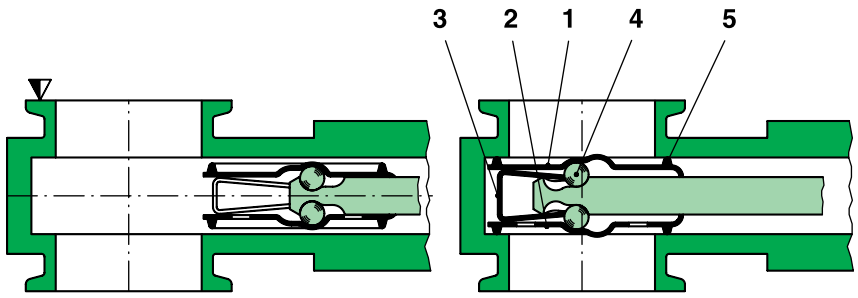
Small and leight-weight

Low cost

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

VATLOCK system: see glossary

Functional principle




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

## Technical data

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

[1] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page

Continued Technical data

| | | | | Valve with manual actuator | | Valve with pneumatic actuator | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DN (nominal I. D.) | | Standard flanges | Conductance (molecular flow) (depending on A-dimension) | Weight | | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing or opening time | Weight | |
| mm | inch | | $ls^{-1}$ | kg | lbs | bar | psi | l | $ft^3$ | s | kg | lbs |
| 16 | ⅝ | See page 25 | 10 | 0.4 | 0.9 | 4.5 – 7 | 65 – 102 | 0.01 | 0.0004 | 0.8 | 0.8 | 1.8 |
| 25 | 1 | | 34 | 0.4 | 0.9 | 4.5 – 7 | 65 – 102 | 0.03 | 0.001 | 1.1 | 0.8 | 1.8 |
| 40 | 1 ½ | | 140 | 0.7 | 1.5 | 4.5 – 7 | 65 – 102 | 0.07 | 0.002 | 1.2 | 1.2 | 2.7 |
| 50 | 2 | | 260 | 0.7 | 1.5 | 4.5 – 7 | 65 – 102 | 0.07 | 0.002 | 1.3 | 1.2 | 2.7 |

## Options

**Actuator**

– Solenoid valve for impulse actuation:
last valve position is maintained at power failure

– Solenoid valve separate, for external mounting

– Other solenoid valve voltage (standard: 24 V DC)

– Manual emergency operation on solenoid valve lockable

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

## Spare parts

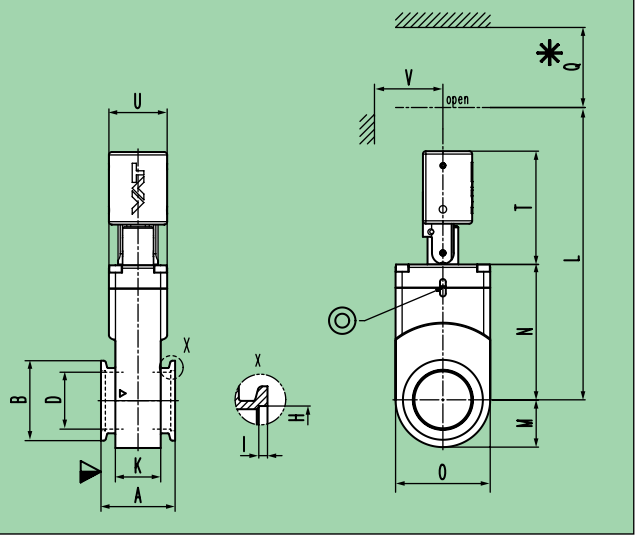
– **Seals**
on request (specify fabrication number of valve)

## Accessories

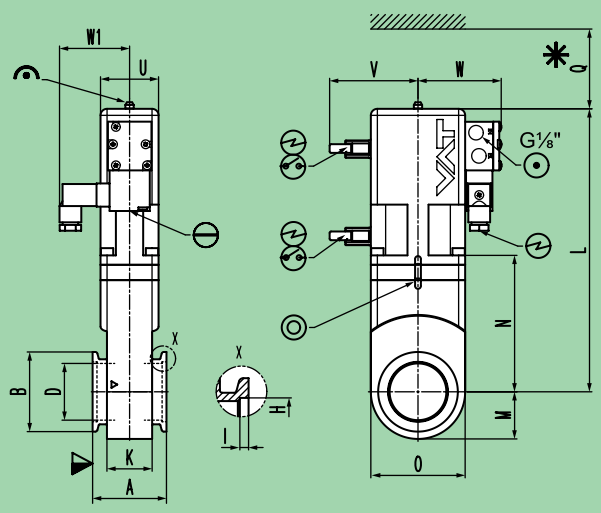
– **Flange connections**
for installation of the valve: see series 31

# Dimensions

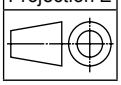
**Valve with manual actuator: toggle lever**
DN 16–50 (⅝"–2") ISO-KF




**Valve with pneumatic actuator: double acting**
DN 16–50 (⅝"–2") ISO-KF




Projection E



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

| DN | | 16 | 25 | 40 | 50 |
|---|---|---|---|---|---|
| | inch | ⅝ | 1 | 1½ | 2 |
| A | mm | 40 | 50 | 51 | 55 |
| | inch | 1.57 | 1.97 | 2.01 | 2.17 |
| B | mm | 30 | 40 | 55 | 75 |
| | inch | 1.18 | 1.57 | 2.17 | 2.95 |
| D | mm | 15 | 24 | 39 | 49 |
| | inch | 0.59 | 0.94 | 1.54 | 1.93 |
| H | mm | 17.20 | 26.20 | 41.20 | 52.20 |
| | inch | 0.68 | 1.03 | 1.62 | 2.06 |
| I | mm | 3 | 3 | 3 | 3 |
| | inch | 0.12 | 0.12 | 0.12 | 0.12 |
| K | mm | 25 | 32 | 31 | 33 |
| | inch | 0.98 | 1.26 | 1.22 | 1.30 |
| L | mm | 100 | 139 | 208 | 240 |
| | inch | 3.94 | 5.47 | 8.19 | 9.45 |
| M | mm | 15 | 22 | 32.50 | 37.50 |
| | inch | 0.59 | 0.87 | 1.28 | 1.48 |
| N | mm | 39 | 59 | 93 | 108 |
| | inch | 1.55 | 2.32 | 3.66 | 4.25 |
| O | mm | 30 | 44 | 65 | 75 |
| | inch | 1.18 | 1.73 | 2.56 | 2.95 |
| Q | mm | 25 | 35 | 55 | 65 |
| | inch | 0.98 | 1.38 | 2.17 | 2.56 |
| T | mm | 37 | 50 | 85 | 93 |
| | inch | 1.46 | 1.97 | 3.35 | 3.67 |
| U | mm | 25 | 32 | 40 | 40 |
| | inch | 0.98 | 1.26 | 1.57 | 1.57 |
| V | mm | 30 | 30 | 50 | 55 |
| | inch | 1.18 | 1.18 | 1.97 | 2.17 |

| DN | | 16 | 25 | 40 | 50 |
|---|---|---|---|---|---|
| | inch | ⅝ | 1 | 1½ | 2 |
| A | mm | 40 | 50 | 51 | 55 |
| | inch | 1.57 | 1.97 | 2.01 | 2.17 |
| B | mm | 30 | 40 | 55 | 75 |
| | inch | 1.18 | 1.57 | 2.17 | 2.95 |
| D | mm | 15 | 24 | 39 | 49 |
| | inch | 0.59 | 0.94 | 1.54 | 1.93 |
| H | mm | 17.20 | 26.20 | 41.20 | 52.20 |
| | inch | 0.68 | 1.03 | 1.62 | 2.06 |
| I | mm | 3 | 3 | 3 | 3 |
| | inch | 0.12 | 0.12 | 0.12 | 0.12 |
| K | mm | 25 | 32 | 31 | 33 |
| | inch | 0.98 | 1.26 | 1.22 | 1.30 |
| L | mm | 105 | 136 | 196 | 220 |
| | inch | 4.13 | 5.35 | 7.72 | 8.66 |
| M | mm | 15 | 22 | 32.50 | 37.50 |
| | inch | 0.59 | 0.87 | 1.28 | 1.48 |
| N | mm | 39 | 56 | 88 | 103 |
| | inch | 1.55 | 2.20 | 3.46 | 4.06 |
| O | mm | 30 | 44 | 65 | 75 |
| | inch | 1.18 | 1.73 | 2.56 | 2.95 |
| Q | mm | 25 | 35 | 55 | 65 |
| | inch | 0.98 | 1.38 | 2.17 | 2.56 |
| U | mm | 25 | 32 | 40 | 40 |
| | inch | 0.98 | 1.26 | 1.57 | 1.57 |
| V | mm | 56 | 61 | 65 | 65 |
| | inch | 2.20 | 2.40 | 2.56 | 2.56 |
| W | mm | 55 | 60 | 61 | 66 |
| | inch | 2.17 | 2.36 | 2.40 | 2.60 |
| W1 | mm | 50 | 50 | 50 | 50 |
| | inch | 1.97 | 1.97 | 1.97 | 1.97 |

## Main applications

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



## Ordering information

**Valve with manual actuator**
DN 50: toggle lever
DN 63–100: push rod

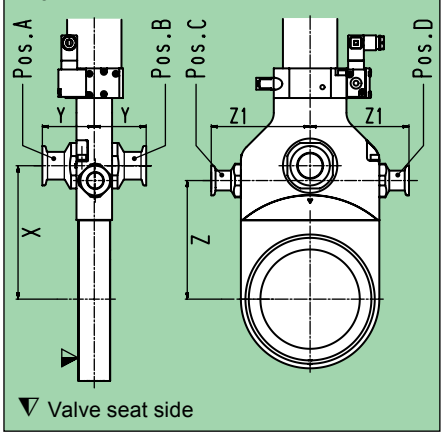
| DN | | Ordering numbers | |
|---|---|---|---|
| mm | inch | with toggle lever | with push rod |
| 50 | 2 | 08234-FA06 | – |
| 63 | 2½ | – | 08136-FA03 |
| 80 | 3 | – | 08138-FA03 |
| 100 | 4 | – | 08140-FA03 |

**Valve with pneumatic actuator**
double acting

| DN | | Ordering numbers (* specify control voltage) | | | |
|---|---|---|---|---|---|
| mm | inch | w/o solenoid valve w/o position indicator | w/o solenoid valve with position indicator | with solenoid valve w/o position indicator | with solenoid valve with position indicator |
| 50 | 2 | 08234-FA14 | 08234-FA24 | 08234-FA34* | 08234-FA44* |
| 63 | 2½ | 08136-FA14 | 08136-FA24 | 08136-FA34* | 08136-FA44* |
| 80 | 3 | 08138-FA14 | 08138-FA24 | 08138-FA34* | 08138-FA44* |
| 100 | 4 | 08140-FA14 | 08140-FA24 | 08140-FA34* | 08140-FA44* |

## Options

Dia. 1




**Actuator**

– Other solenoid valve voltage (standard: 24 V DC)

**Valve**

– Other sealing materials

– Nominal diameters DN 16, 25, 40

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

– Ports for roughing (by-pass)

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

## Spare parts

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

## Features

Body material: aluminum

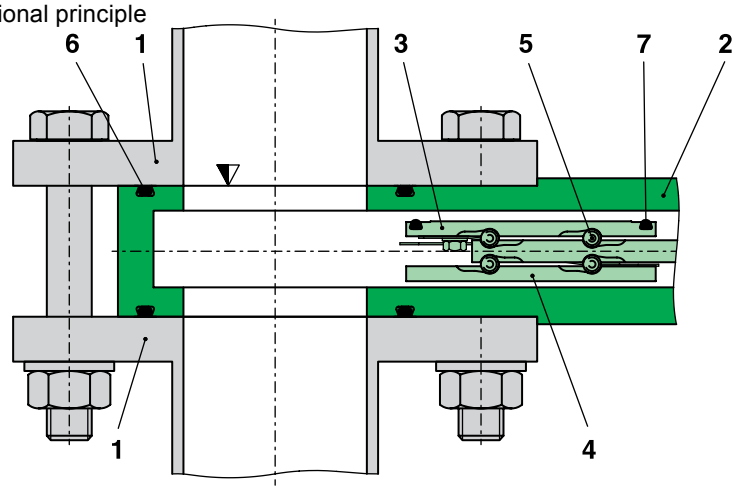
Space saving due to direct mounting between DIN flanges or sealing surfaces

Flanges with DIN centering insert

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

VATLOCK configuration: see glossary

Functional principle




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

## Technical data

| | | |
|---|---|---|
| Leak rate: valve body, valve seat | | $< 1 \cdot 10^{-9}$ mbar l s$^{-1}$ |
| Pressure range | | $1 \cdot 10^{-7}$ mbar to 1.6 bar (abs) |
| Differential pressure on the gate | | |
| – DN 50 / DN 63–100 | | ≤ 1.0 bar / ≤ 1.6 bar |
| Differential pressure at opening | | ≤ 30 mbar |
| Cycles until first service | | |
| – DN 50 | | 50 000 |
| – DN 63–100 | | 200 000 |
| Temperature [1] | | |
| – Valve body | DN 50 | ≤ 100 °C |
| | DN 63–100 | ≤ 120 °C |
| – Manual and pneumatic actuator | | ≤ 80 °C |
| – Solenoid valve | | ≤ 50 °C |
| – Position indicator | | ≤ 80 °C |
| Heating and cooling rate | | ≤ 30 °C h$^{-1}$ |
| Material | | |
| – Valve body | DN 50 | EN AW-6082 (3.2315) |
| | DN 63–100 | EN AW-5083 (3.3547), -6061 (3.3211) |
| – Mechanism | DN 50 | AISI 301 (1.4310) |
| | DN 63–100 | AISI 304 (1.4301) |
| Seal: bonnet, gate | | FKM (Viton®) |
| Feedthrough | | shaft feedthrough |
| Mounting position | | any |
| Solenoid valve | | 24 V DC, 5.4 W (others on request) |
| Position indicator: contact rating | | |
| – Voltage | DN 50 | ≤ 50 V AC / DC |
| | DN 63–100 | ≤ 250 V AC, ≤ 50 V DC |
| – Current | DN 50 | ≤ 0.1 A |
| | DN 63–100 | ≤ 2 A, ≤ 1.2 A |
| – Power | DN 50 | max. 10 W |
| Valve position indication | | visual (mechanical) |

[1] Maximum values: depending on operating conditions and sealing materials

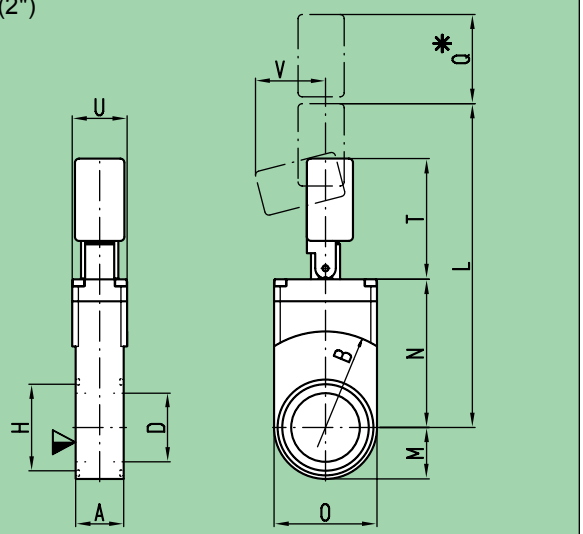
Further technical data on next page

Continued Technical data

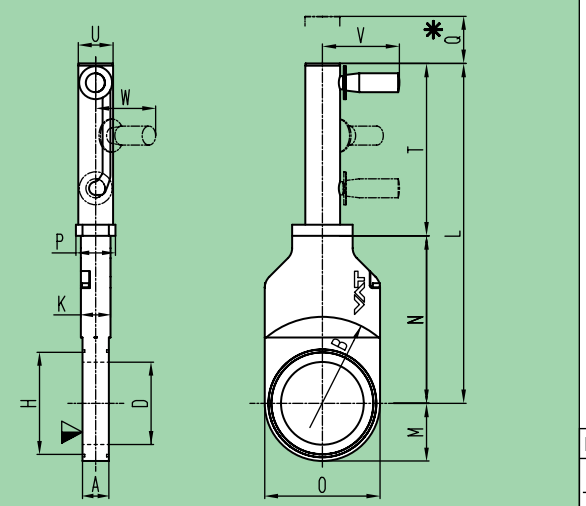
| DN (nominal I.D.) | | Conductance (molecular flow) (depending on A-dimension) | Valve with manual actuator: Weight | | Valve with pneumatic actuator: Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing or opening time | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|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

## Dimensions

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



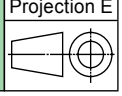

**Valve with manual actuator: push rod**
DN 63–100 (2½"–4")




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

[1] Dimensions of flange seal

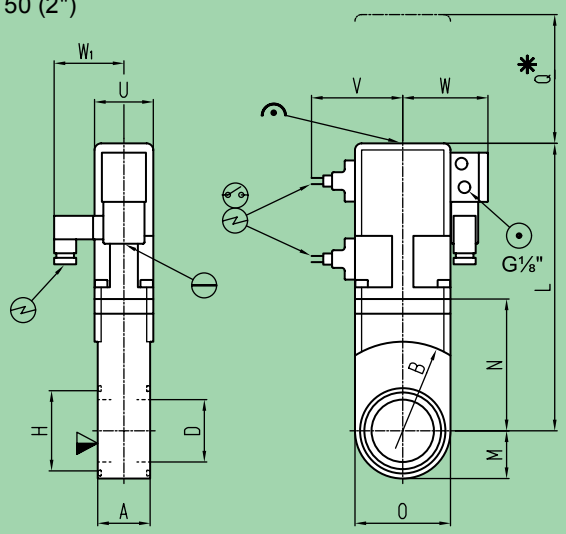
Projection E



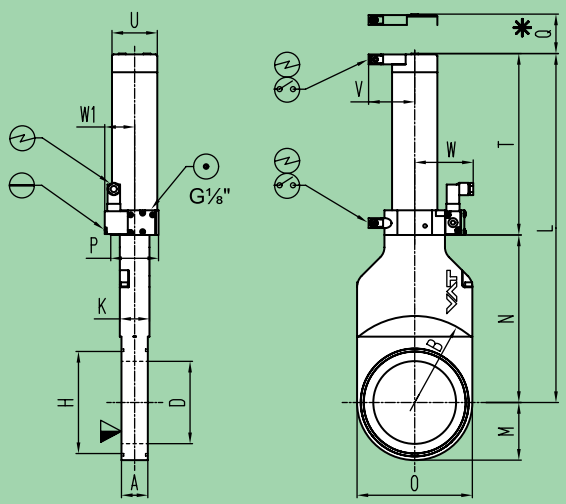
▼ Valve seat side
✳ Required for dismantling

# Dimensions

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



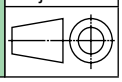

**Valve with manual actuator: double acting**
DN 63–100 (2½"–4")




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

[1] Dimensions of flange seal

Projection E

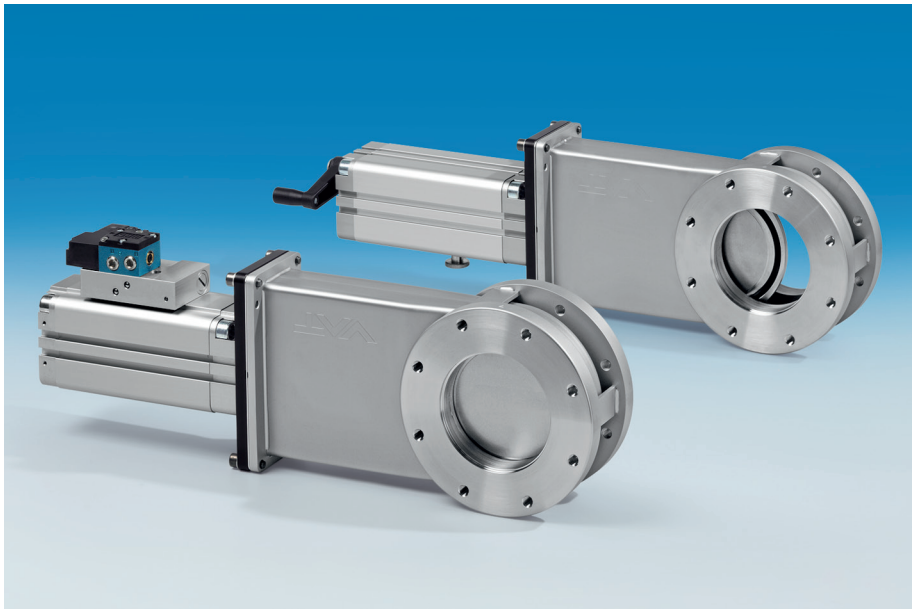


▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⊖ Electrical connection
◠ Mechanical position indication
◔ Position indicator
⊖ Emergency operation

## Main applications

Valve for demanding pump isolation applications

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



## Ordering information

**Valve with manual actuator**
crank handle

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

with position indicator: 091 . . - . E0**8**

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

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

without solenoid valve, with position indicator: 091 . . - . E**2**4
with solenoid valve, with position indicator: 091 . . - . E**4**4 (specify control voltage)

## Features

Body material: stainless steel

With bellows

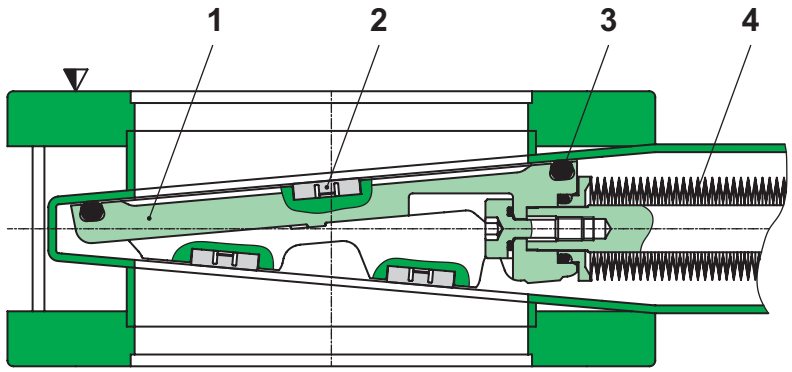
For very contaminating processes

No grease and no moving parts in the vacuum

Opening at 1 bar differential pressure possible

Very easy maintenance thanks to simple wedge design

Functional principle




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

## Technical data

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

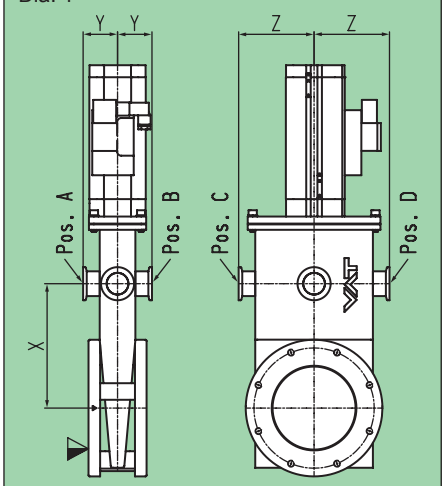
Further technical data on next page →

Continued Technical data

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

## Options

Dia. 1




**Actuator**

– Solenoid valve for impulse actuation:
last valve position is maintained at power failure

– Solenoid valve separate, for external mounting

– Other solenoid valve voltage (standard: 24 V DC)

**Valve**

– Shaft feedthrough

– PTFE bellows for shaft feedthrough

– Ports for roughing (by-pass), venting or for gauges (Dia. 1),
possible in positions A, B, C and D

| DN valve | | 50 | 63 | 80 | 100 | 160 | 200 | 250 |
|---|---|---|---|---|---|---|---|---|
| | mm | 2 | 2½ | 3 | 4 | 6 | 8 | 10 |
| | inch | | | | | | | |
| Recommended port ISO-KF | | 25 | 25 | 25 | 25 | 25 | on request | on request |
| X | mm | 90 | 110 | 130 | 150 | 215 | | |
| | inch | 3.54 | 4.33 | 5.12 | 5.91 | 8.46 | | |
| Y | mm | 41.50 | 41.50 | 41.50 | 41.50 | 52 | | |
| | inch | 1.63 | 1.63 | 1.63 | 1.63 | 2.05 | | |
| Z | mm | 65 | 72.50 | 91 | 91 | 116 | | |
| | inch | 2.56 | 2.85 | 3.58 | 3.58 | 4.57 | | |
| Other ports on request | | | | | | | | |

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

## Spare parts

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

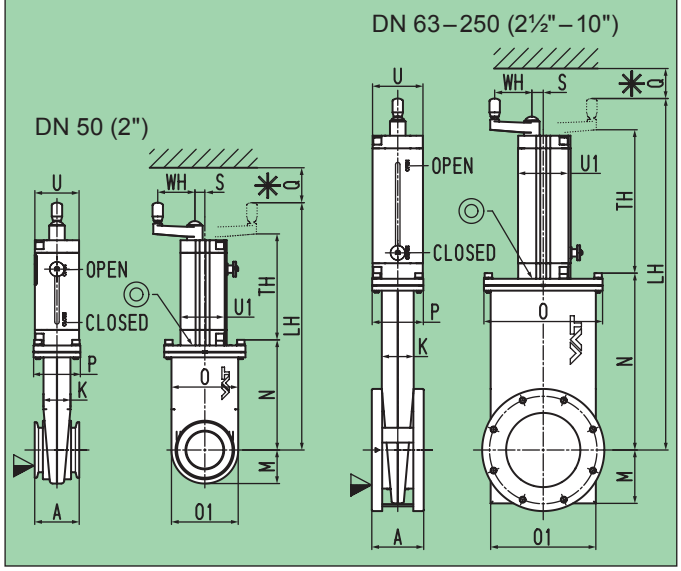
## Accessories

– **Heater**
on request (specify fabrication number of valve)

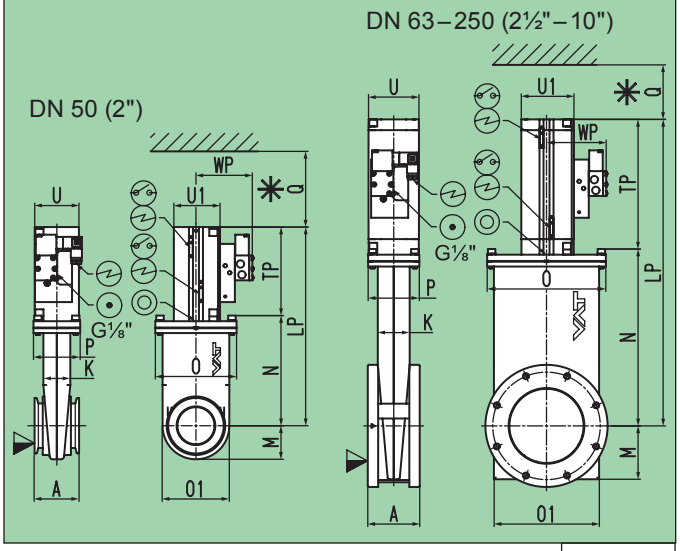
– **Flange connections**
for installation of the valve: see series 32 and 33

# Main dimensions

**Valve with manual actuator: crank handle**

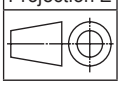



**Valve with pneumatic actuator: double acting**




▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⇄ Electrical connection
◎ Position indicator
◎ Leak detection hole

Projection E



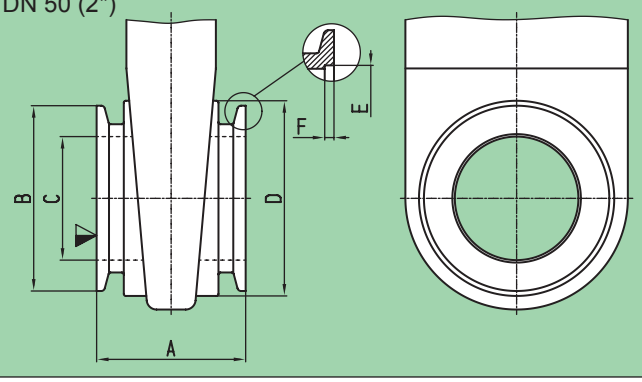
Flange dimensions: see pages 34–35
DN 200–250 (8"–10") on request

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

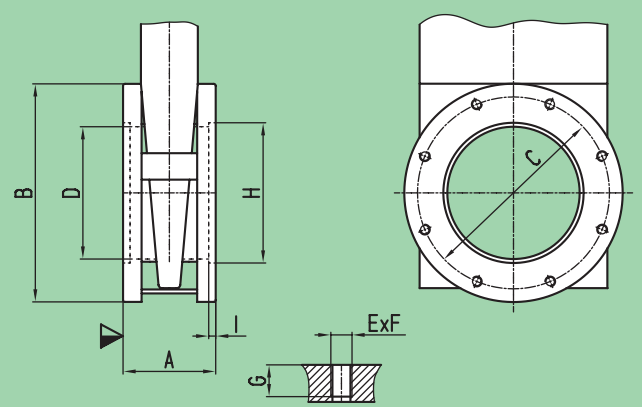
| DN | mm / inch | 50 / 2 | 63 / 2½ | 80 / 3 | 100 / 4 | 160 / 6 |
|---|---|---|---|---|---|---|
| A | mm | 60 | 70 | 70 | 70 | 90 |
| | inch | 2.36 | 2.75 | 2.75 | 2.75 | 3.54 |
| K | mm | 36 | 43 | 43 | 43 | 52.50 |
| | inch | 1.42 | 1.69 | 1.69 | 1.69 | 2.06 |
| LP | mm | 268 | 314 | 384 | 413.50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

## Flange dimensions

**ISO-KF**
DN 50 (2")



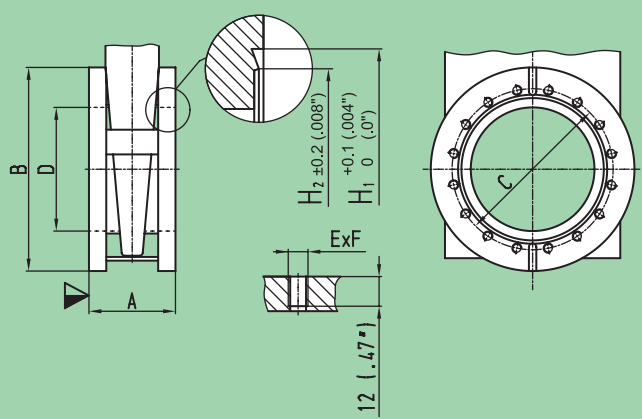

**ISO-F**
DN 63–250 (2½"–10")




| | | ISO-KF | ISO-F | | | |
|---|---|---|---|---|---|---|
| DN | mm | 50 | 63 | 80 | 100 | 160 |
| | inch | 2 | 2 ½ | 3 | 4 | 6 |
| A | mm | 60 | 70 | 70 | 70 | 90 |
| | inch | 2.36 | 2.76 | 2.76 | 2.76 | 3.54 |
| B | mm | 75 | 136 | 145 | 165 | 225 |
| | inch | 2.95 | 5.35 | 5.70 | 6.50 | 8.86 |
| C | mm | 50 | 110 | 125 | 145 | 200 |
| | inch | 1.97 | 4.33 | 4.92 | 5.71 | 7.87 |
| D | mm | 79 | 63 | 80 | 100 | 150 |
| | inch | 3.11 | 2.48 | 3.15 | 3.94 | 5.91 |
| E | mm | 52.20 | – | – | – | – |
| | inch | 2.06 | | | | |
| F | mm | 3 | – | – | – | – |
| | inch | 0.19 | | | | |
| E × F | | – | 4 × M8 | 8 × M8 | 8 × M8 | 8 × M10 |
| G | mm | – | 12 | 12 | 12 | 15 |
| | inch | | 0.47 | 0.47 | 0.47 | 0.59 |
| H | mm | – | 70 | 83 | 102 | 153 |
| | inch | | 2.76 | 3.27 | 4.02 | 6.02 |
| I | mm | – | 3 | 3 | 3 | 5 |
| | inch | | 0.12 | 0.12 | 0.12 | 0.20 |

DN 200–250 (8"–10") on request

**CF-F**
DN 50–250 (2"–10")

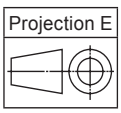



| | | | | | | |
|---|---|---|---|---|---|---|
| DN | mm | 50 | 63 | 80 | 100 | 160 |
| | inch | 2 | 2 ½ | 3 | 4 | 6 |
| O.D. | inch | 3 | 4 ½ | 4 ⅝ | 6 | 8 |
| A | mm | 60 | 70 | 70 | 70 | 90 |
| | inch | 2.36 | 2.76 | 2.76 | 2.76 | 3.54 |
| B | mm | 85.80 | 135.80 | 145 | 164.80 | 224.80 |
| | inch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

DN 200–250 (8"–10") on request

[1] Metric threads
[2] UNF threads

Projection E

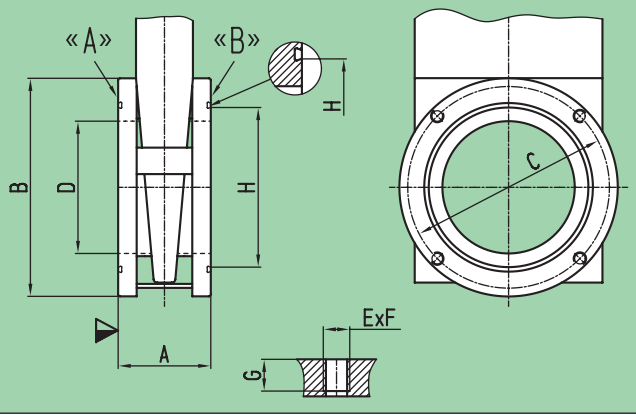


▼ Valve seat side

## Flange dimensions

**ASA-LP**
DN 63–250 (2½"–10")
with or without O-ring groove

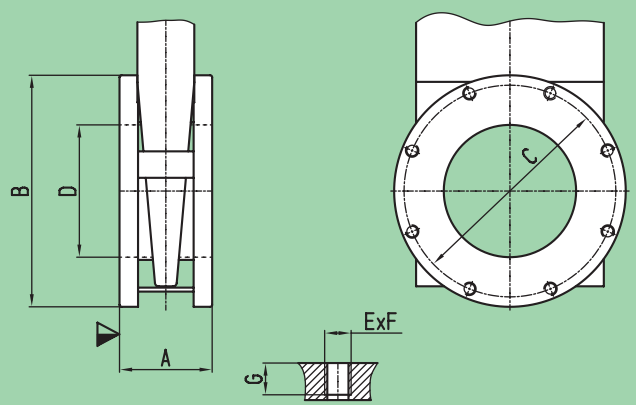
For orders with O-ring groove specify:
«A», «B» or «A+B»




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

DN 200–250 (8"–10") on request

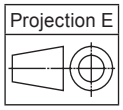
**JIS B 2290: 1998 / ISO 1609**
DN 65–250 (2½"–10")




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

DN 200–250 (8"–10") on request

Projection E



▽ Valve seat side

## Main applications

The standard valve for UHV isolation applications in research and industry



## Ordering information

**Valve with manual actuator**
crank handle

| DN | | Ordering numbers | | | | |
|---|---|---|---|---|---|---|
| mm | inch | ISO-F | CF-F metric threads | CF-F UNF threads | ASA-LP | JIS |
| 63 | 2½ | 10836-PE01 | 10836-CE01 | 10836-UE01 | 10836-TE01 | 10836-JE01 |
| 80 | 3 | 10838-PE01 | 10838-CE01 | 10838-UE01 | 10838-TE01 | 10838-JE01 |
| 100 | 4 | 10840-PE01 | 10840-CE01 | 10840-UE01 | 10840-TE01 | 10840-JE01 |
| 160 | 6 | 10844-PE01 | 10844-CE01 | 10844-UE01 | 10844-TE01 | 10844-JE01 |
| 200 | 8 | 10846-PE01 | 10846-CE01 | 10846-UE01 | 10846-TE01 | 10846-JE01 |
| 250 | 10 | 10848-PE01 | 10848-CE01 | 10848-UE01 | 10848-TE01 | 10848-JE01 |
| 320 | 12 | 10850-PE01 | on request | on request | 10850-TE01 | 10850-JE01 |

with position indicator: 108 . . - . E0**8**

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

| DN | | Ordering numbers (specify control voltage) | | | | |
|---|---|---|---|---|---|---|
| mm | inch | ISO-F | CF-F metric threads | CF-F UNF threads | ASA-LP | JIS |
| 63 | 2½ | 10836-PE44 | 10836-CE44 | 10836-UE44 | 10836-TE44 | 10836-JE44 |
| 80 | 3 | 10838-PE44 | 10838-CE44 | 10838-UE44 | 10838-TE44 | 10838-JE44 |
| 100 | 4 | 10840-PE44 | 10840-CE44 | 10840-UE44 | 10840-TE44 | 10840-JE44 |
| 160 | 6 | 10844-PE44 | 10844-CE44 | 10844-UE44 | 10844-TE44 | 10844-JE44 |
| 200 | 8 | 10846-PE44 | 10846-CE44 | 10846-UE44 | 10846-TE44 | 10846-JE44 |
| 250 | 10 | 10848-PE44 | 10848-CE44 | 10848-UE44 | 10848-TE44 | 10848-JE44 |
| 320 | 12 | 10850-PE44 | on request | on request | 10850-TE44 | 10850-JE44 |

without solenoid valve, without position indicator: 108 . . - . E**1**4
without solenoid valve, with position indicator: 108 . . - . E**2**4
with solenoid valve, without position indicator: 108 . . - . E**3**4 (specify control voltage)

Further ordering information on next page →

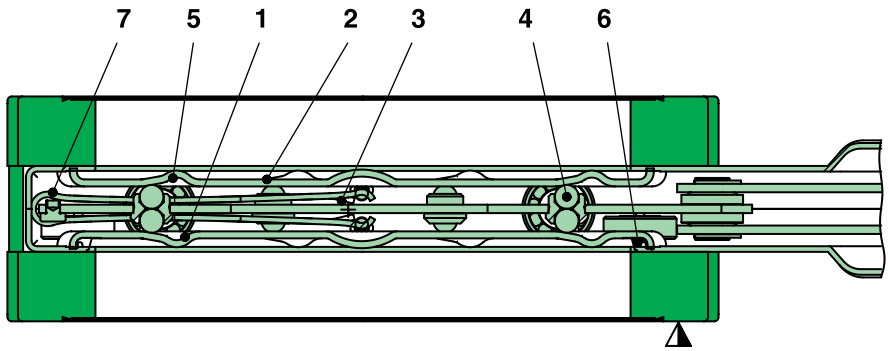
## Features

Body material: stainless steel

Bellows sealed, unlubricated mechanism

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

Functional principle




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

## Technical data

| | |
|---|---|
| Leak rate | |
| – Valve body | $< 5 \cdot 10^{-10}$ mbar ls$^{-1}$ |
| – Valve seat | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| Pressure range | |
| – DN 63–200 | $1 \cdot 10^{-10}$ mbar to 1.6 bar (abs) |
| – DN 250–320 | $1 \cdot 10^{-10}$ mbar to 1.2 bar (abs) |
| Differential pressure on the gate | |
| – DN 63–200 | ≤1.6 bar |
| – DN 250–320 | ≤1.2 bar |
| Differential pressure at opening | ≤30 mbar |
| Cycles until first service | 50 000 |
| Temperature [1] | |
| – Valve body | ≤250 °C open, ≤200 °C closed |
| – Manual actuator | ≤250 °C |
| – Pneumatic actuator | ≤200 °C |
| – Solenoid valve | ≤ 50 °C |
| – Position indicator | ≤ 80 °C |

[1] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page

Continued Ordering information

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

| DN | | Ordering numbers (specify control voltage) | | | | |
|---|---|---|---|---|---|---|
| mm | inch | ISO-F | CF-F metric threads | CF-F UNF threads | ASA-LP | JIS |
| 63 | 2½ | 10836-PE48 | 10836-CE48 | 10836-UE48 | 10836-TE48 | 10836-JE48 |
| 80 | 3 | 10838-PE48 | 10838-CE48 | 10838-UE48 | 10838-TE48 | 10838-JE48 |
| 100 | 4 | 10840-PE48 | 10840-CE48 | 10840-UE48 | 10840-TE48 | 10840-JE48 |
| 160 | 6 | 10844-PE48 | 10844-CE48 | 10844-UE48 | 10844-TE48 | 10844-JE48 |
| 200 | 8 | 10846-PE48 | 10846-CE48 | 10846-UE48 | 10846-TE48 | 10846-JE48 |
| 250 | 10 | 10848-PE48 | 10848-CE48 | 10848-UE48 | 10848-TE48 | 10848-JE48 |
| 320 | 12 | 10850-PE48 | on request | on request | 10850-TE48 | 10850-JE48 |

without solenoid valve, with position indicator: 108 . . - . E**2**8

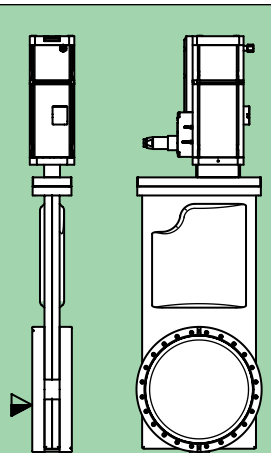
Continued Technical data

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

| | | | | Valve with manual actuator | | | Valve with pneumatic actuator | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DN (nominal I.D.) | | Standard flanges | Conductance (molecular flow) (depending on A-dimension and flange type) | Turns per stroke | Weight | | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing or opening time | Weight | |
| mm | inch | | $ls^{-1}$ | n | kg | lbs | bar | psi | l | $ft^3$ | s | kg | lbs |
| 63 | 2½ | See pages 42 – 43 | 600 | 10 | 9 | 20 | 4 – 7 | 58 – 102 | 0.08 | 0.0028 | 1 | 9 | 20 |
| 80 | 3 | | 765 | 10 | 9 | 20 | 4 – 7 | 58 – 102 | 0.08 | 0.0028 | 1 | 9 | 20 |
| 100 | 4 | | 1740 | 13 | 12 | 26 | 4 – 7 | 58 – 102 | 0.11 | 0.0038 | 1.2 | 12 | 26 |
| 160 | 6 | | 5880 | 17 | 18 | 40 | 4 – 7 | 58 – 102 | 0.14 | 0.0049 | 1.5 | 18 | 40 |
| 200 | 8 | | 12200 | 17 | 25 | 55 | 4 – 7 | 58 – 102 | 0.25 | 0.0087 | 2 | 24 | 53 |
| 250 | 10 | | 21690 | 40 | 52 | 114 | 5 – 7 | 73 – 102 | 0.35 | 0.0122 | 4 | 42 | 92 |
| 320 | 12 | | 29130 | 45 | 86 | 190 | 5 – 7 | 73 – 102 | 0.48 | 0.0167 | 5 | 95 | 210 |

## Options

Dia. 1



▽ Valve seat side

**Actuator**

– Solenoid valve for impulse actuation:
last valve position is maintained at power failure

– Solenoid valve separate, for external mounting

– Other solenoid valve voltage (standard: 24 V DC)

– Manual emergency operation on solenoid valve lockable

– 3-position pneumatic actuator for throttling (Dia. 1):
ordering information on page 37, technical data on request

– Double position indicator
(2 switches each for the positions «open» and «closed»)

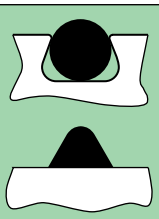
– Bakeable position indicator:
manual actuator bakeable to max. 250 °C, pneumatic actuator to max. 200 °C

– Position indicator with change-over contact

Dia. 2

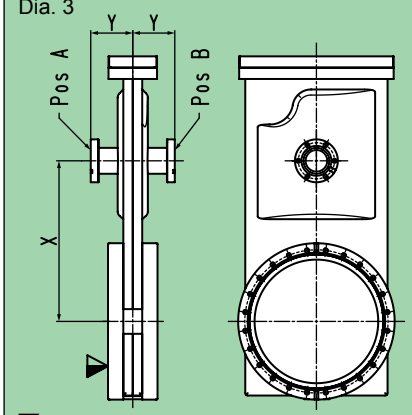
O-ring seal

Vulcanized seal



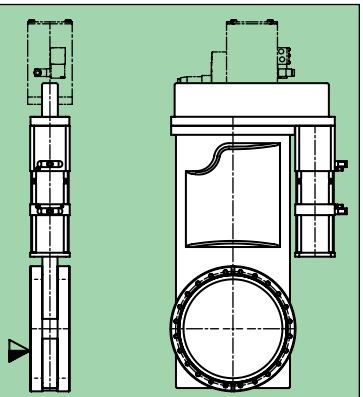
See glossary

Dia. 3




▽ Valve seat side

Dia. 4



▽ Valve seat side

**Valve**

– Customer specified flanges with / without watercooling

– Other sealing materials

– O-ring seal in gate (Dia. 2) with DN 63, 100, 160, 200 (standard: vulcanized seal)

– Ports for roughing (by-pass), venting or for gauges (Dia. 3), possible in positions A and B

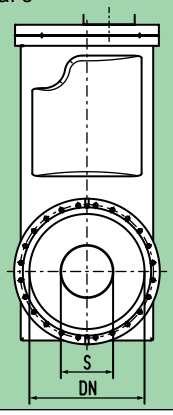
| DN valve | mm / inch | 63 / 2½ | 80 / 3 | 100 / 4 | 160 / 6 | 200 / 8 | 250 / 10 | 320 / 12 |
|---|---|---|---|---|---|---|---|---|
| Recommended port CF-F | | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| X | mm / inch | 110 / 4.33 | 110 / 4.33 | 120 / 4.72 | 205 / 8.07 | 260 / 10.24 | 335 / 13.19 | 415 / 16.34 |
| Y | mm / inch | 44 / 1.73 | 44 / 1.73 | 44 / 1.73 | 44 / 1.73 | 48 / 1.89 | 62 / 2.44 | 72 / 2.83 |
| Other ports on request | | | | | | | | |

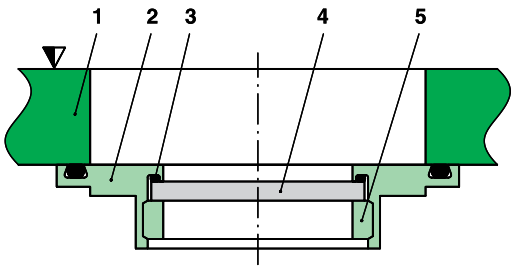
– Space saving compact version, DN 200 + 250 (Dia. 4)

– Special gate for the installation of various foils

– Window in gate with DN 63, 100, 160, 200 (Dia. 5): window screwed into gate, window material: e. g. borosilicate, elastomer seal

Dia. 5




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



| DN valve | mm / inch | 63 / 2½ | 100 / 4 | 160 / 6 | 200 / 8 |
|---|---|---|---|---|---|
| Optically free diameter «S» | mm / inch | 40 / 1.57 | 43 / 1.69 | 68 / 2.67 | 90 / 3.54 |
| Thickness of glass | mm / inch | 4 / 0.15 | 4 / 0.15 | 6 / 0.23 | 6 / 0.23 |

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

## Spare parts

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

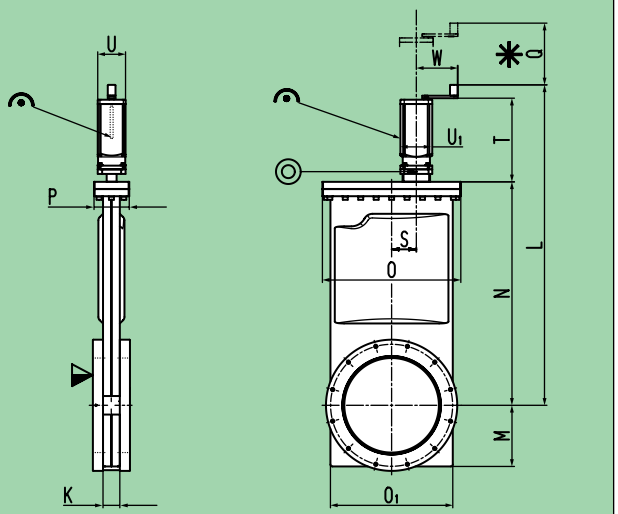
## Accessories

– **Heater**
on request (specify fabrication number of valve)

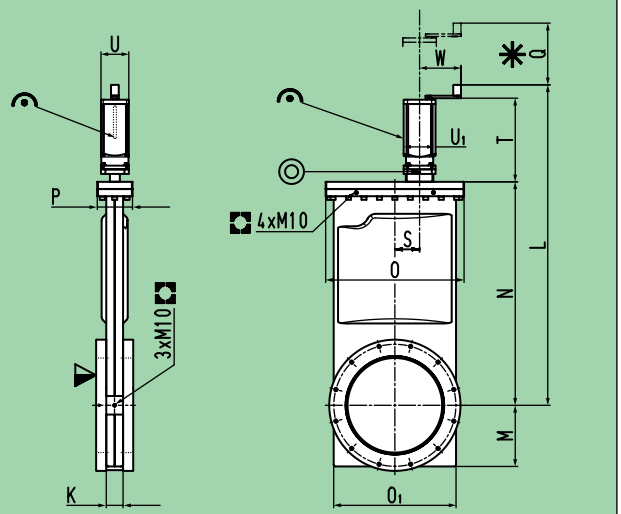
– **Flange connections**
for installation of the valve: see series 32 and 33

## Main dimensions

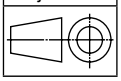
**Valve with manual actuator: crank handle**
DN 63–200 (2½"–8")




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




Projection E



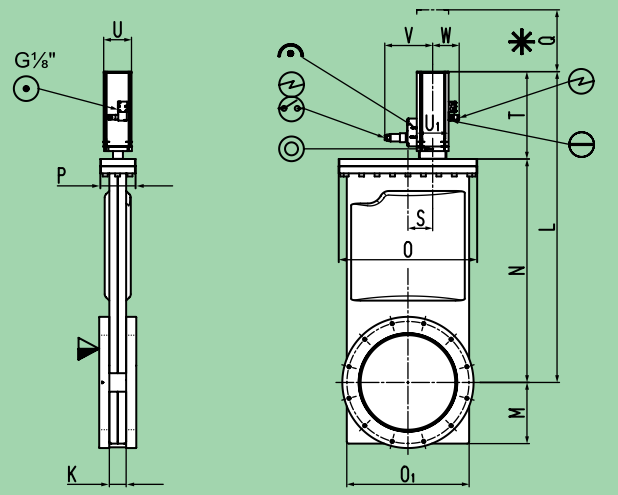
▼ Valve seat side
✳ Required for dismantling
Mechanical position indication
◎ Leak detection hole
For attachment

Flange dimensions: see pages 42–43

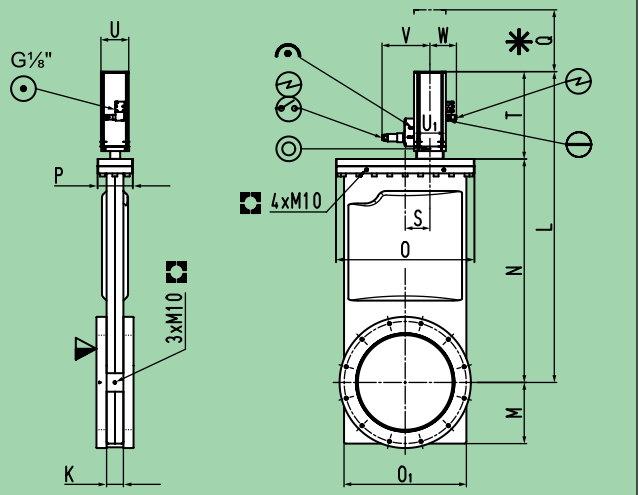
| DN | | 63 | 80 | 100 | 160 | 200 | 250 | 320 |
|---|---|---|---|---|---|---|---|---|
| | mm | 2½ | 3 | 4 | 6 | 8 | 10 | 12 |
| K | mm | 25.55 | 25.55 | 25.55 | 25.55 | 31 | 41 | 54 |
| | inch | 1.01 | 1.01 | 1.01 | 1.01 | 1.22 | 1.61 | 2.13 |
| L | mm | 408 | 421 | 462 | 552 | 660 | 841 | 1038 |
|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

# Main dimensions

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

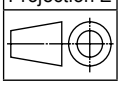



**Valve with pneumatic actuator: double acting**
DN 250–320 (10"–12")




- Valve seat side
- Required for dismantling
- Compressed air connection
- Electrical connection
- Mechanical position indication
- Position indicator
- Leak detection hole
- Emergency operation
- For attachment

Projection E

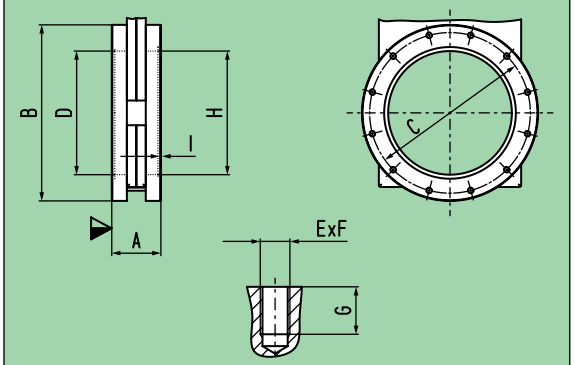


Flange dimensions: see pages 42–43

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

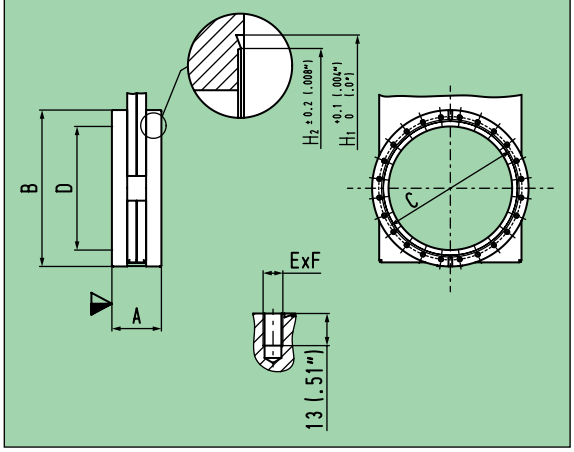
## Flange dimensions

**ISO-F**
DN 63–320 (2½"–12")



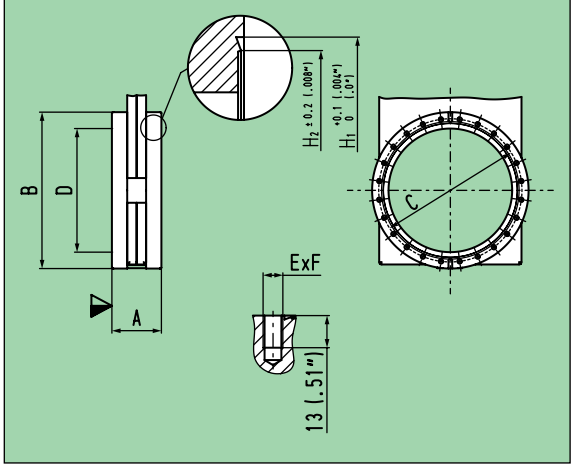

| DN | | 63 | 80 | 100 | 160 | 200 | 250 | 320 |
|---|---|---|---|---|---|---|---|---|
| | inch | 2½ | 3 | 4 | 6 | 8 | 10 | 12 |
| A | mm | 70 | 70 | 70 | 70 | 80 | 100 | 120 |
| | inch | 2.76 | 2.76 | 2.76 | 2.76 | 3.15 | 3.94 | 4.72 |
| B | mm | 130 | 145 | 165 | 225 | 285 | 350 | 425 |
| | inch |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

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



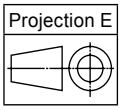

| DN | | 63 | 80 | 100 | 160 | 200 | 250 | |
|---|---|---|---|---|---|---|---|---|
| | inch | 2½ | 3 | 4 | 6 | 8 | 10 | |
| O.D. | inch | 4½ | 4⅝ | 6 | 8 | 10 | 12 | |
| A | mm | 70 | 70 | 70 | 70 | 80 | 100 | |
| | inch | 2.76 | 2.76 | 2.76 | 2.76 | 3.15 | 3.94 | |
| B | mm | 113.50 | 117.50 | 151.60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

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




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

Projection E



▼ Valve seat side

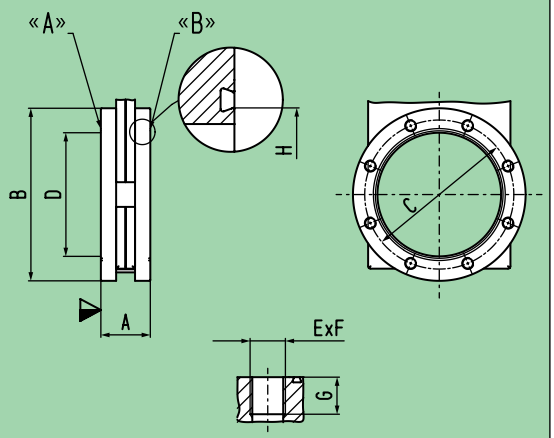
*) O.D. 12" VAT standard, O.D. 13¼" option

**Ordering information for option:** O.D. 13¼"
Ordering No. of valve-X (e. g. 10848-UE44-X, X = O.D. 13¼")

# Flange dimensions

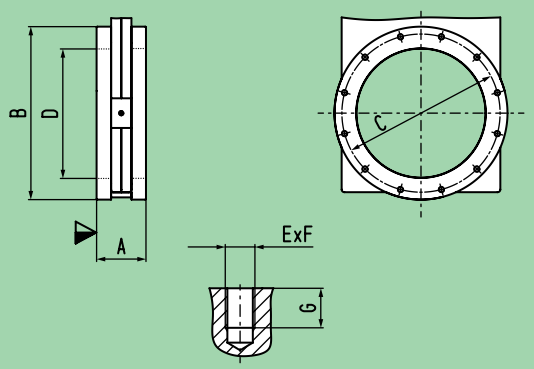
**ASA-LP**
DN 63–320 (2½"–12")
with or without O-ring groove

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



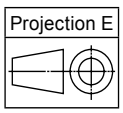

| DN | | 63 | 80 | 100 | 160 | 200 | 250 | 320 |
|---|---|---|---|---|---|---|---|---|
| | mm | 63 | 80 | 100 | 160 | 200 | 250 | 320 |
| | inch | 2½ | 3 | 4 | 6 | 8 | 10 | 12 |
| ASA-LP | | 2 | – | 3 | 4 | 6 | 8 | 10 |
| A | mm | 70 | 70 | 70 | 70 | 80 | 100 | 120 |
| | inch | 2.76 | 2.76 | 2.76 | 2.76 | 3.15 | 3.94 | 4.72 |
| B | mm | 152.40 | 177.80 | 190.50 | 225 | 279.40 | 350 | 425 |
| | inch | 6.00 | 7.00 | 7.50 | 8.86 | 11.00 | 13.78 | 16.73 |
| C | mm | 120.70 | 139.70 | 152.40 | 190.50 | 241.30 | 298.50 | 362 |
| | inch | 4.75 | 5.50 | 6.00 | 7.50 | 9.50 | 11.75 | 14.25 |
| D | mm | 70 | 76 | 100 | 150 | 200 | 254 | 300 |
| | inch | 2.76 | 2.99 | 3.94 | 5.91 | 7.87 | 10.00 | 11.81 |
| E × F | | 4 × ⅜" 16 UNC | 4 × ⅜" 16 UNC | 8 × ⅜" 16 UNC | 8 × ⅜" 16 UNC | 8 × ¾" 10 UNC | 8 × ¾" 10 UNC | 12 × ¾" 10 UNC |
| G | mm | 15 | 15 | 15 | 15 | 19 | 19 | 19 |
| | inch | 0.59 | 0.59 | 0.59 | 0.59 | 0.75 | 0.75 | 0.75 |
| H | mm | 88.90 | 88.90 | 120.65 | 158.75 | 206.40 | 266.70 | 317.50 |
| | inch | 3.50 | 3.50 | 4.75 | 6.25 | 8.13 | 10.50 | 12.50 |
| O-ring I.D. × d | mm inch | 88.49 × 3.53 3.48 × .139 | 88.49 × 3.53 3.48 × .139 | 120.24 × 3.53 4.73 × .139 | 158.34 × 3.53 6.23 × .139 | 202.79 × 3.53 7.98 × .139 | 266.29 × 3.53 10.48 × .139 | 316.87 × 7.00 12.47 × .275 |

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




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

Projection E



▽ Valve seat side

## Main applications

General purpose valve for isolation in high vacuum systems

Especially suited to pump isolation



## Ordering information

**Valve with manual actuator**
crank handle

| DN | | Ordering numbers | | | | |
|---|---|---|---|---|---|---|
| mm | inch | ISO-F | CF-F metric threads | CF-F UNF threads | ASA-LP | JIS |
| 63 | 2½ | 11036-PE01 | 11036-CE01 | 11036-UE01 | 11036-TE01 | 11036-JE01 |
| 80 | 3 | 11038-PE01 | 11038-CE01 | 11038-UE01 | 11038-TE01 | 11038-JE01 |
| 100 | 4 | 11040-PE01 | 11040-CE01 | 11040-UE01 | 11040-TE01 | 11040-JE01 |
| 160 | 6 | 11044-PE01 | 11044-CE01 | 11044-UE01 | 11044-TE01 | 11044-JE01 |
| 200 | 8 | 11046-PE01 | 11046-CE01 | 11046-UE01 | 11046-TE01 | 11046-JE01 |
| 250 | 10 | 11048-PE01 | 11048-CE01 | 11048-UE01 | 11048-TE01 | 11048-JE01 |
| 320 | 12 | 11050-PE01 | on request | on request | 11050-TE01 | 11050-JE01 |

with position indicator: 110 . . - . E0**8**

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

| DN | | Ordering numbers (specify control voltage) | | | | |
|---|---|---|---|---|---|---|
| mm | inch | ISO-F | CF-F metric threads | CF-F UNF threads | ASA-LP | JIS |
| 63 | 2½ | 11036-PE44 | 11036-CE44 | 11036-UE44 | 11036-TE44 | 11036-JE44 |
| 80 | 3 | 11038-PE44 | 11038-CE44 | 11038-UE44 | 11038-TE44 | 11038-JE44 |
| 100 | 4 | 11040-PE44 | 11040-CE44 | 11040-UE44 | 11040-TE44 | 11040-JE44 |
| 160 | 6 | 11044-PE44 | 11044-CE44 | 11044-UE44 | 11044-TE44 | 11044-JE44 |
| 200 | 8 | 11046-PE44 | 11046-CE44 | 11046-UE44 | 11046-TE44 | 11046-JE44 |
| 250 | 10 | 11048-PE44 | 11048-CE44 | 11048-UE44 | 11048-TE44 | 11048-JE44 |
| 320 | 12 | 11050-PE44 | on request | on request | 11050-TE44 | 11050-JE44 |

without solenoid valve, without position indicator: 110 . . - . E**1**4
without solenoid valve, with position indicator: 110 . . - . E**2**4
with solenoid valve, without position indicator: 110 . . - . E**3**4 (specify control voltage)

Further ordering information on next page →

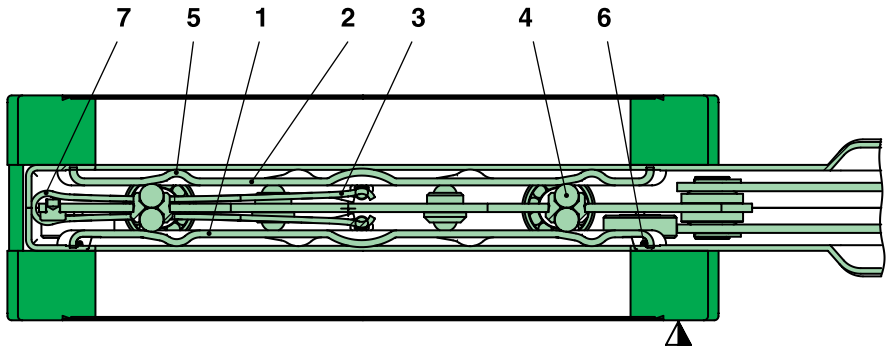
## Features

Body material: stainless steel

Low-cost bellows sealed valve

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

Functional principle




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

## Technical data

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

[1] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page

Continued Ordering information

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

| DN | | Ordering numbers (specify control voltage) | | | | |
|---|---|---|---|---|---|---|
| mm | inch | ISO-F | CF-F metric threads | CF-F UNF threads | ASA-LP | JIS |
| 63 | 2½ | 11036-PE48 | 11036-CE48 | 11036-UE48 | 11036-TE48 | 11036-JE48 |
| 80 | 3 | 11038-PE48 | 11038-CE48 | 11038-UE48 | 11038-TE48 | 11038-JE48 |
| 100 | 4 | 11040-PE48 | 11040-CE48 | 11040-UE48 | 11040-TE48 | 11040-JE48 |
| 160 | 6 | 11044-PE48 | 11044-CE48 | 11044-UE48 | 11044-TE48 | 11044-JE48 |
| 200 | 8 | 11046-PE48 | 11046-CE48 | 11046-UE48 | 11046-TE48 | 11046-JE48 |
| 250 | 10 | 11048-PE48 | 11048-CE48 | 11048-UE48 | 11048-TE48 | 11048-JE48 |
| 320 | 12 | 11050-PE48 | on request | on request | 11050-TE48 | 11050-JE48 |

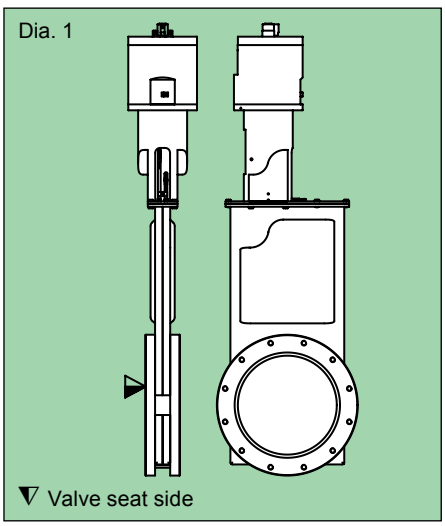
without solenoid valve, with position indicator: 110 . . - . E**2**8

Continued Technical data

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

| | | | | Valve with manual actuator | | | Valve with pneumatic actuator | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DN (nominal I. D.) | | Standard flanges | Conductance (molecular flow) (depending on A-dimension and flange type) | Turns per stroke | Weight | | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing or opening time | Weight | |
| mm | inch | | $l s^{-1}$ | n | kg | lbs | bar | psi | l | $ft^3$ | s | kg | lbs |
| 63 | 2½ | Sse pages 50 – 51 | 600 | 10 | 7 | 16 | 4 – 7 | 58 – 102 | 0.096 | 0.0034 | 1 | 7 | 16 |
| 80 | 3 | | 765 | 10 | 8 | 18 | 4 – 7 | 58 – 102 | 0.096 | 0.0034 | 1 | 8 | 18 |
| 100 | 4 | | 1740 | 14 | 10 | 22 | 4 – 7 | 58 – 102 | 0.127 | 0.0045 | 1.5 | 10.5 | 23 |
| 160 | 6 | | 5880 | 17 | 12 | 27 | 4 – 7 | 58 – 102 | 0.150 | 0.0053 | 2.5 | 13.5 | 30 |
| 200 | 8 | | 13940 | 17 | 21 | 47 | 4 – 7 | 58 – 102 | 0.260 | 0.0092 | 3.5 | 21 | 47 |
| 250 | 10 | | 27110 | 24 | 45 | 100 | 5 – 7 | 73 – 102 | 0.350 | 0.0124 | 4.5 | 39 | 86 |
| 320 | 12 | | 34955 | 32 | 70 | 155 | 5 – 7 | 73 – 102 | 0.460 | 0.0162 | 5.5 | 70 | 155 |

## Options




**Actuator**

– Solenoid valve for impulse actuation:
last valve position is maintained at power failure

– Solenoid valve separate, for external mounting

– Other solenoid valve voltage (standard: 24 V DC)

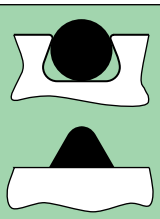
– Manual emergency operation on solenoid valve lockable

– 3-position pneumatic actuator for throttling (Dia. 1):
ordering information on page 45, technical data on request

Dia. 2

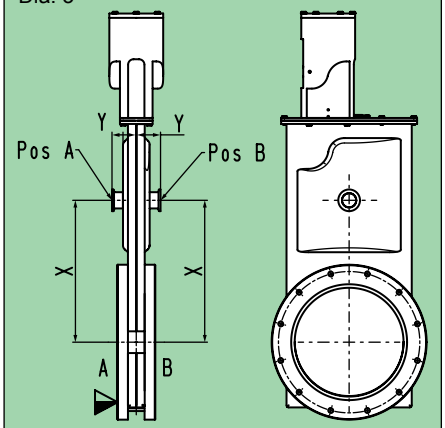
O-ring seal

Vulcanized seal



See glossary

Dia. 3




▼ Valve seat side

**Valve**

– Customer specified flanges with / without watercooling

– Other sealing materials

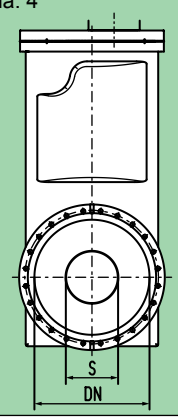
– O-ring seal in gate (Dia. 2) with DN 63, 100, 160, 200 (standard: vulcanized seal)

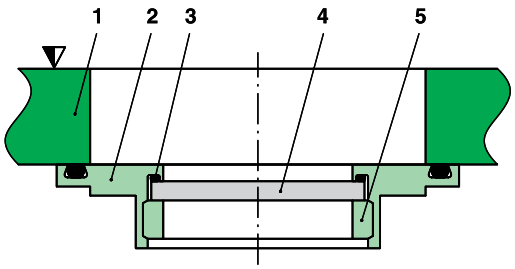
– Ports for roughing (by-pass), venting or for gauges (Dia. 3), possible in positions A and B

| DN valve | mm<br>inch | 63<br>2½ | 80<br>3 | 100<br>4 | 160<br>6 | 200<br>8 | 250<br>10 | 320<br>12 |
|---|---|---|---|---|---|---|---|---|
| Recommended port ISO-KF | | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| X | mm<br>inch | 110<br>4.33 | 110<br>4.33 | 150<br>5.91 | 205<br>8.07 | 260<br>10.24 | 335<br>13.19 | 415<br>16.34 |
| Y | mm<br>inch | 20<br>0.79 | 20<br>0.79 | 20<br>0.79 | 20<br>0.79 | 20<br>0.79 | 20<br>0.79 | 20<br>0.79 |
| Other ports on request | | | | | | | | |

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

Dia. 4




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



| DN valve | mm<br>inch | 63<br>2½ | 100<br>4 | 160<br>6 | 200<br>8 |
|---|---|---|---|---|---|
| Optically free diameter «S» | mm<br>inch | 40<br>1.57 | 43<br>1.69 | 68<br>2.67 | 90<br>3.54 |
| Thickness of glass | mm<br>inch | 4<br>0.15 | 4<br>0.15 | 6<br>0.23 | 6<br>0.23 |

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

## Spare parts

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

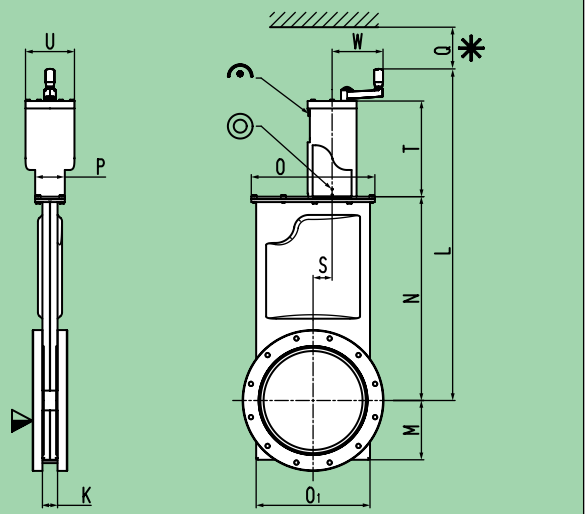
## Accessories

– **Heater**
on request (specify fabrication number of valve)

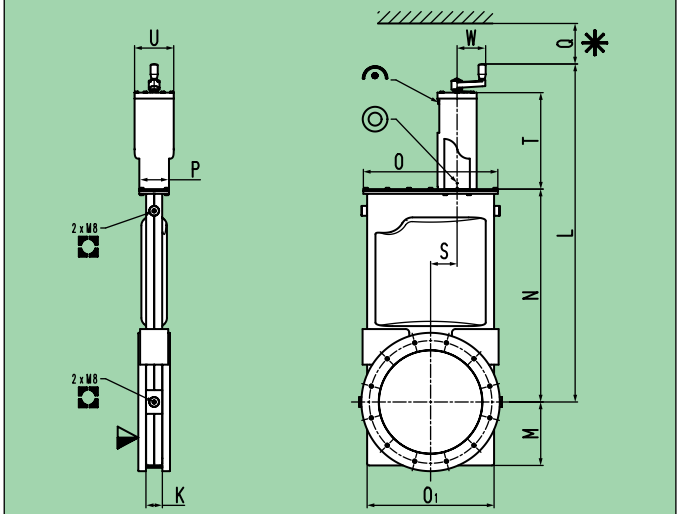
– **Flange connections**
for installation of the valve: see series 32 and 33

## Main dimensions

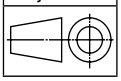
**Valve with manual actuator: crank handle**
DN 63–200 (2½"–8")




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




Projection E



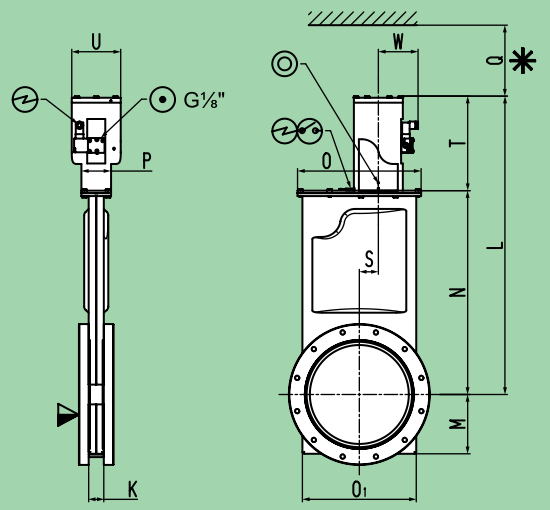
▼ Valve seat side
✳ Required for dismantling
Mechanical position indication
◎ Leak detection hole
For attachment

Flange dimensions: see pages 50–51

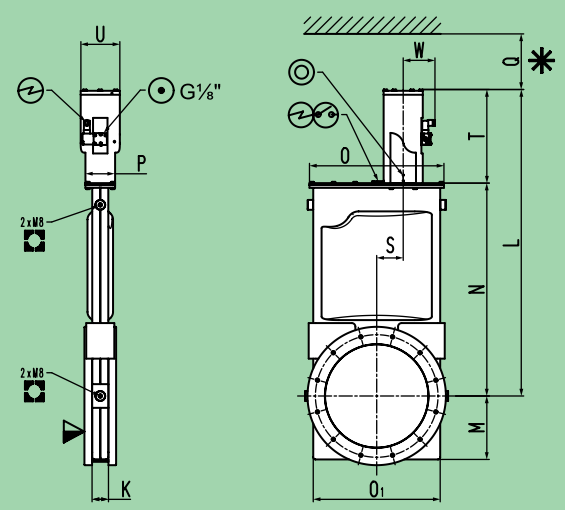
| DN | | 63 | 80 | 100 | 160 | 200 | 250 | 320 |
|---|---|---|---|---|---|---|---|---|
| | mm | 2½ | 3 | 4 | 6 | 8 | 10 | 12 |
| K | mm | 25.55 | 25.55 | 25.55 | 25.55 | 31 | 41 | 54 |
| | inch | 1.01 | 1.01 | 1.01 | 1.01 | 1.22 | 1.61 | 2.13 |
| L | mm | 390.60 | 390.60 | 472.60 | 601.40 | 684.60 |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

# Main dimensions

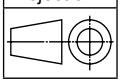
**Valve with pneumatic actuator: double acting**
DN 63–200 (2½"–8")




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




Projection E



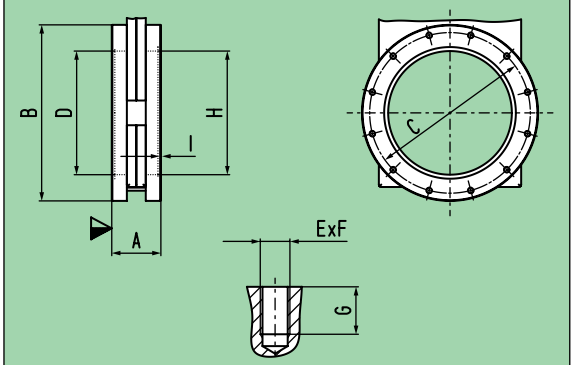
▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⊖ Electrical connection
◔ Position indicator
◎ Leak detection hole
◘ For attachment

Flange dimensions: see pages 50–51

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

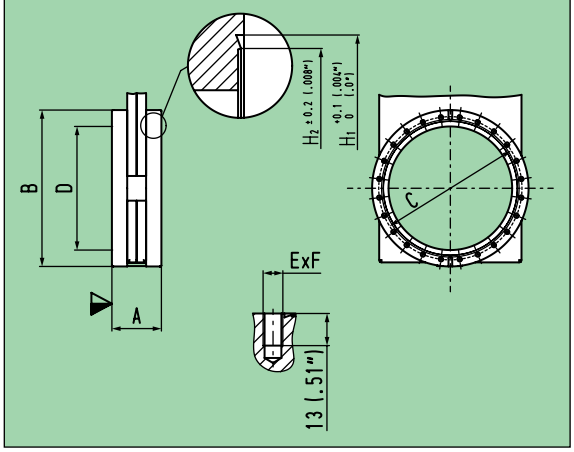
## Flange dimensions

**ISO-F**
DN 63–320 (2½"–12")



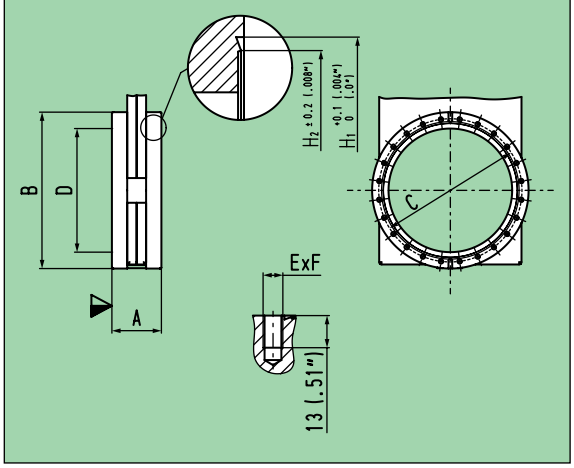

| DN | | 63 | 80 | 100 | 160 | 200 | 250 | 320 |
|---|---|---|---|---|---|---|---|---|
| | inch | 2½ | 3 | 4 | 6 | 8 | 10 | 12 |
| A | mm | 70 | 70 | 70 | 70 | 70 | 80 | 100 |
| | inch | 2.76 | 2.76 | 2.76 | 2.76 | 2.76 | 3.15 | 3.94 |
| B | mm | 130 | 145 | 165 | 225 | 285 | 350 | 425 |
| | inch | 5.12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

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



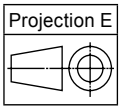

| DN | | 63 | 80 | 100 | 160 | 200 | 250 | |
|---|---|---|---|---|---|---|---|---|
| | inch | 2½ | 3 | 4 | 6 | 8 | 10 | |
| O.D. | inch | 4½ | 4⅝ | 6 | 8 | 10 | 12 | |
| A | mm | 70 | 70 | 70 | 70 | 80 | 100 | |
| | inch | 2.76 | 2.76 | 2.76 | 2.76 | 3.15 | 3.94 | |
| B | mm | 113.50 | 117.50 | 151.60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

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




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

Projection E



▼ Valve seat side

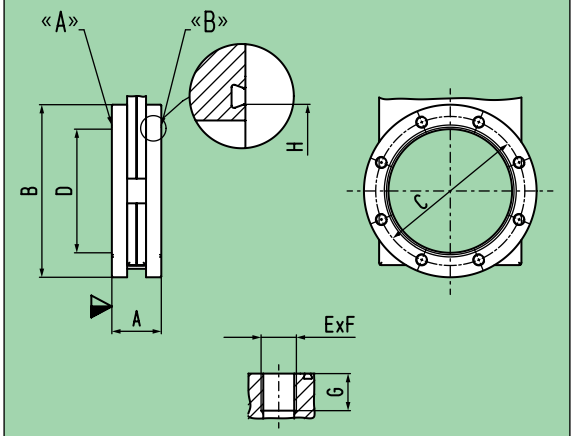
*) O.D. 12" VAT standard, O.D. 13¼" option

**Ordering information for option:** O.D. 13¼"
Ordering No. of valve-X (e. g. 11048-UE44-X, X = O.D. 13¼")

# Flange dimensions

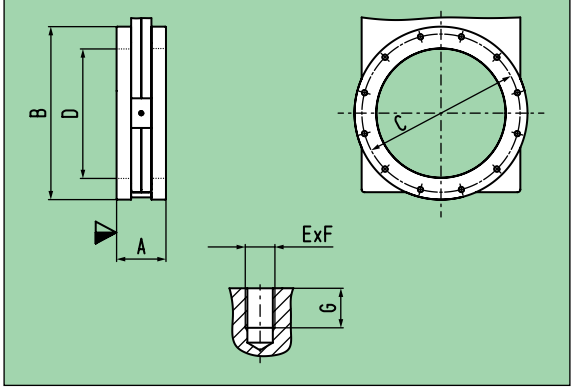
**ASA-LP**
DN 63–320 (2½"–12")
with or without O-ring groove

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




| DN | | 63 | 80 | 100 | 160 | 200 | 250 | 320 |
|---|---|---|---|---|---|---|---|---|
| | inch | 2½ | 3 | 4 | 6 | 8 | 10 | 12 |
| ASA-LP | | 2 | – | 3 | 4 | 6 | 8 | 10 |
| A | mm | 70 | 70 | 70 | 70 | 80 | 100 | 120 |
| | inch | 2.76 | 2.76 | 2.76 | 2.76 | 3.15 | 3.94 | 4.72 |
| B | mm | 152.40 | 177.80 | 190.50 | 225 | 279.40 | 350 | 425 |
| | inch | 6.00 | 7.00 | 7.50 | 8.86 | 11.00 | 13.78 | 16.73 |
| C | mm | 120.70 | 139.70 | 152.40 | 190.50 | 241.30 | 298.50 | 362 |
| | inch | 4.75 | 5.50 | 6.00 | 7.50 | 9.50 | 11.75 | 14.25 |
| D | mm | 70 | 76 | 100 | 150 | 200 | 254 | 300 |
| | inch | 2.76 | 2.99 | 3.94 | 5.91 | 7.87 | 10.00 | 11.81 |
| E × F | | 4 × ⅜" 16 UNC | 4 × ⅜" 16 UNC | 8 × ⅜" 16 UNC | 8 × ⅜" 16 UNC | 8 × ¾" 10 UNC | 8 × ¾" 10 UNC | 12 × ¾" 10 UNC |
| G | mm | 13 | 15 | 15 | 15 | 19 | 19 | 19 |
| | inch | 0.51 | 0.59 | 0.59 | 0.59 | 0.75 | 0.75 | 0.75 |
| H | mm | 88.90 | 88.90 | 120.65 | 158.75 | 206.40 | 266.70 | 317.50 |
| | inch | 3.50 | 3.50 | 4.75 | 6.25 | 8.13 | 10.50 | 12.50 |
| O-ring I.D. × d | mm | 88.49 × 3.53 | 88.49 × 3.53 | 120.24 × 3.53 | 158.34 × 3.53 | 202.79 × 3.53 | 266.29 × 3.53 | 316.87 × 7.00 |
| | inch | 3.48 × .139 | 3.48 × .139 | 4.73 × .139 | 6.23 × .139 | 7.98 × .139 | 10.48 × .139 | 12.47 × .275 |

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




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

Projection E

▽ Valve seat side

## Main applications

The standard valve for vacuum isolation applications in research and industry



## Ordering information

**Valve with manual actuator**
push rod

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

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

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

without solenoid valve, without position indicator: 121 . . - . A**1**4
without solenoid valve, with position indicator: 121 . . - . A**2**4
with solenoid valve, without position indicator: 121 . . - . A**3**4 (specify control voltage)

## Features

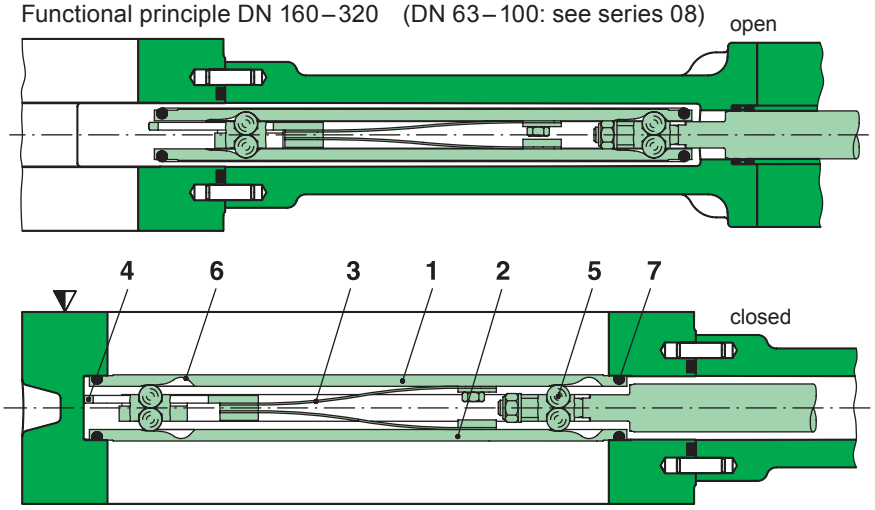
Body material: aluminum

Low cost gate valve

Split body for easy cleaning

VATLOCK configuration: see glossary

Functional principle DN 160 – 320 (DN 63 – 100: see series 08)




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

## Technical data

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

[1] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

| DN (nominal I.D.) | | Standard flanges | Conductance (molecular flow) (depending on A-dimension and flange type) | Valve with manual actuator: Weight | | Valve with pneumatic actuator: Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing or opening time | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | | $ls^{-1}$ | kg | lbs | bar | psi | l | $ft^3$ | s | kg | lbs |
| 63 | 2½ | See page 57 | 550 | 3 | 7 | 4–7 | 58–102 | 0.16 | 0.006 | 1.5 | 3 | 6.6 |
| 80 | 3 | | 1000 | 3.8 | 9 | 4–7 | 58–102 | 0.20 | 0.007 | 1.7 | 3.8 | 8.4 |
| 100 | 4 | | 2000 | 4.5 | 10 | 4–7 | 58–102 | 0.22 | 0.008 | 2 | 4.5 | 9.9 |
| 160 | 6 | | 6000 | 9 | 20 | 4–7 | 58–102 | 0.50 | 0.018 | 2 | 9 | 19.8 |
| 200 | 8 | | 12000 | – | – | 4–7 | 58–102 | 0.90 | 0.032 | 3 | 18 | 39.7 |
| 250 | 10 | | 22000 | – | – | 4–7 | 58–102 | 1.50 | 0.053 | 5 | 25 | 55.1 |
| 320 | 12 | | 33000 | – | – | 4–7 | 58–102 | 2.80 | 0.099 | 7 | 40 | 88.2 |

## Options

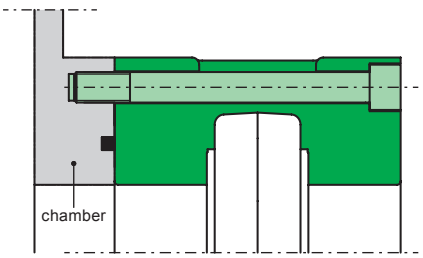
**Actuator**

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

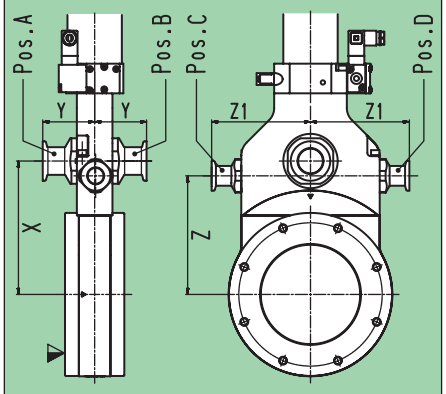
**Valve**

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

Dia. 1



Dia. 2




▽ Valve seat side

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

| DN valve | mm<br>inch | 63<br>2½ | 80<br>3 | 100<br>4 | 160<br>6 | 200<br>8 | 250<br>10 | 320<br>12 |
|---|---|---|---|---|---|---|---|---|
| Recommended port ISO-KF | | 16 | 16 | 25 | 25 | 40 | 40 | 40 |
| X | mm<br>inch | 105<br>4.13 | 110<br>4.33 | 135<br>5.31 | 190<br>7.48 | 232<br>9.13 | 285<br>11.22 | 350<br>13.78 |
| Y | mm<br>inch | 48<br>1.89 | 48<br>1.89 | 63<br>2.48 | 54<br>2.13 | 60<br>2.36 | 65<br>2.56 | 74<br>2.91 |
| Z | mm<br>inch | 90<br>3.54 | 100<br>3.94 | 120<br>4.72 | – | – | – | – |
| Z1 | mm<br>inch | 80<br>3.15 | 89<br>3.50 | 100<br>3.94 | – | – | – | – |
| Other ports on request | | | | | | | | |

– Ports for roughing (by-pass)

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

## Spare parts

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

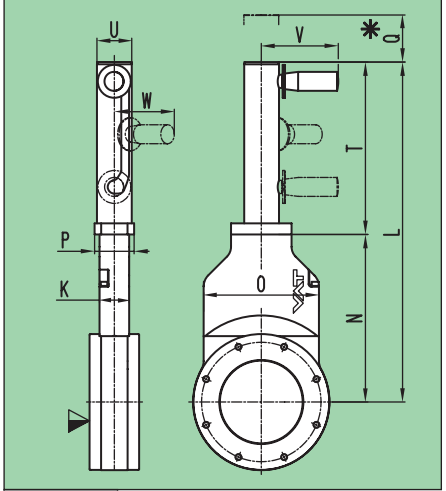
## Accessories

– **Heater and insulation jacket**
  on request (specify fabrication number of valve)

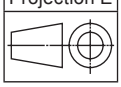
– **Flange connections**
  for installation of the valve: see series 32

## Main dimensions

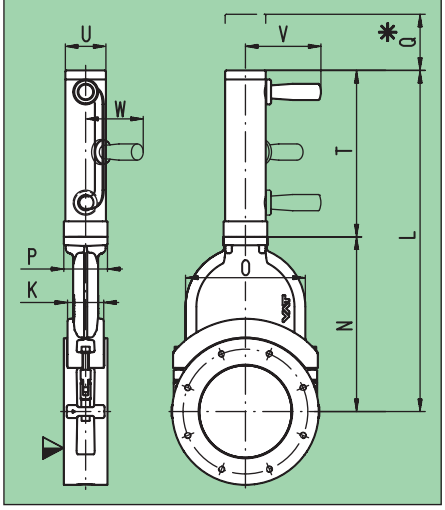
**Valve with manual actuator: push rod**
DN 63–100 (2½"–4")




Projection E



**Valve with manual actuator: push rod**
DN 160 (6")



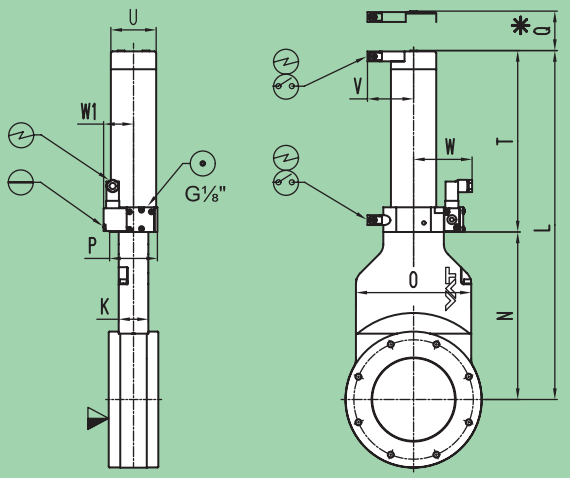

▽ Valve seat side
✳ Required for dismantling

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

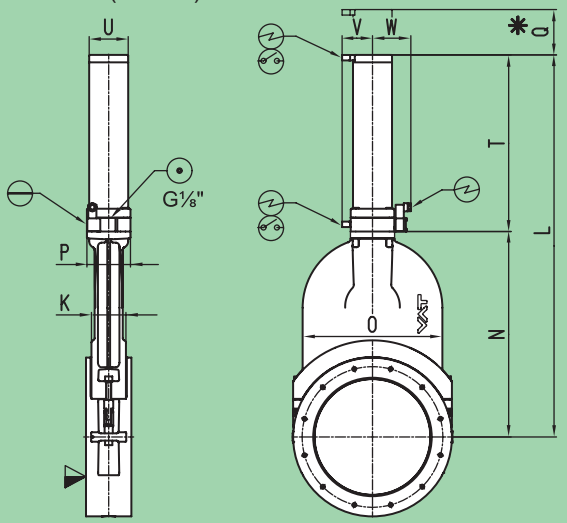
Flange dimensions: see page 57

## Main dimensions

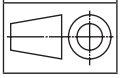
**Valve with pneumatic actuator: double acting**
DN 63–100 (2½"–4")




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




Projection E



- Valve seat side
- Required for dismantling
- Compressed air connection
- Electrical connection
- Position indicator
- Emergency operation

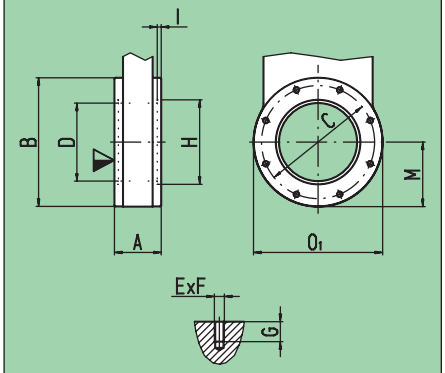
Flange dimensions: see page 57

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

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

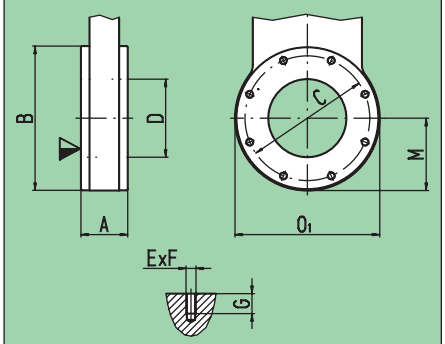
## Flange dimensions

**ISO-F**
DN 63–320 (2½"–12")



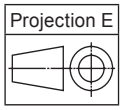

| DN | | 63 | 80 | 100 | 160 | 200 | 250 | 320 |
|---|---|---|---|---|---|---|---|---|
| | inch | 2½ | 3 | 4 | 6 | 8 | 10 | 12 |
| A | mm | 60 | 60 | 60 | 70 | 80 | 100 | 120 |
| | inch | 2.36 | 2.36 | 2.36 | 2.76 | 3.15 | 3.94 | 4.72 |
| B | mm | 130 | 145 | 165 | 235 | 288 | 350 | 425 |
| | inch |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

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




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

Projection E



▽ Valve seat side

# Series 14.1

## Main applications

General purpose valve for isolation in high or rough vacuum applications

Especially suited to industrial processes



## Ordering information

**Valve with manual actuator**
crank handle

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

with position indicator: 141 . . - . E0**8**
with lever (instead of crank handle): 141 . . - . E0**6**

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

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

without solenoid valve, without position indicator: 141 . . - . E**1**4
without solenoid valve, with position indicator: 141 . . - . E**2**4
with solenoid valve, without position indicator: 141 . . - . E**3**4 (specify control voltage)

Further ordering information on next page →

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

## Features

Body material: stainless steel

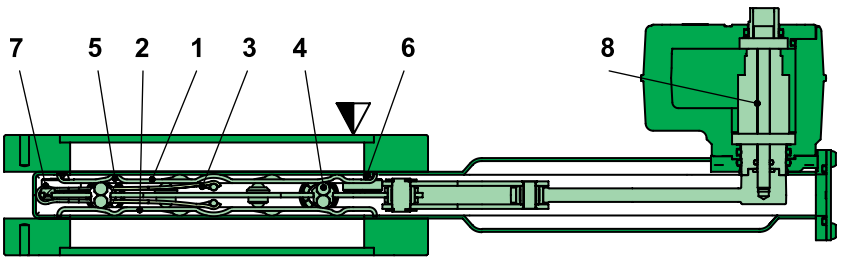
Very compact design

Manual and pneumatic actuator mountable in 6 positions

Rotary feedthrough for a high number of cycles

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

Functional principle




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

## Technical data

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

[1] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page

Continued Ordering information

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

| DN | | Ordering numbers (specify control voltage) | | | | |
|---|---|---|---|---|---|---|
| mm | inch | ISO-F | CF-F metric threads | CF-F UNF threads | ASA-LP | JIS |
| 63 | 2½ | 14136-PE48 | 14136-CE48 | 14136-UE48 | 14136-TE48 | 14136-JE48 |
| 80 | 3 | 14138-PE48 | 14138-CE48 | 14138-UE48 | 14138-TE48 | 14138-JE48 |
| 100 | 4 | 14140-PE48 | 14140-CE48 | 14140-UE48 | 14140-TE48 | 14140-JE48 |
| 160 | 6 | 14144-PE48 | 14144-CE48 | 14144-UE48 | 14144-TE48 | 14144-JE48 |
| 200 | 8 | 14146-PE48 | 14146-CE48 | 14146-UE48 | 14146-TE48 | 14146-JE48 |
| 250 | 10 | 14148-PE48 | 14148-CE48 | 14148-UE48 | 14148-TE48 | 14148-JE48 |
| 320 | 12 | 14150-PE48 | on request | on request | 14150-TE48 | 14150-JE48 |

without solenoid valve, with position indicator: 141 . . - . E**2**8

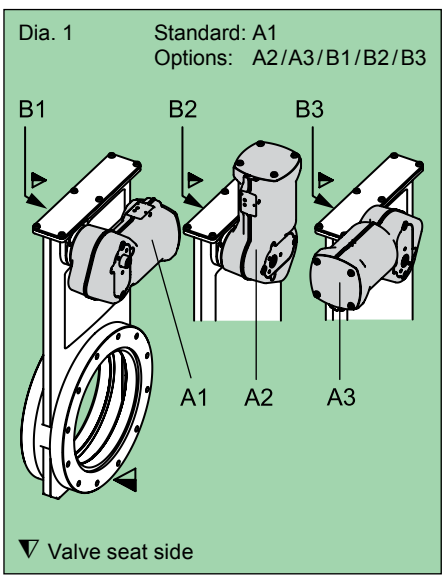
Valve DN 400: see series 64.0, pages 66–71

Continued Technical data

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

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

## Options




**Actuator**

– Solenoid valve for impulse actuation:
last valve position is maintained at power failure

– Solenoid valve separate, for external mounting

– Other solenoid valve voltage (standard: 24 V DC)

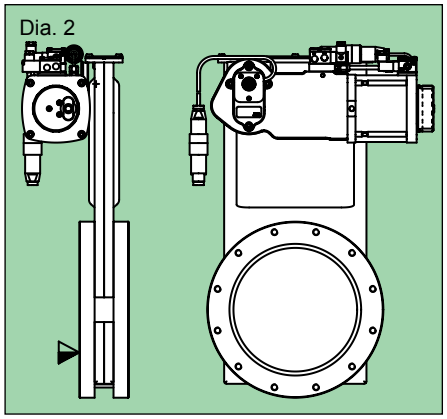
– Manual emergency operation on solenoid valve lockable

– Standard pneumatic actuator mountable in 6 positions (Dia. 1):
- position A1, A2, A3 on A-side (valve seat side): to be specified with order
- position B1, B2, B3 on B-side (rear side): to be specified with order

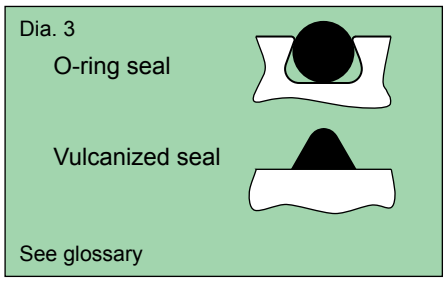
– 3-position pneumatic actuator for throttling (Dia. 2),
mountable in 6 positions (Dia. 1):
- position A1, A2, A3 on A-side (valve seat side): to be specified with order
- position B1, B2, B3 on B-side (rear side): to be specified with order
ordering information on page 59, technical data on request

– Double position indicator
(2 switches each for the positions «open» and «closed»)

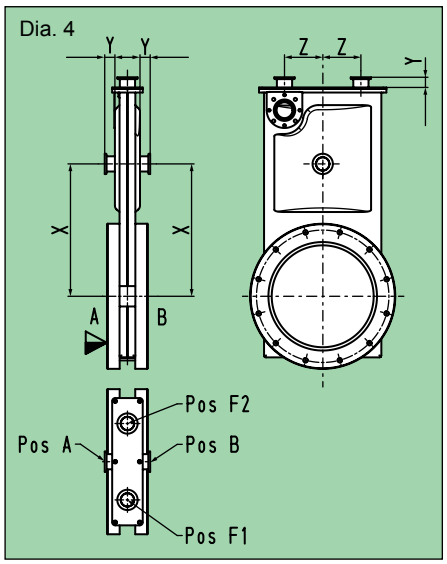
Dia. 2



Dia. 3




Dia. 4




▼ Valve seat side

**Valve**

– Customer specified flanges with / without watercooling

– Other sealing materials

– O-ring seal in gate (Dia. 3) with DN 63, 100, 160, 200 (standard: vulcanized seal)

– Intermediate pumping of the rotary feedthrough

– Ports for roughing (by-pass), venting or for gauges (Dia. 4)
  - possible in positions B, F1 and F2 with DN 63–250
  - possible in positions A, B, F1 and F2 with DN 320

| DN valve | mm / inch | 63 / 2½ | 80 / 3 | 100 / 4 | 160 / 6 | 200 / 8 | 250 / 10 | 320 / 12 |
|---|---|---|---|---|---|---|---|---|
| Recommended port Pos. A+B: ISO-KF | | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| Recommended port Pos. F1+F2: ISO-KF | | 16 | 16 | 16 | 16 | 16 | 25 | 25 |
| X | mm | 110 | 110 | 150 | 205 | 260 | 335 | 415 |
| | inch | 4.33 | 4.33 | 5.91 | 8.07 | 10.24 | 13.19 | 16.34 |
| Y | mm | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| | inch | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Z | mm | 30 | 30 | 47.50 | 59 | 85 | 100 | 135 |
| | inch | 1.18 | 1.18 | 1.87 | 2.32 | 3.35 | 3.94 | 5.31 |
| Other ports on request | | | | | | | | |

**Ordering information for options:**
Ordering No. of valve-X (e. g. 14146-CE01-X,
X = actuator A2, port ISO-KF 40 in position F2)

## Spare parts

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

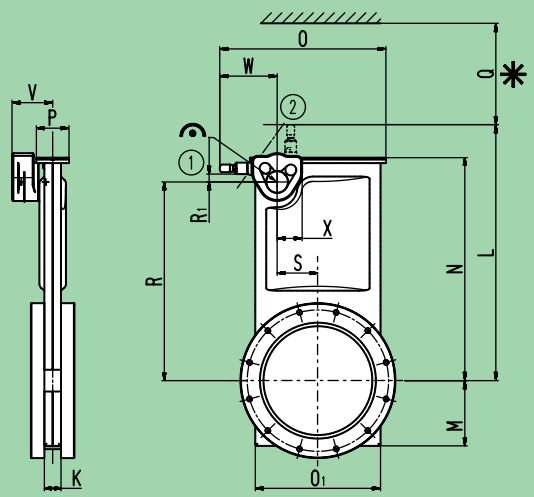
## Accessories

– **Heater**
on request (specify fabrication number of valve)

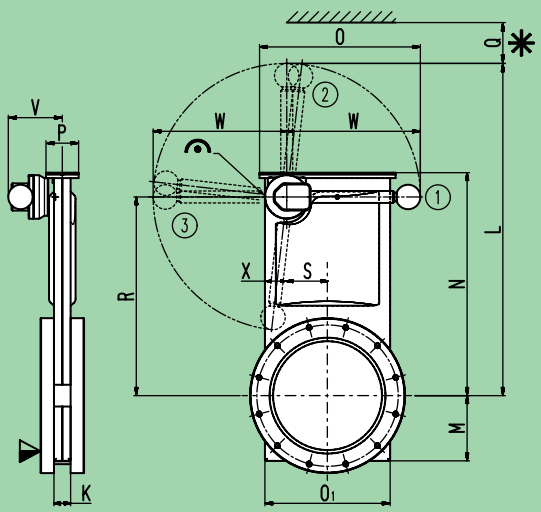
– **Flange connections**
for installation of the valve: see series 32 and 33

## Main dimensions

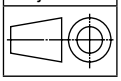
**Valve with manual actuator: crank handle**
DN 63–320 (2½"–12")




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




Projection E



▼ Valve seat side
✳ Required for dismantling
Mechanical position indication
① Standard actuator position
②③ Optional actuator positions

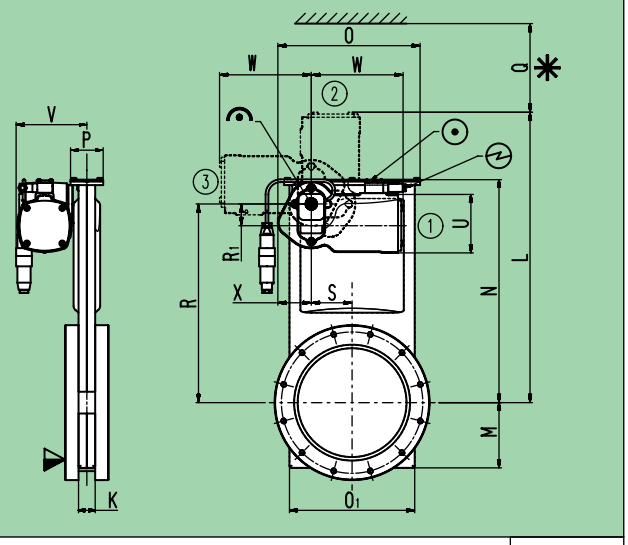
Flange dimensions: see pages 64–65

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

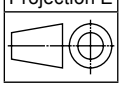
| DN | mm / inch | 63 / 2½ | 80 / 3 | 100 / 4 | 160 / 6 | 200 / 8 | 250 / 10 | 320 / 12 |
|---|---|---|---|---|---|---|---|---|
| K | mm | 26 | 26 | 26 | 26 | 31 | 41 | 54.40 |
| | inch | 1.02 | 1.02 | 1.02 | 1.02 | 1.22 | 1.61 | 2.14 |
| L | mm | 343 | 343 | 383 | 527 | 609 | 835 | 998 |
| | inch |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

# Main dimensions

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




Projection E



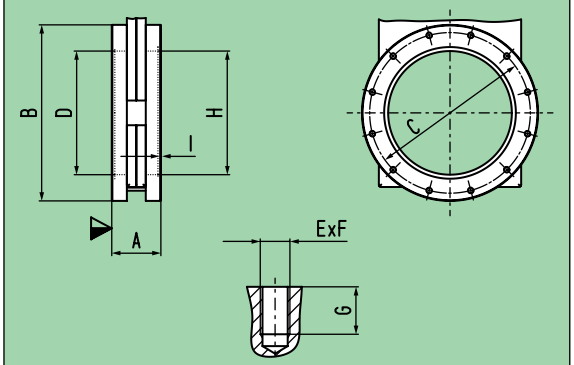
- Valve seat side
- Required for dismantling
- Compressed air connection
- Electrical connection
- Mechanical position indication
- ① Standard actuator position
- ②③ Optional actuator positions

Flange dimensions: see pages 64–65

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

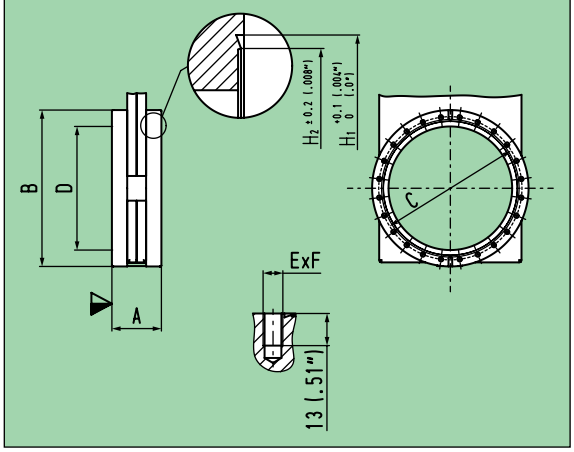
## Flange dimensions

**ISO-F**
DN 63–320 (2½"–12")



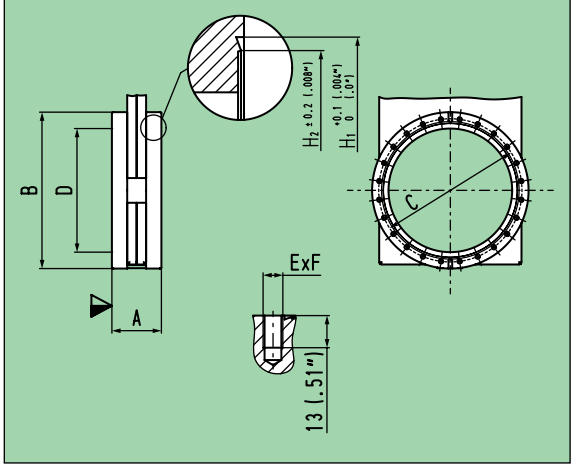

| DN | | 63 | 80 | 100 | 160 | 200 | 250 | 320 |
|---|---|---|---|---|---|---|---|---|
| | inch | 2½ | 3 | 4 | 6 | 8 | 10 | 12 |
| A | mm | 70 | 70 | 70 | 70 | 80 | 100 | 120 |
| | inch | 2.76 | 2.76 | 2.76 | 2.76 | 3.15 | 3.94 | 4.72 |
| B | mm | 130 | 145 | 165 | 225 | 285 | 350 | 425 |
| | inch |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

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



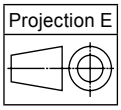

| DN | | 63 | 80 | 100 | 160 | 200 | 250 | |
|---|---|---|---|---|---|---|---|---|
| | inch | 2½ | 3 | 4 | 6 | 8 | 10 | |
| O.D. | inch | 4½ | 4⅝ | 6 | 8 | 10 | 12 | |
| A | mm | 70 | 70 | 70 | 70 | 80 | 100 | |
| | inch | 2.76 | 2.76 | 2.76 | 2.76 | 3.15 | 3.94 | |
| B | mm | 113.50 | 117.50 | 151.60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

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




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

Projection E



▼ Valve seat side

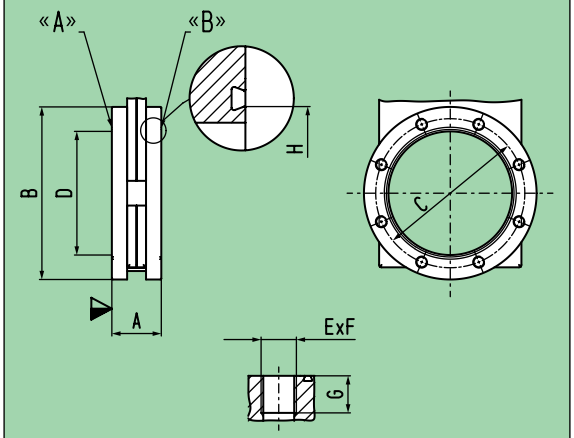
*) O.D. 12" VAT standard, O.D. 13¼" option

**Ordering information for option:** O.D. 13¼"
Ordering No. of valve-X (e. g. 14148-UE44-X, X = O.D. 13¼")

# Flange dimensions

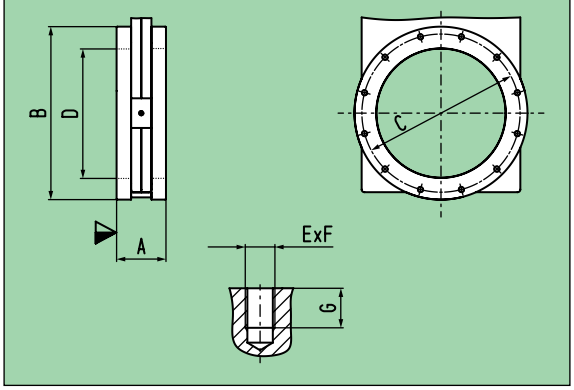
**ASA-LP**
DN 63–320 (2½"–12")
with or without O-ring groove

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



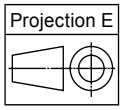

| DN | | 63 | 80 | 100 | 160 | 200 | 250 | 320 |
|---|---|---|---|---|---|---|---|---|
| | inch | 2½ | 3 | 4 | 6 | 8 | 10 | 12 |
| ASA-LP | | 2 | – | 3 | 4 | 6 | 8 | 10 |
| A | mm | 70 | 70 | 70 | 70 | 80 | 100 | 120 |
| | inch | 2.76 | 2.76 | 2.76 | 2.76 | 3.15 | 3.94 | 4.72 |
| B | mm | 152.40 | 177.80 | 190.50 | 225 | 279.40 | 350 | 425 |
| | inch | 6.00 | 7.00 | 7.50 | 8.86 | 11.00 | 13.78 | 16.73 |
| C | mm | 120.70 | 139.70 | 152.40 | 190.50 | 241.30 | 298.50 | 362 |
| | inch | 4.75 | 5.50 | 6.00 | 7.50 | 9.50 | 11.75 | 14.25 |
| D | mm | 70 | 76 | 100 | 150 | 200 | 254 | 300 |
| | inch | 2.76 | 2.99 | 3.94 | 5.91 | 7.87 | 10.00 | 11.81 |
| E×F | | 4×⅜" 16 UNC | 4×⅜" 16 UNC | 4×⅜" 16 UNC | 8×⅜" 16 UNC | 8×¾" 10 UNC | 8×¾" 10 UNC | 12×¾" 10 UNC |
| G | mm | 15 | 15 | 15 | 15 | 19 | 19 | 19 |
| | inch | 0.59 | 0.59 | 0.59 | 0.59 | 0.75 | 0.75 | 0.75 |
| H | mm | 88.90 | 88.90 | 120.65 | 158.75 | 206.40 | 266.70 | 317.50 |
| | inch | 3.50 | 3.50 | 4.75 | 6.25 | 8.13 | 10.50 | 12.50 |
| O-ring I.D.×d | mm | 88.49 × 3.53 | 88.49 × 3.53 | 120.24 × 3.53 | 158.34 × 3.53 | 202.79 × 3.53 | 266.29 × 3.53 | 316.87 × 7.00 |
| | inch | 3.48 × .139 | 3.48 × .139 | 4.73 × .139 | 6.23 × .139 | 7.98 × .139 | 10.48 × .139 | 12.47 × .275 |

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




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

Projection E



▽ Valve seat side

# Series 14.0, 64.0

## Main applications

General purpose valve for isolation in high or rough vacuum applications

Especially suited to industrial processes



## Ordering information

**Series 14.0**
**Valve with manual actuator**
handwheel

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

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

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

without solenoid valve, without position indicator: 140 . . - . E**1**4
without solenoid valve, with position indicator: 140 . . - . E**2**4
with solenoid valve, without position indicator: 140 . . - . E**3**4 (specify control voltage)

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

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

without solenoid valve, with position indicator: 640 . . - . E**2**8

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

## Features

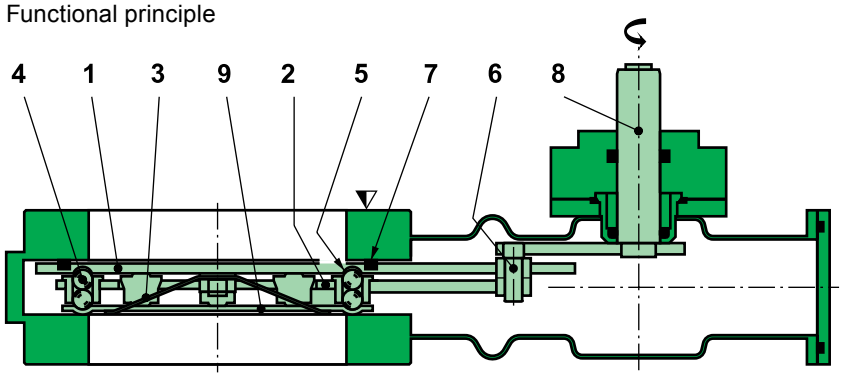
Body material: stainless steel

Very compact design

Manual and pneumatic actuator mountable in 6 positions

Rotary feedthrough for a high number of cycles

Functional principle




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

## Technical data

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

[1] Maximum values: depending on operating conditions and sealing materials

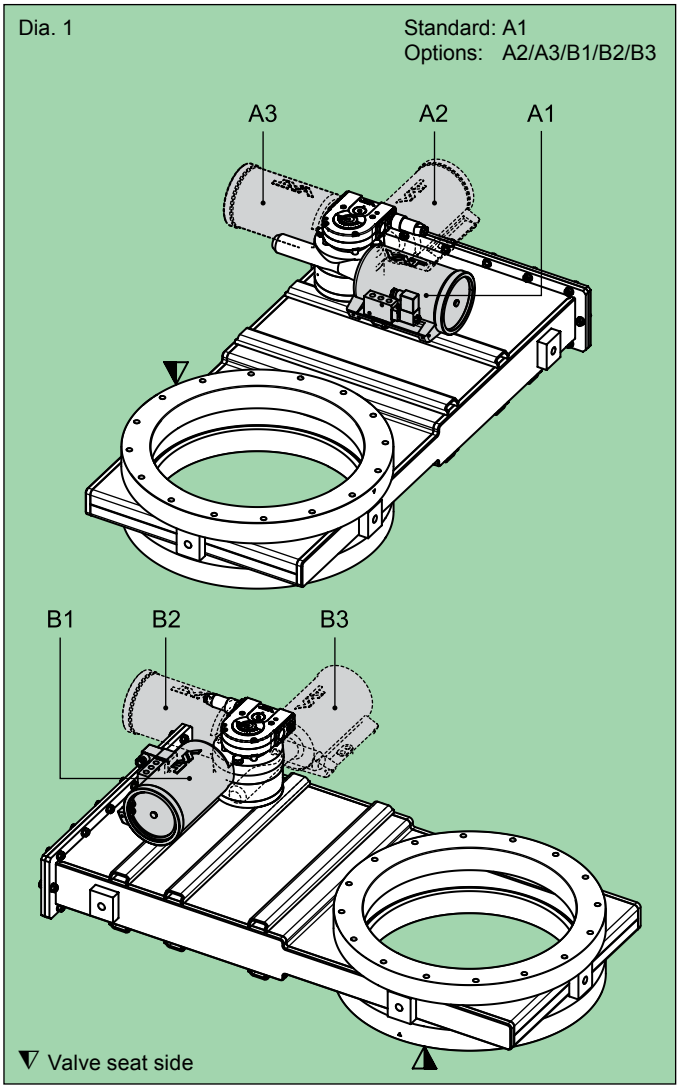
[2] For other mounting positions please contact VAT

[3] Depending on A-dimension and flange type

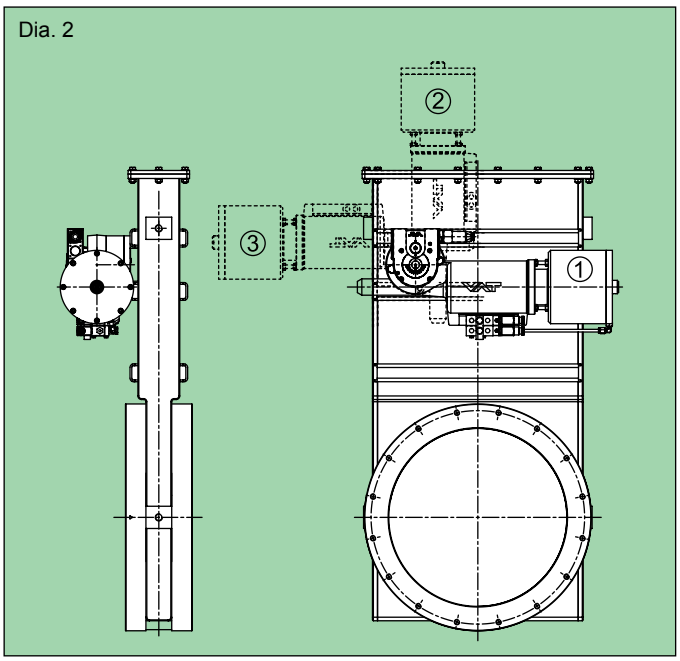
## Options

Dia. 1

Standard: A1
Options: A2/A3/B1/B2/B3




Dia. 2




**Actuator**

– Solenoid valve for impulse actuation:
last valve position is maintained at power failure

– Solenoid valve separate, for external mounting

– Other solenoid valve voltage (standard: 24 V DC)

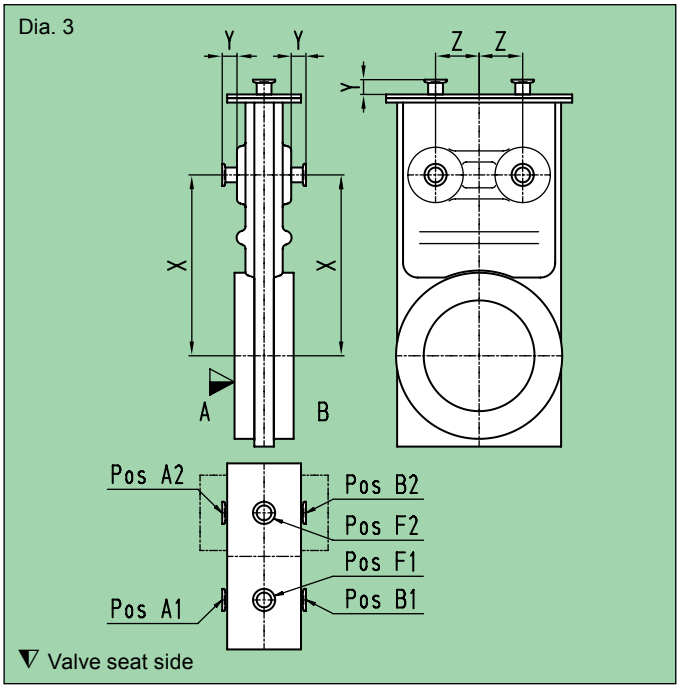
– Manual emergency operation on solenoid valve lockable

– Standard pneumatic actuator mountable in 6 positions (Dia. 1):
- position A1, A2, A3 on A-side (valve seat side):
to be specified with order
- position B1, B2, B3 on B-side (rear side):
to be specified with order

– 3-position pneumatic actuator for throttling (Dia. 2), mountable in 6 positions (Dia. 1):
- position A1, A2, A3 on A-side (valve seat side):
to be specified with order
- position B1, B2, B3 on B-side (rear side):
to be specified with order
ordering information on page 66, technical data on request

– Double position indicator
(2 switches each for the positions «open» and «closed»)

Dia. 3




**Valve**

– Customer specified flanges with / without watercooling

– Other sealing materials

– Intermediate pumping of the rotary feedthrough

– Ports for roughing (by-pass), venting or for gauges (Dia. 3), possible in positions A1, A2, B1, B2, F1 and F2

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

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

## Spare parts

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

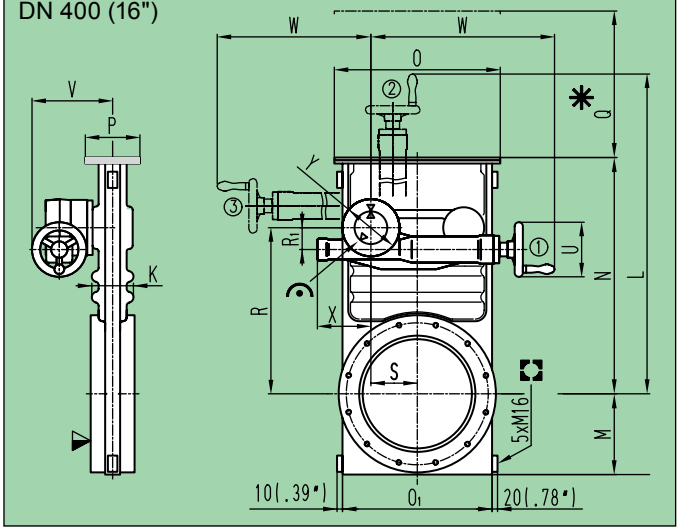
## Accessories

– **Heater**
on request (specify fabrication number of valve)

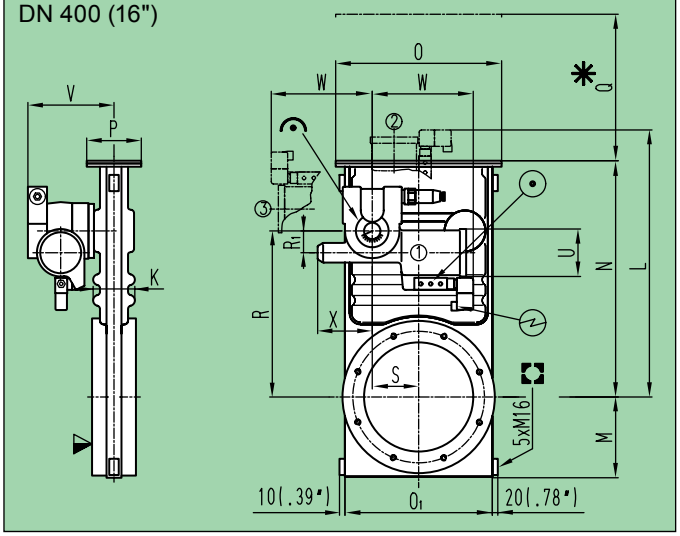
– **Flange connections**
for installation of the valve: see series 32 and 33

## Main dimensions

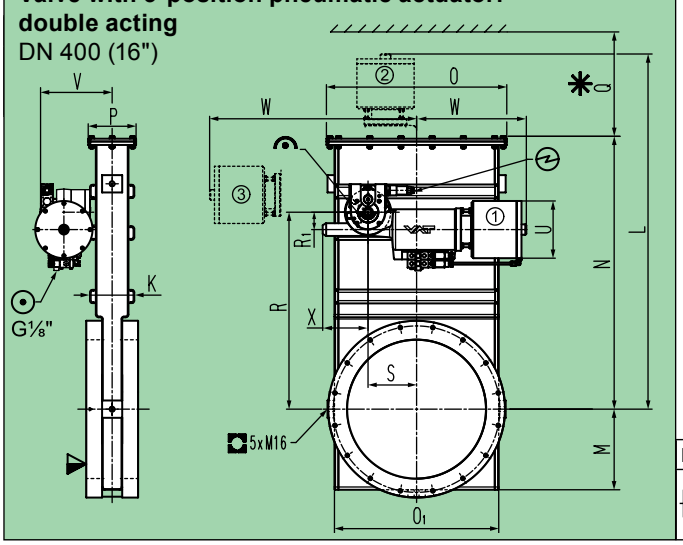
**Valve with manual actuator: handwheel**
DN 400 (16")




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



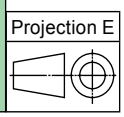

**Valve with 3-position pneutmatic actuator: double acting**
DN 400 (16")




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

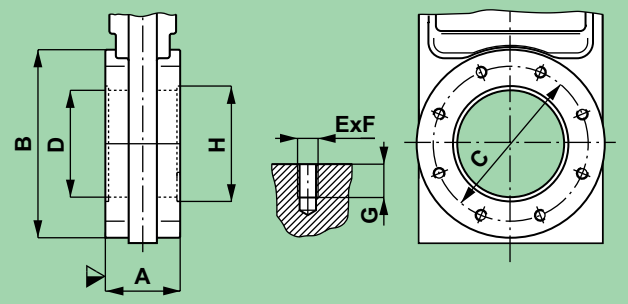
▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⏚ Electrical connection
◠ Mechanical position indication
◘ For attachment
① Standard actuator position
②③ Optional actuator positions

Projection E

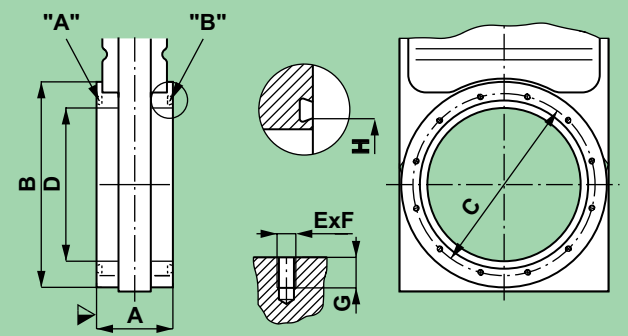


# Flange dimensions

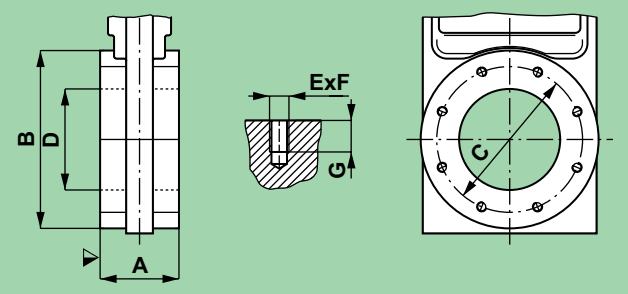
**ISO-F**
DN 400 (16")




**ASA**
DN 400 (16")



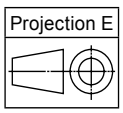

**JIS B 2290: 1998 / ISO 1609**
DN 400 (16")




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

▼ Valve seat side

Projection E



## Main applications

Isolation valve for extremely particle and shock sensitive vacuum systems



## Ordering information

**Series 15.0**
**Vacuum valve with pneumatic actuator**
double acting
with solenoid valve
with position indicator

| DN | | Ordering numbers (specify control voltage) | | |
|---|---|---|---|---|
| mm | inch | ISO-F | ASA-LP | JIS |
| 63 | 2½ | 15036-PA44 | 15036-TA44 | 15036-JA44 |
| 100 | 4 | 15040-PA44 | 15040-TA44 | 15040-JA44 |
| 160 | 6 | 15044-PA44 | 15044-TA44 | 15044-JA44 |

without solenoid valve, without position indicator: 150 . . - . A**1**4
without solenoid valve, with position indicator: 150 . . - . A**2**4
with solenoid valve, without position indicator: 150 . . - . A**3**4 (specify control voltage)

**Series 15.1**
**HV valve with pneumatic actuator**
double acting
with solenoid valve
with position indicator

| DN | | Ordering numbers (specify control voltage) | | |
|---|---|---|---|---|
| mm | inch | ISO-F | ASA-LP | JIS |
| 63 | 2½ | 15136-PA44 | 15136-TA44 | 15136-JA44 |
| 100 | 4 | 15140-PA44 | 15140-TA44 | 15140-JA44 |
| 160 | 6 | 15144-PA44 | 15144-TA44 | 15144-JA44 |

without solenoid valve, without position indicator: 151 . . - . A**1**4
without solenoid valve, with position indicator: 151 . . - . A**2**4
with solenoid valve, without position indicator: 151 . . - . A**3**4 (specify control voltage)

**Series 15.2**
**UHV valve with pneumatic actuator**
double acting
with solenoid valve
with position indicator

| DN | | Ordering numbers (specify control voltage) | | | | |
|---|---|---|---|---|---|---|
| mm | inch | ISO-F | CF-F metric threads | CF-F UNF threads | ASA-LP | JIS |
| 63 | 2½ | 15236-PE44 | 15236-CE44 | 15236-UE44 | 15236-TE44 | 15236-JE44 |
| 100 | 4 | 15240-PE44 | 15240-CE44 | 15240-UE44 | 15240-TE44 | 15240-JE44 |
| 160 | 6 | 15244-PE44 | 15244-CE44 | 15244-UE44 | 15244-TE44 | 15244-JE44 |
| 200 | 8 | 15246-PE44 | 15246-CE44 | 15246-UE44 | 15246-TE44 | 15246-JE44 |
| 250 | 10 | 15248-PE44 | 15248-CE44 | 15248-UE44 | 15248-TE44 | 15248-JE44 |

without solenoid valve, without position indicator: 152 . . - . E**1**4
without solenoid valve, with position indicator: 152 . . - . E**2**4
with solenoid valve, without position indicator: 152 . . - . E**3**4 (specify control voltage)

## Features

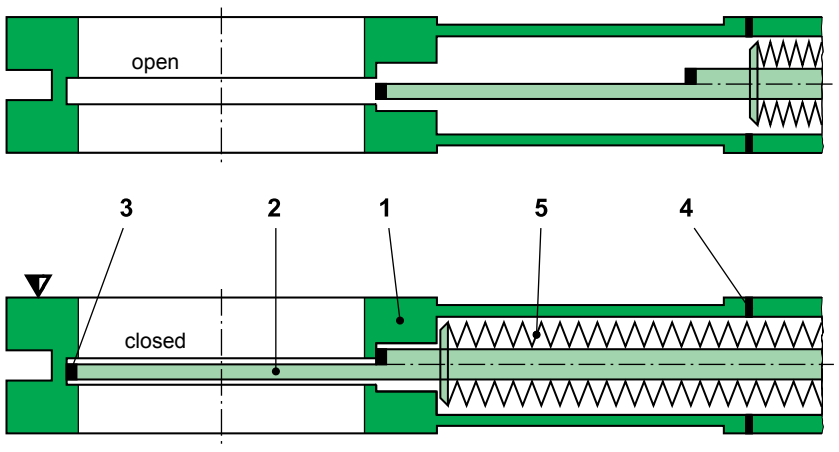
Body material:
Series 15.0, 15.1: aluminum
Series 15.2: stainless steel

Long lifetime

Very small installation dimension

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

Functional principle




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

## Technical data

| | |
|---|---|
| Leak rate | |
| – Valve body | |
| - Series 15.0, 15.1 | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| - Series 15.2 | $< 5 \cdot 10^{-10}$ mbar ls$^{-1}$ |
| – Valve seat | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| Pressure range | |
| – Series 15.0 | $1 \cdot 10^{-7}$ mbar to 1 bar (abs) |
| – Series 15.1 | $1 \cdot 10^{-8}$ mbar to 1 bar (abs) |
| – Series 15.2 | $1 \cdot 10^{-10}$ mbar to 1 bar (abs) |
| Differential pressure on the gate | ≤ 1.2 bar |
| Differential pressure at opening | ≤ 30 mbar |
| Cycles until first service [1] | 500 000 |
| Temperature [2] | |
| – Valve body | |
| - Series 15.0, 15.1 | ≤ 120 °C [3] |
| - Series 15.2 DN 63–200 | ≤ 250 °C open / ≤ 200 °C closed |
| - Series 15.2 DN 250 | ≤ 120 °C [3] |
| – Actuator | |
| - Series 15.0, 15.1 | ≤ 100 °C |
| - Series 15.2 DN 63–160 | ≤ 200 °C |
| - Series 15.2 DN 200–250 | ≤ 100 °C [3] |
| – Solenoid valve | ≤ 50 °C |
| – Position indicator | ≤ 80 °C |
| Heating and cooling rate | |
| – Series 15.0, 15.1 | ≤ 30 °C h$^{-1}$ |
| – Series 15.2 | ≤ 50 °C h$^{-1}$ |

[1] Higher number of cycles on request

[2] Maximum values: depending on operating conditions and sealing materials

[3] Higher temperatures on request

Further technical data on next page

Continued Technical data

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

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

Feedthrough
- Series 15.0: shaft feedthrough
- Series 15.1, 15.2: bellows

Mounting position: any

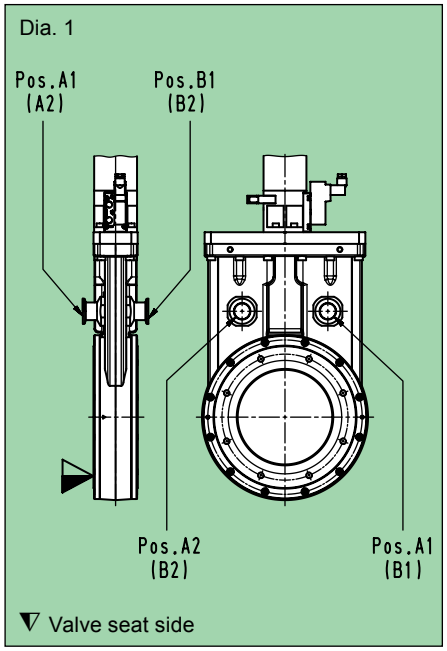
Solenoid valve: 24 V DC, 5.4 W (others on request)

Position indicator: contact rating
- Voltage: ≤ 250 V AC ≤ 50 V DC
- Current: ≤ 2 A ≤ 1.2 A

Valve position indication: visual (mechanical)

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

## Options




**Actuator**

– Solenoid valve for impulse actuation:
last valve position is maintained at power failure

– Solenoid valve separate, for external mounting

– Other solenoid valve voltage (standard: 24 V DC)

– Double position indicator
(2 switches each for the positions «open» and «closed»)

– Bakeable position indicator: bakeable to max. 140 °C

**Valve**

– Customer specified flanges

– Other sealing materials

– Ports for roughing (by-pass), venting or for gauges (Dia. 1),
possible in positions A1, A2, B1 and B2

– Special gate for the installation of various windows and foils

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

## Spare parts

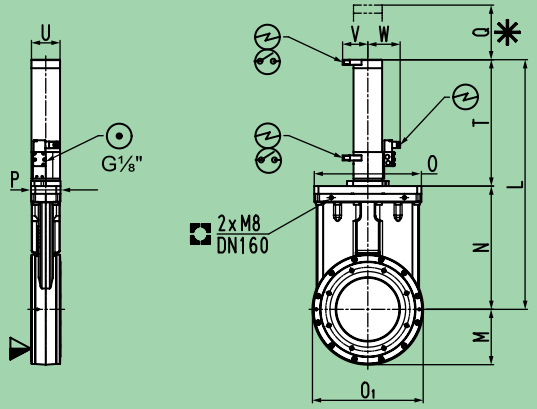
– **Seals**
on request (specify fabrication number of valve)

## Accessories

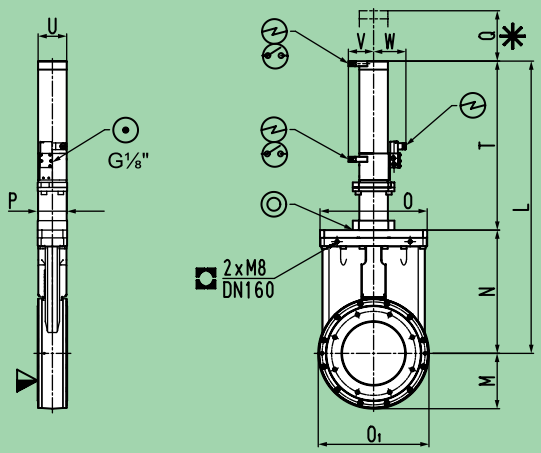
– **Flange connections**
for installation of the valve: see series 32 and 33

## Main dimensions

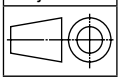
**Series 15.0**
**Vacuum valve with pneumatic actuator: double acting**
DN 63–160 (2½"–6")




**Series 15.1**
**HV valve with pneumatic actuator: double acting**
DN 63–160 (2½"–6")




Projection E



- Valve seat side
- Required for dismantling
- Compressed air connection
- Electrical connection
- Position indicator
- Leak detection hole
- For attachment

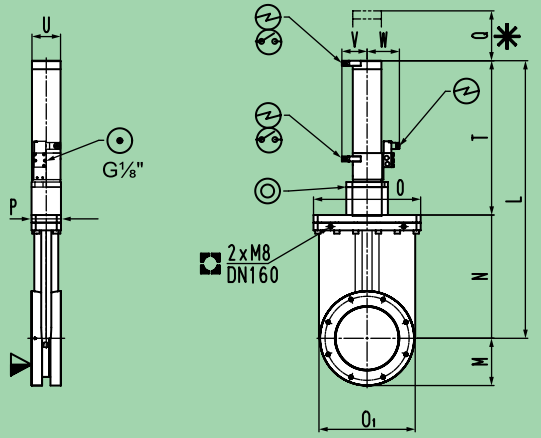
Flange dimensions: see pages 78–79

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

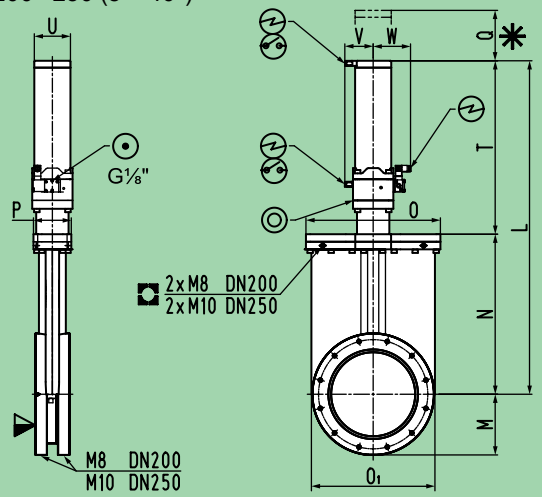
| DN | mm / inch | 63 / 2½ | 100 / 4 | 160 / 6 |
|---|---|---|---|---|
| L | mm | 443 | 553 | 700 |
| | inch | 17.44 | 21.77 | 27.56 |
| M | mm | 87 | 107 | 132 |
| | inch | 3.43 | 4.21 | 5.20 |
| N | mm | 169 | 221 | 294 |
| | inch | 6.65 | 8.70 | 11.57 |
| O | mm | 155 | 195 | 255 |
| | inch | 6.10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

# Main dimensions

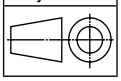
**Series 15.2**
**UHV valve with pneumatic actuator: double acting**
DN 63–160 (2½"–6")




**Series 15.2**
**UHV valve with pneumatic actuator: double acting**
DN 200–250 (8"–10")




Projection E



▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⊖ Electrical connection
◔ Position indicator
◎ Leak detection hole
◘ For attachment

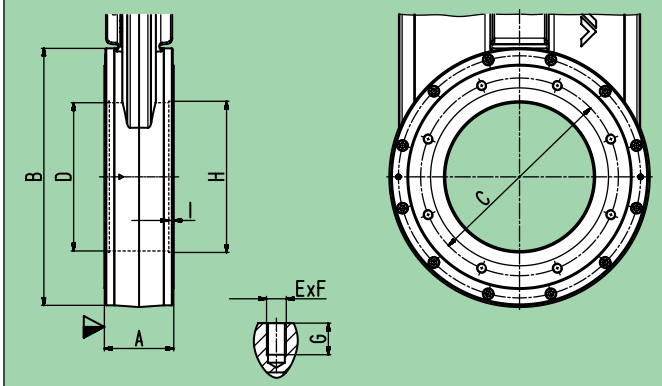
Flange dimensions: see pages 78–79

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

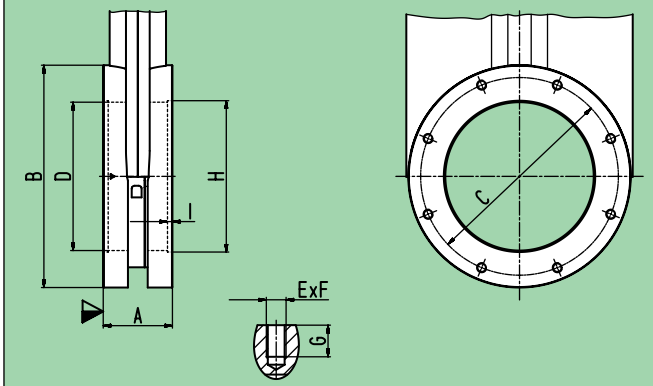
| | | | | |
|---|---|---|---|---|
| DN | mm | 200 | 250 | |
| | inch | 8 | 10 | |
| L | mm | 795 | 943 | |
| | inch | 31.30 | 37.13 | |
| M | mm | 144.50 | 176.50 | |
| | inch | 5.69 | 6.95 | |
| N | mm | 382 | 482 | |
| | inch | 15.04 | 18.98 | |
| O | mm | 320 | 391 | |
| | inch | 12.60 | 15.39 | |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

## Flange dimensions

**ISO-F**
Series 15.0, 15.1: DN 63–160 (2½"–6")



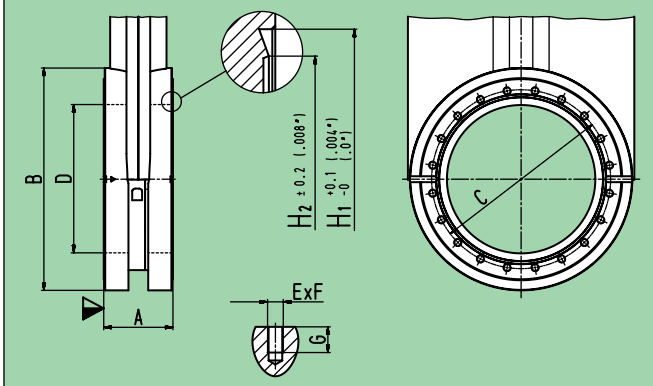

Series 15.2: DN 63–250 (2½"–10")




| DN | | 63 | 100 | 160 | 200 | 250 |
|---|---|---|---|---|---|---|
| | inch | 2½ | 4 | 6 | 8 | 10 |
| A | mm | 70 | 70 | 70 | 80 | 100 |
| | inch | 2.76 | 2.76 | 2.76 | 3.15 | 3.94 |
| B [1] | mm | 170 | 210 | 260 | – | – |
| | inch | 6.69 | 8.27 | 10.24 | | |
| B [2] | mm | 135 | 175 | 225 | 290 | 354 |
| | inch | 5.31 | 6.89 | 8.86 | 11.42 | 13.94 |
| C | mm | 110 | 145 | 200 | 260 | 310 |
| | inch | 4.33 | 5.71 | 7.87 | 10.24 | 12.20 |
| D | mm | 65 | 100 | 150 | 200 | 250 |
| | inch | 2.56 | 3.94 | 5.91 | 7.87 | 9.84 |
| E × F | | 4 × M8 | 8 × M8 | 8 × M10 | 12 × M10 | 12 × M10 |
| G | mm | 12 | 12 | 15 | 15 | 15 |
| | inch | 0.47 | 0.47 | 0.59 | 0.59 | 0.59 |
| H | mm | 70 | 102 | 153 | 213 | 261 |
| | inch | 2.76 | 4.02 | 6.02 | 8.39 | 10.28 |
| I | mm | 5 | 5 | 5 | 5 | 5 |
| | inch | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |

[1] Series 15.0, 15.1
[2] Series 15.2

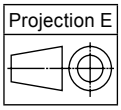
**CF-F**
Series 15.2: DN 63–250 (2½"–10")




| DN | | 63 | 100 | 160 | 200 | 250 |
|---|---|---|---|---|---|---|
| | inch | 2½ | 4 | 6 | 8 | 10 |
| O.D. | inch | 4½ | 6 | 8 | 10 | 12 |
| A | mm | 70 | 70 | 70 | 80 | 100 |
| | inch | 2.76 | 2.76 | 2.76 | 3.15 | 3.94 |
| B | mm | 135 | 175 | 225 | 290 | 354 |
| | inch | 5.31 | 6.89 | 8.86 | 11.42 | 13.94 |
| C | mm | 92.10 | 130.30 | 181 | 231.80 | 284 |
| | inch | 3.63 | 5.13 | 7.13 | 9.13 | 11.18 |
| D | mm | 65 | 100 | 150 | 200 | 250 |
| | inch | 2.56 | 3.94 | 5.91 | 7.87 | 9.84 |
| E × F [1] | | 8 × M8 | 16 × M8 | 20 × M8 | 24 × M8 | 32 × M8 |
| E × F [2] | | 8 × 5/16" 24 UNF | 16 × 5/16" 24 UNF | 20 × 5/16" 24 UNF | 24 × 5/16" 24 UNF | 32 × 5/16" 24 UNF |
| G | mm | 12 | 12 | 12 | 12 | 12 |
| | inch | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 |
| H1 | mm | 82.50 | 120.65 | 171.45 | 222.30 | 273.15 |
| | inch | 3.25 | 4.75 | 6.75 | 8.75 | 10.75 |
| H2 | mm | 77.40 | 115.50 | 166 | 217 | 267 |
| | inch | 3.05 | 4.55 | 6.54 | 8.54 | 10.51 |

[1] Metric threads
[2] UNF threads

Projection E

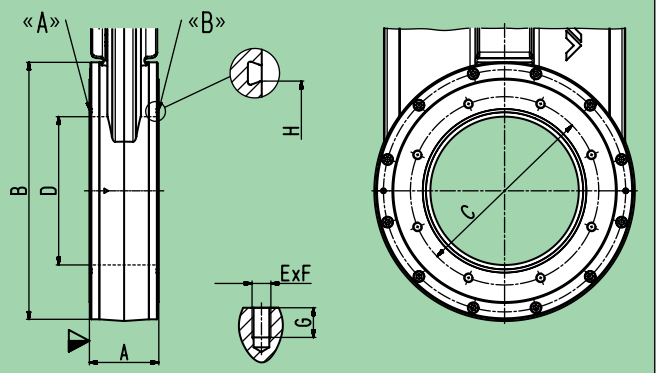


Valve seat side

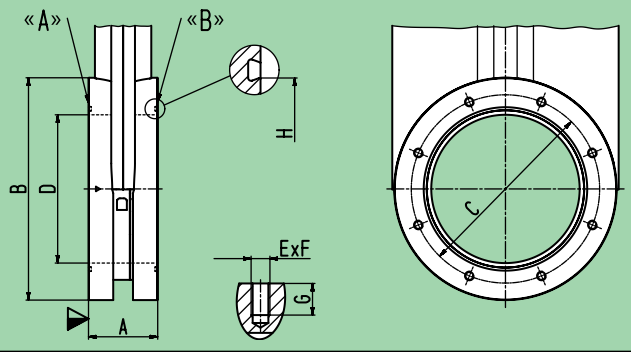
# Flange dimensions

**ASA-LP** *)

Series 15.0, 15.1: DN 63–160 (2½"–6")




Series 15.2: DN 63–250 (2½"–10")




*) **ASA-LP**
with or without O-ring groove

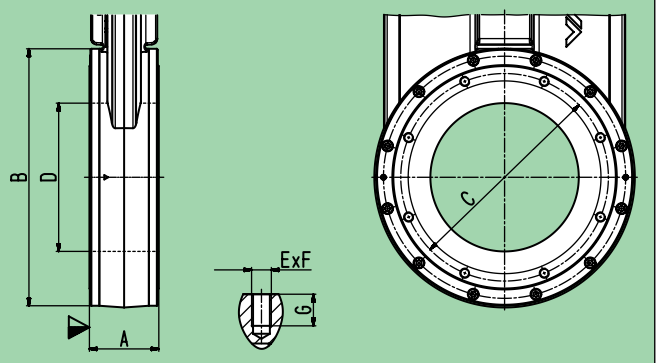
For orders with O-ring groove specify:
«A», «B» or «A + B»

| DN | mm / inch | 63 / 2½ | 100 / 4 | 160 / 6 | 200 / 8 | 250 / 10 |
|---|---|---|---|---|---|---|
| ASA-LP | | 2 | 3 | 4 | 6 | 8 |
| A | mm | 70 | 70 | 70 | 80 | 100 |
| | inch | 2.76 | 2.76 | 2.76 | 3.15 | 3.94 |
| B [1] | mm | 170 | 210 | 260 | – | – |
| | inch | 6.69 | 8.27 | 10.24 | | |
| B [2] | mm | 135 | 175 | 225 | 290 | 354 |
| | inch | 5.31 | 6.89 | 8.86 | 11.41 | 13.94 |
| C | mm | 120.70 | 152.40 | 190.50 | 241.30 | 298.50 |
| | inch | 4.75 | 6.00 | 7.50 | 9.50 | 11.75 |
| D | mm | 65 | 100 | 150 | 200 | 250 |
| | inch | 2.56 | 3.94 | 5.91 | 7.87 | 9.84 |
| E × F | | 4 × ⅜" 16 UNC | 4 × ⅜" 16 UNC | 8 × ⅜" 16 UNC | 8 × ¾" 10 UNC | 8 × ¾" 10 UNC |
| G | mm | 15 | 15 | 15 | 19 | 19 |
| | inch | 0.59 | 0.59 | 0.59 | 0.75 | 0.75 |
| H | mm | 88.90 | 120.65 | 158.75 | 206.40 | 266.70 |
| | inch | 3.50 | 4.75 | 6.25 | 8.13 | 10.50 |
| O-ring I.D. × d | mm | 88.49 × 3.53 | 120.24 × 3.53 | 158.34 × 3.53 | 202.79 × 3.53 | 266.29 × 3.53 |
| | inch | 3.48 × 0.139 | 4.73 × 0.139 | 6.23 × 0.139 | 7.98 × .139 | 10.48 × .139 |

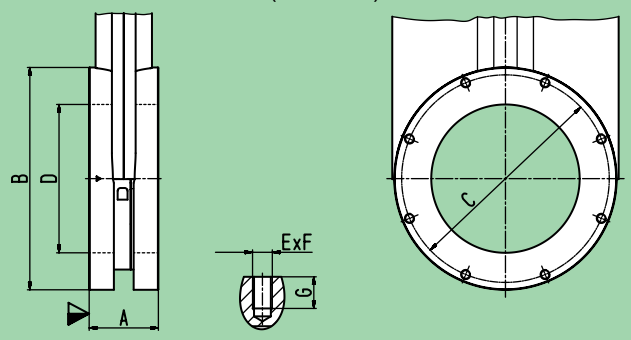
[1] Series 15.0, 15.1
[2] Series 15.2

**JIS B 2290: 1998 / ISO 1609**

Series 15.0, 15.1: DN 65–150 (2½"–6")




Series 15.2: DN 65–250 (2½"–10")




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

[1] Series 15.0, 15.1
[2] Series 15.2

Projection E

▽ Valve seat side

# Series 16.2



## Main applications

Applications requiring a compact design

Especially suited to demanding corrosive processes

## Ordering information

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

| DN | | Ordering numbers | | |
|---|---|---|---|---|
| mm | inch | ISO-F | ASA-LP | JIS |
| 63 | 2½ | 16236-PA21 | 16236-TA21 | 16236-JA21 |
| 100 | 4 | 16240-PA21 | 16240-TA21 | 16240-JA21 |
| 160 | 6 | 16244-PA21 | 16244-TA21 | 16244-JA21 |
| 200 | 8 | 16246-PA21 | 16246-TA21 | 16246-JA21 |
| 250 | 10 | 16248-PA21 | 16248-TA21 | 16248-JA21 |
| 320 | 12 | 16250-PA21 | 16250-TA21 | 16250-JA21 |
| 350 | 14 | – | 16251-TA21 | 16251-JA21 |
| 400 | 16 | 16252-PA21 | 16252-TA21 | 16252-JA21 |
| 500 | 20 | 16254-PA21 | 16254-TA21 | 16254-JA21 |
| 550 | 22 | on request | on request | on request |

without solenoid valve, without position indicator: 162 . . - . A**1**1
with solenoid valve, without position indicator: 162 . . - . A**3**1 (specify control voltage)
with solenoid valve, with position indicator: 162 . . - . A**4**1 (specify control voltage)

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

| DN | | Ordering numbers | | |
|---|---|---|---|---|
| mm | inch | ISO-F | ASA-LP | JIS |
| 63 | 2½ | 16236-PA28 | 16236-TA28 | 16236-JA28 |
| 100 | 4 | 16240-PA28 | 16240-TA28 | 16240-JA28 |
| 160 | 6 | 16244-PA28 | 16244-TA28 | 16244-JA28 |
| 200 | 8 | 16246-PA28 | 16246-TA28 | 16246-JA28 |
| 250 | 10 | 16248-PA28 | 16248-TA28 | 16248-JA28 |
| 320 | 12 | 16250-PA28 | 16250-TA28 | 16250-JA28 |
| 350 | 14 | – | 16251-TA28 | 16251-JA28 |
| 400 | 16 | 16252-PA28 | 16252-TA28 | 16252-JA28 |
| 500 | 20 | 16254-PA28 | 16254-TA28 | 16254-JA28 |
| 550 | 22 | on request | on request | on request |

with solenoid valve, with position indicator: 162 . . - . A**4**8 (specify control voltage)

## Features

Body material: aluminum

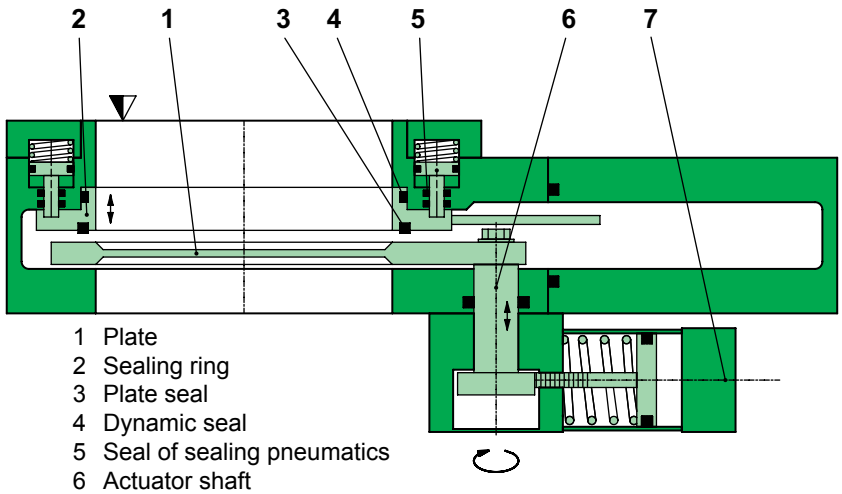
Compact

Low vibration level and low particle count during operation

Split body design for easy maintenance

No readjustment after cleaning

Functional principle




1 Plate
2 Sealing ring
3 Plate seal
4 Dynamic seal
5 Seal of sealing pneumatics
6 Actuator shaft
7 Pneumatic actuator
▽ Valve seat side

## Technical data

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

[1] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page

Continued Technical data

| DN (nominal I. D.) | | Standard flanges | Conductance (molecular flow) (depending on A-dimension and flange type) | Minimum adjustable conductance with 3-position pneumatic actuator | Max. differential pressure in closed position | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing or opening time *) | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | | $l s^{-1}$ | $l s^{-1}$ | mbar | bar | psi | l | $ft^3$ | s | kg | lbs |
| 63 | 2½ | See page 85 | 440 | 6.5 | 1200 | 5–7 | 73–102 | 0.20 | 0.007 | 3 | 13 | 28.7 |
| 100 | 4 | | 1700 | 7.5 | 1200 | 5–7 | 73–102 | 0.20 | 0.007 | 3 | 13 | 28.7 |
| 160 | 6 | | 4700 | 12.5 | 1200 | 5–7 | 73–102 | 0.25 | 0.009 | 3 | 20 | 44.1 |
| 200 | 8 | | 11000 | 15 | 1200 | 5–7 | 73–102 | 0.30 | 0.010 | 4 | 23 | 50.7 |
| 250 | 10 | | 21700 | 22 | 1200 | 5–7 | 73–102 | 0.35 | 0.012 | 4 | 30 | 66.1 |
| 320 | 12 | | 32600 | 54 | 1200 | 5–7 | 73–102 | 0.55 | 0.020 | 5 | 56 | 123.5 |
| 350 | 14 | | 41500 | 62 | 1200 | 5–7 | 73–102 | 0.60 | 0.021 | 5 | 65 | 143.3 |
| 400 | 16 | | 61000 | 69 | 1200 | 5–7 | 73–102 | 0.65 | 0.023 | 5.5 | 76 | 167.6 |
| 500 | 20 | | 101500 | 100 | 1200 | 5–7 | 73–102 | 1.40 | 0.047 | 10 | 120 | 264.6 |

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

## Easy and fast maintenance

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



## Spare parts

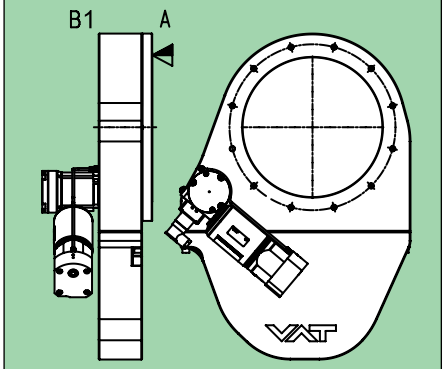
– **Seals**
on request (specify fabrication number of valve)

## Accessories

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

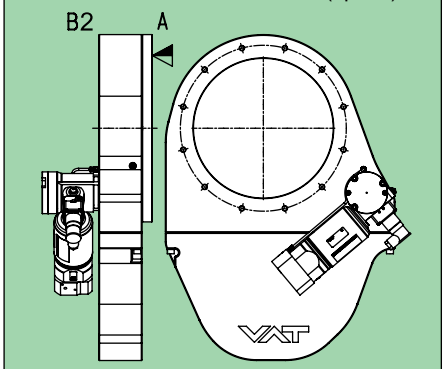
# Options

Dia. 1 Actuator on B1-side (standard)




▼ Valve seat side

Dia. 2 Actuator on B2-side (option)




▼ Valve seat side

Pic. 3



Pic. 4



**Actuator**

– Other solenoid valve voltage (standard: 24 V DC)

– Actuator on B2-side (Dia. 2). B1-side is standard.

**Valve**

– Customer specified flanges

– Other sealing materials

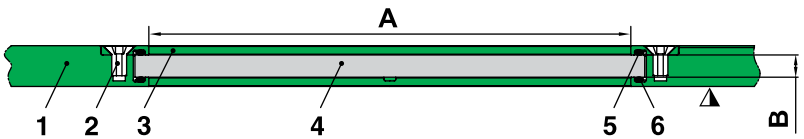
– Heater with insulation and overtemperature switch (Pic. 3)

– Valve body hard anodized or nickel-plated

– Helicoils for valve flanges

– Ports in valve body for roughing (by-pass), venting or for gauges

– Window in plate (Pic. 4):
window material: borosilicate or sapphire, elastomer seals




1 Plate
2 Screw
3 Flange
4 Window
5, 6 Seals
▼ Valve seat side

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

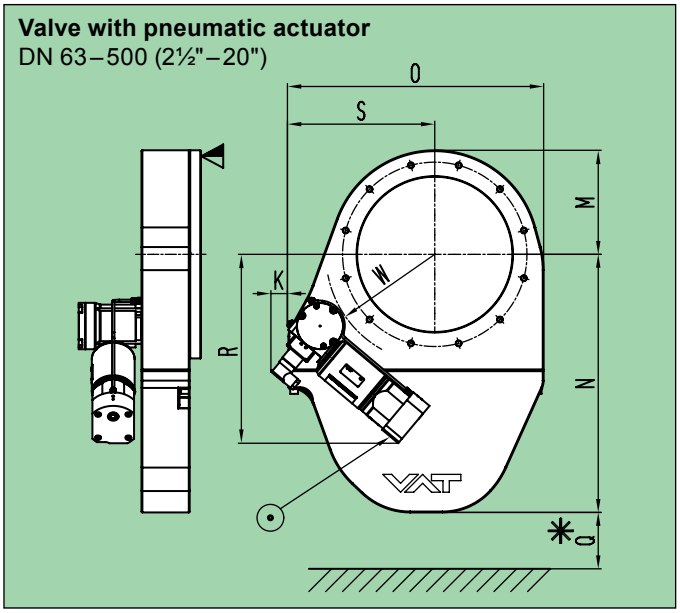
| | DN valve | | 63 | 100 | 160 | 200 | 250 | 320 | 350 | 400 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mm | 63 | 80 | 90 | 130 | 130 | 150 | 150 | 150 | |
| Borosilicate | Optically free diameter «A» | inch | 2 ½ | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 20 |
| | | mm | 2.48 | 3.15 | 3.54 | 5.12 | 5.12 | 5.91 | 5.91 | 5.91 | |
| | Thickness of glass «B» | mm | 5 | 5 | 6 | 6 | 6 | 8 | 8 | 8 | on request |
| | | inch | 0.20 | 0.20 | 0.24 | 0.24 | 0.24 | 0.31 | 0.31 | 0.31 | |
| | | mm | 63 | 80 | 112 | 170 | 200 | 250 | 250 | 250 | |
| Sapphire | Optically free diameter «A» | inch | 2.48 | 3.15 | 4.41 | 6.69 | 7.87 | 9.84 | 9.84 | 9.84 | |
| | | mm | 4 | 4 | 4 | 5 | 6 | 6 | 6 | 6 | |
| | Thickness of glass «B» | inch | 0.16 | 0.16 | 0.16 | 0.20 | 0.24 | 0.24 | 0.24 | 0.24 | |

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

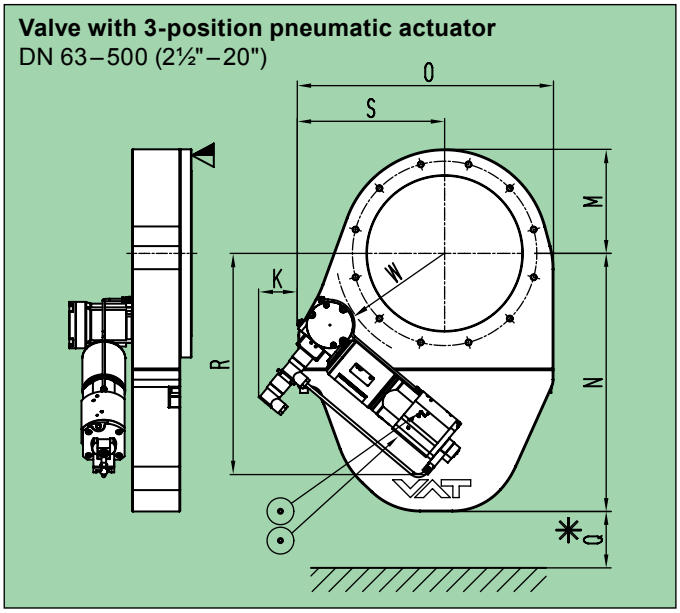
**Ordering information for options:**
Ordering No. of valve-X (e. g. 16246-PA21-X, X = window in plate)

## Main dimensions

**Valve with pneumatic actuator**
DN 63–500 (2½"–20")




**Valve with 3-position pneumatic actuator**
DN 63–500 (2½"–20")

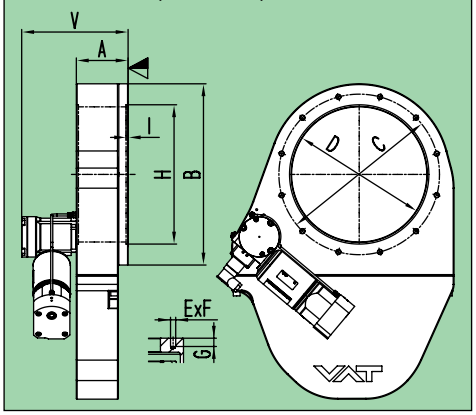



▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection

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

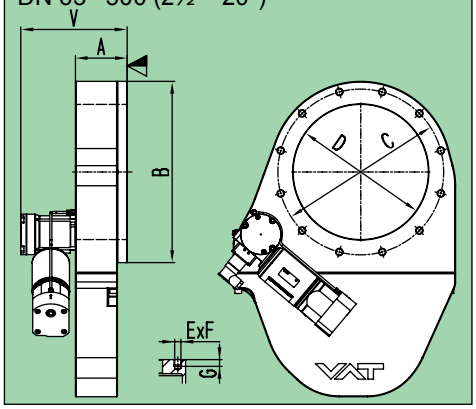
# Flange dimensions

**ISO-F**
DN 63–500 (2½"–20")




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

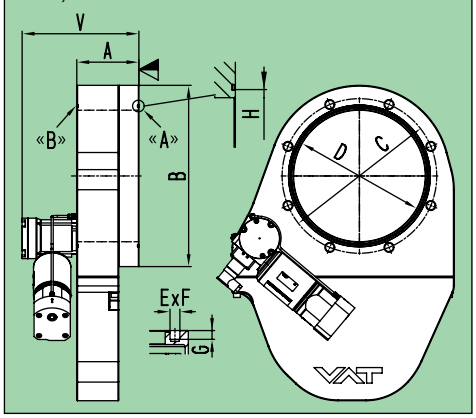
**JIS B 2290: 1998 / ISO 1609**
DN 65–500 (2½"–20")




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

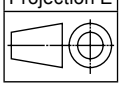
**ASA-LP** DN 63–320 (2½"–12")
with or without O-ring groove

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




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

Projection E



▼ Valve seat side

Larger sizes on request

# Series 16.8



## Main applications

Applications requiring a compact design in larger DN sizes

Especially suited to large coating and FPD production systems

## Ordering information

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

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

without solenoid valve, without position indicator: 168 . . - . A**1**4
with solenoid valve, with position indicator: 168 . . - . A**4**4 (specify control voltage)

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

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

with solenoid valve, with position indicator: 168 . . - . A**4**8 (specify control voltage)

## Spare parts

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

## Accessories

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

## Features

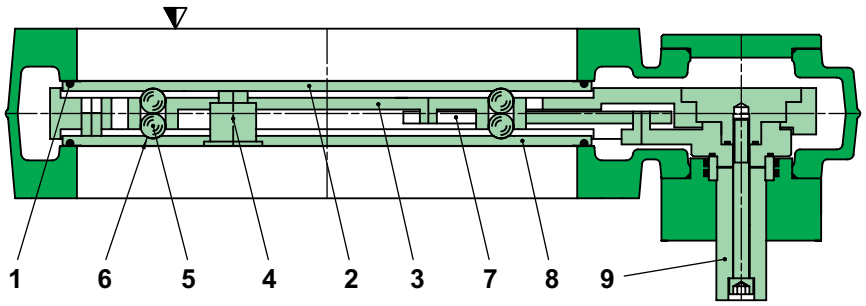
Body material: aluminum

Compact

Low vibration level during operation

Split body design for easy maintenance

Functional principle




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

## Technical data

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

[1] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

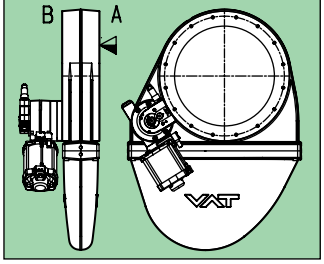
Continued Technical data

| DN (nominal I. D.) | | Standard flanges | Conductance (molecular flow) (depending on A-dimension and flange type) | Minimum adjustable conductance with 3-pos. pneumatic actuator | Max. differential pressure in closed position | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing or opening time *) | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | | $l s^{-1}$ | $l s^{-1}$ | mbar | bar | psi | l | $ft^3$ | s | kg | lbs |
| 400 | 16 | See page 89 | 50000 | 150 | 1200 | 5–7 | 73–102 | 2.0 | 0.071 | 12 | 85 | 187 |
| 457 | 16 | | 68000 | 200 | 1200 | 5–7 | 73–102 | 3.3 | 0.116 | 14 | 125 | 276 |
| 500 | 20 | | 90000 | 200 | 1200 | 5–7 | 73–102 | 3.3 | 0.116 | 14 | 115 | 254 |

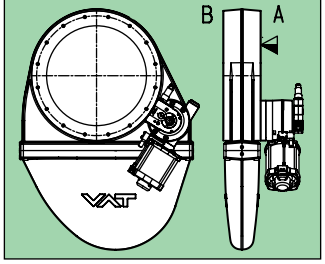
*) extended closing / opening time with 3-position pneumatic actuator

## Options

Dia. 1 Actuator on B-side (standard)

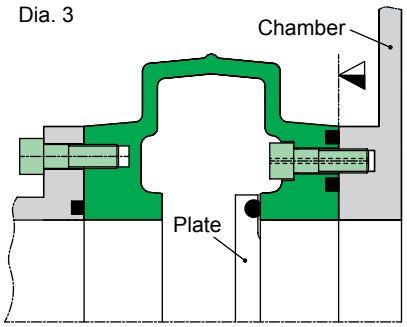



Dia. 2 Actuator on A-side (option)




▼ Valve seat side

Dia. 3




**Actuator**

– Other solenoid valve voltage (standard: 24 V DC)

– Actuator on A-side (Dia. 2). B-side is standard.

**Valve**

– Customer specified flanges

– Splinter shield grid for turbo pump

– For direct mounting to chamber (Dia. 3)

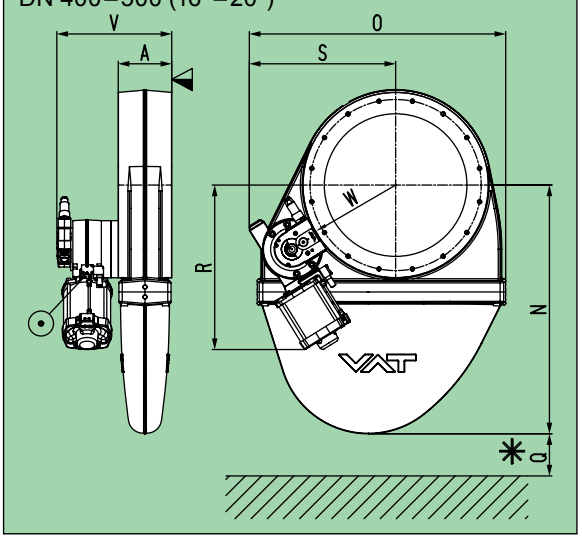
– Ports in valve body for roughing (by-pass), venting or for gauges

– Window in plate

**Ordering information for options:**
Ordering No. of valve-X
(e. g. (16852-PA24-X, X = window in plate)

## Main dimensions

**Valve with pneumatic actuator**
DN 400–500 (16"–20")

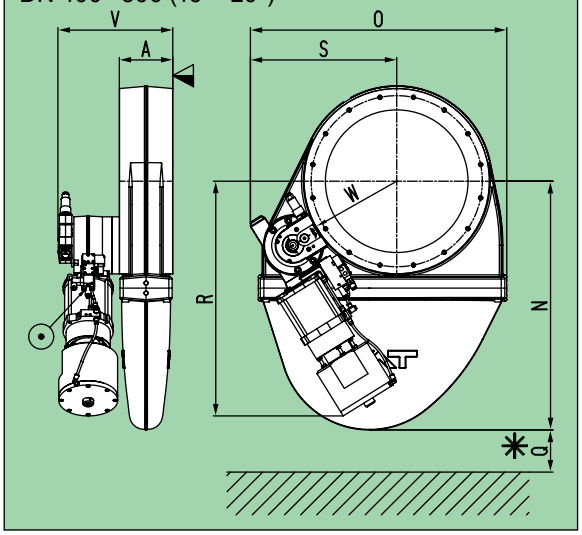



▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection

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

## Main dimensions

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

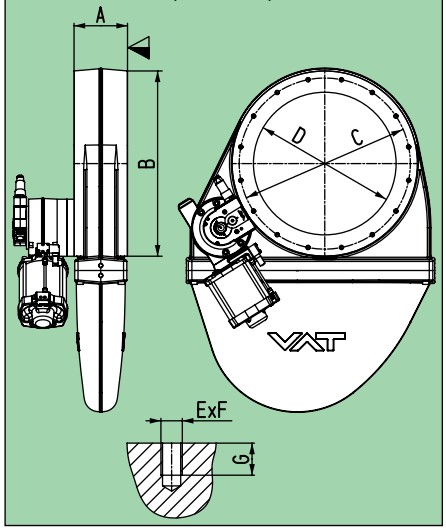



| DN | mm / inch | 400 / 16 | 500 / 20 |
|---|---|---|---|
| A | mm | 150 | 170 |
| | inch | 5.91 | 6.69 |
| N | mm | 698 | 850 |
| | inch | 27.48 | 33.46 |
| O | mm | 716 | 854 |
| | inch | 28.19 | 33.62 |
| Q | mm | 200 | 230 |
| | inch | 7.87 | 9.06 |
| R | mm | 659 | 805 |
| | inch | 25.94 | 31.69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

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

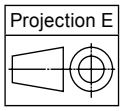
## Flange dimensions

**ISO-F**
DN 400–500 (16"–20")



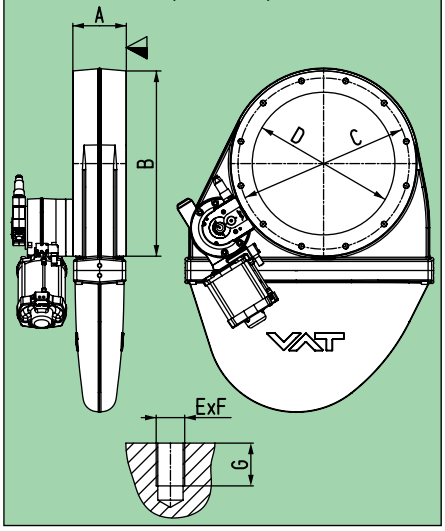

| DN | mm / inch | 400 / 16 | 500 / 20 |
|---|---|---|---|
| A | mm | 150 | 170 |
| | inch | 5.91 | 6.69 |
| B | mm | 520 | 625 |
| | inch | 20.47 | 24.61 |
| C | mm | 480 | 580 |
| | inch | 18.90 | 22.83 |
| D | mm | 400 | 501.20 |
| | inch | 15.75 | 19.73 |
| E × F | | 16 × M12 | 16 × M12 |
| G | mm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

Projection E



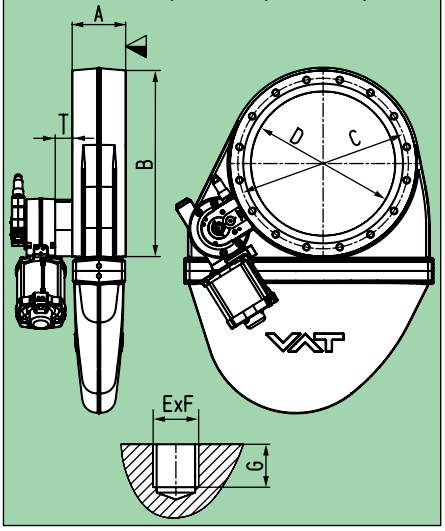
▼ Valve seat side

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




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

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




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

## Main applications

Isolation valve for contaminating processes



## Ordering information

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

| DN | | Ordering numbers | | |
|---|---|---|---|---|
| mm | inch | ISO-KF | CF-F metric threads | CF-F UNF threads |
| 40 | 1½ | 17432-KE01 | 17432-CE01 | 17432-UE01 |
| 50 | 2 | 17434-KE01 | on request | on request |

with position indicator: 174 . . - . E0**8**

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

| | | | | |
|---|---|---|---|---|
| 40 | 1½ | 17432-KE41 | 17432-CE41 | 17432-UE41 |
| 50 | 2 | 17434-KE41 | on request | on request |

without solenoid valve, without position indicator: 174 . . - . E**1**1
without solenoid valve, with position indicator: 174 . . - . E**2**1
with solenoid valve, without position indicator: 174 . . - . E**3**1 (…31/41 specify control voltage)

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

| | | | | |
|---|---|---|---|---|
| 40 | 1½ | 17432-KE44 | 17432-CE44 | 17432-UE44 |
| 50 | 2 | 17434-KE44 | on request | on request |

without solenoid valve, without position indicator: 174 . . - . E**1**4
without solenoid valve, with position indicator: 174 . . - . E**2**4
with solenoid valve, without position indicator: 174 . . - . E**3**4 (…34/44 specify control voltage)

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

| DN | | Ordering numbers | | | | |
|---|---|---|---|---|---|---|
| mm | inch | ISO-F | CF-F metric threads | CF-F UNF threads | ASA-LP | JIS |
| 63 | 2½ | 17236-PE01 | 17236-CE01 | 17236-UE01 | 17236-TE01 | 17236-JE01 |
| 100 | 4 | 17240-PE01 | 17240-CE01 | 17240-UE01 | 17240-TE01 | 17240-JE01 |
| 160 | 6 | 17244-PE01 | 17244-CE01 | 17244-UE01 | 17244-TE01 | 17244-JE01 |
| 200 | 8 | 17246-PE01 | 17246-CE01 | 17246-UE01 | 17246-TE01 | 17246-JE01 |
| 250 | 10 | on request | on request | on request | on request | on request |
| 320 | 12 | on request | on request | on request | on request | on request |

with position indicator: 172 . . - . E0**8**
with lever (instead of handwheel): 172 . . - . E0**6**

Further ordering information on next page

## Features

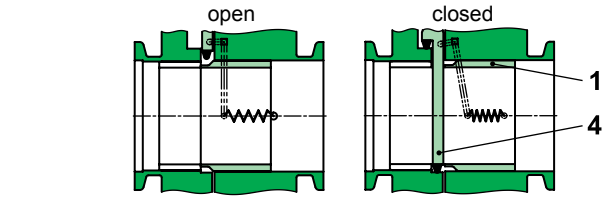
Body material: stainless steel

Long lifetime even under contaminating conditions

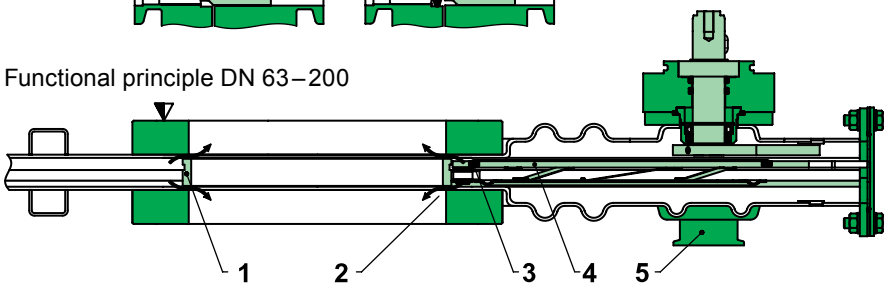
Protective ring

Easy to service: fast exchange of gate seal

Functional principle DN 40–50




Functional principle DN 63–200




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

## Technical data

| | |
|---|---|
| Leak rate: valve body, valve seat | $< 1 \cdot 10^{-9}$ mbar l s$^{-1}$ |
| Pressure range | $1 \cdot 10^{-8}$ mbar to 2 bar (abs) |
| Differential pressure on the gate | ≤2 bar |
| Differential pressure at opening | ≤30 mbar |
| Cycles until first service | |
| – DN 40– 50 | 20000 |
| – DN 63–200 | 100000 |
| Temperature [1] | |
| – Valve body | |
| - DN 40– 50 | ≤200 °C |
| - DN 63–200 | ≤150 °C |
| – Manual actuator | ≤ 80 °C |
| – Pneumatic actuator | ≤ 50 °C |
| – Solenoid valve | ≤ 50 °C |
| – Position indicator | ≤ 80 °C |
| Heating and cooling rate | ≤50 °C h$^{-1}$ |

[1] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page

Continued Ordering information

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

| DN | | Ordering numbers (specify control voltage) | | | | |
|---|---|---|---|---|---|---|
| mm | inch | ISO-F | CF-F metric threads | CF-F UNF threads | ASA-LP | JIS |
| 63 | 2½ | 17236-PE44 | 17236-CE44 | 17236-UE44 | 17236-TE44 | 17236-JE44 |
| 100 | 4 | 17240-PE44 | 17240-CE44 | 17240-UE44 | 17240-TE44 | 17240-JE44 |
| 160 | 6 | 17244-PE44 | 17244-CE44 | 17244-UE44 | 17244-TE44 | 17244-JE44 |
| 200 | 8 | 17246-PE44 | 17246-CE44 | 17246-UE44 | 17246-TE44 | 17246-JE44 |
| 250 | 10 | on request | on request | on request | on request | on request |
| 320 | 12 | on request | on request | on request | on request | on request |

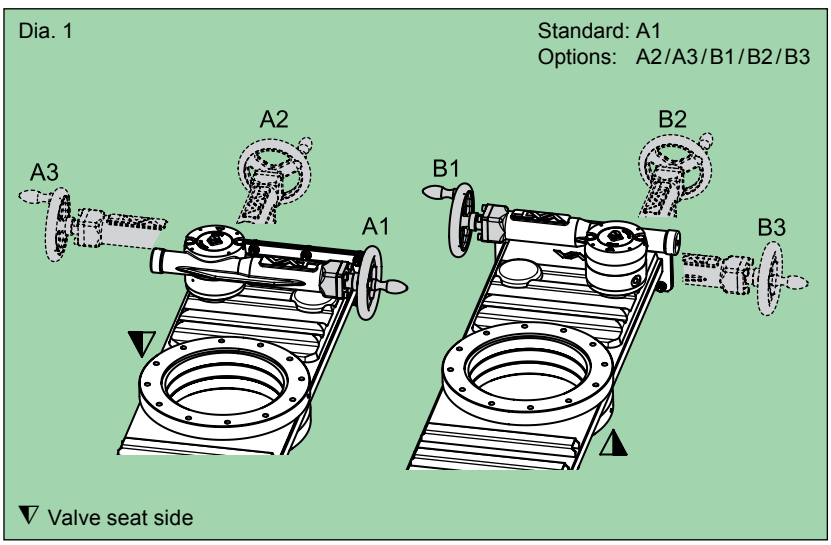
without solenoid valve, without position indicator: 172 . . - . E**1**4
without solenoid valve, with position indicator: 172 . . - . E**2**4
with solenoid valve, without position indicator: 172 . . - . E**3**4 (specify control voltage)

Continued Technical data

| | |
|---|---|
| Material | |
| – Valve body, flange | AISI 304 (1.4301), AISI 316L (1.4435) |
| – Mechanism (main components) | AISI 304 (1.4301), AISI 316L (1.4404) |
| Seal | |
| – Bonnet | |
| - DN 40 – 50 | metal |
| - DN 63 – 200 | FKM (Viton®) |
| – Gate | FKM (Viton®) |
| Feedthrough | |
| – DN 40 – 50 | bellows |
| – DN 63 – 200 | rotary feedthrough with intermediate pumping |
| Mounting position | any |
| Solenoid valve | 24 V DC, 2.5 W (others on request) |
| Position indicator: contact rating | |
| – Voltage | ≤ 250 V AC ≤ 50 V AC / DC |
| – Current | ≤ 2 A ≤ 3 A |
| Valve position indication | visual (mechanical) |

| | | | | Valve with manual actuator | | | | | | Valve with pneumatic actuator | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DN (nominal I.D.) | | Standard flanges | Conductance (molecular flow) (depending on A-dimension and flange type) | Weight with turning handle | | Weight with handwheel | | Weight with lever | | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing or opening time | Weight | |
| mm | inch | | $ls^{-1}$ | | | kg | lbs | kg | lbs | bar | psi | l | $ft^3$ | s | kg | lbs |
| 40 | 1½ | See pages 96 – 97 | 80 | 2.3 | 5.1 | – | – | – | – | 5 – 7 | 73 – 102 | 0.06 | 0.002 | 1 | 3 | 6.6 |
| 50 | 2 | | 80 | 2.5 | 5.5 | – | – | – | – | 5 – 7 | 73 – 102 | 0.06 | 0.002 | 1 | 3.1 | 6.8 |
| 63 | 2½ | | 435 | – | – | 11 | 24 | 9 | 20 | 4 – 7 | 58 – 102 | 0.13 | 0.005 | 1.5 | 11 | 24 |
| 100 | 4 | | 1740 | – | – | 17 | 38 | 15 | 33 | 4 – 7 | 58 – 102 | 0.13 | 0.005 | 1.5 | 17 | 38 |
| 160 | 6 | | 5145 | – | – | 30 | 66 | 28 | 62 | 4 – 7 | 58 – 102 | 0.28 | 0.01 | 2.5 | 31 | 68 |
| 200 | 8 | | 12200 | – | – | 39 | 86 | 37 | 82 | 4 – 7 | 58 – 102 | 0.28 | 0.01 | 2.5 | 39 | 86 |

## Options




**Actuator**

– Solenoid valve for impulse actuation: last valve position is maintained at power failure

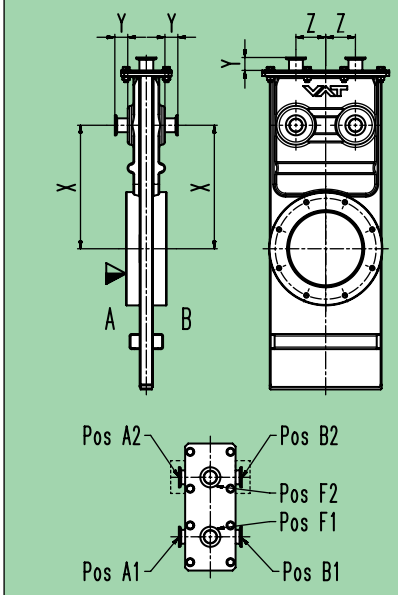
– Solenoid valve separate, for external mounting

– Other solenoid valve voltage (standard: 24 V DC)

– Pneumatic actuator of DN 63 – 200 mountable in 6 positions (Dia. 1):
- position A1, A2, A3 on A-side (valve seat side): to be specified with order
- position B1, B2, B3 on B-side (rear side): to be specified with order

– Double position indicator (2 switches each for the positions «open» and «closed»)

Dia. 2




▽ Valve seat side

**Valve**

– Customer specified flanges with / without watercooling

– For direct mounting to flat chamber: special flange for mounting to chamber wall, standard flange on opposite side

– Heat-resistant mechanism

– Ports for roughing (by-pass), venting or for gauges (Dia. 2)
- DN 63 – 200: possible in positions A1, A2, B1, B2, F1 and F2
- DN 40 – 50: positions on request

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

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

## Spare parts

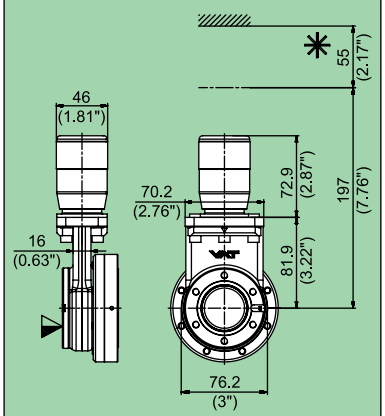
– **Seals**
on request (specify fabrication number of valve)

## Accessories

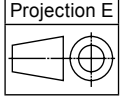
– **Flange connections**
for installation of the valve: see series 31, 32 and 33

## Dimensions

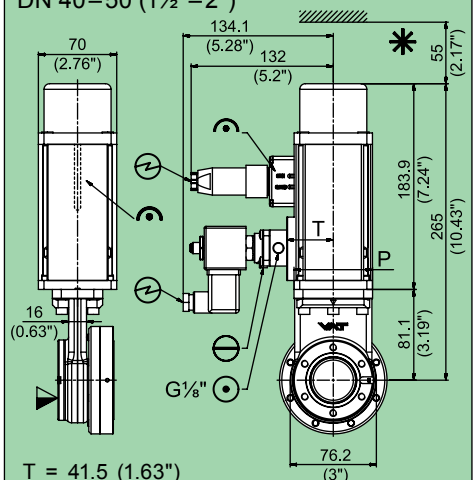
**Valve with manual actuator: turning handle**
DN 40 – 50 (1½" – 2")




Projection E

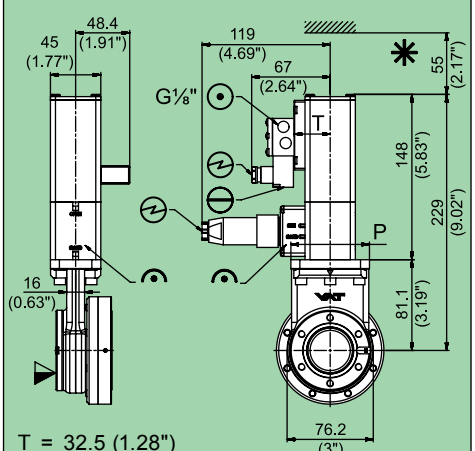


**Valve with pneumatic actuator: single acting with closing spring (NC)**
DN 40 – 50 (1½" – 2")




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

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

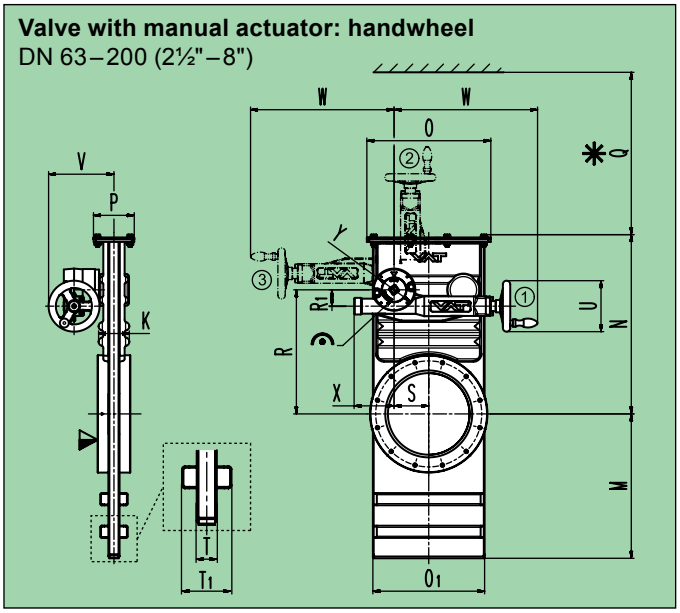



T = 32.5 (1.28")
P = 70.2 (2.76")

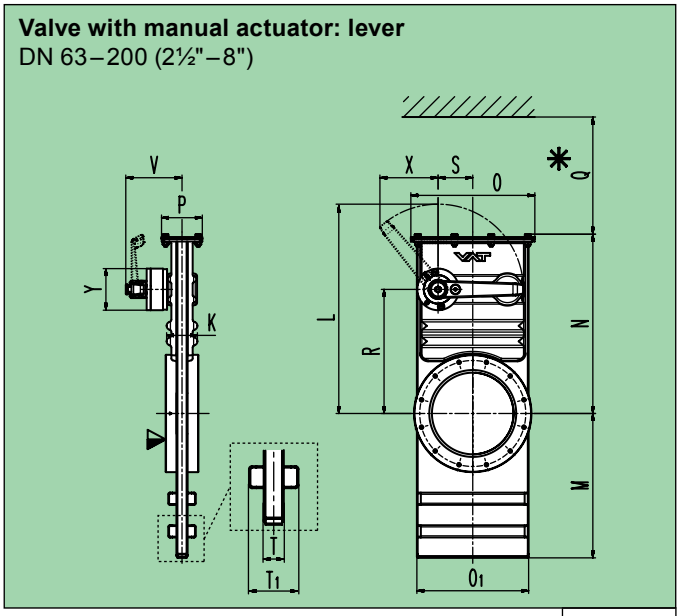
▽ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⊖ Electrical connection
◠ Mechanical position indication
⊖ Emergency operation

## Main dimensions

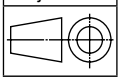
**Valve with manual actuator: handwheel**
DN 63–200 (2½"–8")




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




Projection E



▼ Valve seat side
✳ Required for dismantling
Mechanical position indication
① Standard actuator position
②③ Optional actuator positions

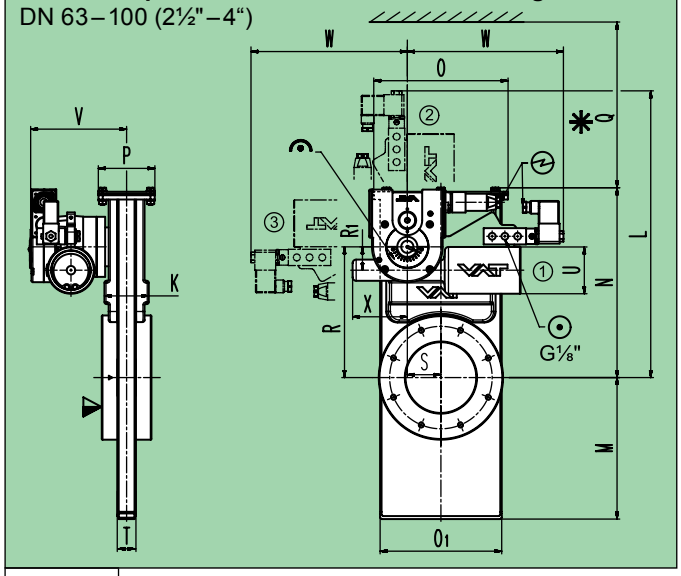
Flange dimensions: see pages 96–97

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

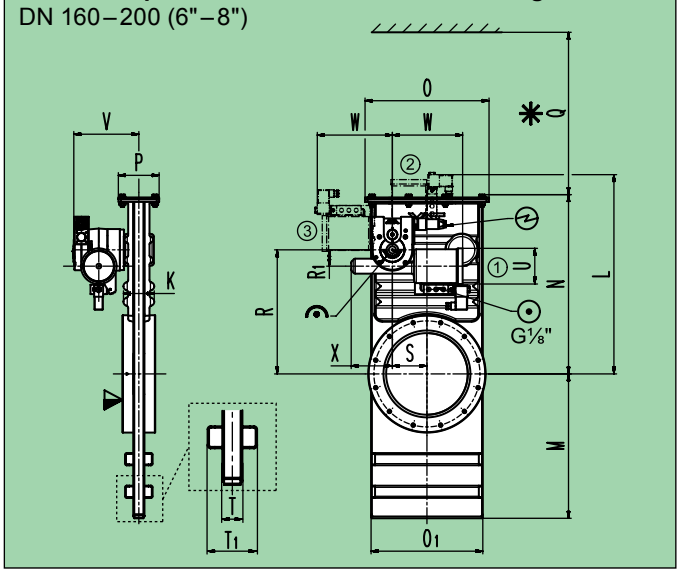
| DN | | 63 | 100 | 160 | 200 |
|---|---|---|---|---|---|
| | inch | 2½ | 4 | 6 | 8 |
| K | mm | 51 | 63 | 74 | 77 |
| | inch | 2.01 | 2.48 | 2.91 | 3.03 |
| L | mm | 276 | 315 | 455 | 515 |
| | inch | 10.87 | 12.40 | 17.91 | 20.28 |
| M | mm | 151 | 200 | 279 | 354 |
| | inch | 5.94 | 7.87 | 10.98 |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

# Main dimensions

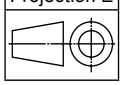
**Valve with pneumatic actuator: double acting**
DN 63–100 (2½"–4")




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




Projection E



▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⊖ Electrical connection
Mech. position indication
① Standard actuator position
②③ Optional actuator positions

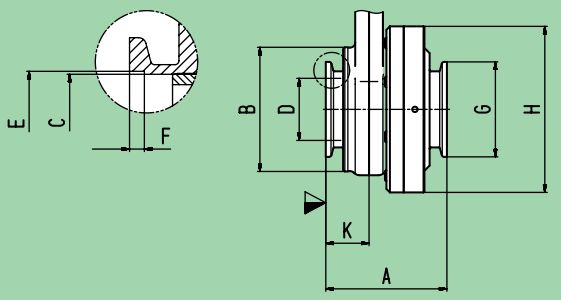
Flange dimensions: see pages 96–97

| DN | mm / inch | 63 / 2½ | 100 / 4 | | |
|---|---|---|---|---|---|
| K | mm | 51 | 63 | | |
| | inch | 2.01 | 2.48 | | |
| L | mm | 367 | 406 | | |
| | inch | 14.45 | 15.98 | | |
| M | mm | 151 | 200 | | |
| | inch | 5.94 | 7.87 | | |
| 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 | 1.30 | 1.30 | | |
| S | mm | 30 | 47.50 | | |
| | inch | 1.18 | 1.87 | | |
| T | mm | 26.50 | 26.50 | | |
| | inch | 1.04 | 1.04 | | |
| U | mm | 66 | 66 | | |
| | inch | 2.60 | 2.60 | | |
| V | mm | 135 | 135.20 | | |
| | inch | 5.31 | 5.32 | | |
| W | mm | 221 | 221 | | |
| | inch | 8.70 | 8.70 | | |
| X | mm | 78 | 78 | | |
| | inch | 3.07 | 3.07 | | |

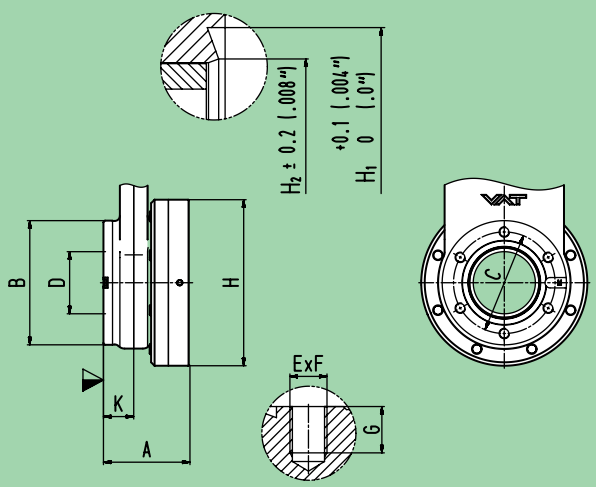
| DN | mm / inch | 160 / 6 | 200 / 8 | | |
|---|---|---|---|---|---|
| K | mm | 74 | 77 | | |
| | inch | 2.91 | 3.03 | | |
| L | mm | 435 | 495 | | |
| | inch | 17.13 | 19.49 | | |
| M | mm | 279 | 354 | | |
| | inch | 10.98 | 13.94 | | |
| N | mm | 361 | 441 | | |
| | inch | 14.21 | 17.36 | | |
| O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

## Flange dimensions

**ISO-KF**
Series 17.4: DN 40–50 (1½"–2")



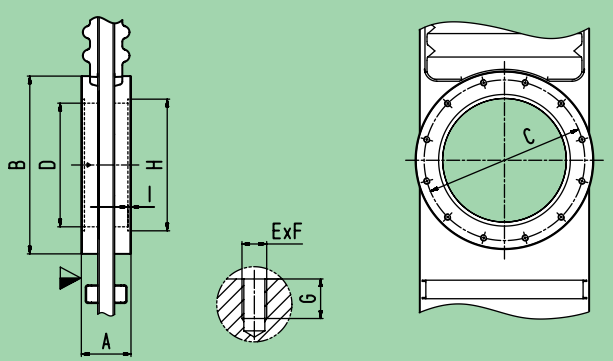

**CF-F**
Series 17.4: DN 40 (1½")




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

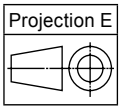
[1] Metric threads
[2] UNF threads

**ISO-F**
Series 17.2: DN 63–200 (2½"–8")




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

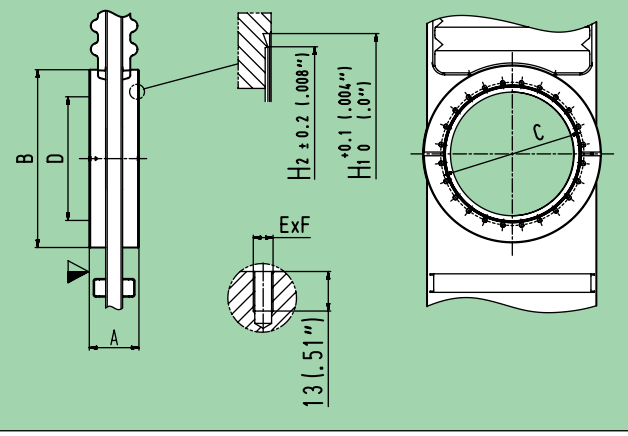
Projection E



▼ Valve seat side

# Flange dimensions

**CF-F**
Series 17.2: DN 63–200 (2½"–8")

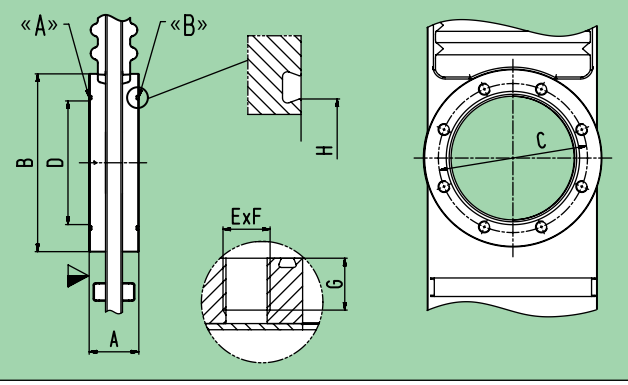



[1] Metric threads
[2] UNF threads

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

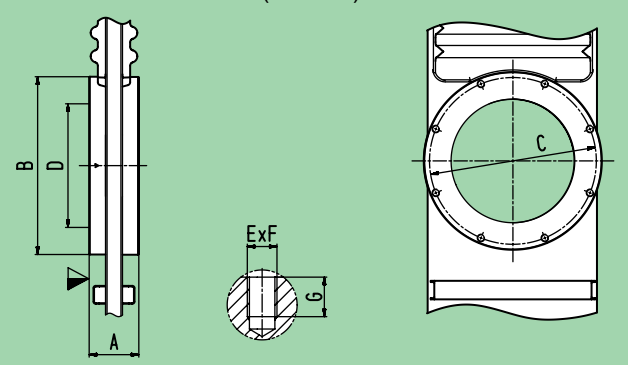
**ASA-LP**
Series 17.2: DN 63–200 (2½"–8")
with or without O-ring groove

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



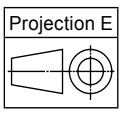

| DN | mm<br>inch | 63<br>2½ | 100<br>4 | 160<br>6 | 200<br>8 |
|---|---|---|---|---|---|
| ASA-LP | | 2 | 3 | 4 | 6 |
| A | mm<br>inch | 70<br>2.76 | 70<br>2.76 | 70<br>2.76 | 80<br>3.15 |
| B | mm<br>inch | 152.40<br>6 | 190.50<br>7.50 | 225<br>8.86 | 279.40<br>11 |
| C | mm<br>inch | 120.70<br>4.75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

**JIS B 2290: 1998 / ISO 1609**
Series 17.2: DN 65–200 (2½"–8")




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

Projection E



▽ Valve seat side

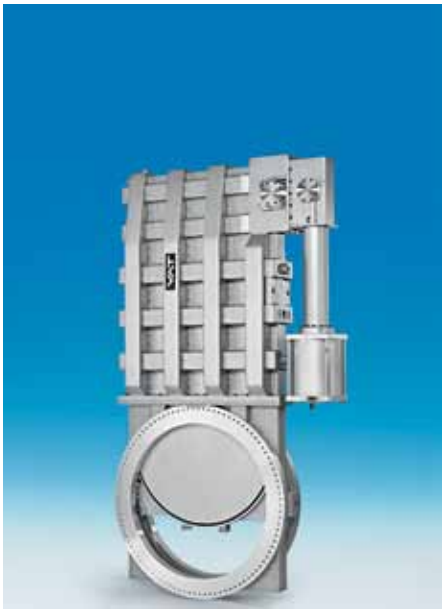
## Main applications

Isolation valve for research and industrial applications requiring large DN sizes

Especially suited to space simulation systems



Series 19.0 Vacuum gate valve



Series 19.1 HV gate valve
Series 19.2 UHV gate valve

## Ordering information

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

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

*) customer-specific

without solenoid valve, without position indicator: 19 . . . - . E**1**4
without solenoid valve, with position indicator: 19 . . . - . E**2**4
with solenoid valve, without position indicator: 19 . . . - . E**3**4
(…34 specify control voltage)

## Projects for special versions

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

## Acceptance tests

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

## References

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

## Features

Body material: stainless steel

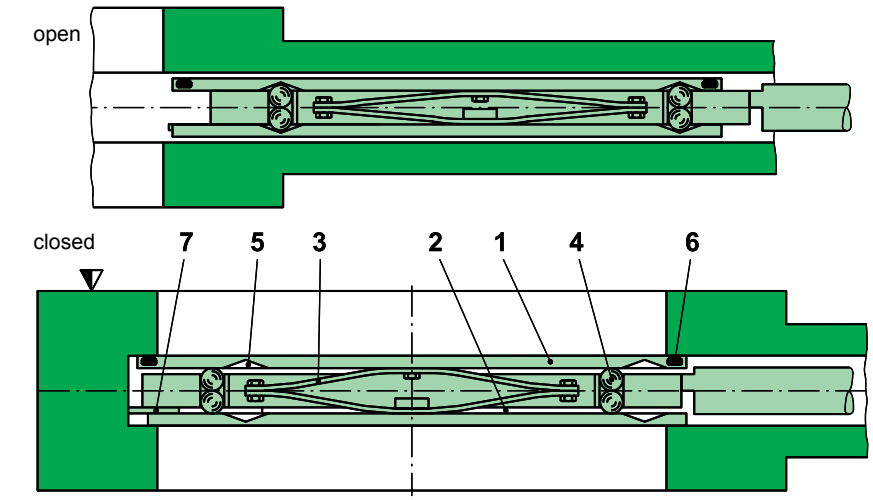
Damped opening and closing

Differential pressure possible on either side

VATLOCK configuration: see glossary

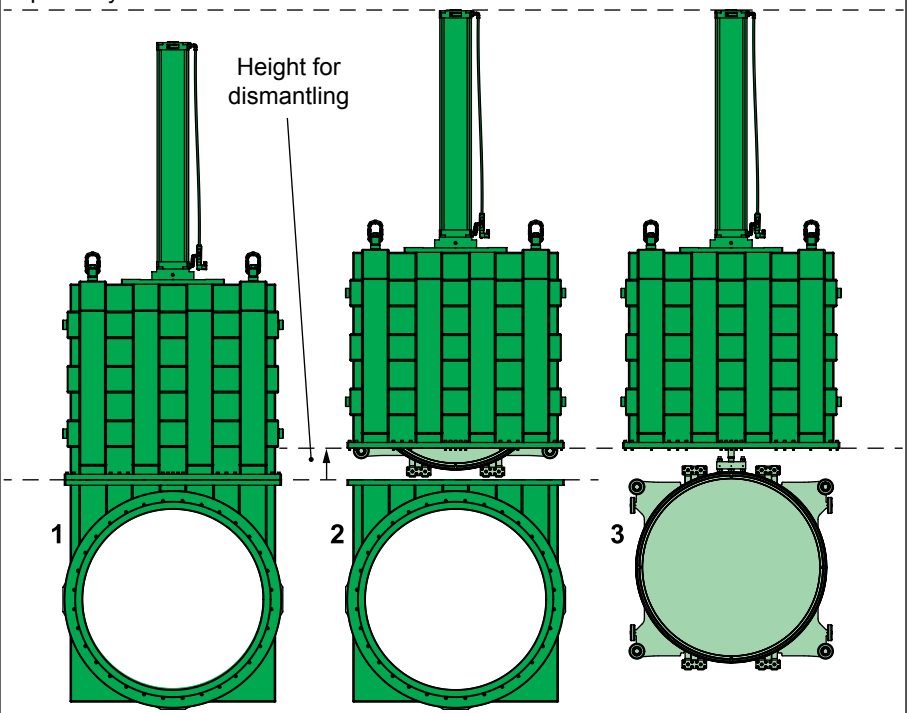
From DN 900 with split body (see illustration below): short height for dismantling and convenient maintenance

Functional principle




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

Split body DN 900 – 2000




1 Put valve to the open position

2 Unscrew actuator part and lift it off (flange part remains in the system)

3 Move gate assembly out of body and carry out maintenance work

## Technical data

| | | |
|---|---|---|
| Leak rate | | |
| – Valve body | Series 19.0, 19.1 | $<1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| | Series 19.2 | $<5 \cdot 10^{-10}$ mbar ls$^{-1}$ |
| – Valve seat | | $<1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| Pressure range | | |
| – Series 19.0 | | $1 \cdot 10^{-7}$ mbar to 1 bar (abs) |
| – Series 19.1 | | $1 \cdot 10^{-8}$ mbar to 1 bar (abs) |
| – Series 19.2 | | $1 \cdot 10^{-10}$ mbar to 1 bar (abs) |
| Differential pressure on the gate | | ≤1 bar |

Further technical data on next page

Continued Technical data

| | | |
|---|---|---|
| Differential pressure at opening | | |
| – DN 400– 500 | | ≤20 mbar |
| – DN 630–2000 | | ≤10 mbar |
| Cycles until first service | | |
| – Series 19.0 | DN 400–500 | 100000 |
| – Series 19.0 | DN 630 | 20000 |
| – Series 19.1, 19.2 | DN 400–630 | 20000 |
| – Series 19.0, 19.1, 19.2 | DN 800–2000 | 10000 |
| Temperature [1] | | |
| – Valve body | | ≤150 °C |
| – Actuator | | ≤ 80 °C |
| – Solenoid valve | | ≤ 50 °C |
| – Position indicator | | ≤ 80 °C |
| Heating and cooling rate | | |
| – DN 400– 630 | | ≤30 °C $h^{-1}$ |
| – DN 800–1250 | | ≤ 5 °C $h^{-1}$ |
| Material | | |
| – Valve body | | AISI 304 (1.4301) |
| – Mechanism | | EN AW-6082 (3.2315), AISI 304 (1.4301) |
| – Bellows (Series 19.1, 19.2 only) | | AISI 316L (1.4435) or AISI 304L (1.4306) |
| Seal | | |
| – Bonnet Series 19.0, 19.1 | | FKM (Viton®) |
| Series 19.2 | | metal |
| – Gate | | FKM (Viton®) |
| Feedthrough | | |
| – Series 19.0 | | shaft feedthrough |
| – Series 19.1, 19.2 | | bellows |
| Mounting position | | |
| – DN 400– 800 | | any |
| – DN 900–2000 | | please define |
| Solenoid valve | | 24 V DC, max. 2 W (others on request) |

| Position indicator: contact rating | Series 19.0 | Series 19.1 and 19.2 | |
|---|---|---|---|
| – Voltage | ≤50 V AC/DC | ≤50 V DC | ≤250 V AC |
| – Current | ≤0.1 A | ≤1.2 A | ≤2 A |

| | |
|---|---|
| Valve position indication | |
| – Series 19.0 | LED |
| – Series 19.1, 19.2 | visual (mechanical) |

[1] Maximum values: depending on operating conditions and sealing materials

| DN (nominal I.D.) | | Conductance (molecular flow) | Compressed air min.–max. overpressure | | | | Volume of pneumatic actuator | | | | Closing or opening time | | Weight | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 19.0 | | 19.1, 19.2 | | 19.0 | | 19.1, 19.2 | | 19.0 | 19.1, 19.2 | 19.0 | | 19.1, 19.2 | |
| mm | inch | $l s^{-1}$ | bar | psi | bar | psi | l | $ft^3$ | l | $ft^3$ | s | s | kg | lbs | kg | lbs |
| 400 | 16 | 50000 | 5–7 | 73–102 | 5–9 | 73–131 | 5.9 | 0.208 | 2.1 | 0.074 | 8 | 10 | 140 | 309 | 160 | 353 |
| 500 | 20 | 90000 | 5–7 | 73–102 | 5–9 | 73–131 | 6.9 | 0.244 | 2.7 | 0.095 | 8 | 10 | 200 | 441 | 235 | 518 |
| 630 | 25 | 186000 | 5–7 | 73–102 | 6–9 | 87–131 | 8.8 | 0.311 | 4.8 | 0.170 | 10 | 14 | 350 | 772 | 385 | 849 |
| 800 | 32 | 280000 | 5–7 | 73–102 | 6–9 | 87–131 | 17.9 | 0.632 | 11 | 0.388 | 21 | 35 | 580 | 1279 | 730 | 1610 |
| 900 | 36 | 430000 | 5–7 | 73–102 | 6–9 | 87–131 | 20.8 | 0.735 | *) | *) | 23 | *) | 760 | 1676 | *) | *) |
| 1000 | 40 | 505000 | 5–7 | 73–102 | 6–9 | 87–131 | 22.6 | 0.798 | 18.8 | 0.664 | 25 | 50 | 1000 | 2205 | 1300 | 2867 |
| 1250 | 50 | 950000 | 5–7 | 73–102 | 6–9 | 87–131 | 43.6 | 1.540 | 25.9 | 0.915 | 30 | 70 | 1700 | 3749 | 2100 | 4631 |
| 1600 | 63 | 1460000 | 5–7 | 73–102 | *) | *) | 111.1 | 3.923 | *) | *) | 35 | *) | 2800 | 6174 | *) | *) |
| 2000 | 78 | 2790000 | 5–7 | 73–102 | *) | *) | 217.4 | 7.677 | *) | *) | 55 | *) | 5050 | 11135 | *) | *) |

*) on request

## Options

**Actuator**

– Solenoid valve for impulse actuation:
last valve position is maintained at power failure

– Solenoid for impulse actuation and nonreturn valve:
last valve position is maintained at power failure and compressed air failure

– Solenoid valve separate, for external mounting

– Other solenoid valve voltage (standard: 24 V DC)

– 3-position pneumatic actuator

– Mechanical position indicator for series 19.0

**Valve**

– ISO, ASA, ASA-LP, JIS flanges

– Customer specified flanges with / without watercooling

– Static seals made of metal

– Ports for roughing (by-pass), venting or for gauges

– Protective ring

– Heat protection shield

– Leaf springs made of Nimonic

– Other sizes

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

## Spare parts

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

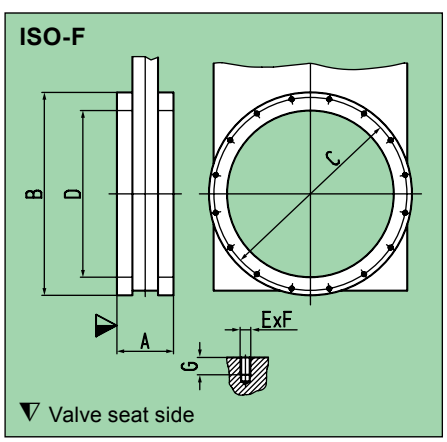
## Accessories

– **Bake-out equipment**

– **Blank-off flanges**
for testing and bake-out

## Flange dimensions

*) customer-specific

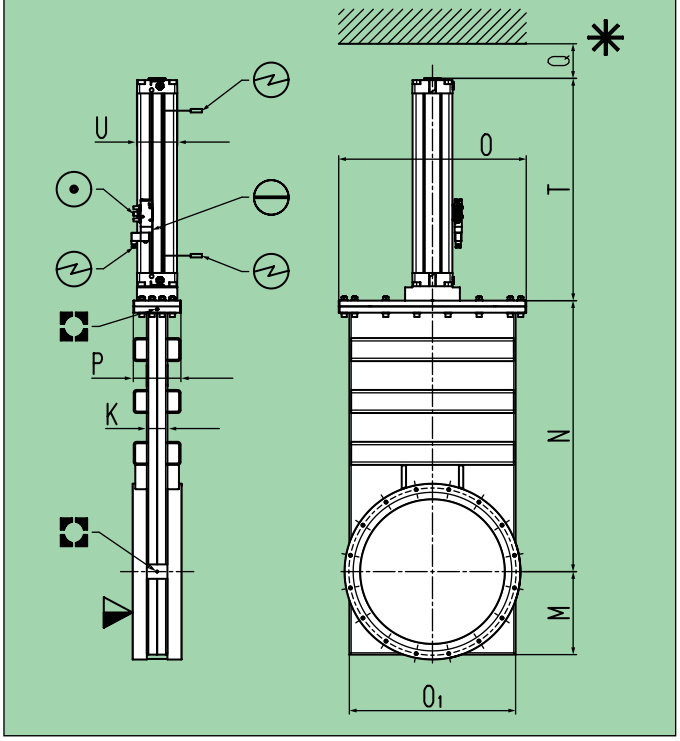



| DN | | 400 | 500 | 630 | 800 | 900 *) | 1000 | 1250 *) | 1600 *) | 2000 *) |
|---|---|---|---|---|---|---|---|---|---|---|
| | inch | 16 | 20 | 25 | 32 | 36 | 40 | 50 | 63 | 78 |
| A | mm | 150 | 170 | 180 | 220.50 | 204 | 240 | 250 | 250 | 340 |
| | inch | 5.90 | 6.69 | 7.09 | 8.66 | 8.03 | 9.45 | 9.84 | 9.84 | 13.40 |
| B | mm | 510 | 610 | 780 | 960 | 1060 | 1168 | 1500 | 1830 | 2232 |
| | inch | 20.08 | 24.02 | 30.71 | 37.80 | 41.70 | 46 | 59.05 | 72.05 | 87.80 |
| C | mm | 480 | 580 | 720 | 890 | 990 | 1090 | 1370 | 1760 | 2121 |
| | inch | 18.90 | 22.83 | 28.35 | 35.04 | 38.90 | 42.91 | 53.94 | 29.30 | 83.50 |
| D | mm | 400 | 501 | 651 | 800 | 900 | 1000.50 | 1250 | 1600 | 1982 |
| | inch | 15.75 | 19.72 | 25.63 | 31.50 | 35.40 | 39.37 | 49.21 | 63 | 78 |
| E × F | | 16 × M12 | 16 × M12 | 20 × M12 | 24 × M12 | – | 32 × M12 | 32 × M16 | 40 × M24 | 36 × ¾" |
| G | mm | 20 | 20 | 20 | 20 | – | 20 | 25 | 48 | 34 |
| | inch | 0.79 | 0.79 | 0.79 | 0.79 | | 0.79 | 0.98 | 1.89 | 1.33 |

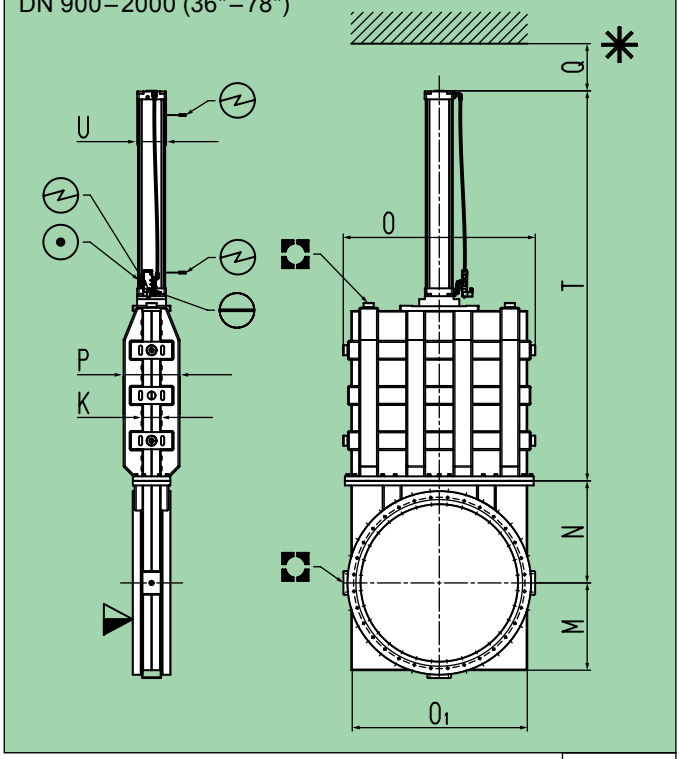
Dimensions for other flanges on request

## Main dimensions

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

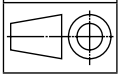



**Series 19.0** (with shaft feedthrough):
**Vacuum valve with pneumatic actuator: double acting**
DN 900–2000 (36"–78")




▽ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⊖ Electrical connection
⊖ Emergency operation
◘ For attachment

Projection E



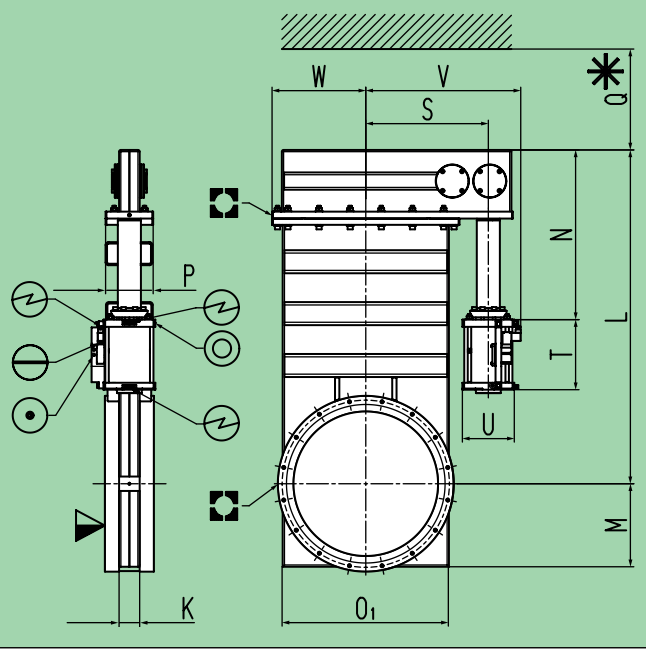
Flange dimensions: see page 101

*) customer-specific

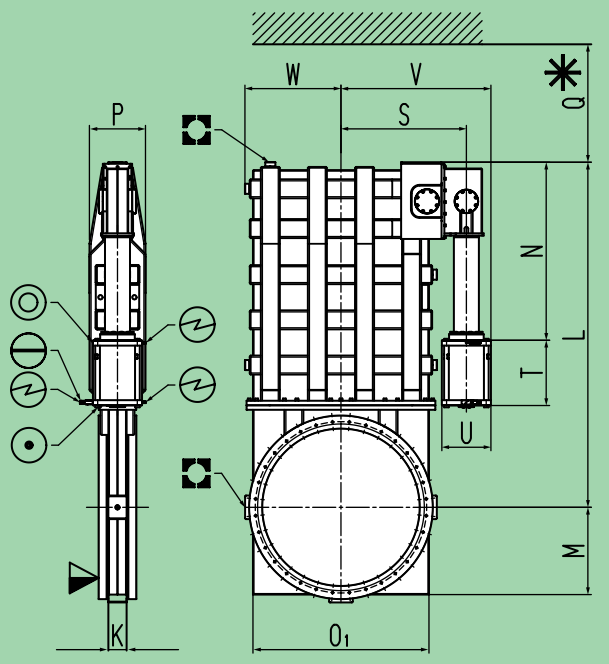
| DN | | 400 | 500 | 630 | 800 | 900 *) | 1000 | 1250 *) | 1600 *) | 2000 *) |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm | 16 | 20 | 25 | 32 | 36 | 40 | 50 | 63 | 78 |
| K | mm | 67 | 72 | 74 | 87 | 87 | 116 | 116 | 125 | 145 |
| | inch | 2.64 | 2.83 | 2.91 | 3.43 | 3.43 | 4.57 | 4.57 | 4.92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

## Main dimensions

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

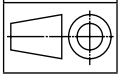



**Series 19.1, 19.2** (with bellows):
**HV/UHV valve with pneumatic actuator: double acting**
DN 900–2000 (36"–78")




▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⊖ Electrical connection
⊖ Emergency operation
◎ Leak detection hole
◘ For attachment

Projection E



Flange dimensions: see page 101

*) customer-specific

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

# Series 20.0 / 20.2



## Main applications

Compact isolation valve for clean processes

## Features

Body material:
aluminum or stainless steel

Bellows

No friction of the plate seal

Mechanically locked in open and closed position

Compact alternative to gate valves

## Ordering information

**Valve with manual actuator**
turning handle: ½ turn

| DN | | Ordering numbers | | | |
|---|---|---|---|---|---|
| | | Series 20.0 with standard body | | Series 20.2 with extended body | |
| | | aluminum | stainless steel | aluminum | stainless steel |
| mm | inch | ISO-F | CF-F metric threads | ISO-F | CF-F metric threads |
| 63 | 2½ | 20036-PA04 | 20036-CE04 | 20236-PA04 | 20236-CE04 |
| 100 | 4 | 20040-PA04 | 20040-CE04 | 20240-PA04 | 20240-CE04 |
| 160 | 6 | 20044-PA04 | 20044-CE04 | 20244-PA04 | 20244-CE04 |

**Valve with pneumatic actuator**

See series 20.3 / 20.4, pages 106 – 109

## Technical data

further technical data on request

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

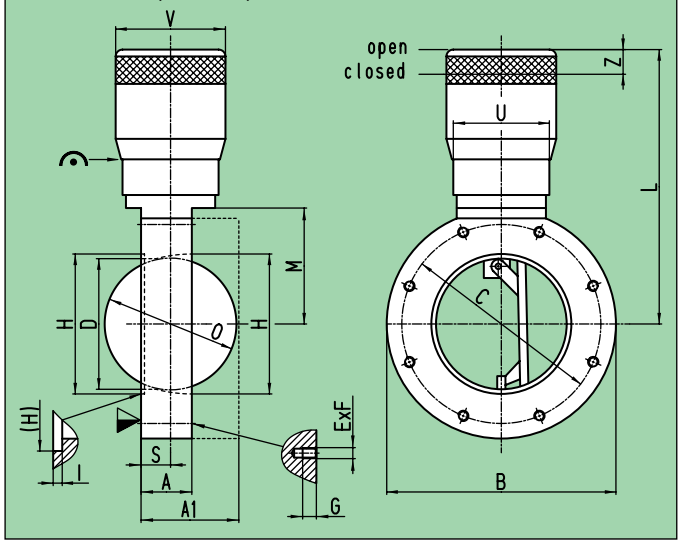
[1] Maximum values: depending on operating conditions and sealing materials

## Options, accessories

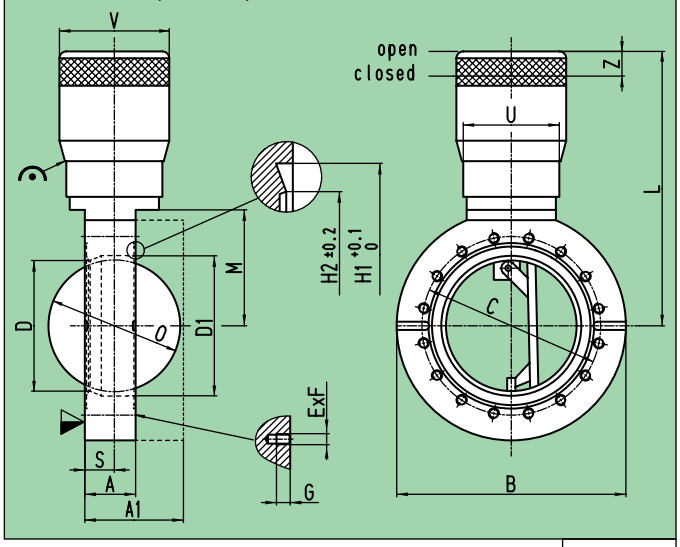
On request

# Dimensions

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

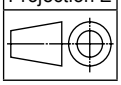



**Valve with manual actuator: turning handle**
DN 63–160 (2½"–6") CF-F




Valve seat side  Mechanical position indication

Projection E



A: standard body, series 20.0
A1: extended body, series 20.2

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

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

# Series 20.3 / 20.4

## Main applications

Compact isolation valve for contaminating and aggressive processes



## Ordering information

**Valve with manual actuator**

See series 20.0 / 20.2, pages 104 – 105

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

| DN | | Ordering numbers Series 20.3 with standard body | | |
|---|---|---|---|---|
| | | aluminum | stainless steel | |
| mm | inch | ISO-F | ISO-F | CF-F metric threads |
| 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 |

without solenoid valve, with position indicator: 203 . . - . . **2**4
with solenoid valve, without position indicator: 203 . . - . . **3**4 (specify control voltage)
with solenoid valve, with position indicator: 203 . . - . . **4**4 (specify control voltage)

| DN | | Ordering numbers Series 20.4 with extended body | | |
|---|---|---|---|---|
| | | aluminum | stainless steel | |
| mm | inch | ISO-F | ISO-F | CF-F metric threads |
| 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 |

without solenoid valve, with position indicator: 204 . . - . . **2**4
with solenoid valve, without position indicator: 204 . . - . . **3**4 (specify control voltage)
with solenoid valve, with position indicator: 204 . . - . . **4**4 (specify control voltage)

## Features

Body material:
aluminum or stainless steel

Rotary feedthrough for a high number of cycles

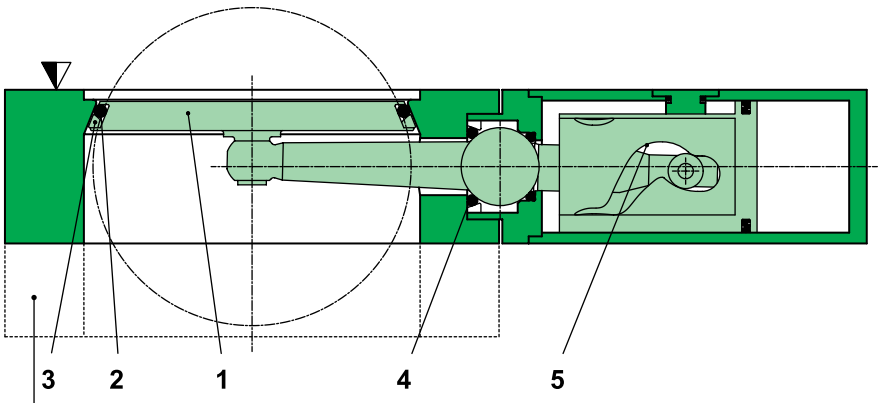
No moving parts in the vacuum

No friction of the plate seal

Mechanically locked in open and closed position

Compact alternative to gate valves

Functional principle




Series 204:
extended body

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

## Technical data

| | |
|---|---|
| Leak rate: valve body, valve seat | $< 1 \cdot 10^{-9}$ mbar l s$^{-1}$ |
| Pressure range | $1 \cdot 10^{-8}$ mbar to 2 bar (abs) |
| Differential pressure on the plate | |
| – In opening direction | ≤ 1.2 bar |
| – In closing direction | ≤ 1.6 bar |
| Differential pressure at opening | ≤ 500 mbar |
| Cycles until first service | 100 000 |
| Temperature [1] | |
| – Valve body | ≤ 120 °C (150 °C optional) |
| – Actuator | ≤ 120 °C |
| – Solenoid valve | ≤ 50 °C |
| – Position indicator | ≤ 80 °C |
| Material | |
| – Valve body and plate | |
| - aluminum | EN AW-6060 (3.3206), -6061 (3.3211), -6063 (3.3206), -6082 (3.2315) |
| - stainless steel | AISI 304 (1.4301) |
| – Mechanism | AISI 316L (1.4435), AISI 304 (1.4301) |
| – Support ring | |
| - standard | POM |
| - 150 °C Option | PEEK |
| Seal: bonnet, plate, feedthrough | FKM (Viton®) |
| Feedthrough | rotary feedthrough |
| Mounting position | any |
| Solenoid valve | 24 V DC, 7.6 W (others on request) |
| Position indicator: contact rating | |
| – Voltage | ≤ 50 V AC / DC |
| – Current | ≤ 0.5 A |
| – Power | max. 10 W |

[1] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page

Continued Technical data

| | DN (nominal I. D.) | | Conductance (molecular flow) | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing or opening time [1] | Weight Aluminum valve body | | Weight Stainless steel valve body | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | inch | $ls^{-1}$ | bar | psi | l | $ft^3$ | s | kg | lbs | kg | lbs |
| Series 20.3 with standard body | 63 | 2½ | 550 | 4–7 | 58–102 | 0.04 | 0.0014 | 0.4 | 2.3 | 5.1 | 4.6 | 10.1 |
| | 80 | 3 | 700 | 4–7 | 58–102 | 0.08 | 0.0030 | 0.8 | 3.8 | 8.4 | 7.5 | 16.5 |
| | 100 | 4 | 1400 | 4–7 | 58–102 | 0.08 | 0.0030 | 0.8 | 4.0 | 8.8 | 8.0 | 17.6 |
| | 160 | 6 | 4000 | 4–7 | 58–102 | 0.13 | 0.0045 | 1.4 | 7.4 | 16.3 | 15.6 | 34.4 |
| | 200 | 8 | 7500 | 4–7 | 58–102 | 0.30 | 0.0100 | 1.8 | 16.1 | 35.5 | 34.2 | 75.4 |
| Series 20.4 with extended body | 63 | 2½ | 450 | 4–7 | 58–102 | 0.04 | 0.0014 | 0.4 | 2.5 | 5.5 | 5.3 | 11.7 |
| | 80 | 3 | 600 | 4–7 | 58–102 | 0.08 | 0.0030 | 0.8 | 4.2 | 9.3 | 8.5 | 18.7 |
| | 100 | 4 | 1050 | 4–7 | 58–102 | 0.08 | 0.0030 | 0.8 | 4.7 | 10.4 | 10.1 | 22.3 |
| | 160 | 6 | 2550 | 4–7 | 58–102 | 0.13 | 0.0045 | 1.4 | 9.7 | 21.4 | 22.3 | 49.2 |
| | 200 | 8 | 4700 | 4–7 | 58–102 | 0.30 | 0.0100 | 1.8 | 21.3 | 47.0 | 20.8 | 45.9 |

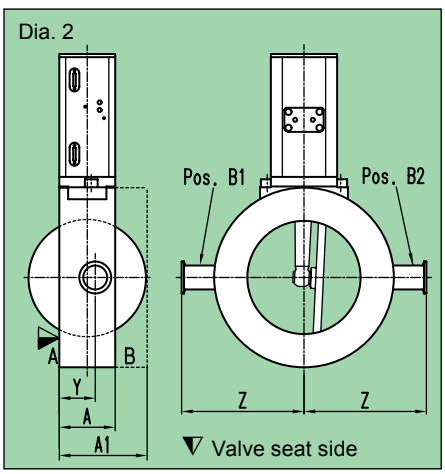
[1] depending on pneumatic installation

## Options

Pic. 1



Dia. 2




**Actuator**

– Other solenoid valve voltage (standard: 24 V DC)

**Valve**

– Customer specified flanges

– CF-F flanges with UNF threads

– Soft-pump function (Pic. 1)

– Ports for roughing (by-pass), venting or for gauges (Dia. 2), possible in positions B1 and B2
- screwed (aluminum valve body)
- welded (stainless steel valve body)

| DN valve | | mm<br>inch | 63<br>2½ | 80<br>3 | 100<br>4 | 160<br>6 | 200<br>8 |
|---|---|---|---|---|---|---|---|
| Recommended port<br>[1] aluminum valve body<br>[2] stainless steel valve body | [1] ISO-KF | | 16<br>⅝ | 25<br>1 | 25<br>1 | 25<br>1 | 40<br>1½ |
| | [2] CF-F | | 16<br>⅝ | 16<br>⅝ | 16<br>⅝ | 40<br>1½ | 40<br>1½ |
| Y | | mm<br>inch | 30<br>1.18 | 35<br>1.38 | 35<br>1.38 | 35<br>1.38 | 45<br>1.77 |
| Z ISO-KF | | mm<br>inch | 92<br>3.62 | 112<br>4.41 | 122<br>4.80 | 152<br>5.98 | 185<br>7.28 |
| Z CF-F | | mm<br>inch | 90<br>3.54 | 100<br>3.94 | 110<br>4.33 | 145<br>5.71 | 180<br>7.09 |
| Other ports on request | | | | | | | |

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

## Spare parts

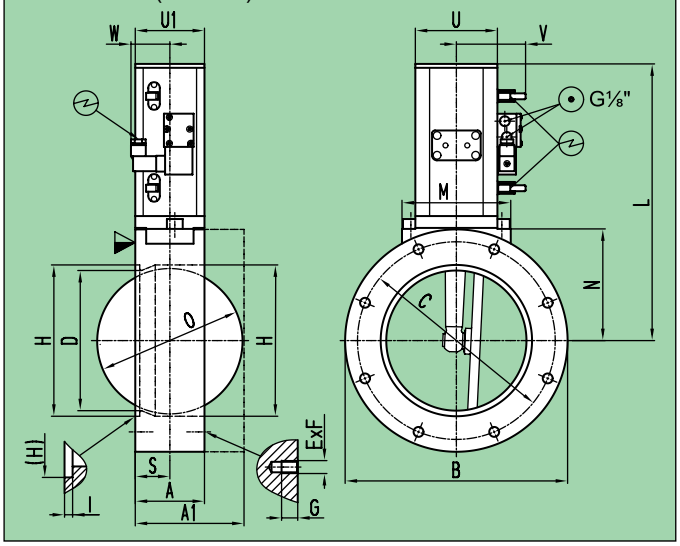
– **Seals**
on request (specify fabrication number of valve)

## Accessories

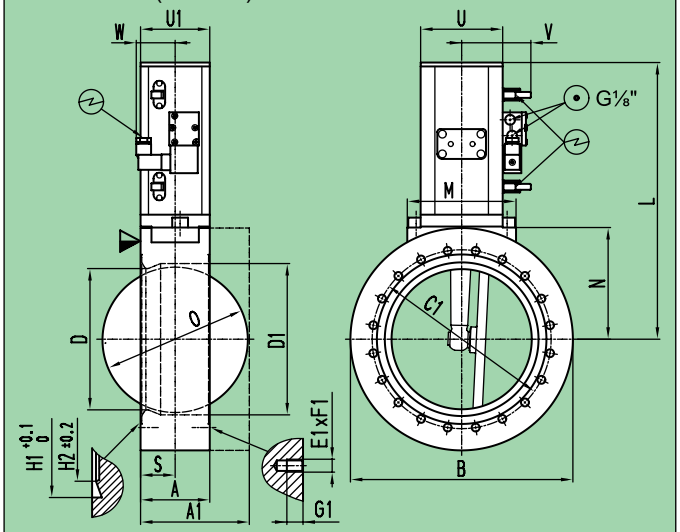
– **Flange connections**
for installation of the valve: see series 32 and 33

# Dimensions

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

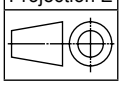



**Valve with pneumatic actuator: double acting**
DN 63–200 (2½"–8") CF-F




▼ Valve seat side
⊙ Compressed air connection
⊖ Electrical connection

Projection E



A: standard body, series 20.3
A1: extended body, series 20.4

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

## Main applications

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



## Ordering information

**Valve with manual actuator**
handwheel

| DN | | Ordering numbers CF-F | | |
|---|---|---|---|---|
| mm | inch | without position indicator | with position indicator 80 °C | with position indicator 200 °C |
| 16 | ⅝ | 48124-CE01 | 48124-CE08 | 48124-CE05 |
| 40 | 1½ | 48132-CE01 | 48132-CE08 | 48132-CE05 |
| 63 | 2½ | 48236-CE01 | 48236-CE08 | 48236-CE05 |
| 100 | 4 | 48240-CE01 | 48240-CE08 | 48240-CE05 |
| 160 | 6 | 48244-CE01 | 48244-CE08 | 48244-CE05 |
| 200 | 8 | 48146-CE01 | 48146-CE08 | 48146-CE05 |

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

| DN | | Ordering numbers (specify control voltage) CF-F | |
|---|---|---|---|
| mm | inch | compact actuator: valve bakeable to 200 °C | extended actuator: valve bakeable to 300 °C |
| 16 | ⅝ | – | 48124-CE44 |
| 40 | 1½ | – | 48132-CE44 |
| 63 | 2½ | 48236-CE74 | 48236-CE44 |
| 100 | 4 | 48240-CE74 | 48240-CE44 |
| 160 | 6 | 48244-CE74 | 48244-CE44 |
| 200 | 8 | 48146-CE74 | 48146-CE44 |
| 250 | 10 | 48148-CE74 | 48148-CE44 |
| 320 | 12 | 48150-XE74 X = customer specific | 48150-XE44 X = customer specific |

without solenoid valve, with position indicator 80 °C: compact actuator 48 . . . - . E7**2**
extended actuator 48 . . . - . E**2**4

Other versions: see pages 112 + 113

**Bake-out jacket**

See page 270: ordering information and technical data on request

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

## Features

Body material: stainless steel

VATRING configuration: see glossary

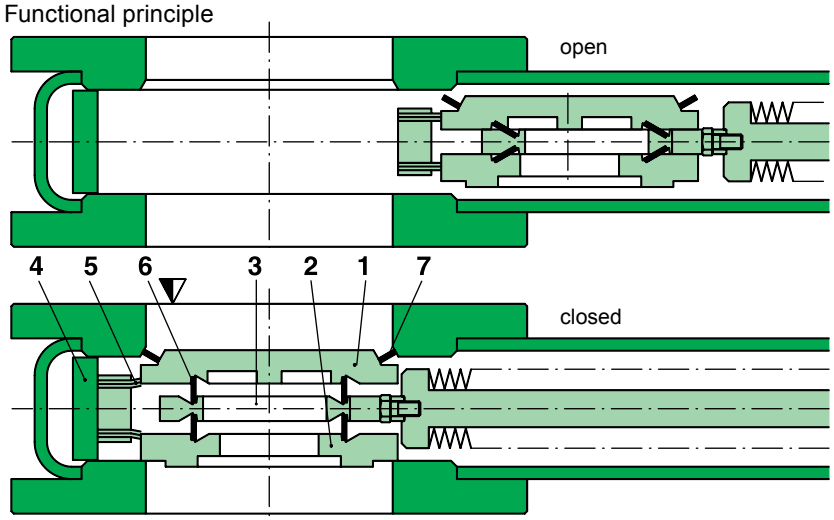
Sealing surfaces are only elastically deformed

Mechanically locked in closed position

Radiation resistant

Bakeable to 300 °C in open and closed position

Functional principle




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

## Technical data

| | |
|---|---|
| Leak rate: valve body, valve seat | $< 1 \cdot 10^{-10}$ mbar $l s^{-1}$ |
| Pressure range | XHV to 2 bar (abs) |
| Differential pressure on the gate | ≤2 bar |
| Differential pressure at opening | |
| – DN 16– 40 | ≤1 bar |
| – DN 63–250 | ≤500 mbar [1] |
| – DN 320 | ≤500 mbar [2] |
| Cycles until first service | |
| – DN 16–200 | 20000 |
| – DN 250–320 | 5000 |
| Bake-out temperature [3] | |
| – Valve body | ≤300 °C |
| – Manual actuator | ≤140 °C (option: 200 °C) |
| – Pneumatic actuator | ≤200 °C |
| – Solenoid valve | ≤ 80 °C |
| – Position indicator | ≤ 80 °C (option: 200 °C) |
| Heating and cooling rate | |
| – DN 16 | ≤80 °C $h^{-1}$ |
| – DN 40–160 | ≤50 °C $h^{-1}$ |
| – DN 200–320 | ≤25 °C $h^{-1}$ |
| Material | |
| – Valve body, mechanism | AISI 316L (1.4435, 1.4404) |
| – Bellows | AISI 316L (1.4435) |
| Seal: bonnet, gate | metal |
| Feedthrough | bellows |
| Mounting position: DN 16–250 / DN 320 | any / on request |
| Solenoid valve | 24 V DC, 2.5 W (others on request) |
| Position indicator: contact rating | |
| – Voltage | ≤50 V AC/DC |
| – Current | 80 °C: ≤1.2 A / 200 °C: ≤1 A |
| Valve position indication | visual (mechanical) |

[1] 1 bar with reduced number of cycles

[2] Reduced number of cycles

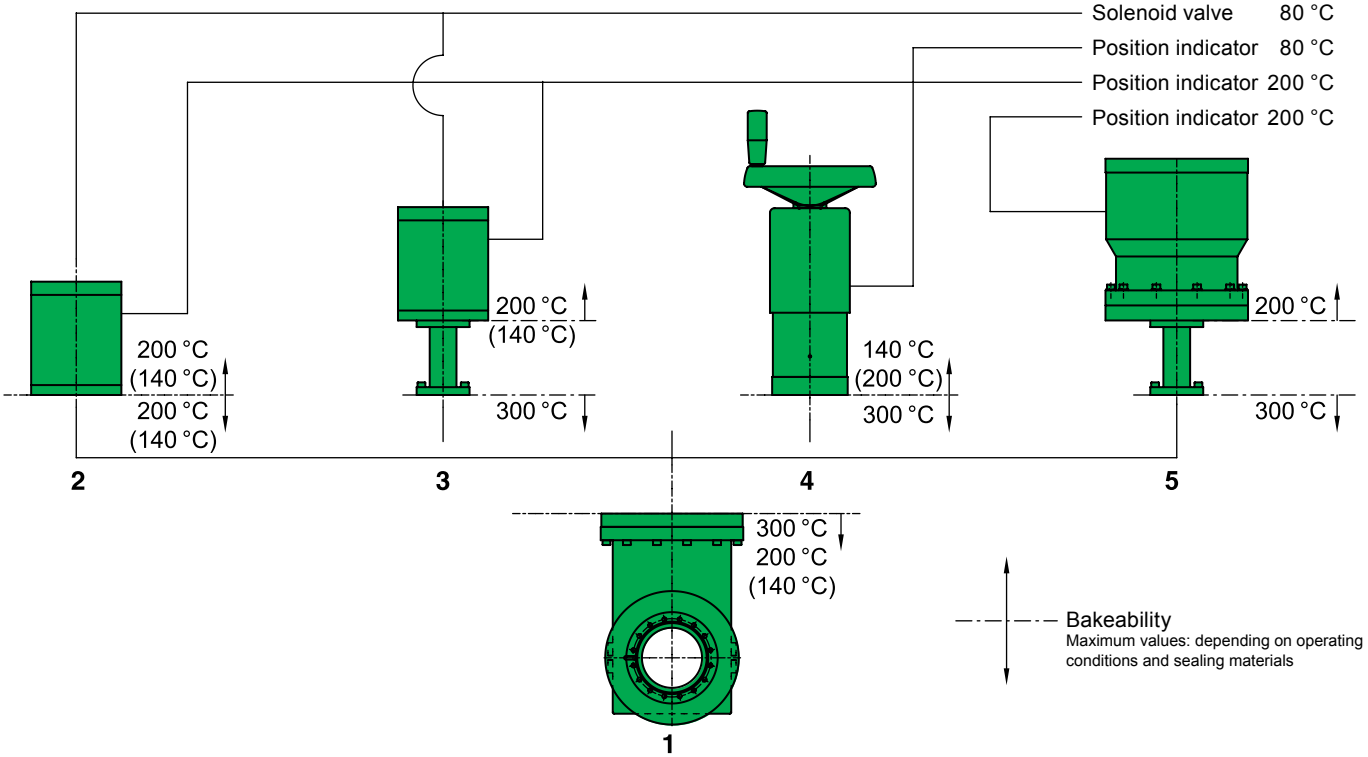
[3] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

| DN (nominal I. D.) | | CF-F flange | Conductance (molecular flow) | Valve with manual actuator: Turns per stroke | Valve with manual actuator: Weight | | Valve with pneumatic actuator: Compressed air min. – max. overpressure | | Valve with pneumatic actuator: Volume of pneumatic actuator | | Valve with pneumatic actuator: Closing or opening time | Valve with pneumatic actuator: Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | O. D. | $ls^{-1}$ | n | kg | lbs | bar | psi | l | $ft^3$ | s | kg | lbs |
| 16 | ⅝ | 1⅓ | 10 | 19 | 3.0 | 6.6 | 4 – 8 | 58 – 116 | 0.1 | 0.004 | 1 | 3.8 | 8.4 |
| 40 | 1½ | 2¾ | 100 | 21 | 5.5 | 12 | 4 – 8 | 58 – 116 | 0.27 | 0.010 | 1.5 | 7.2 | 16 |
| 63 | 2½ | 4½ | 400 | 32 | 16 | 35 | 4 – 8 | 58 – 116 | 0.5 | 0.018 | 2 | 17.3 | 38 |
| 100 | 4 | 6 | 1400 | 46 | 23.5 | 52 | 4 – 8 | 58 – 116 | 1.4 | 0.049 | 4 | 27 | 60 |
| 160 | 6 | 8 | 4200 | 66 | 39 | 85 | 4 – 8 | 58 – 116 | 4.3 | 0.152 | 9 | 45 | 100 |
| 200 | 8 | 10 | 6900 | 63 | 74.5 | 164 | 4 – 8 | 58 – 116 | 8.3 | 0.293 | 15 | 88 | 194 |
| 250 | 10 | 12 | 12700 | – | – | – | 4 – 8 | 58 – 116 | 10.7 | 0.378 | 20 | 156 | 344 |
| 320 | 12 | X | 23500 | – | – | – | 4 – 8 | 58 – 116 | 12.9 | 0.456 | 20 | 230 | 507 |

## Body and actuators: modular selection




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

## Spare parts

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

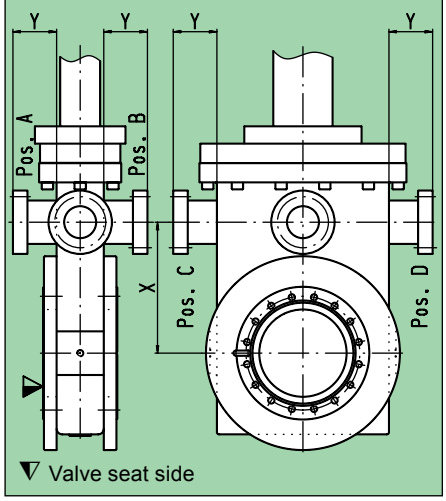
## Accessories

– **Flexible bake-out jacket**: see page 270

– **Flange connections**
for installation of the valve: see series 33

# Options

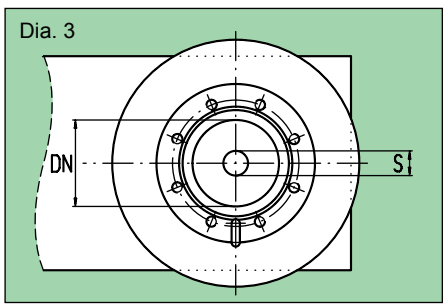
Dia. 1




Pic. 2



Dia. 3




**Actuator**

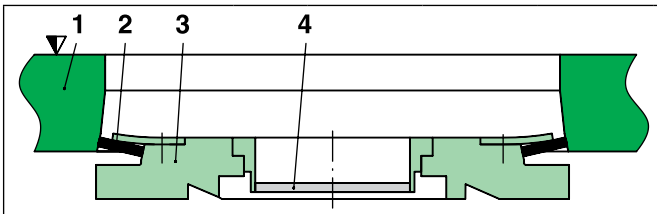
- Solenoid valve for impulse actuation:
  last valve position is maintained at power failure
- Other solenoid valve voltage (standard: 24 V DC)
- Solenoid valve radiation resistant to $10^6$ Gy (standard: $10^4$ Gy)
- Position indicator for manual and pneumatic actuator bakeable to 200 °C [1)]
  (standard: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

**Valve**

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

| DN valve | mm<br>inch | 16<br>⅝ | 40<br>1½ | 63<br>2½ | 100<br>4 | 160<br>6 | 200<br>8 | 250<br>10 | 320<br>12 |
|---|---|---|---|---|---|---|---|---|---|
| Recommended port CF-F | mm<br>inch | 16<br>⅝ | 16<br>⅝ | 16<br>⅝ | 40<br>1½ | 40<br>1½ | 40<br>1½ | 40<br>1½ | 40<br>1½ |
| X | mm<br>inch | 40<br>1.57 | 70<br>2.76 | 115<br>4.53 | 135<br>5.31 | 220<br>8.66 | 280<br>11.02 | 365<br>14.37 | 440<br>17.32 |
| Y | mm<br>inch | 18<br>0.71 | 18<br>0.71 | 20<br>0.79 | 50<br>1.97 | 50<br>1.97 | 50<br>1.97 | 50<br>1.97 | 50<br>1.97 |
| Other ports on request | | | | | | | | | |

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




1 Valve body
2 VATRING
3 Gate
4 Window
Valve seat side

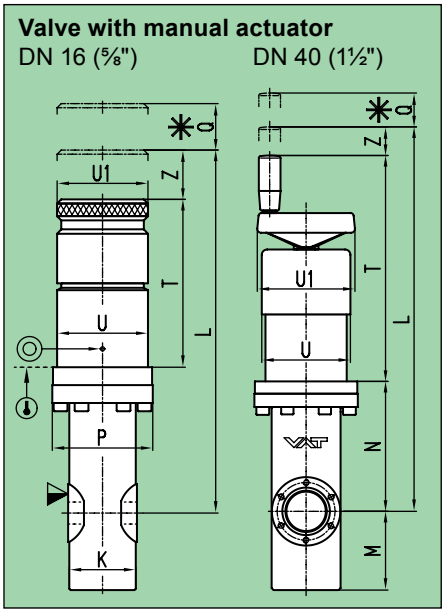
| DN valve | mm<br>inch | 40<br>1½ | 63<br>2½ | 100<br>4 | 160<br>6 | 200<br>8 |
|---|---|---|---|---|---|---|
| Optically free diameter «S» | mm<br>inch | 12<br>0.47 | 18<br>0.71 | 34<br>1.34 | 34<br>1.34 | 34<br>1.34 |
| Thickness of glass | mm<br>inch | 2<br>0.08 | 2<br>0.08 | 2<br>0.08 | 2<br>0.08 | 2<br>0.08 |

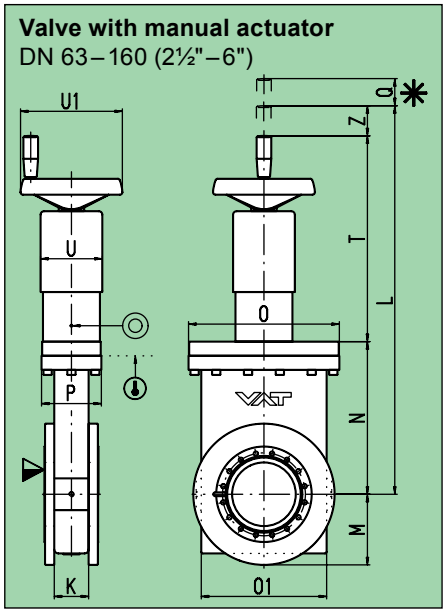
Options:
- Special glass qualities
- Other materials (e. g. berillium)
- Other window sizes

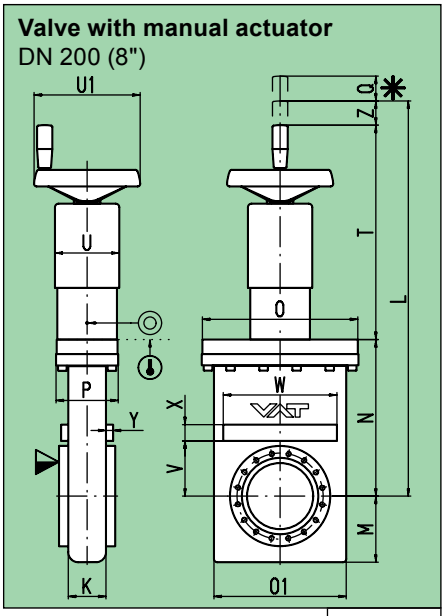
**Ordering information for options:**
Ordering No. of valve-X (e. g. 48240-CE44-X, X = port CF-F 40 in position A)

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

## Main dimensions

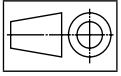



▽ Valve seat side ✳ Required for dismantling ◎ Leak detection hole ⓘ Bake-out area

Projection E

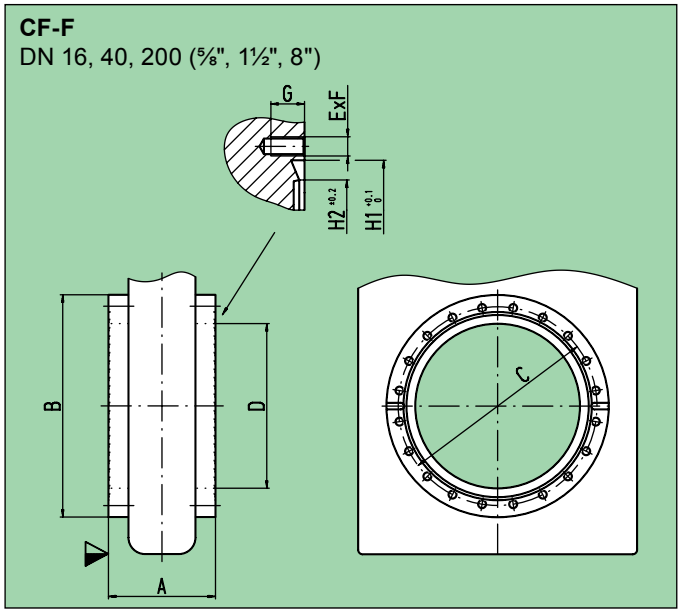


Flange dimensions: see page 115

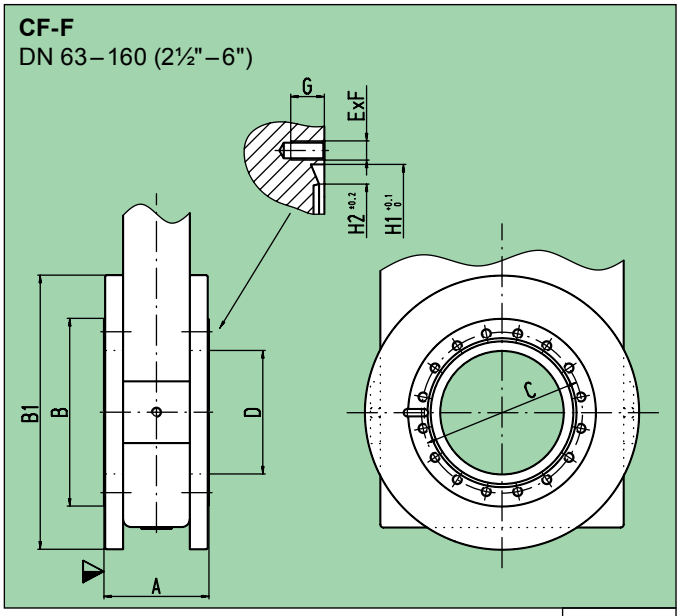
| DN | | 16 | 40 | 63 | 100 | 160 | 200 |
|---|---|---|---|---|---|---|---|
| | mm | ⅝ | 1½ | 2½ | 4 | 6 | 8 |
| K | mm | 48.50 | 70 | 46 | 54 | 58 | 78 |
| | inch | 1.91 | 2.76 | 1.81 | 2.13 | 2.28 | 3.07 |
| L | mm | 261 | 414 | 554 | 678 | 873 | 1101 |
| | inch | 10.28 | 16.30 | 17.13 | 26.69 | 34.37 | 43.33 |
| M | mm | 56 | 80 | 90 | 111 | 144 | 161 |
| | inch | 2.20 | 3.15 | 3.54 | 4.37 | 5.67 | 6.34 |
| N | mm | 106 | 132 | 209 | 240 | 329 | 410 |
| | inch | 4.17 | 5.20 | 8.23 | 9.45 | 12.95 | 16.14 |
| O | mm | – | – | 189 | 237 | 287 | 352 |
| | inch | | | 7.44 | 9.33 | 11.30 | 13.86 |
| O1 | mm | – | – | 156 | 197 | 253 | 316 |
| | inch | | | 6.14 | 7.76 | 9.96 | 12.44 |
| P | mm | 73 | 105 | 77 | 94 | 93 | 114 |
| | inch | 2.87 | 4.13 | 3.03 | 3.70 | 3.66 | 4.49 |
| Q | mm | 150 | 200 | 280 | 320 | 450 | 570 |
| | inch | 5.90 | 7.87 | 11.02 | 12.60 | 17.72 | 22.44 |
| T | mm | 122 | 230 | 266 | 324 | 378 | 473 |
| | inch | 4.80 | 9.06 | 8.90 | 12.76 | 14.88 | 18.62 |
| U | mm | 66 | 90 | 97 | 97 | 97 | 97 |
| | inch | 2.60 | 3.54 | 3.81 | 3.81 | 3.81 | 3.81 |
| U1 | mm | 66 | 100 | 100 | 160 | 160 | 200 |
| | inch | 2.60 | 3.70 | 3.94 | 6.30 | 6.30 | 7.87 |
| V | mm | – | – | – | – | – | 155 |
| | inch | | | | | | 6.10 |
| W | mm | – | – | – | – | – | 277 |
| | inch | | | | | | 10.91 |
| X | mm | – | – | – | – | – | 40 |
| | inch | | | | | | 1.57 |
| Y | mm | – | – | – | – | – | 30 |
| | inch | | | | | | 1.18 |
| Z | mm | 33 | 52 | 79 | 114 | 166 | 218 |
| | inch | 1.30 | 2.05 | 3.11 | 4.49 | 6.54 | 8.58 |

## Flange dimensions

**CF-F**
DN 16, 40, 200 (⅝", 1½", 8")

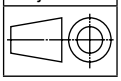



**CF-F**
DN 63–160 (2½"–6")




▽ Valve seat side

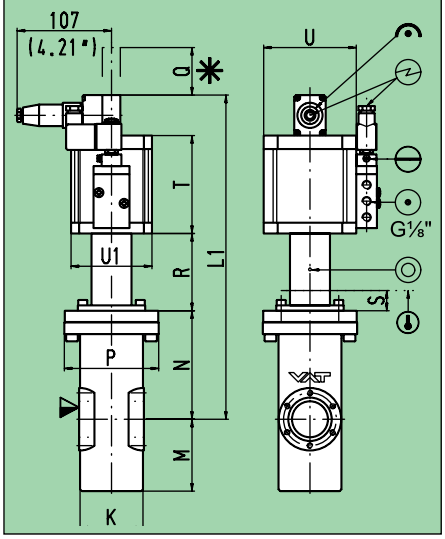
Projection E



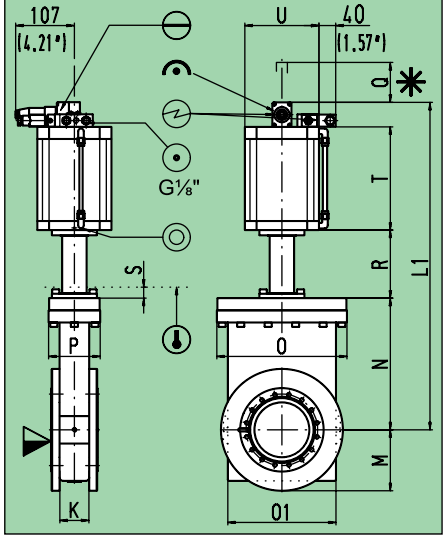
| DN | mm<br>inch | 16<br>⅝ | 40<br>1½ | 63<br>2½ | 100<br>4 | 160<br>6 | 200<br>8 |
|---|---|---|---|---|---|---|---|
| O.D. | inch | 1⅓ | 2¾ | 4½ | 6 | 8 | 10 |
| A | mm<br>inch | 50<br>1.97 | 72<br>2.83 | 75<br>2.95 | 85<br>3.35 | 97.50<br>3.84 | 140<br>5.51 |
| B | mm<br>inch | 42<br>1.65 | 69.50<br>2.73 | 113.50<br>4.47 | 152<br>5.98 | 202.50<br>7.97 | 277<br>10.90 |
| B1 | mm<br>inch | – | – | 180<br>7.08 | 222<br>8.74 | 288<br>11.34 | – |
| C | mm<br>inch | 27<br>1.06 | 58.70<br>2.31 | 92.10<br>3.63 | 130.30<br>5.13 | 181<br>7.13 | 231.80<br>9.13 |
| D | mm<br>inch | 16<br>0.63 | 40<br>1.57 | 63<br>2.48 | 100<br>3.94 | 150<br>5.91 | 200<br>7.87 |
| E × F | mm<br>inch | 6 × M4 | 6 × M6 | 8 × M8 | 16 × M8 | 20 × M8 | 24 × M8 |
| G | mm<br>inch | 8<br>0.31 | 10<br>0.39 | 12<br>0.47 | 14<br>0.55 | 16<br>0.63 | 17<br>0.67 |
| H1 | mm<br>inch | 21.40<br>0.84 | 48.30<br>1.90 | 82.50<br>3.25 | 120.65<br>4.75 | 171.45<br>6.75 | 222.30<br>8.75 |
| H2 | mm<br>inch | 18.50<br>0.72 | 42<br>1.65 | 77.40<br>3.05 | 115.50<br>4.55 | 166<br>6.54 | 217<br>8.54 |

## Main dimensions

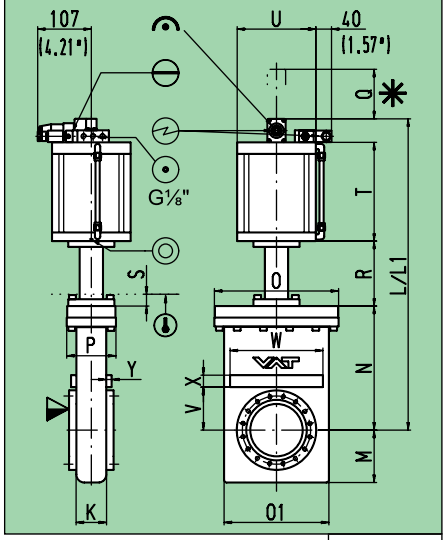
**Valve with pneumatic actuator**
DN 16–40 (⅝"–1½")




**Valve with pneumatic actuator**
DN 63–160 (2½"–6")

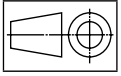



**Valve with pneumatic actuator**
DN 200–320 (8"–12")




▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⇄ Electrical connection
⊖ Emergency operation
◎ Leak detection hole
Bake-out area
Mechanical position indication

Projection E



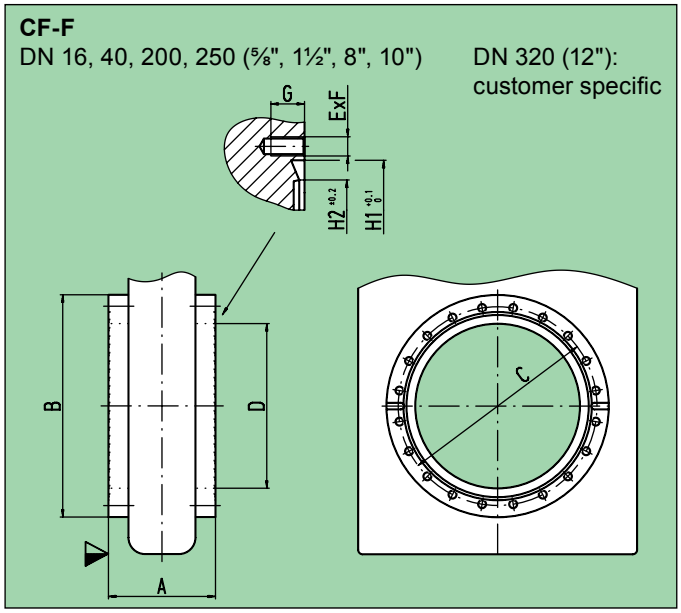
L1 and R for extended actuator / flange dimensions: see page 117

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| DN | mm | 16 | 40 | 63 | 100 | 160 | 200 | 250 | 320 |
| | inch | ⅝ | 1½ | 2½ | 4 | 6 | 8 | 10 | 12 |
| K | mm | 48.50 | 70 | 46 | 54 | 58 | 78 | 90 | 105 |
| | inch | 1.91 | 2.76 | 1.81 | 2.13 | 2.28 | 3.07 | 3.54 | 4.13 |
| L | mm | – | – | 403 | 473 | 616 | 770 | 947 | 1114 |
| | inch | | | 15.87 | 18.62 | 24.25 | 30.31 | 37.28 | 43.86 |
| L1 | mm | 312 | 372 | 527 | 597 | 740 | 894 | 1071 | 1238 |
| | inch | 12.28 | 14.65 | 20.75 | 23.50 | 29.13 | 35.20 | 42.17 | 48.74 |
| M | mm | 56 | 80 | 90 | 111 | 144 | 161 | 205 | 240 |
| | inch | 2.20 | 3.15 | 3.54 | 4.37 | 5.67 | 6.34 | 8.07 | 9.45 |
| N | mm | 106 | 132 | 209 | 240 | 329 | 410 | 525 | 632 |
| | inch | 4.17 | 5.20 | 8.23 | 9.45 | 12.95 | 16.14 | 20.67 | 24.88 |
| O | mm | – | – | 189 | 237 | 287 | 352 | 446 | 516 |
| | inch | | | 7.44 | 9.33 | 11.30 | 13.86 | 17.56 | 20.32 |
| O1 | mm | – | – | 156 | 197 | 253 | 316 | 410 | 480 |
| | inch | | | 6.14 | 7.76 | 9.96 | 12.44 | 16.14 | 18.89 |
| P | mm | 73 | 105 | 77 | 94 | 93 | 114 | 126 | 141 |
| | inch | 2.87 | 4.13 | 3.03 | 3.70 | 3.66 | 4.49 | 4.96 | 5.55 |
| Q | mm | 150 | 200 | 280 | 320 | 450 | 535 | 675 | 800 |
| | inch | 5.90 | 7.87 | 11.02 | 12.60 | 17.72 | 21.06 | 26.57 | 31.50 |
| R | mm | 64 | 86 | 124 | 124 | 124 | 124 | 124 | 124 |
| | inch | 2.52 | 3.39 | 4.88 | 4.88 | 4.88 | 4.88 | 4.88 | 4.88 |
| S | mm | 15 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| | inch | 0.59 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| T | mm | 90 | 109 | 149 | 188 | 242 | 315 | 377 | 438 |
| | inch | 3.54 | 4.29 | 5.87 | 7.40 | 9.53 | 12.40 | 14.84 | 17.24 |
| U | mm | 83 | 103 | 98 | 135 | 190 | 230 | 230 | 230 |
| | inch | 3.27 | 4.06 | 3.86 | 5.31 | 5.91 | 9.06 | 9.06 | 9.06 |
| U1 | mm | 70 | 90 | – | – | – | – | – | – |
| | inch | 2.76 | 3.54 | | | | | | |
| V | mm | – | – | – | – | – | 155 | 210 | 245 |
| | inch | | | | | | 6.10 | 8.27 | 9.65 |
| W | mm | – | – | – | – | – | 277 | 441 | 511 |
| | inch | | | | | | 10.91 | 17.36 | 20.12 |
| X×Y | mm | – | – | – | – | – | 40×30 | 50×50 | 60×60 |
| | inch | | | | | | 1.57×1.18 | 1.97×1.97 | 2.36×2.36 |

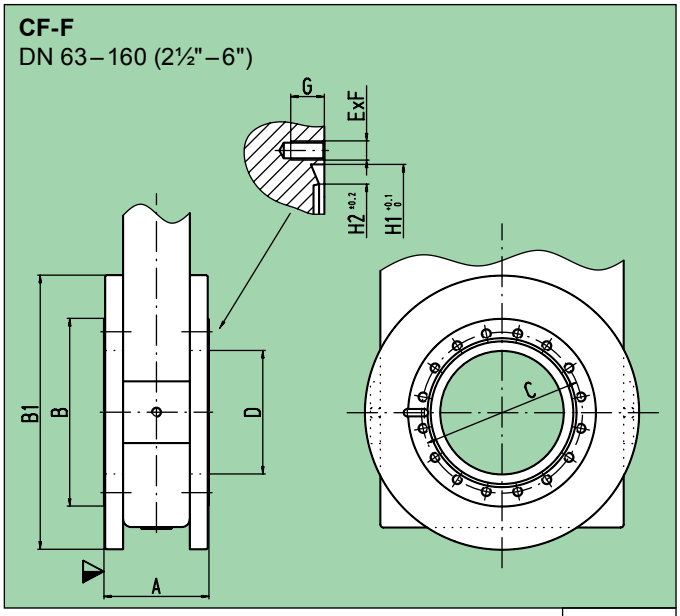
## Flange dimensions

**CF-F**
DN 16, 40, 200, 250 (⅝", 1½", 8", 10")

DN 320 (12"): customer specific

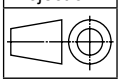



**CF-F**
DN 63–160 (2½"–6")




▼ Valve seat side

Projection E



| DN | mm<br>inch | 16<br>⅝ | 40<br>1½ | 63<br>2½ | 100<br>4 | 160<br>6 | 200<br>8 | 250<br>10 | 320<br>12 |
|---|---|---|---|---|---|---|---|---|---|
| O.D. | inch | 1⅓ | 2¾ | 4½ | 6 | 8 | 10 | 12 | – |
| A | mm<br>inch | 50<br>1.97 | 72<br>2.83 | 75<br>2.95 | 85<br>3.35 | 97.50<br>3.84 | 140<br>5.51 | 150<br>5.91 | 170<br>6.69 |
| B | mm<br>inch | 42<br>1.65 | 69.50<br>2.73 | 113.50<br>4.47 | 152<br>5.98 | 202.50<br>7.97 | 277<br>10.90 | 380<br>14.96 | 444<br>17.48 |
| B1 | mm<br>inch | – | – | 180<br>7.08 | 222<br>8.74 | 288<br>11.34 | – | – | – |
| C | mm<br>inch | 27<br>1.06 | 58.70<br>2.31 | 92.10<br>3.63 | 130.30<br>5.13 | 181<br>7.13 | 231.80<br>9.13 | 284<br>11.18 | – |
| D | mm<br>inch | 16<br>0.63 | 40<br>1.57 | 63<br>2.48 | 100<br>3.94 | 150<br>5.91 | 200<br>7.87 | 250<br>9.84 | 320<br>12.60 |
| E×F | mm<br>inch | 6×M4 | 6×M6 | 8×M8 | 16×M8 | 20×M8 | 24×M8 | 32×M8 | – |
| G | mm<br>inch | 8<br>0.31 | 10<br>0.39 | 12<br>0.47 | 14<br>0.55 | 16<br>0.63 | 17<br>0.67 | 17<br>0.67 | – |
| H1 | mm<br>inch | 21.40<br>0.84 | 48.30<br>1.90 | 82.50<br>3.25 | 120.65<br>4.75 | 171.45<br>6.75 | 222.30<br>8.75 | 273.15<br>10.75 | – |
| H2 | mm<br>inch | 18.50<br>0.72 | 42<br>1.65 | 77.40<br>3.05 | 115.50<br>4.55 | 166<br>6.54 | 217<br>8.54 | 267<br>10.51 | – |

# Series 61.2

## Main applications

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

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



DN 25 – 50



DN 63 – 250

## Ordering information

**Valve with stepper motor and integrated pressure controller**

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

Controller configurations:

x

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

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

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

VC = Valve Cluster (for operating several valves synchronously)

y

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

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

Pressure controller: see pages 146 – 149

## Features

Body material:
aluminum or stainless steel

Compact design

Fast operation

Integrated pressure controller

Extremely short control response times

Automatic service signal (contamination)

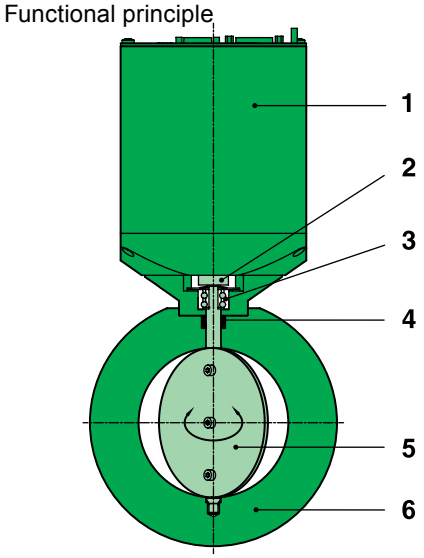
Position indication

Service port for connecting a computer or a service box 2

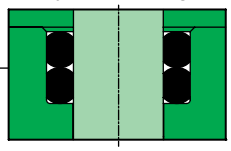
Excellent resistance to contaminating processes

Easy maintenance

Functional principle




Double seal of rotary feedthrough



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

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

## Technical data

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

[1] Unheated on delivery

[2] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page

Continued Technical data

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

Technical data for pressure controller: see pages 146 – 149

## Options

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



**Actuator**

– Ultra fast actuator (0.1 s)

– Output for control of isolation valve

– Controller with configurable PID parameters (adaptive, upstream, downstream, soft-pump)

– RS232 interface with 2 analog outputs

**Valve**

– Other sizes, e. g. DN 10, 320

– Other flanges, e. g. JIS, ASA-LP, CF-F

– Customer specified flanges

– Surface treatment, e. g. aluminum, hard anodized or nickel-plated

– Other sealing materials

– Heater with insulation (picture) for valve temperatures up to 150 °C (for temperatures up to 200 °C on request)

– Industrial version up to DN 160 for harsh conditions, e. g. differential pressure up to 1 bar, heavy contamination

– «Combo» body to combine a series 61.2 control valve with an isolation valve: see series 95, pages 144 – 145

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

## Spare parts

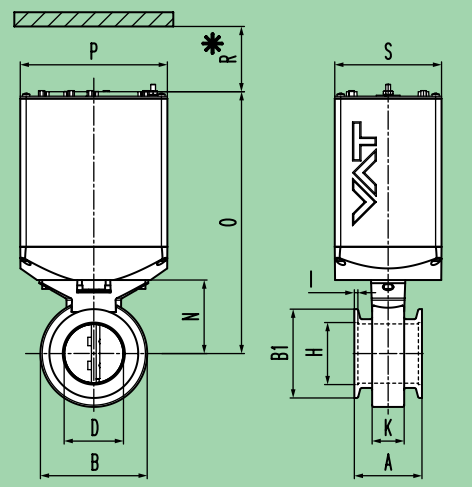
– **Seals**
on request (specify fabrication number of valve)

## Accessories

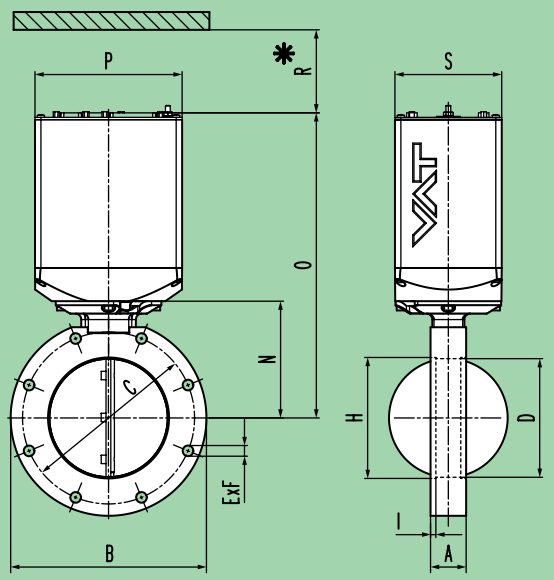
– **Flange connections**
for installation of the valve: see series 31 and 32

# Dimensions

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

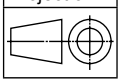



**Valve with stepper motor and integrated pressure controller** DN 63–250 (2½"–10") ISO-F




✳ Required for dismantling

Projection E



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

# Series 61.5

## Main applications

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

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



## Ordering information

**Valve with stepper motor and integrated pressure controller**

| DN | | Ordering numbers | | | |
|---|---|---|---|---|---|
| | | 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 |

Controller configurations:

x

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

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

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

VC = Valve Cluster (for operating several valves synchronously)

y

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

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

Pressure controller: see pages 146 – 149

## Features

Body material:
aluminum, hard anodized
or stainless steel

Compact design

Fast operation

Integrated pressure controller

Extremely short control response times

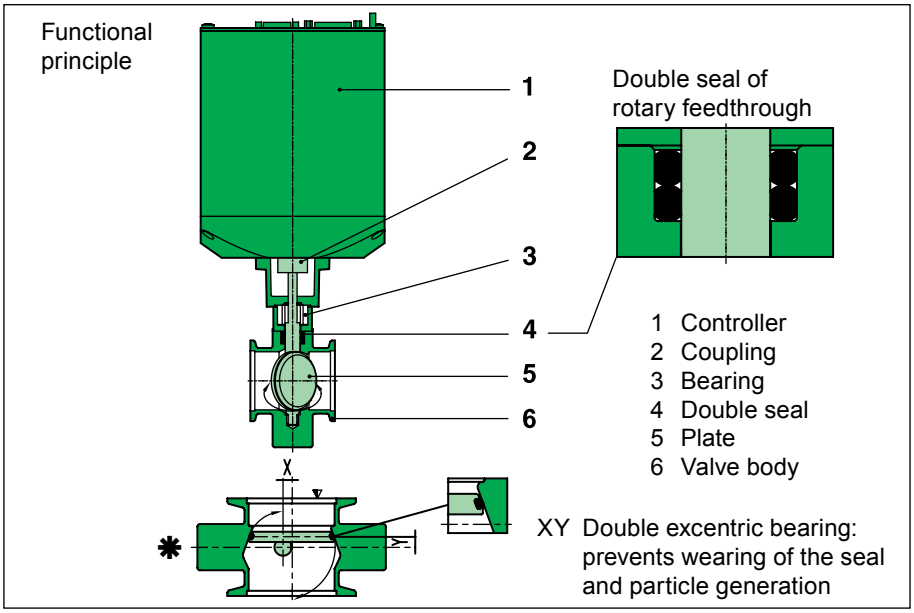
Automatic service signal (contamination)

Position indication

Service port for connecting a computer or a service box 2

Accurate pressure control at high pressures and low flows

Easy maintenance




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

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

## Technical data

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

[1] Unheated on delivery

[2] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page

Continued Technical data

| | |
|---|---|
| Material | |
| – Valve body, plate | |
| - aluminum | EN AW-6082 (3.2315) |
| - stainless steel | AISI 316L (1.4404 or 1.4435) |
| – Shaft | AISI 316L (1.4404 or 1.4435) |
| – Other parts | iglidur®X, AISI 316L (1.4404 or 1.4435) |
| Seal: plate, feedthrough | FKM (Viton®) |
| Feedthrough | rotary feedthrough |
| Mounting position | valve seat towards chamber |

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

Technical data for pressure controller: see pages 146 – 149

## Options

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



**Actuator**

– Ultra fast actuator (0.18 / 0.2 s)

– Controller with configurable PID parameters (adaptive, upstream, downstream, soft-pump)

– RS232 interface with 2 analog outputs

**Valve**

– Other flanges, e. g. JIS, ASA-LP, CF-F

– Customer specified flanges

– Other sealing materials

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

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

## Spare parts

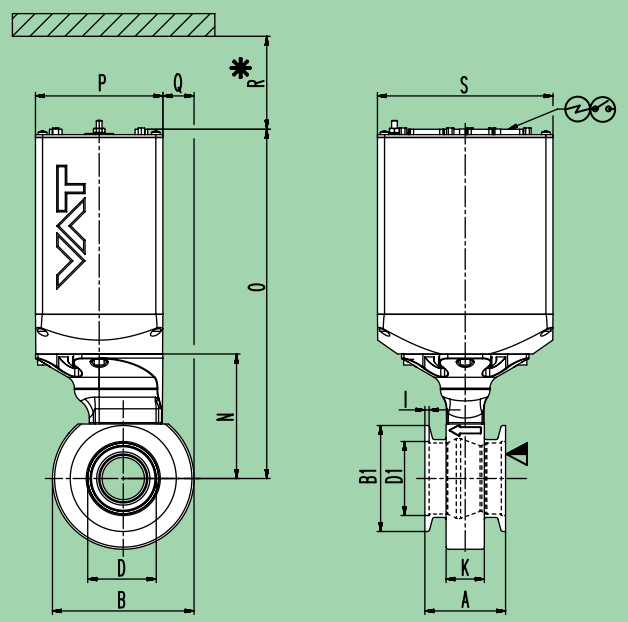
– **Seals**
on request (specify fabrication number of valve)

## Accessories

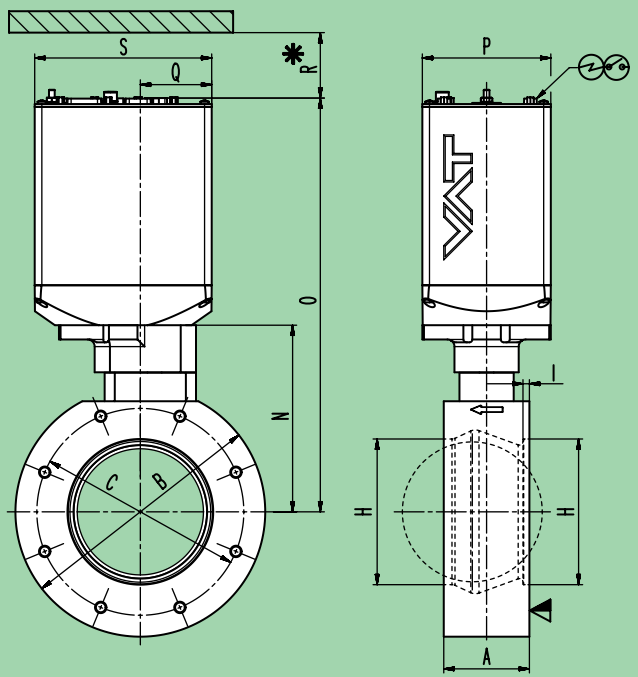
– **Flange connections**
for installation of the valve: see series 31 and 32

## Dimensions

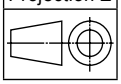
**Valve with stepper motor and integrated pressure controller** DN 40–50 (1½"–2") ISO-KF




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




Projection E



▼ Valve seat side
✳ Required for dismantling
⊖ Electrical connection
⊖ Position indicator

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

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

## Main applications

Control and isolation valve for SEMI, FPD and industrial processes

Optimal for sputtering and etching processes



## Ordering information

**Valve with stepper motor and integrated pressure controller**

| DN | | Ordering numbers | | | | |
|---|---|---|---|---|---|---|
| mm | inch | ISO-F | CF-F metric threads | CF-F UNF threads | ASA-LP (T) ASA (A) | JIS |
| 63 | 2½ | 64236-PE x y | 64236-CE x y | 64236-UE x y | 64236-TE x y | 64236-JE x y |
| 80 | 3 | 64238-PE x y | 64238-CE x y | 64238-UE x y | 64238-TE x y | 64238-JE x y |
| 100 | 4 | 64240-PE x y | 64240-CE x y | 64240-UE x y | 64240-TE x y | 64240-JE x y |
| 160 | 6 | 64244-PE x y | 64244-CE x y | 64244-UE x y | 64244-TE x y | 64244-JE x y |
| 200 | 8 | 64246-PE x y | 64246-CE x y | 64246-UE x y | 64246-TE x y | 64246-JE x y |
| 250 | 10 | 64248-PE x y | 64248-CE x y | 64248-UE x y | 64248-TE x y | 64248-JE x y |
| 320 | 12 | 64250-PE x y | on request | on request | 64250-TE x y | 64250-JE x y |
| 350 | 14 | – | – | – | – | 64251-JE x y |
| 400 | 16 | 64252-PE x y | on request | on request | 64252-AE x y | 64252-JE x y |

Controller configurations:

x

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

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

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

VC = Valve Cluster (for operating several valves synchronously)

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

y

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

Further ordering information on next page →

Pressure controller: see pages 146 – 149

## Features

Body material: stainless steel

Compact design

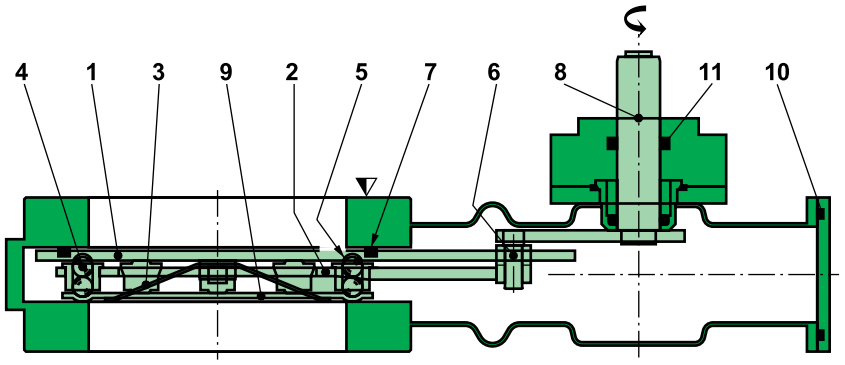
Integrated or external pressure controller

Extremely short control response times

Position indication

Service port for connecting a computer or a service box 2

Functional principle




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

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

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

Continued Ordering information

**Valve with stepper motor**
(external pressure controller)

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

Pressure controller: see pages 146 – 149

## Technical data

| | |
|---|---|
| Leak rate [1]: valve body, valve seat | $1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| Pressure range [1] | |
| – DN 63–200 | $1 \cdot 10^{-8}$ mbar to 2.0 bar (abs) |
| – DN 250–400 | $1 \cdot 10^{-8}$ mbar to 1.2 bar (abs) |
| Differential pressure on the gate | |
| – Valve closed DN 63–200 | ≤2.0 bar |
| DN 250–400 | ≤1.2 bar |
| – During closing/opening | ≤30 mbar |
| Cycles until first service [2] | |
| – Pressure control | 1 million |
| – Closing/opening | 200000 |
| Temperature [2] | |
| – Valve body | ≤150 °C |
| – Ambient | ≤ 50 °C |
| Material | |
| – Valve body, plate | AISI 304 (1.4301) |
| – Mechanism | AISI 301 (1.4310), AISI 304 (1.4301), AISI 420 (1.4034), AISI 420D (1.4037), AISI 430 (1.4016) |
| Seal: bonnet, gate, feedthrough | FKM (Viton®) |
| Feedthrough | rotary feedthrough |
| Mounting position | |
| – DN 63–350 | any [3] |
| – DN 400 | horizontal **only** [4] |
| Valve position indication | visual (mechanical and on controller) |

[1] Unheated on delivery

[2] Maximum values: depending on operating conditions and sealing materials

[3] Seat side towards chamber

[4] Vertical mounting position: see «Options»

| DN (nominal I.D.) | | Standard flanges | Conductance (molecular flow) | Minimum controllable conductance (molecular flow) | Operating time for throttling | Typical closing or opening time | Weight | |
|---|---|---|---|---|---|---|---|---|
| mm | inch | | ls$^{-1}$ | ls$^{-1}$ | s | s | kg | lbs |
| 63 | 2½ | See pages 132–133 | 440 | 0.65 | 3 | 4 | 14 | 31 |
| 80 | 3 | | 800 | 0.8 | 3 | 4 | 14 | 31 |
| 100 | 4 | | 1700 | 1 | 3 | 6 | 17 | 37 |
| 160 | 6 | | 5000 | 1.6 | 5 | 6 | 28 | 62 |
| 200 | 8 | | 12000 | 2 | 5 | 6 | 34 | 75 |
| 250 | 10 | | 22000 | 2.5 | 9 | 10 | 62 | 136 |
| 320 | 12 | | 30000 | 3.2 | 9 | 10 | 112 | 246 |
| 350 | 14 | | 40000 | 3.5 | 9 | 10 | 120 | 264 |
| 400 | 16 | | 50000 | 4 | 9 | 10 | 155 | 340 |

Technical data for pressure controller: see pages 146–149

## Spare parts

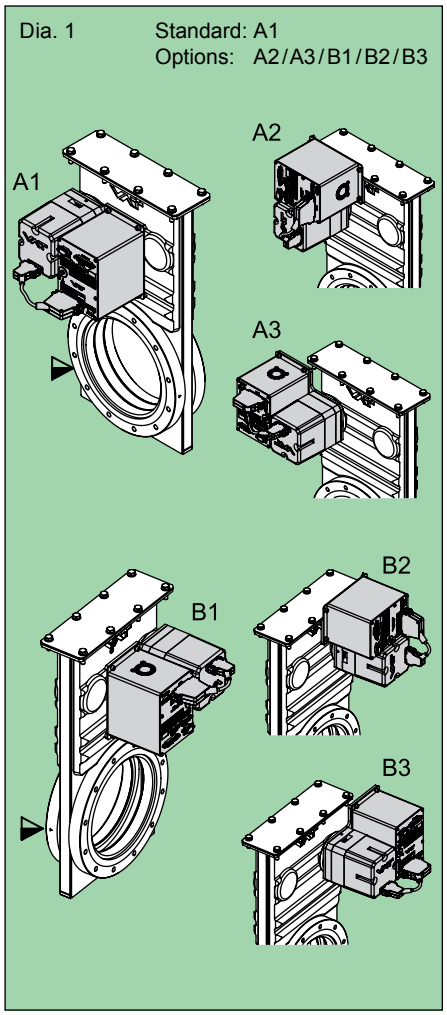
– **Seals**
on request (specify fabrication number of valve)

## Accessories

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

# Options

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




**Actuator**

– Stepper motor with integrated controller mountable in 6 positions (Dia. 1):
  - position A1, A2, A3 on A-side (valve seat side): to be specified with order
  - position B1, B2, B3 on B-side (rear side): to be specified with order

– Valve with external pressure controller (Dia. 2), ordering No. …52, see page 127 (controller and cable must be ordered in addition)

– Actuator for mounting the valve DN 400 in vertical position (extended closing time, fewer cycles)

– Controller with configurable PID parameters (adaptive, upstream, downstream, soft-pump)

– RS232 interface with 2 analog outputs

**Valve**

– Customer specified flanges with / without watercooling

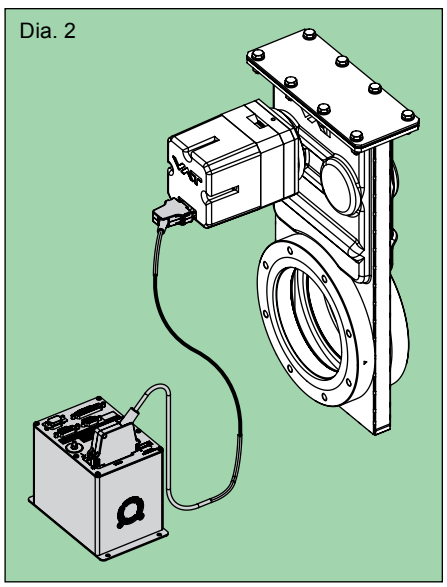
– Other sealing materials

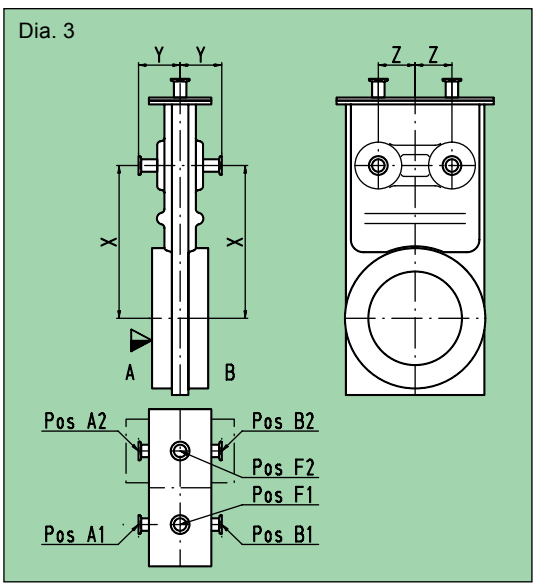
– Intermediate pumping of the rotary feedthrough

– Ports for roughing (by-pass), venting or for gauges, possible in positions A1, A2, B1, B2, F1 and F2 (Dia. 3)

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

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

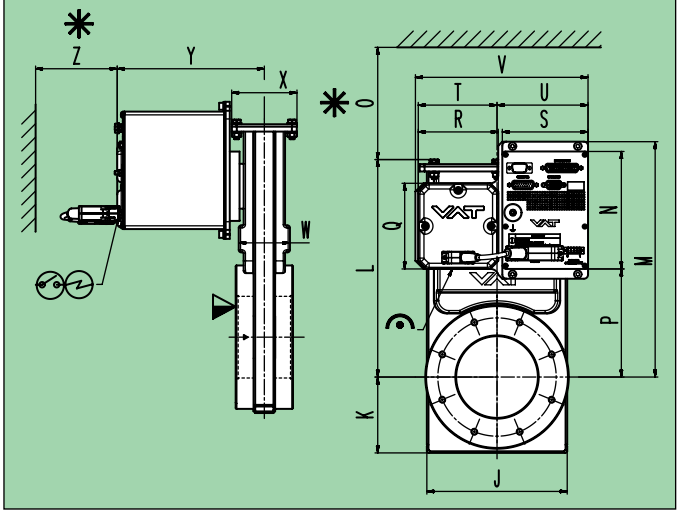


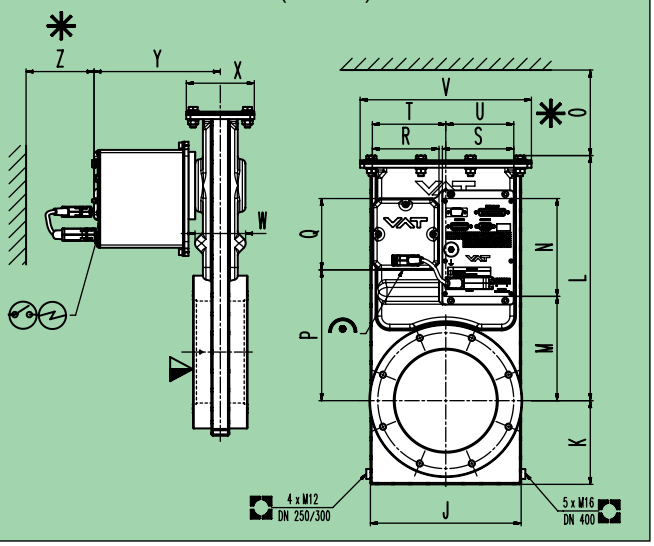

▼ Valve seat side

## Main dimensions

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




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

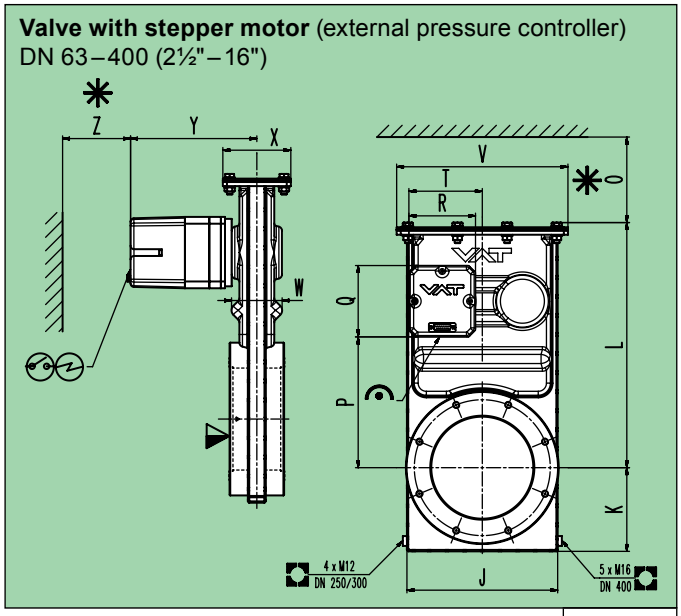



Flange dimensions: see pages 132–133

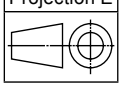
| DN | | 63 | 80 | 100 | 160 | 200 | 250 | 320 | 350 | 400 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm | | | | | | | | | |
| | inch | 2½ | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 |
| J | mm | 134 | 134 | 172 | 222 | 274 | 355 | 420 | 420 | 474 |
| | inch | 5.28 | 5.28 | 6.77 | 8.74 | 10.79 | 13.98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

# Main dimensions

**Valve with stepper motor** (external pressure controller)
DN 63–400 (2½"–16")




Projection E



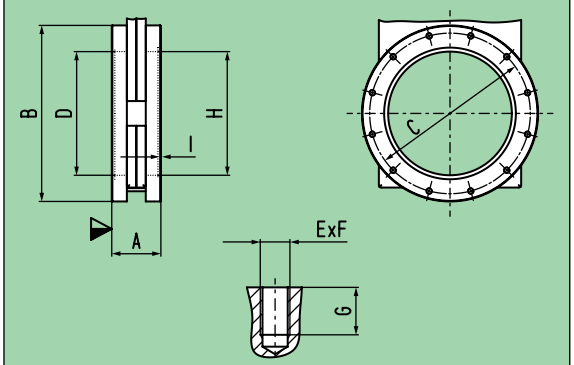
▼ Valve seat side
✳ Required for dismantling
⊖ Electrical connection
⊖ Position indicator
Mechanical position indication
□ For attachment

Flange dimensions: see pages 132–133

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

## Flange dimensions

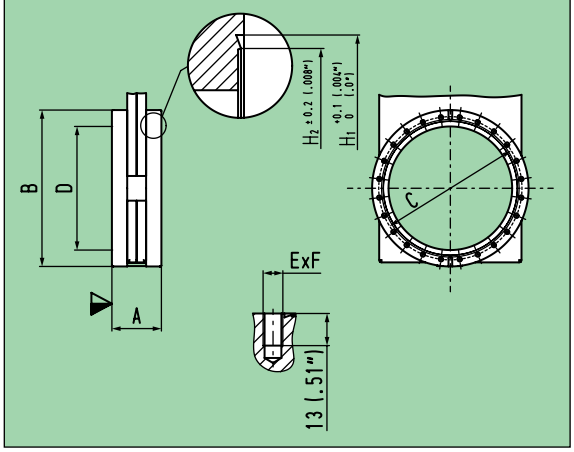
**ISO-F**
DN 63–320 (2½"–12")




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

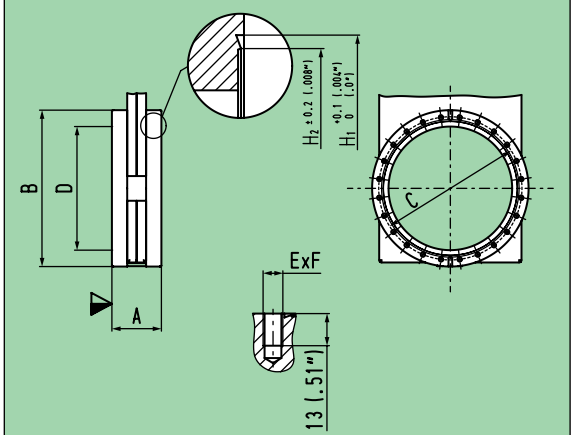
| DN | | 63 | 80 | 100 | 160 | 200 | 250 | 320 |
|---|---|---|---|---|---|---|---|---|
| | inch | 2½ | 3 | 4 | 6 | 8 | 10 | 12 |
| A | mm | 70 | 70 | 70 | 70 | 80 | 100 | 120 |
| | inch | 2.76 | 2.76 | 2.76 | 2.76 | 3.15 | 3.94 | 4.72 |
| B | mm | 130 | 145 | 165 | 225 | 285 | 350 | 425 |
| | inch |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

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



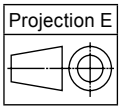

| DN | | 63 | 80 | 100 | 160 | 200 | 250 | |
|---|---|---|---|---|---|---|---|---|
| | inch | 2½ | 3 | 4 | 6 | 8 | 10 | |
| O.D. | inch | 4½ | 4⅝ | 6 | 8 | 10 | 12 | |
| A | mm | 70 | 70 | 70 | 70 | 80 | 100 | |
| | inch | 2.76 | 2.76 | 2.76 | 2.76 | 3.15 | 3.94 | |
| B | mm | 113.50 | 117.50 | 151.60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

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




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

Projection E



▼ Valve seat side

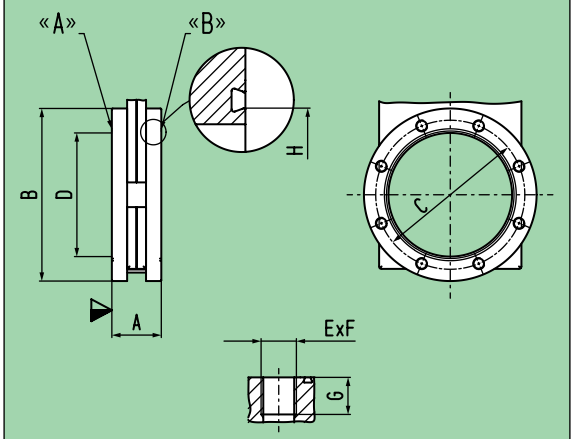
*) O.D. 12" VAT standard, O.D. 13¼" option

**Ordering information for option:** O.D. 13¼"
Ordering No. of valve-X (e. g. 64248-UE . . -X, X = O.D. 13¼")

# Flange dimensions

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

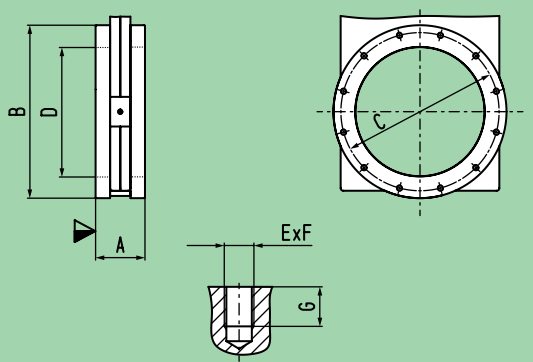
For orders with O-ring groove specify:
«A», «B» or «A+B»




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

| DN | mm<br>inch | 63<br>2½ | 80<br>3 | 100<br>4 | 160<br>6 | 200<br>8 | 250<br>10 | 320<br>12 |
|---|---|---|---|---|---|---|---|---|
| ASA-LP | | 2 | – | 3 | 4 | 6 | 8 | 10 |
| A | mm<br>inch | 70<br>2.76 | 70<br>2.76 | 70<br>2.76 | 70<br>2.76 | 80<br>3.15 | 100<br>3.94 | 120<br>4.72 |
| B | mm<br>inch | 152.40<br>6 | 177.80<br>7 | 190.50<br>7.50 | 225<br>8.86 | 279.40<br>11 | 350<br>13.78 | 425<br>16.73 |
| C | mm<br>inch | 120.70<br>4.75 | 139.70<br>5.50 | 152.40<br>6 | 190.50<br>7.50 | 241.30<br>9.50 | 298.50<br>11.75 | 362<br>14.25 |
| D | mm<br>inch | 70<br>2.76 | 76<br>2.99 | 100<br>3.94 | 150<br>5.91 | 200<br>7.87 | 254<br>10 | 300<br>11.81 |
| E × F | | 4 × ⅜"<br>16 UNC | 4 × ⅜"<br>16 UNC | 4 × ⅜"<br>16 UNC | 8 × ⅜"<br>16 UNC | 8 × ¾"<br>10 UNC | 8 × ¾"<br>10 UNC | 12 × ¾"<br>10 UNC |
| G | mm<br>inch | 15<br>0.59 | 15<br>0.59 | 15<br>0.59 | 15<br>0.59 | 19<br>0.75 | 19<br>0.75 | 19<br>0.75 |
| H | mm<br>inch | 88.90<br>3.50 | 88.90<br>3.50 | 120.65<br>4.75 | 158.75<br>6.25 | 206.40<br>8.13 | 266.70<br>10.50 | 317.50<br>12.50 |
| O-ring<br>I.D. × d | mm<br>inch | 88.49 × 3.53<br>3.48 × .139 | 88.49 × 3.53<br>3.48 × .139 | 120.24 × 3.53<br>4.73 × .139 | 158.34 × 3.53<br>6.23 × .139 | 202.79 × 3.53<br>7.98 × .139 | 266.29 × 3.53<br>10.48 × .139 | 316.87 × 7.00<br>12.47 × .275 |

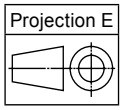
**JIS B 2290: 1998 / ISO 1609**
DN 65–300 (2½"–12")




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

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

Projection E



▼ Valve seat side

# Series 65.0

## Main applications

Downstream pressure control and isolation valve for SEMI and FPD processes

Optimal for corrosive etching and cleaning processes



## Ordering information

**Valve with stepper motor and integrated pressure controller**

| DN | | Ordering numbers | | | |
|---|---|---|---|---|---|
| | | 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 |

Controller configurations:

x

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

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

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

VC = Valve Cluster (for operating several valves synchronously)

y

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

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

Pressure controller: see pages 146 – 149

## Features

Bodymaterial:
aluminum or
aluminum, hard anodized

Compact design

Fast, virtually particle-free and shock-free operation

Integrated or external pressure controller

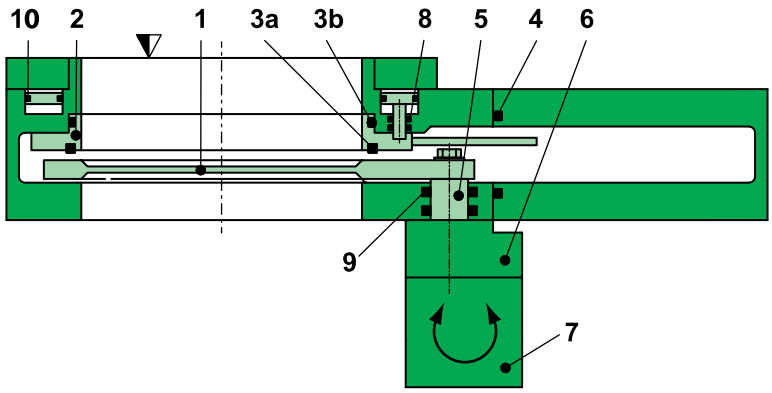
Extremely short control response times

Position indication

Service port for connecting a computer or a service box 2

Easy maintenance

Functional principle

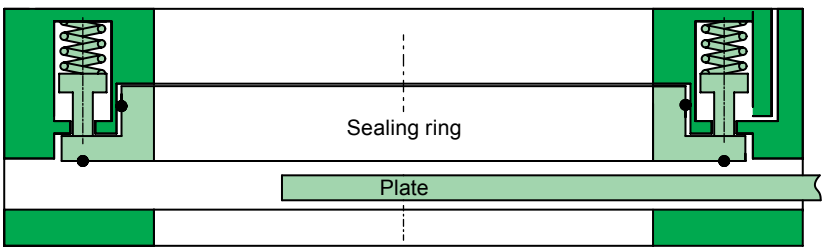



| | | | | | |
|---|---|---|---|---|---|
| 1 | Plate | 4 | Bonnet seal | 8 | Shaft feedthrough seal |
| 2 | Sealing ring | 5 | Actuator shaft | 9 | Rotary feedthrough seal |
| 3a | Plate seal | 6 | Actuator | 10 | Piston ring seal |
| 3b | Body seal | 7 | Controller | ▼ | Valve seat side |

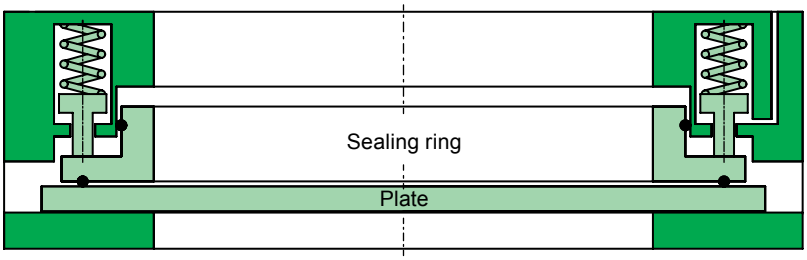
The plate acts as a throttling element and varies the conductance of the valve opening. The pressure controller calculates the required plate position to achieve the setpoint pressure. See also principle drawing on page 280. Actuation is performed by a stepper motor. An encoder monitors the position.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

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

Pressure control




Isolation



## Technical data

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

[1] Unheated on delivery

[2] Maximum values: depending on operating conditions and sealing materials

[3] Valve seat on chamber side recommended

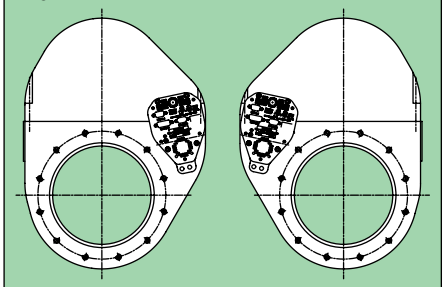
| DN (nominal I.D.) | | Conductance (molecular flow) | Minimum controllable conductance (molecular flow) | Max. differential pressure on the plate | Max. differential pressure during operation | Compressed air min.–max. overpressure | | Operating time for throttling | Typical closing / opening time | | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Open→closed | Closed→open | | |
| mm | inch | $ls^{-1}$ | $ls^{-1}$ | mbar | mbar | bar | psi | s | s | s | kg | lbs |
| 100 | 4 | 1700 | 3 | 1200 | 30 | 4–7 | 58–102 | 0.7 | 3 | 4 | 12 | 27 |
| 160 | 6 | 5000 | 5 | 1200 | 10 | 4–7 | 58–102 | 0.8 | 3 | 4 | 18 | 40 |
| 200 | 8 | 12000 | 10 | 1200 | 5 | 4–7 | 58–102 | 0.9 | 3 | 4 | 22 | 49 |
| 250 | 10 | 22000 | 15 | 1200 | 5 | 4–7 | 58–102 | 0.9 | 3 | 4 | 29 | 64 |
| 320 | 12 | 30000 | 22 | 1200 | 5 | 4–7 | 58–102 | 1.1 | 5 | 6 | 48 | 106 |
| 350 | 14 | 43000 | 25 | 1200 | 5 | 4–7 | 58–102 | 1.3 | 5 | 6 | 59 | 130 |
| 400 | 16 | 61000 | 30 | 1200 | 5 | 4–7 | 58–102 | 1.5 | 5 | 6 | 68 | 150 |

Technical data for pressure controller: see pages 146–149

# Options

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

Dia. 1



Actuator on B1-side (standard)

Actuator on B2-side (option)

Pic. 2



Pic. 3



**Actuator**

– Actuator on B2-side (Dia. 1)

– Controller with configurable PID parameters (adaptive, upstream, downstream, soft-pump)

– RS232 interface with 2 analog outputs

**Valve**

– Other sizes, e. g. DN 80

– Other flanges, e. g. ASA-LP

– Customer specified flanges, e. g. rectangular flange for direct mounting to chamber

– Surface treatment, e. g. nickel-plated

– Other sealing materials

– KF ports in body

– Heater with insulation (Pic. 2) for valve temperatures up to 120 °C (for valve temperatures up to 200 °C on request)

– Valve with detached pressure controller (Pic. 3)

– Valve for pressure control only (no leaktight closing)

– Wedge-shaped plate for smaller controllable conductances
  - DN 320: 16 $ls^{-1}$ (standard 22 $ls^{-1}$)
  - DN 350: 19 $ls^{-1}$ (standard 25 $ls^{-1}$)
  - DN 400: 22 $ls^{-1}$ (standard 30 $ls^{-1}$)

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

# Spare parts

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

# Accessories

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

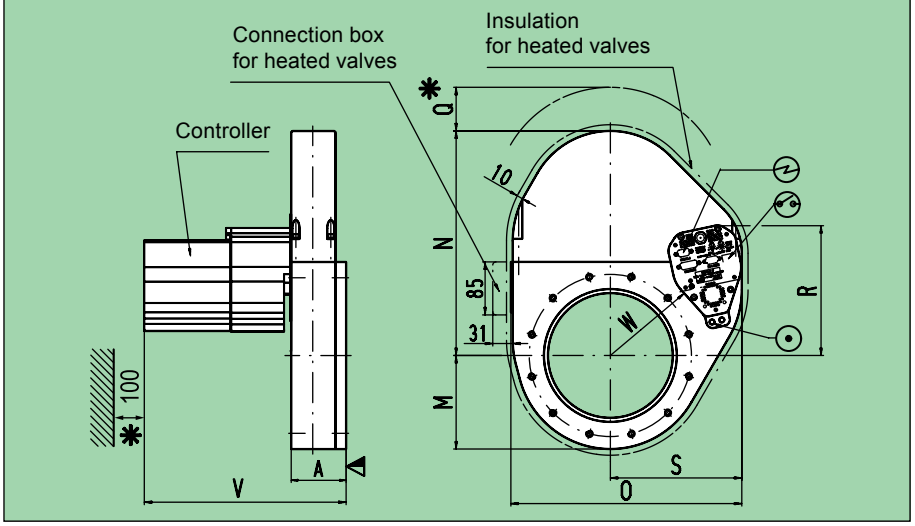
## Easy maintenance



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

## Main dimensions

**Valve with stepper motor and integrated pressure controller**
DN 100–400 (4"–16")

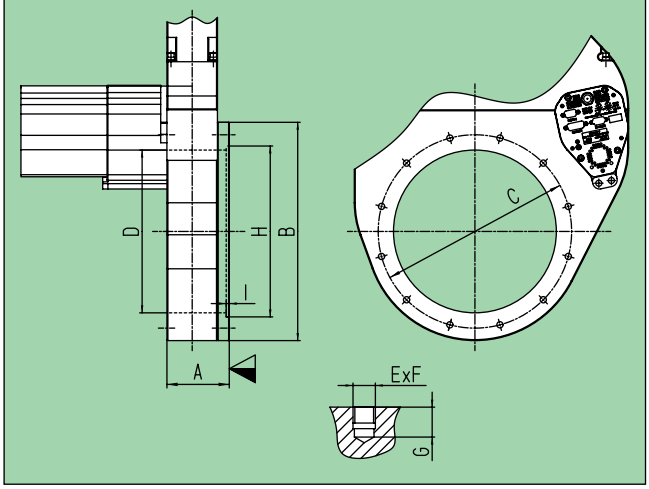



▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⊖ Electrical connection
◔ Position indicator

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

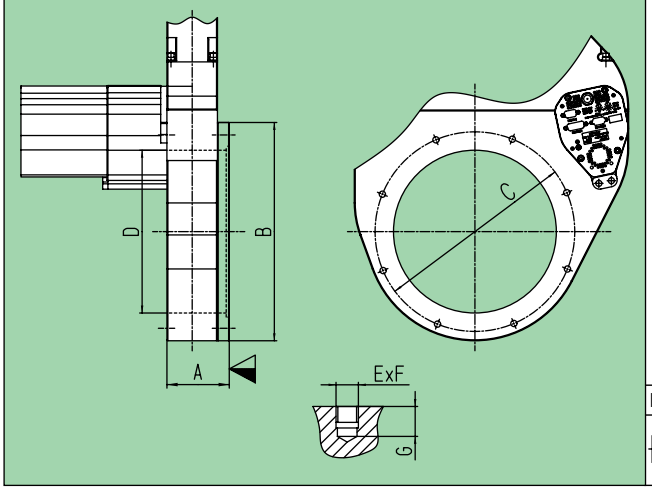
# Flange dimensions

**ISO-F**
DN 100–400 (4"–16")



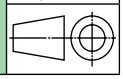

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DN | mm<br>inch | 100<br>4 | 160<br>6 | 200<br>8 | 250<br>10 | 320<br>12 | – | 400<br>16 |
| A | mm<br>inch | 70<br>2.76 | 88<br>3.46 | 88<br>3.46 | 100<br>3.94 | 120<br>4.72 | – | 128<br>5.04 |
| B | mm<br>inch | 190<br>7.48 | 243<br>9.57 |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

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




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

Projection E



▽ Valve seat side

# Series 65.2

## Main applications

Downstream pressure control and isolation valve for SEMI and FPD processes

Optimal for corrosive etching and cleaning processes



## Ordering information

**Valve with stepper motor and integrated pressure controller**

| DN | | Ordering numbers | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 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 |

Controller configurations:

x

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

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

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

VC = Valve Cluster (for operating several valves synchronously)

y

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

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

Pressure controller: see pages 146 – 149

## Features

Bodymaterial:
aluminum or
aluminum, hard anodized

Compact design

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

Purely electrical actuation

Integrated or external pressure controller

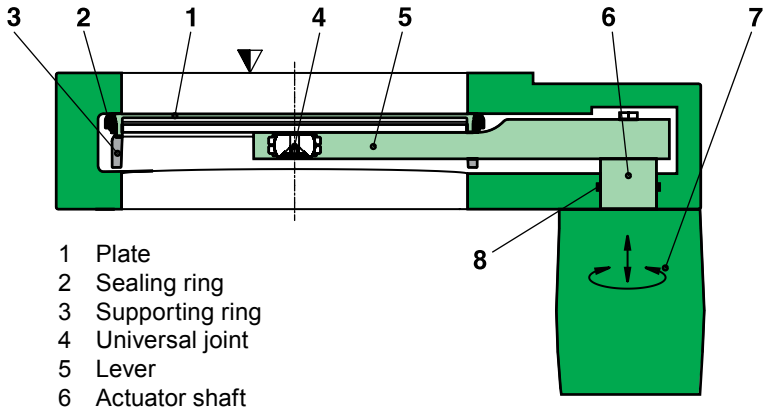
Conductance control to almost 0 $ls^{-1}$

Position indication

Service port for connecting a computer or a service box 2

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

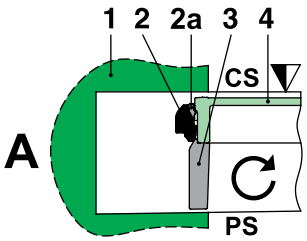
Functional principle




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

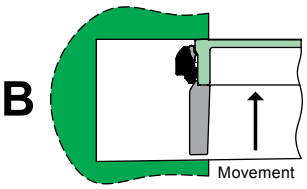
The plate acts, due to its pendulum and stroke movement, as a throttling element and varies the conductance of the valve opening. The pressure controller calculates the required plate position to achieve the setpoint pressure. See also principle drawing on page 280. Actuation is performed by a stepper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

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

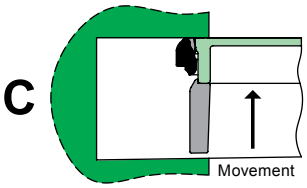



Pressure control:
sealing ring and plate relaxed

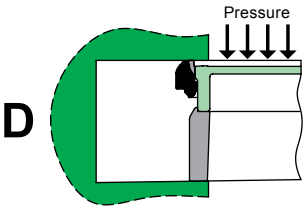
1 Valve body
2 Sealing ring
2a Seal
3 Supporting ring
4 Plate
▼ Valve seat side
CS Chamber side
PS Pump side




Pressure control:
valve almost closed
(conductance almost 0 $ls^{-1}$,
plate touches body)




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




Valve closed:
differential pressure chamber→pump

## Technical data

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

[1] Unheated on delivery

[2] Maximum values: depending on operating conditions and sealing materials

[3] Valve seat on chamber side recommended

| DN (nominal I. D.) | | Conductance (molecular flow) | Minimum controllable conductance (molecular flow) | Max. differential pressure on the plate | Max. differential pressure during operation | Typical closing / opening time: Open → optically closed | Open → minimum conductance | Open → closed | Closed → open | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | ls$^{-1}$ | ls$^{-1}$ | mbar | mbar | s | s | s | s | kg | lbs |
| 200 | 8 | 12 000 | 0.20 | 1200 | 10 | 0.8 | 1.2 | 1.9 | 2.6 | 27 | 60 |
| 250 | 10 | 22 000 | 0.25 | 1200 | 10 | 0.9 | 1.3 | 2.2 | 3.1 | 34 | 75 |

Technical data for pressure controller: see pages 146 – 149

## Spare parts

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

## Accessories

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

# Options

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



**Actuator**

– Controller with configurable PID parameters (adaptive, upstream, downstream, soft-pump)

– RS232 interface with 2 analog outputs

**Valve**

– Other sizes, e. g. DN 160, 320, 350

– O-ring seal in plate (standard: vulcanized seal)

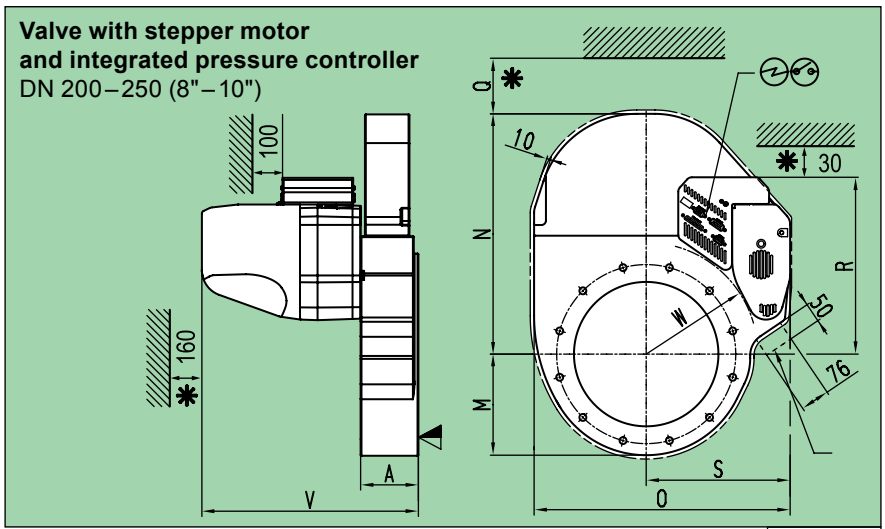
– Valve with external pressure controller

– Heater with insulation (picture) for valve temperatures up to 120 °C

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

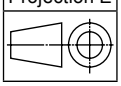
# Main dimensions

**Valve with stepper motor and integrated pressure controller**
DN 200–250 (8"–10")




▼ Valve seat side ✳ Required for dismantling ⊖ Electrical connection ⊘ Position indicator

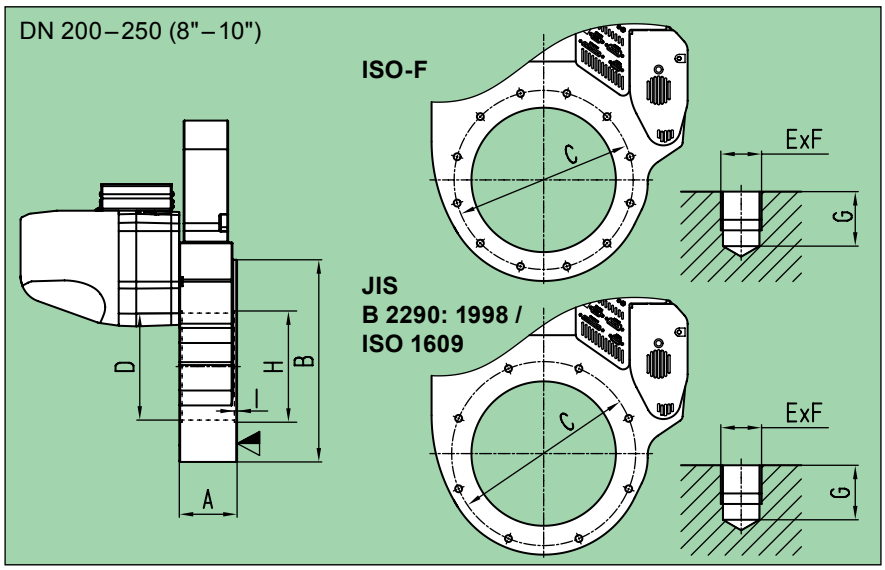
Projection E



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

# Flange dimensions

DN 200–250 (8"–10")




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

## Main applications

Downstream pressure control and isolation

## Features

Control and isolation valve combined as a compact unit

Series 95.1:
Control and angle valve with bellows, opening at 1 bar differential pressure possible

Series 95.2:
Control and gate valve with shaft feed-through



Series 95.1: DN 25 – 50



Series 95.2: DN 63 – 250

## Ordering information

**Valve with stepper motor and integrated pressure controller**

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

Controller configurations:

x

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

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

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

VC = Valve Cluster (for operating several valves synchronously)

y

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

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

Pressure controller: see pages 146 – 149

## Technical data

| | | |
|---|---|---|
| Leak rate [1]: valve body, valve seat | | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| Pressure range [1] | | |
| – Series 95.1 | | $1 \cdot 10^{-8}$ mbar to 1.2 bar (abs) |
| – Series 95.2 | | $1 \cdot 10^{-7}$ mbar to 1.2 bar (abs) |
| Cycles until first service [2] | | |
| – Pressure control | | 2 million |
| – Closing/opening | DN 25–50 | 2 million |
| | DN 63–100 | 200 000 |
| | DN 160–250 | 100 000 |
| Temperature [2] | | |
| – Valve body | | ≤ 120 °C |
| – Ambient | | ≤ 50 °C |
| Mounting position | | any |

[1] Unheated on delivery

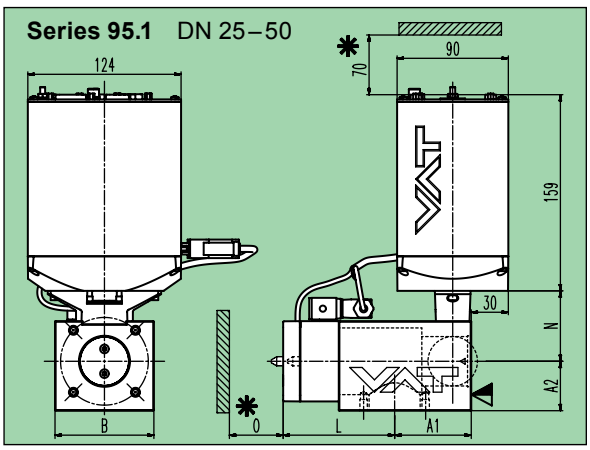
[2] Maximum values: depending on operating conditions and sealing materials

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

Technical data for pressure controller: see pages 146–149

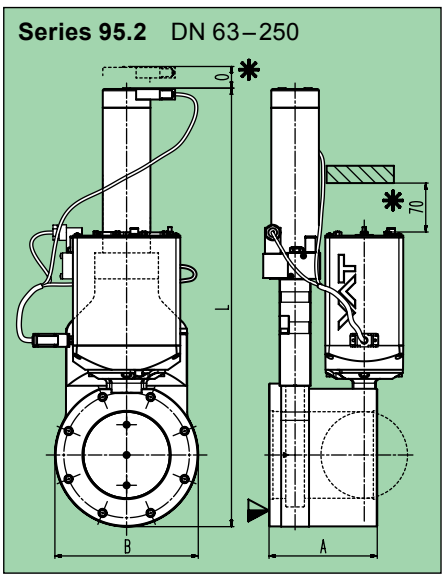
## Dimensions

**Series 95.1** DN 25–50




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

**Series 95.2** DN 63–250

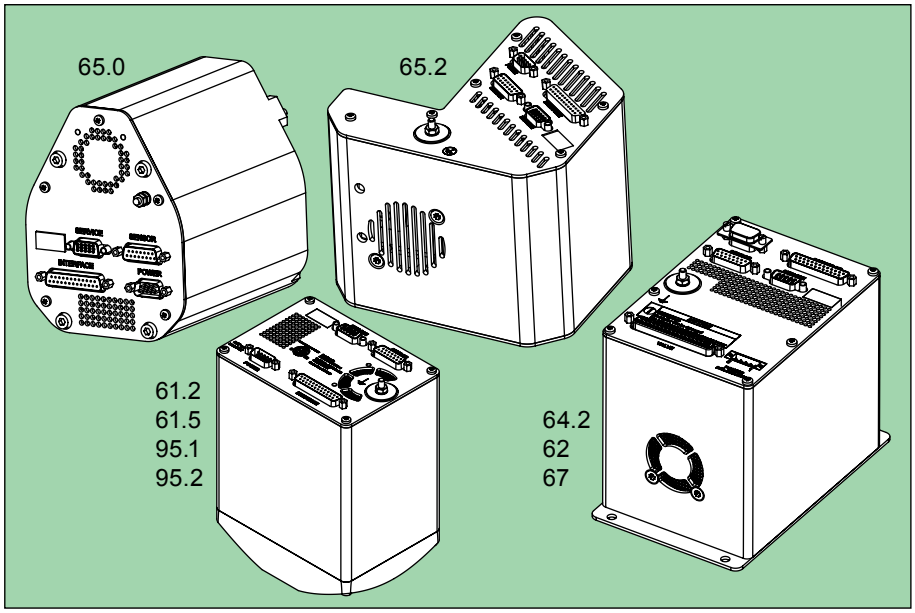



| DN | mm / inch | 63 / 2½ | 80 / 3 | 100 / 4 | 160 / 6 | 200 / 8 | 250 / 10 |
|---|---|---|---|---|---|---|---|
| A | mm | 125 | 125 | 125 | 140 | 175 | 210 |
| | inch | 4.92 | 4.92 | 4.92 | 5.51 | 6.89 | 8.27 |
| B | mm | 131 | 146 | 166 | 237 | 290 | 352 |
| | inch | 5.16 | 5.75 | 6.54 | 9.33 | 11.42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

▽ Valve seat side

✳ Required for dismantling

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




## Features

Integrated or external pressure controller, depending on valve type

Automatic learning of system parameters

Extremely short control response times

Fast and accurate pressure control

Valve position control

Remote control or local operation

Input for pressure sensor

Information display

## Function

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

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

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

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

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

## Electrical connections

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

## Accessories

– **CPA software** (see «Operation»)

– **Service box, control panel** (see «Operation»)

– **Connector kits** for the various interfaces

– **AC power supply unit** (input: 100 – 240 V AC, output: 24 V DC / 4 A)

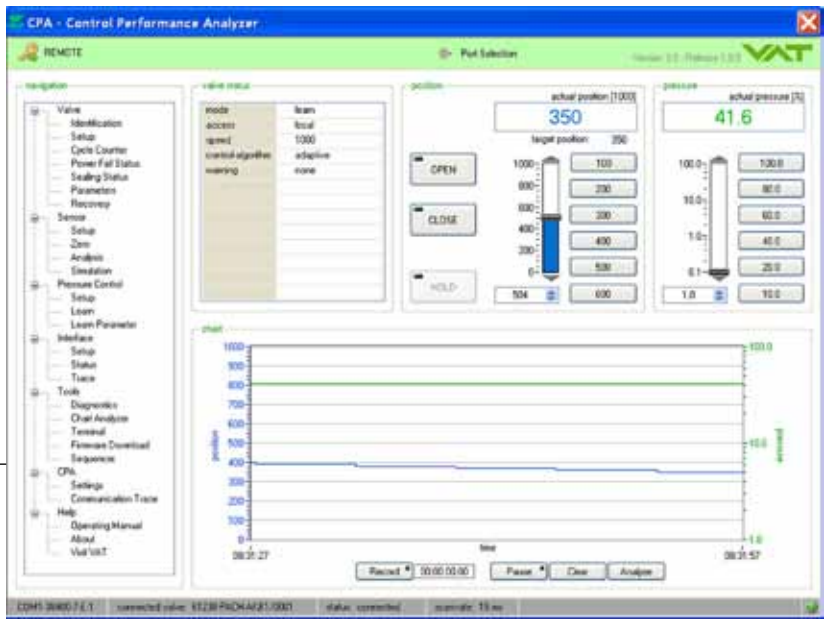
# Operation

**Remote control via computer**

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

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






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

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

**Local operation by means of a service box or control panel**



Standard service box 2 with cable



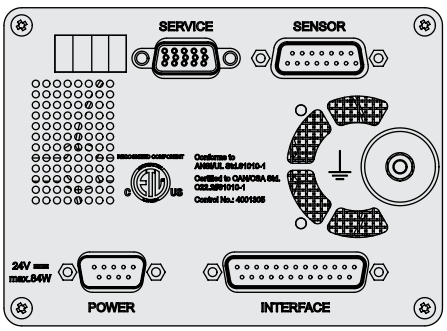
Control panel with cable for integration into a 19" rack

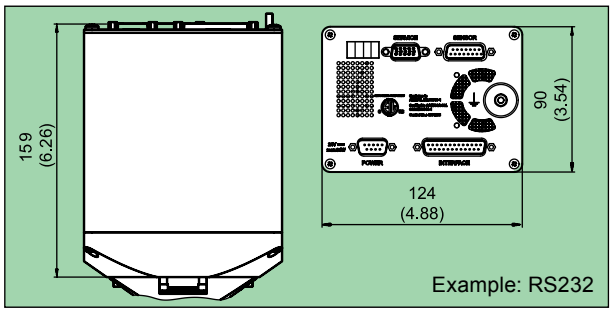
# Options

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

## Integrated controller: Series 61.2, 61.5, 95.1, 95.2





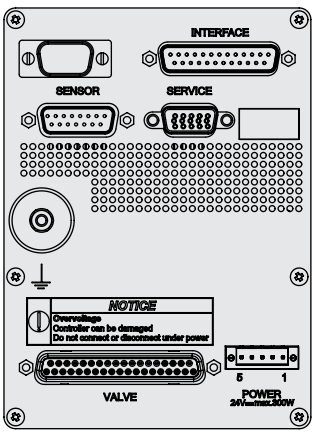

Available interfaces:
- Logic
- RS232
- RS485
- DeviceNet®
- Ethernet
- Profibus
- CC-Link
- EtherCAT

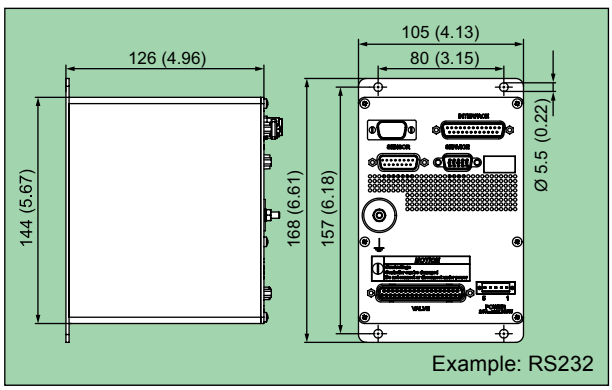
| | |
|---|---|
| Power consumption | max. +24 V DC (±10 %) @ 0.5 V pk-pk |
| – Controller + motor | max. 38 W |
| – Power failure option (PFO) | max. 10 W |
| – Sensor power supply (SPS) | max. 36 W |
| Sensor supply | 24 V DC or ±15 V DC |
| Sensor input | |
| – Signal voltage | 0 – 10 V DC linear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

[1] The higher value applies

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





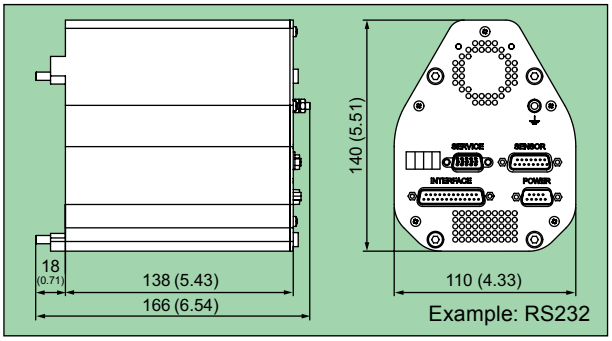

Available interfaces:
- Logic
- RS232
- RS485
- DeviceNet®
- Ethernet
- Profibus
- CC-Link
- EtherCAT

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

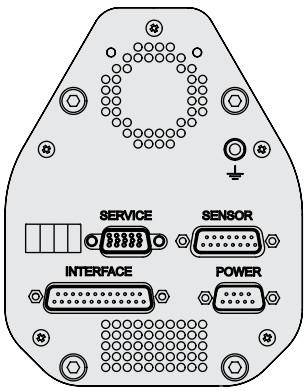
[1] The higher value applies

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






Available interfaces:
- Logic
- RS232
- RS485
- DeviceNet®
- Ethernet
- Profibus
- CC-Link
- EtherCAT

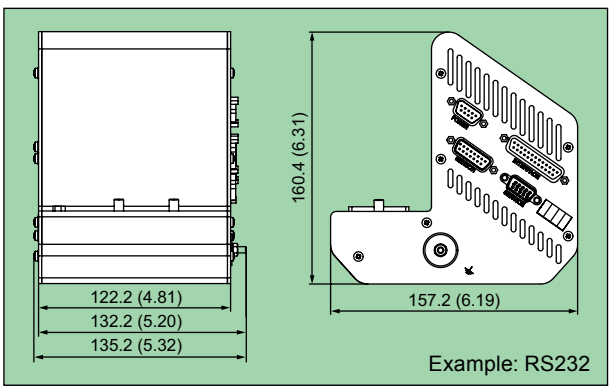



| | |
|---|---|
| Power consumption | max. +24 V DC (±10 %) @ 0.5 V pk-pk |
| – Controller + motor | max. 50 W |
| – Power failure option (PFO) | max. 10 W |
| – Sensor power supply (SPS) | max. 36 W |
| Sensor supply | 24 V DC or ±15 V DC |
| Sensor input | |
| – Signal voltage | 0 – 10 V DC linear with pressure |
| – Input resistance | Ri = 100 kΩ |
| – Resolution | 0.23 mV |
| – Sampling rate | 10 ms |
| Control accuracy | 5 mV or 0.1% of setpoint [1] |
| Position resolution | ≥ 9155 (depending on nominal diameter) |
| Protective system | IP 20 |

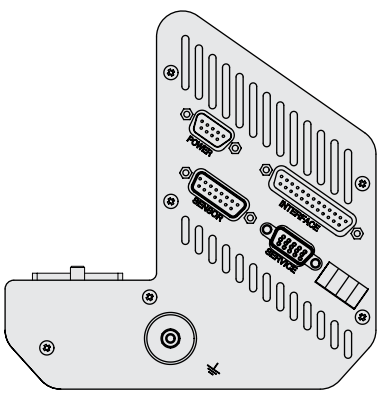
[1] The higher value applies

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






Available interfaces:
- Logic
- RS232
- RS485
- DeviceNet®
- Ethernet
- Profibus
- CC-Link
- EtherCAT




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

[1] The higher value applies

# Series 02.2 Valve
# Series 03.2 Insert



## Main applications

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

## Ordering information

**Series 02.2**
**Valve with pneumatic actuator**
double acting
with position indicator

**Type A**
Opening:
Rear side = seat side

| | DN (D1 × D) | | Ordering numbers (* specify control voltage) | | | |
|---|---|---|---|---|---|---|
| | | | aluminum | | stainless steel | |
| | mm | inch | without solenoid valve | with impulse solenoid valve | without solenoid valve | with impulse solenoid valve |
| SEMI E21-94 | 32 × 222 | 1.26 × 8.74 | 02209-AA24 | 02209-AA44 * | 02209-AE24 | 02209-AE44 * |
| SEMI E21-94 | 46 × 236 | 1.81 × 9.29 | 02210-AA24 | 02210-AA44 * | 02210-AE24 | 02210-AE44 * |
| SEMI E21.1-1296 | 50 × 336 | 1.97 × 13.23 | 02212-AA24 | 02212-AA44 * | 02212-AE24 | 02212-AE44 * |
| | 56 × 496 | 2.20 × 19.53 | 02213-AA24 | 02213-AA44 * | 02213-AE24 | 02213-AE44 * |
| | 100 × 500 | 3.94 × 19.69 | 02241-AA24 | 02241-AA44 * | 02241-AE24 | 02241-AE44 * |
| | Other sizes on request | | | | | |

**Series 02.2**
**Valve with pneumatic actuator**
double acting
with position indicator

**Type B**
Opening:
Rear side > seat side

| | DN (D1 × D) | | Ordering numbers (* specify control voltage) | | | |
|---|---|---|---|---|---|---|
| | | | aluminum | | stainless steel | |
| | mm | inch | without solenoid valve | with impulse solenoid valve | without solenoid valve | with impulse solenoid valve |
| SEMI E21-94 | 32 × 222 | 1.26 × 8.74 | 02209-BA24 | 02209-BA44 * | 02209-BE24 | 02209-BE44 * |
| SEMI E21-94 | 46 × 236 | 1.81 × 9.29 | 02210-BA24 | 02210-BA44 * | 02210-BE24 | 02210-BE44 * |
| SEMI E21.1-1296 | 50 × 336 | 1.97 × 13.23 | 02212-BA24 | 02212-BA44 * | 02212-BE24 | 02212-BE44 * |
| | 56 × 496 | 2.20 × 19.53 | 02213-BA24 | 02213-BA44 * | 02213-BE24 | 02213-BE44 * |
| | 100 × 500 | 3.94 × 19.69 | 02241-BA24 | 02241-BA44 * | 02241-BE24 | 02241-BE44 * |
| | Other sizes on request | | | | | |

**Series 03.2**
**Insert with pneumatic actuator**
double acting
with position indicator

**Type C**

| | DN (D1 × D) | | Ordering numbers (* specify control voltage) | | | |
|---|---|---|---|---|---|---|
| | | | aluminum | | stainless steel | |
| | mm | inch | without solenoid valve | with impulse solenoid valve | without solenoid valve | with impulse solenoid valve |
| SEMI E21-94 | 32 × 222 | 1.26 × 8.74 | 03209-CA24 | 03209-CA44 * | 03209-CE24 | 03209-CE44 * |
| SEMI E21-94 | 46 × 236 | 1.81 × 9.29 | 03210-CA24 | 03210-CA44 * | 03210-CE24 | 03210-CE44 * |
| SEMI E21.1-1296 | 50 × 336 | 1.97 × 13.23 | 03212-CA24 | 03212-CA44 * | 03212-CE24 | 03212-CE44 * |
| | 56 × 496 | 2.20 × 19.53 | 03213-CA24 | 03213-CA44 * | 03213-CE24 | 03213-CE44 * |
| | 100 × 500 | 3.94 × 19.69 | 03241-CA24 | 03241-CA44 * | 03241-CE24 | 03241-CE44 * |
| | Other sizes and insert types on request | | | | | |

## Features

Body material:
aluminum or stainless steel

Compact design

Virtually particle and vibration-free

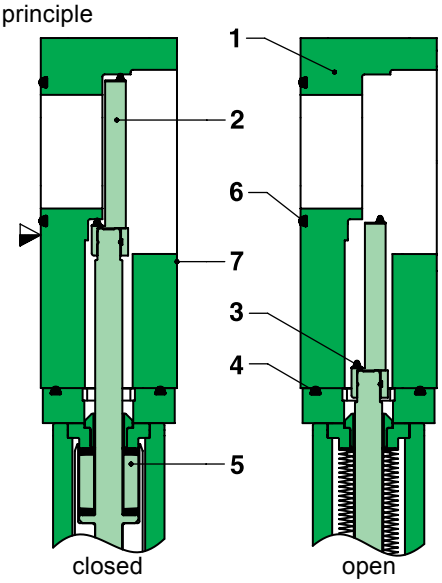
Modular design: same actuator for different valve sizes

Maintenance-free actuator

Self-adjusting gate without detached mounting parts

Vulcanized gate seal: see glossary

Functional principle

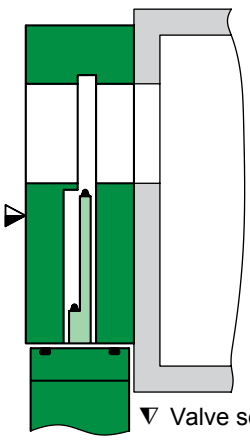



1 Valve body
2 Gate
3 Gate seal
4 Bonnet flange seal
5 Bellows
6 Body flange seal, seat side
7 Body flange sealing surface, rear side
▼ Valve seat side

C

## Types

**Valve type A**

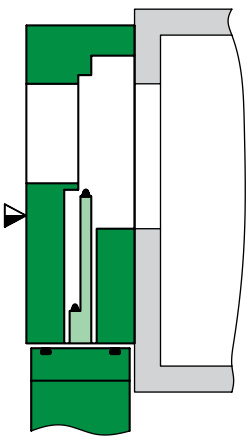



Opening:
Rear side = seat side

With bonnet flange

Gate service through bonnet flange

**Valve type B**

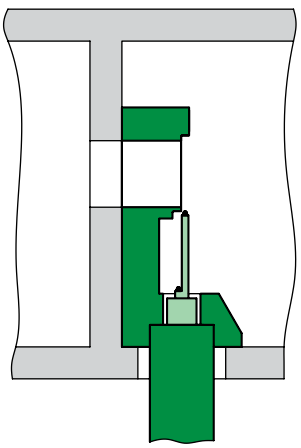


Opening:
Rear side > seat side

With bonnet flange

Gate service through bonnet flange

**Insert type C**



MONOVAT seat mounted inside of chamber

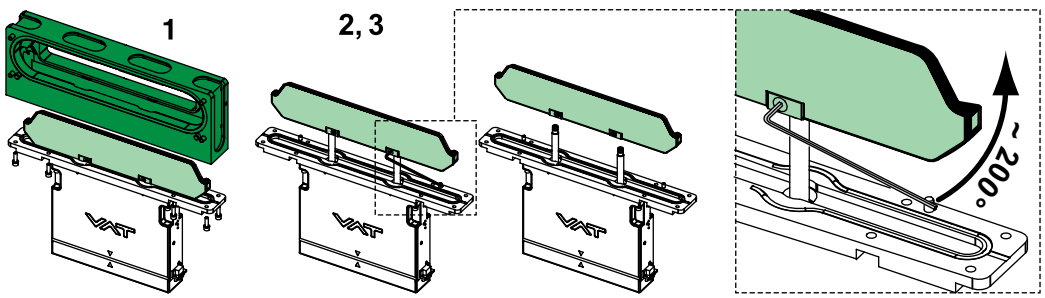
Insert installation from the top

Gate service through chamber

## Easy maintenance

1 Remove screws and withdraw actuator/gate assembly from valve body

2, 3 Remove gate screws by applying an Allen wrench and turning it approx. 200°



## Technical data

Leak rate [1) 2)] at valve body and valve seat in mbar $l s^{-1}$

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

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

Differential pressure on the gate: 1.2 bar

Differential pressure at opening: ≤ 30 mbar

Cycles until first service: up to DN 56 × 496: ≥ 5 million
DN 100 × 500: ≥ 1 million

Temperature [3)]

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

Heating and cooling rate: ≤ 40 °C $h^{-1}$

Temperature difference seat / gate: < 40 °C

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

Seal: gate, bonnet flange: FKM (Viton®)

Compressed air connection: internal threads ⅛" (ISO / NPT)

Mounting position: actuator up or down

Impulse solenoid valve: 24 V DC, 2.5 W (others on request)

Position indicator: contact rating
- Voltage: ≤ 50 V AC / DC
- Current: ≤ 0.1 A, > 5 mA
- Connection: 9 pin subminiature D

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

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

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

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

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

## Options

**Actuator**

– Other solenoid valve voltage (standard: 24 V DC)

– Pneumatically locked in closed and open position

– Manual mechanical locking

– Bakeable to 150 °C

– Double position indicator for the positions «open» and «closed»

– Pressure control for the closed position

– Position indicator with mechanical and electronic sensors with LED display

– Cycle counter

**Valve and insert**

– Surface
  - Aluminum: hard anodised or nickel-plated
  - Aluminum, stainless steel: ball-polished
  - Stainless steel gate: electro-polished

– Temperature management
  - Valve body prepared for liquid cooling (stainless steel) or nitrogen purge (aluminum, stainless steel)
  - Gate prepared for liquid cooling
  - Gate with heating conductor
  - Heating cartridges with/without thermocouples
  - PTC heating cartridges
  - Temperature sensors with/without overtemperature protection

– FFKM gate seal, other sealing materials on request

– Protective shield for gate
  (protection against coating, plasma and process gases, heat radiation)

**Valve**

– Body flange
  - Sealing surface or groove for O-ring seal
  - FKM (Viton®) or FFKM body seal (O-ring)
  - Metal body seal (stainless steel version)
  - Other sealing materials
  - Screw holes outside or inside of the sealing line
  - Centering pins, centering holes

– UHV version
  - Body flange sealing surfaces for metal seal
  - Metal seal on bonnet flange

– Ports ISO-KF 16 for roughing (by-pass), venting or for gauges

– Valve body prepared for customer-specific sensor systems
  (pressure, temperature, wafer detection)

**Insert**

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

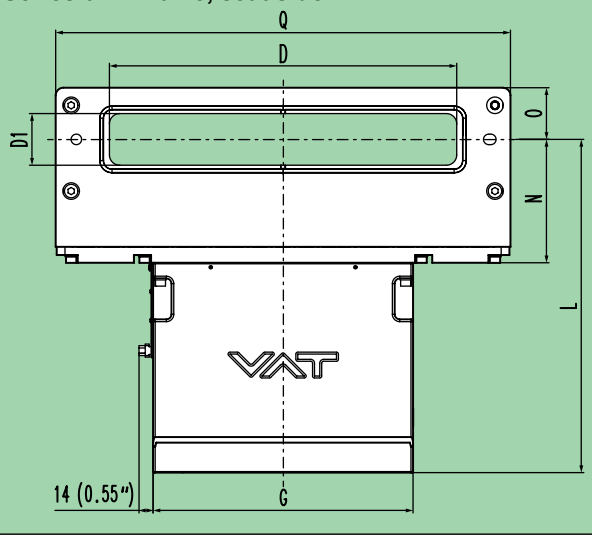
– Type L Seat mounted to chamber wall, with bonnet flange, gate service through bonnet flange

– Type M Seat mounted to chamber wall, without bonnet flange, gate service through chamber

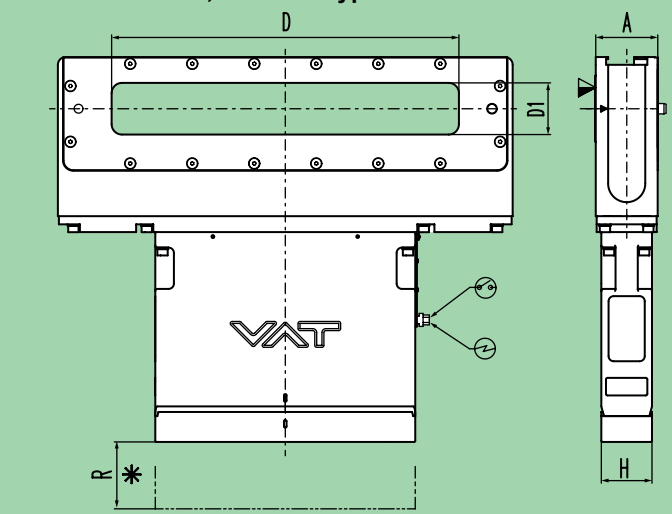
– Type N Seat mounted through chamber wall, without bonnet flange, gate service through chamber

## Dimensions

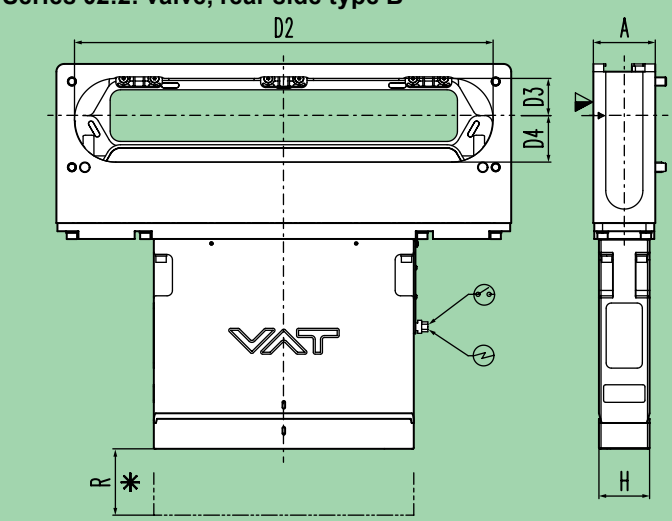
**Series 02.2: valve, seat side**




**Series 02.2: valve, rear side type A**



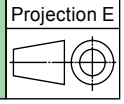

**Series 02.2: valve, rear side type B**




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

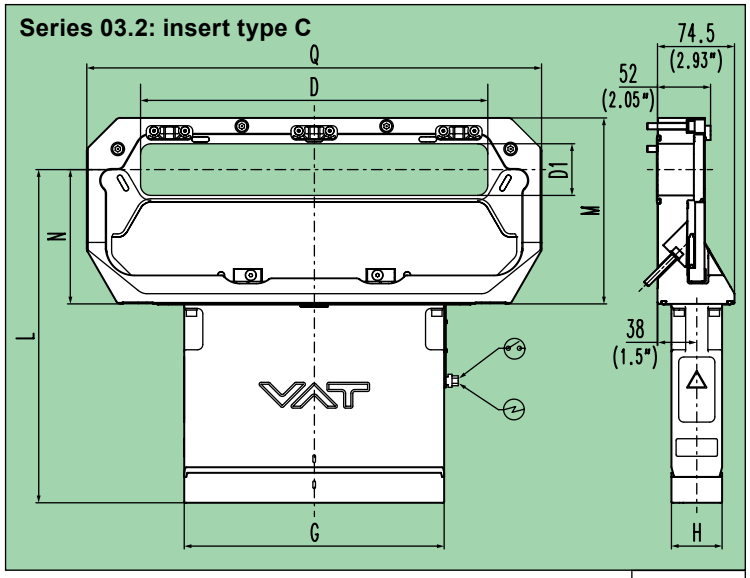
[1] On request

Projection E

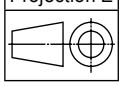


- Valve seat side
- Required for dismantling
- Position indicator
- Electrical connection

## Dimensions




Projection E



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

Position indicator
Electrical connection

[1] On request

C

## Spare parts

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

# Series 04.3 Valve
# Series 05.3 Insert



## Main applications

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

Corrosive processes such as etching and CVD

HB-LED manufacturing

## Ordering information

**Series 04.3**
**Valve with pneumatic actuator**
double acting
with position indicator

| | DN (D1 × D) | | Ordering numbers (* specify control voltage) | | | |
|---|---|---|---|---|---|---|
| | | | aluminum | | aluminum, hard anodized | |
| | mm | inch | without solenoid valve | with impulse solenoid valve | without solenoid valve | with impulse solenoid valve |
| SEMI E21.1-1296 | 50 × 336 | 1.97 × 13.23 | 04312-BA24 | 04312-BA44 * | 04312-BH24 | 04312-BH44 * |
| | 50 × 480 | 1.97 × 18.90 | on request | on request | on request | on request |
| | 56 × 496 | 2.20 × 19.53 | 04313-BA24 | 04313-BA44 * | 04313-BH24 | 04313-BH44 * |
| | 80 × 500 | 3.15 × 19.69 | 04331-BA24 | 04331-BA44 * | 04331-BH24 | 04331-BH44 * |
| | 100 × 800 | 3.94 × 31.50 | 04344-BA24 | 04344-BA44 * | 04344-BH24 | 04344-BH44 * |
| | Other sizes on request | | | | | |

**Series 05.3**
**Insert with pneumatic actuator**
double acting
with position indicator

| | DN (D1 × D) | | Ordering numbers (* specify control voltage) | | | |
|---|---|---|---|---|---|---|
| | | | aluminum | | aluminum, hard anodized | |
| | mm | inch | without solenoid valve | with impulse solenoid valve | without solenoid valve | with impulse solenoid valve |
| SEMI E21.1-1296 | 50 × 336 | 1.97 × 13.23 | 05312-LA24 | 05312-LA44 * | 05312-LH24 | 05312-LH44 * |
| | 50 × 480 | 1.97 × 18.90 | on request | on request | on request | on request |
| | 56 × 496 | 2.20 × 19.53 | 05313-LA24 | 05313-LA44 * | 05313-LH24 | 05313-LH44 * |
| | 80 × 500 | 3.15 × 19.69 | 05331-LA24 | 05331-LA44 * | 05331-LH24 | 05331-LH44 * |
| | 100 × 800 | 3.94 × 31.50 | 05344-LA24 | 05344-LA44 * | 05344-LH24 | 05344-LH44 * |
| | Other sizes on request | | | | | |

## Features

Body material:
aluminium or
aluminum, hard anodized

Uniform compression and long lifetime of the gate seal due to a real L-motion

Virtually particle-free

Vulcanized gate seal: see glossary

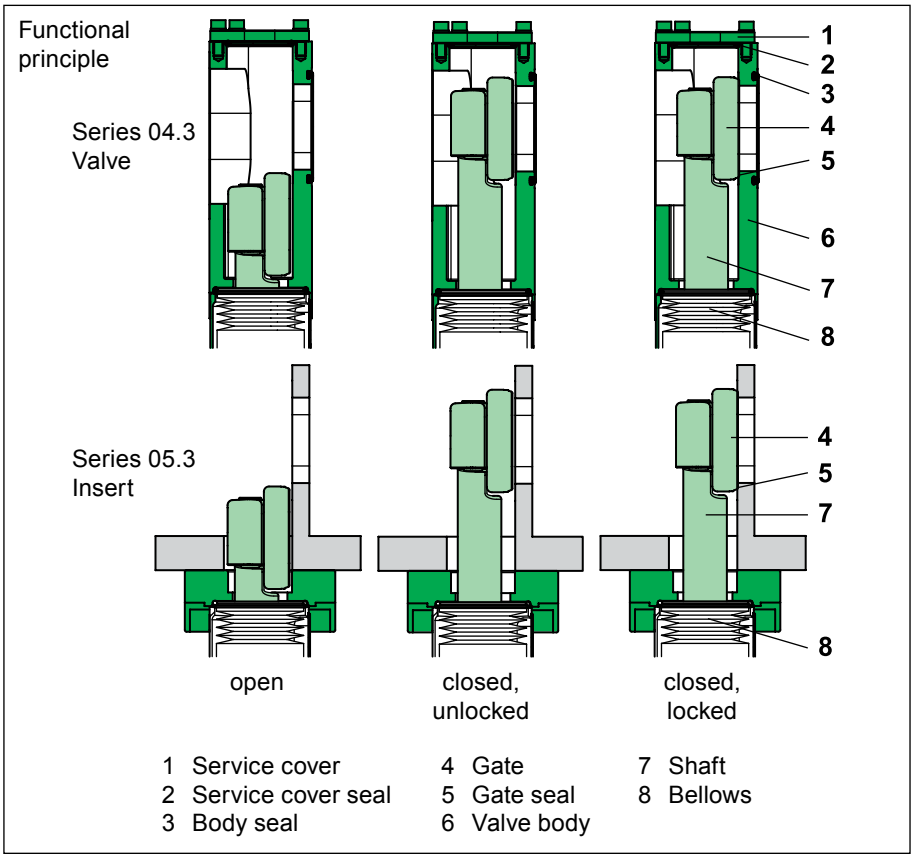
Protected bellows

Fast and smooth operation

Adjustable sealing force for different sealing materials

Pneumatically locked in closed and open position

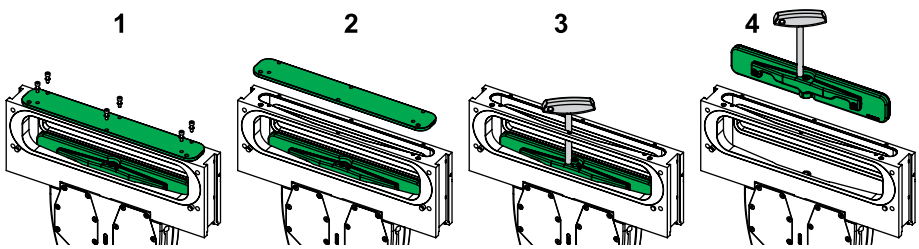
Service cover for easy maintenance




C

## Easy maintenance

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




## Technical data

Leak rate [1) 2)] at valve body and valve seat in mbar $l s^{-1}$

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

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

Differential pressure on the gate 1.1 bar

Differential pressure at opening
– DN 50 × 336 up to 80 × 500 ≤ 30 mbar
– DN 100 × 800 ≤ 10 mbar

Further technical data on next page

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

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

Continued Technical data

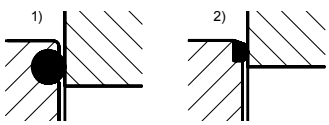
| | |
|---|---|
| Cycles until first service | |
| – DN 50 × 336 up to 56 × 496 | ≥ 3 million |
| – DN 80 × 500 up to 100 × 800 | ≥ 2 million |
| Temperature [3] | |
| – Gate, valve body | ≤ 120 °C |
| – Actuator | ≤ 80 °C |
| Heating and cooling rate | ≤ 40 °C $h^{-1}$ |
| Material | |
| – Valve body,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

[3] Maximum values: depening on operating conditions and sealing materials

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

## Options

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




## Accessories

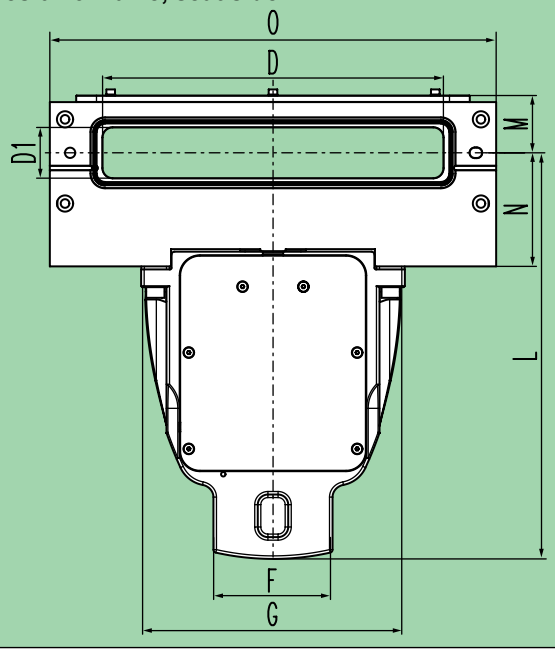
- **Service tool** for gate exchange
  Ordering number on request



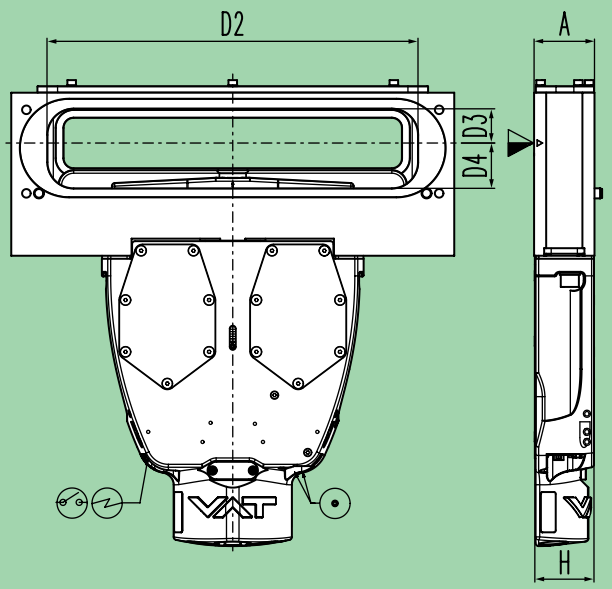
service tool

# Dimensions

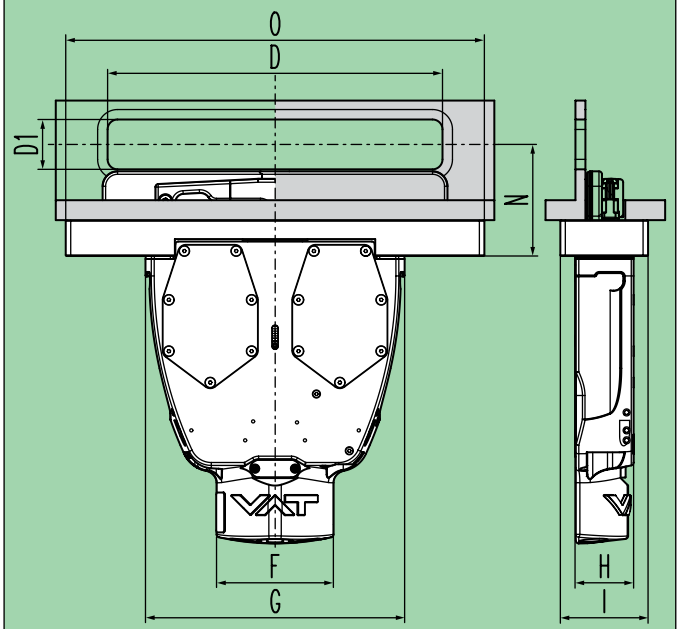
**Series 04.3: valve, seat side**



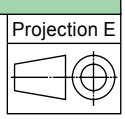

**Series 04.3: valve, rear side**




**Series 05.3: insert**




Projection E



- Valve seat side
- Electrical connection
- Compressed air connection
- Position indicator

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

[1] On request
[2] Valve
[3] Insert

# Series 07.6

## Main applications

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



## Ordering information

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

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

## Features

Easy installation

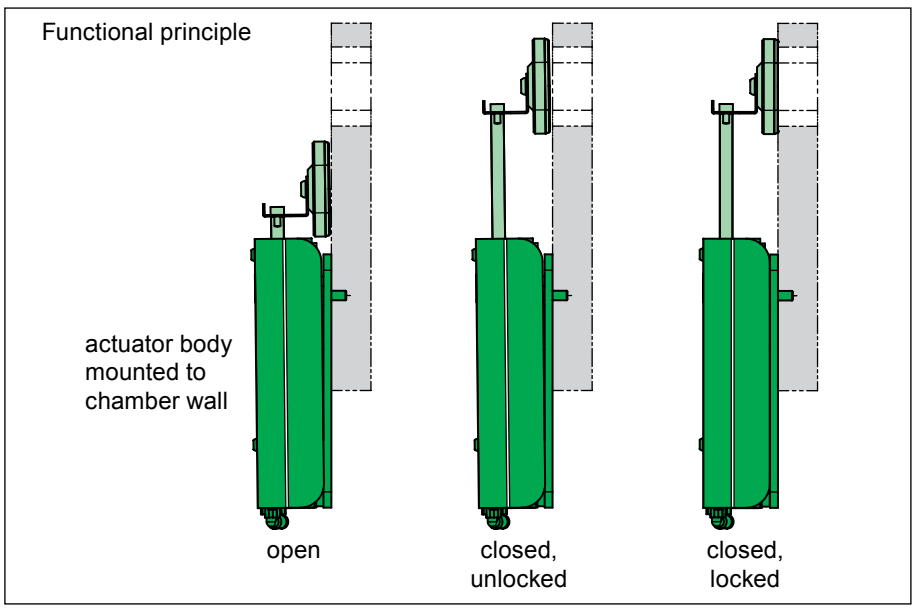
Vulcanized gate seal: see glossary

Fast closing and opening

Long lifetime of actuator

Virtually particle and vibration-free

Easy maintenance




## Options

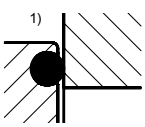
– Other solenoid valve voltage (standard: 24 V DC)

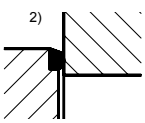
– Other sealing materials

– O-ring seal [1] in gate (standard: vulcanized seal [2])

– Pneumatically locked in closed and open position

– Parts kit for fast replacement of the door 07.5 against the door 07.6



## Technical data

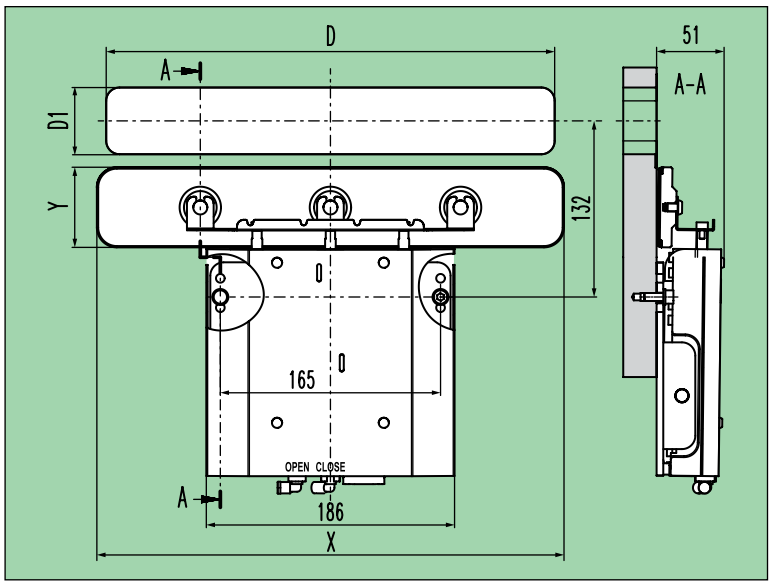
| | |
|---|---|
| Leak rate [1]: gate | $< 1 \cdot 10^{-9}$ mbar l/s$^{-1}$ |
| Pressure range | $1 \cdot 10^{-9}$ mbar to 1 bar (abs) |
| Differential pressure on the gate | |
| – In closing direction | 1 bar |
| – In opening direction | 0 bar |
| Cycles until first service | ≥ 3 million |
| Temperature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

[1] With FKM (Viton®) seal

[2] Maximum values: depending on operating conditions and sealing materials

| DN (D1 × D) D1 slit height D slit length | | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing or opening time | Weight | |
|---|---|---|---|---|---|---|---|---|
| mm | inch | bar | psi | l | ft³ | s | kg | lbs |
| 50 × 336 | 1.97 × 13.23 | 4 – 7 | 58 – 102 | 0.25 | 0.007 | ≤ 1 | 4.3 | 9.5 |
| 56 × 496 | 2.20 × 19.53 | 4 – 7 | 58 – 102 | 0.25 | 0.007 | ≤ 1 | 4.9 | 10.8 |

## Dimensions




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

# Series 02.4



## Main applications

FPD production systems
up to generation 6

Suitable for use in high vacuum environment, e. g. in vapor deposition systems for organic materials

## Ordering information

**Valve with pneumatic actuator**
double acting
with position indicator

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

Available dimensions:

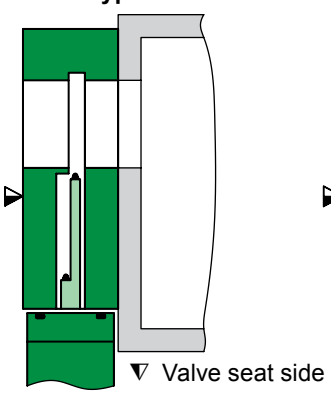
Standard sizes (X)

Special sizes (O), available on request

| Length mm | | Height mm 50 | 80 | 100 | 130 | 150 |
|---|---|---|---|---|---|---|
| X = 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 |
| O = special | 1350 / 1450 / | O | O | O | O | O |
| | 1550 / 1650 / | O | O | O | O | O |
| | 1750 | O | O | O | O | O |

## Types

**Valve type A**

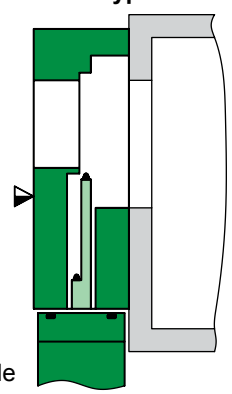



Opening:
Rear side = seat side

With bonnet flange

Gate service through bonnet flange

**Valve type B**

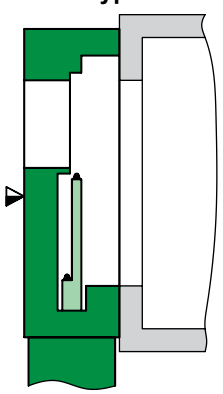


Opening:
Rear side > seat side

With bonnet flange

Gate service through bonnet flange

**Valve type C**



Opening:
Rear side > seat side

Without bonnet flange

Gate service through opening on rear side

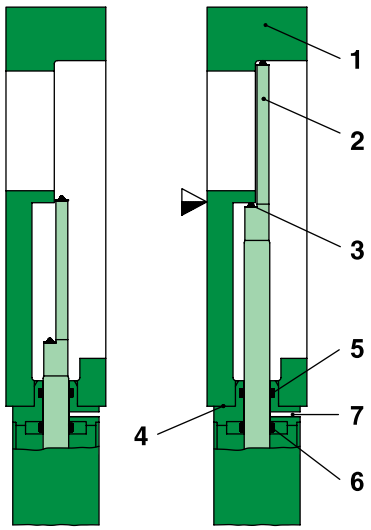
## Features

Body material: aluminum

MONOVAT sealing technology:
see glossary

Compact design and small mounting dimension
- 95 mm with opening lengths up to 900 mm
- 115 mm with opening lengths up to 1250 mm

Functional principle




1 Valve body
2 Gate
3 Gate seal
4 Bonnet seal
5 Shaft feedthrough seal 1
6 Shaft feedthrough seal 2
7 Intermediate pumping port
▼ Valve seat side

D

## Technical data

Further data on request

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

[1] Maximum values: depending on operating conditions and sealing materials

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

## Options

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

# Series 02.7

## Main applications

Web / foil coating systems



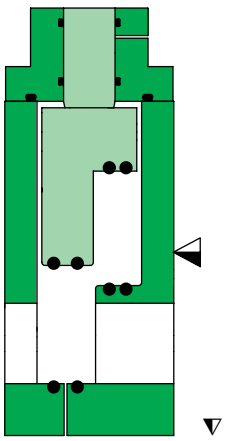
## Ordering information

**Valve with pneumatic actuator**
double acting
with position indicator

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

## Type

**Valve type A**



▼ Valve seat side

Opening:
Rear side = seat side

With bonnet flange

Gate service through
bonnet flange

## Features

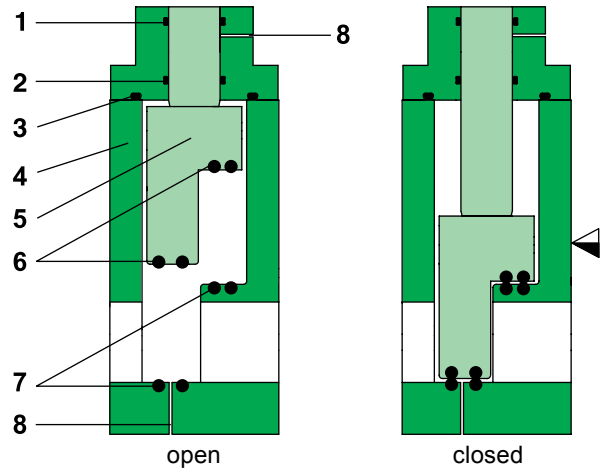
Body material:
aluminum or stainless steel

MONOVAT sealing technology:
see glossary

No damage of the foil due to the sophisticated sealing technology

Excellent sealing performance and high safety due to double sealing and intermediate pumping

Functional principle




1 Feedthrough seal 1
2 Feedthrough seal 2
3 Bonnet seal
4 Valve body
5 Gate
6 Gate seals
7 Body seals
8 Access for intermediate pumping
▼ Valve seat side

D

## Technical data

Further data on request

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

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

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

## Options

– Solenoid for impulse actuation 24 V DC (others on request)

– Surface treatment, e. g. aluminum, hard anodized or nickel-plated

– Bellows

# Series 06.0

## Main applications

FPD production systems
up to generation 11

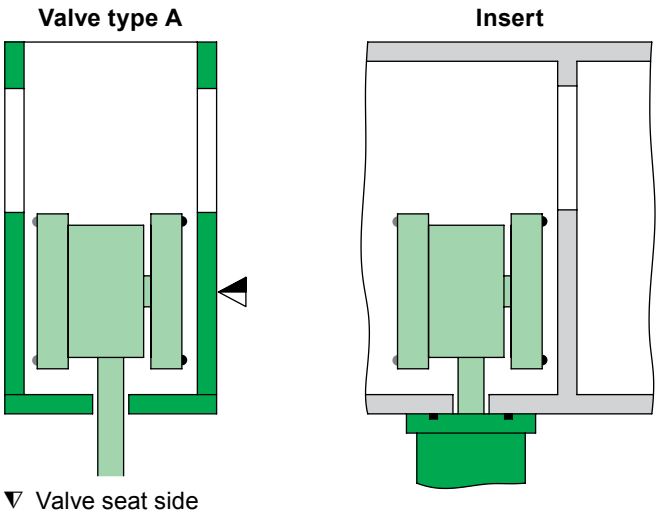


## Ordering information

**Valve with pneumatic actuator**
double acting
with position indicator

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

## Types




▼ Valve seat side

## Features

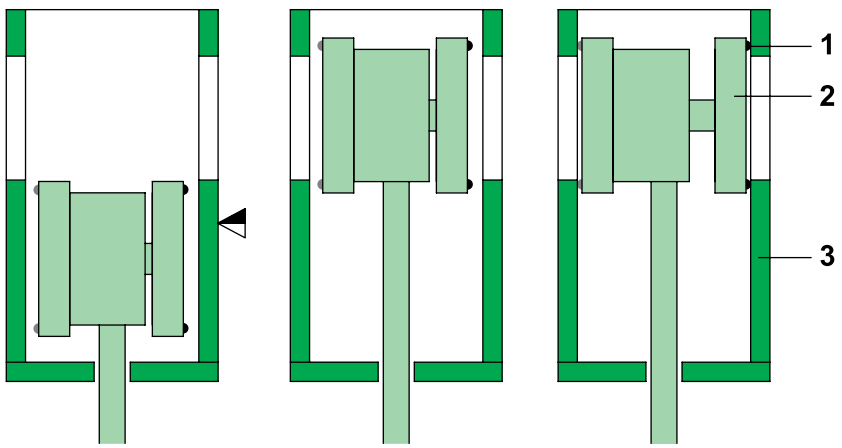
Body material: aluminum

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

Same mounting dimension for all opening sizes

Logic or RS232 interface

Functional principle




1 Gate seal 2 Gate 3 Valve body ▼ Valve seat side

D

## Technical data

Further data on request

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

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

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

## Options

– Other sealing materials

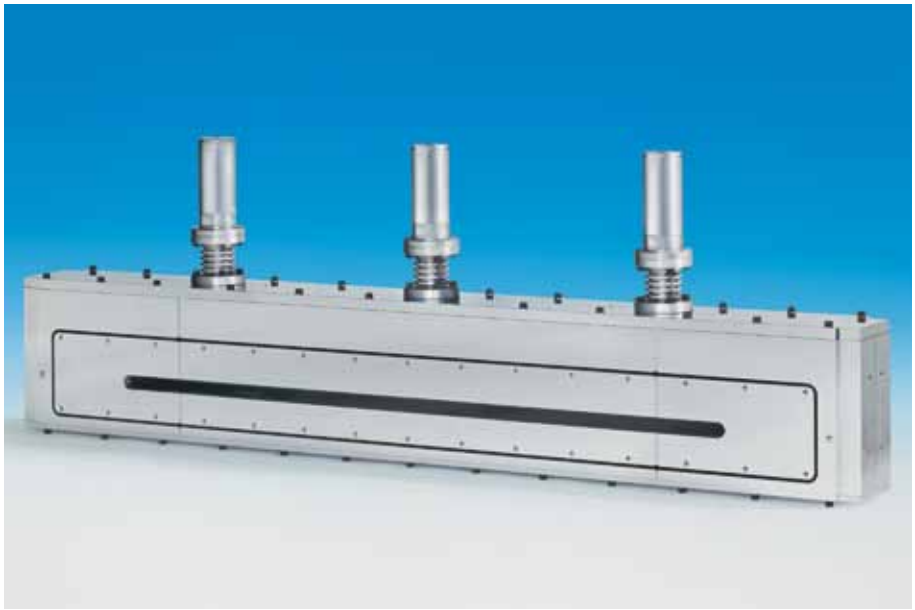
– Bellows

– Grounding of gate

– Resistant against 1 bar differential pressure in opening direction

– Surface treatment, e. g. aluminum, hard anodized

# Series 06.6



## Main applications

PV and large coating systems

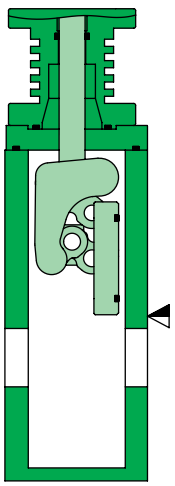
## Ordering information

**Valve with pneumatic actuator**
double acting
with position indicator

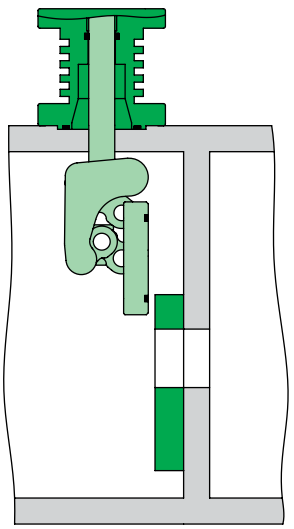
| | |
|---|---|
| Opening sizes | 50 × 500 mm ( 1.97" × 19.69") to<br>300 × 3000 mm (11.81" × 118.11") |
| Ordering numbers | on request (example: 0660X-VA24- . . . .) |

## Types

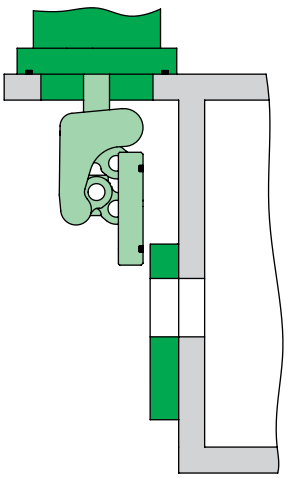
**Valve type V**



**Insert type I**



**Door type T**



▽ Valve seat side

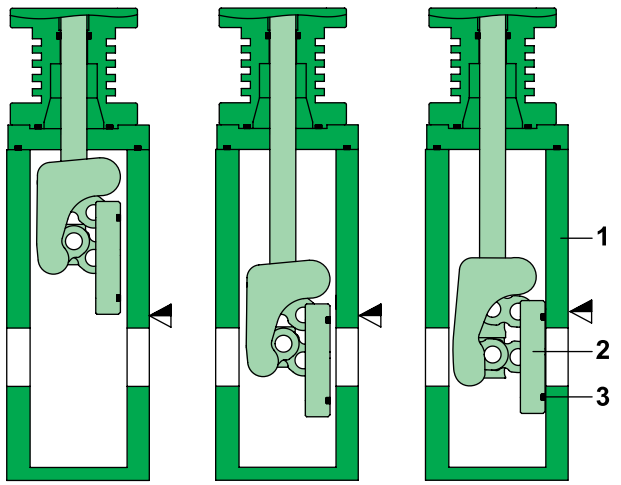
## Features

Body material:
aluminum or stainless steel

Mechanism designed for harsh process conditions

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

Functional principle




1 Valve body
2 Gate
3 Gate seal
▼ Valve seat side

D

## Technical data

Further data on request

| | |
|---|---|
| Leak rate [1] | |
| – Valve body | $< 1 \cdot 10^{-7}$ mbar ls$^{-1}$ |
| – Valve seat | $< 1 \cdot 10^{-5}$ mbar ls$^{-1}$ |
| Differential pressure on the gate | ≤ 1 bar |
| Differential pressure at opening | ≤ 5 mbar |
| Cycles until first service [1] [2] | 1 million |
| Closing or opening time [1] | ≤ 2.0 s (with 100 mm opening height) |
| Temperature [1] | |
| – Valve body, flanges | |
| - aluminum | ≤ 120 °C |
| - stainless steel | ≤ 200 °C |
| – Actuator, position indicator | ≤ 80 °C |
| Material | |
| – Valve body, gate, flanges | |
| - aluminum | EN AW-6082 (3.2315), EN AW-5083 (3.3547) |
| - stainless steel | AISI 304 (1.4301), AISI 316L (1.4404) |
| – Actuator shafts | AISI 304 (1.4301) hard-chrome plated |
| Seal | |
| – Gate, flanges, feedthrough | FKM (Viton®) |
| Feedthrough | shaft feedthrough |
| Mounting position [2] | actuator up, down or lateral |
| Position indicator: voltage | 10 – 30 V DC PNP (NPN optional) |

[1] Maximum values: depending on operating conditions and sealing materials

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

## Options

– Solenoid for impulse actuation 24 V DC (others on request)

– Bellows

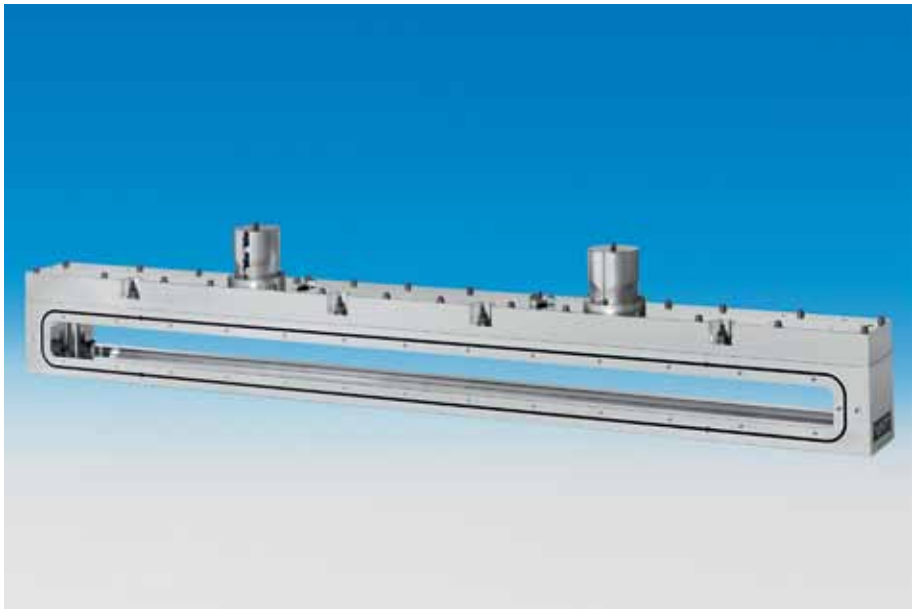
– Water cooling in valve body and gate

– Pneumatic locking for open gate position

# Series 06.8

## Main applications

PV and large coating systems



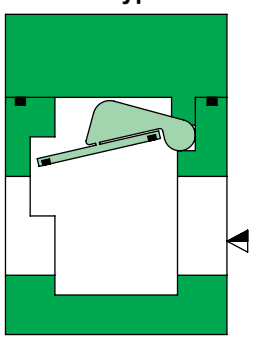
## Ordering information

**Valve with pneumatic actuator**
double acting
with position indicator

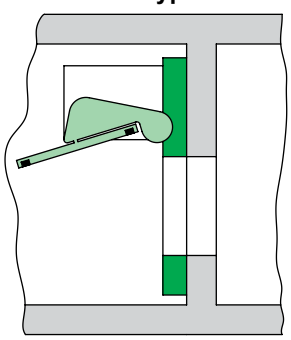
| | |
|---|---|
| Opening sizes | 50 × 500 mm (1.97" × 19.69") to<br>100 × 3000 mm (3.94" × 118.11") |
| Ordering numbers | on request (example: 0680X-VA24- . . . .) |

## Types

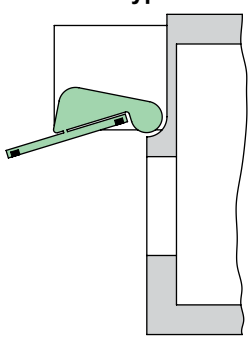
**Valve type V**



**Insert type I**

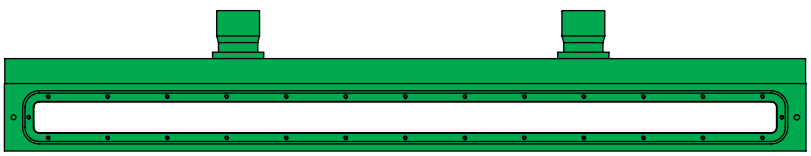


**Door type T**

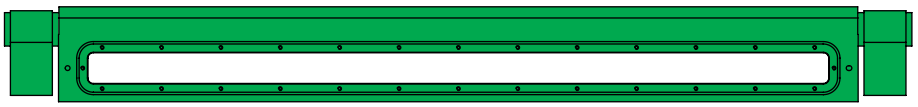


▼ Valve seat side

Actuators up



Actuators lateral



## Features

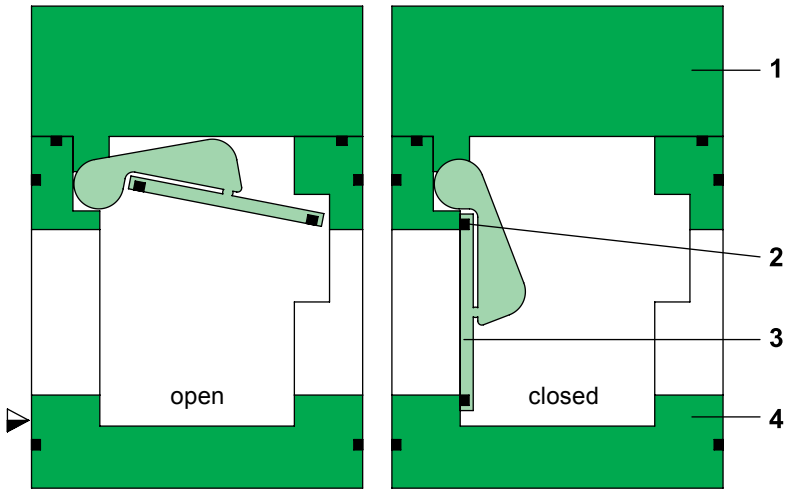
Body material:
aluminum or stainless steel

Mechanism designed for harsh process conditions

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

Mechanically locked in closed position

Functional principle




1 Bonnet flange
2 Gate seal
3 Gate
4 Valve body
▽ Valve seat side

D

## Technical data

Further data on request

| | |
|---|---|
| Leak rate [1] | |
| – Valve body | $< 1 \cdot 10^{-7}$ mbar l/s$^{-1}$ |
| – Valve seat | $< 1 \cdot 10^{-5}$ mbar l/s$^{-1}$ |
| Differential pressure on the gate | |
| – In closing direction | ≤ 1 bar |
| – In opening direction | ≤ 10 mbar (optional 1 bar) |
| Differential pressure at opening | ≤ 5 mbar |
| Cycles until first service [1] [2] | 1 million |
| Closing or opening time [1] | ≤ 1.2 s (with size 80 × 1500 mm) |
| Temperature [1] | |
| – Valve body, gate | |
| - aluminum | ≤ 120 °C |
| - stainless steel | ≤ 200 °C |
| – Actuator | ≤ 80 °C |
| Material | |
| – Valve body, gate, flanges | |
| - aluminum | EN AW-5083 (3.3547) |
| - stainless steel | AISI 304 (1.4301) |
| – Actuator shafts | SAE 1045 (1.1191), nitro carburized and oxidized |
| Seal: gate, flanges | FKM (Viton®) |
| Feedthrough | rotary feedthrough |
| Mounting position [2] | actuator up, down or lateral |
| Position indicator: voltage | 10 – 30 V DC PNP (NPN optional) |

[1] Maximum values: depending on operating conditions and sealing materials

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

## Options

– Solenoid for impulse actuation 24 V DC (others on request)
– Other sealing materials
– Water cooling in valve body and gate
– Pneumatic locking for open gate position
– Resistant against 1 bar differential pressure in opening direction

# Series 07.5

## Main applications

FPD and PV production systems



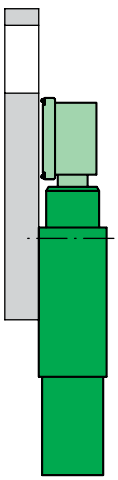
## Ordering information

**Door with pneumatic actuator**
double acting
with position indicator

| | |
|---|---|
| Opening sizes | 25 × 560 mm (0.98" × 22.05") to<br>80 × 3500 mm (3.15" × 137.80") |
| Ordering numbers | on request (example: 0750X-UA24- . . . .) |

## Type

**Door type U**



Actuator body mounted
to chamber wall

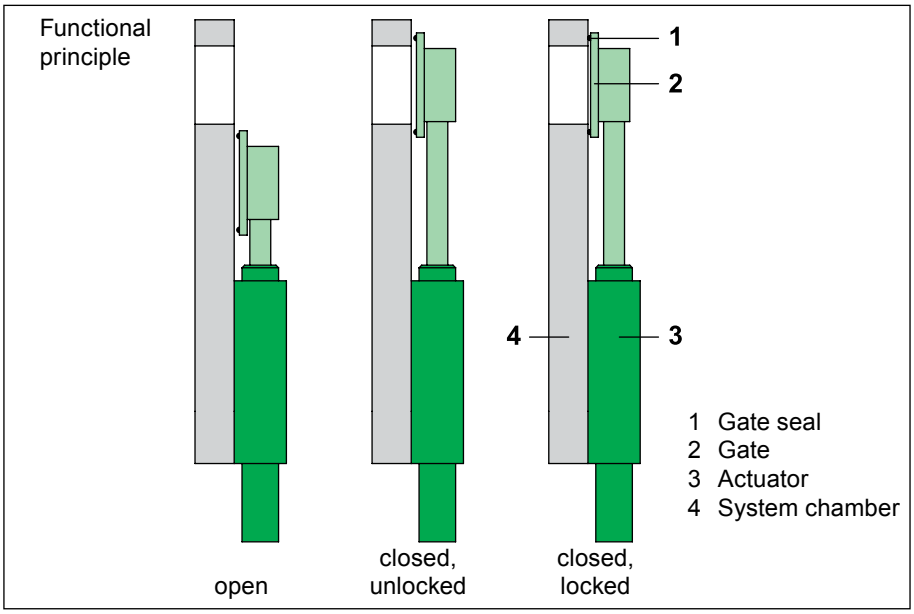
## Features

Gate material:
aluminum or stainless steel

L-VAT sealing technology: see glossary

Virtually particle-free and vibration-free L-movement

Low cost of ownership




D

## Technical data

Further data on request

| | |
|---|---|
| Leak rate [1]: gate in closing direction | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ ($\Delta p$ at gate = 1 bar) |
| Differential pressure on the gate | |
| – In closing direction | ≤1 bar |
| – In opening direction | ≤5 mbar |
| Differential pressure at opening | ≤5 mbar |
| Cycles until first service [1) 2)] | 1 million |
| Closing or opening time [1)] | |
| – Opening height 25 – 50 mm | ≤1.5 s |
| – Opening height 51 – 80 mm | ≤2.0 s |
| Temperature [1)] | |
| – Gate | |
| - aluminum | ≤120 °C |
| - stainless steel | ≤150 °C |
| – Actuator, position indicator | ≤ 80 °C |
| Material | |
| – Gate | |
| - aluminum | EN AW-5083 (3.3547) |
| - stainless steel | AISI 304 (1.4301), AISI 316L (1.4404) |
| – Actuator shafts | AISI 304 (1.4301) hard-chrome plated |
| – Connecting parts | EN AW-6082 (3.2315) |
| Seal | |
| – Gate, actuator, pressure plate | FKM (Viton®) |
| Mounting position [2)] | actuator up, down or lateral |
| Position indicator: voltage | 10 – 30 V DC PNP (NPN optional) |

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

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

## Options

– Solenoid for impulse actuation 24 V DC (others on request)

– Surface treatment, e. g. aluminum, hard anodized or nickel-plated

– Other sealing materials

# Series 07.8 «small»



## Main applications

FPD and PV production systems

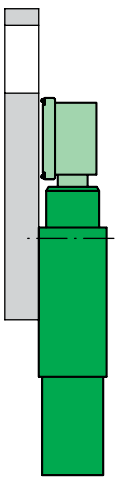
## Ordering information

**Door with pneumatic actuator**
double acting
with position indicator

| | |
|---|---|
| Opening sizes | 81 × 800 mm (3.19" × 31.50") to<br>200 × 1200 mm (7.87" × 47.24") |
| Ordering numbers | on request (example: 0780X-UA24- . . . .) |

## Type

**Door type U**



Actuator body mounted
to chamber wall

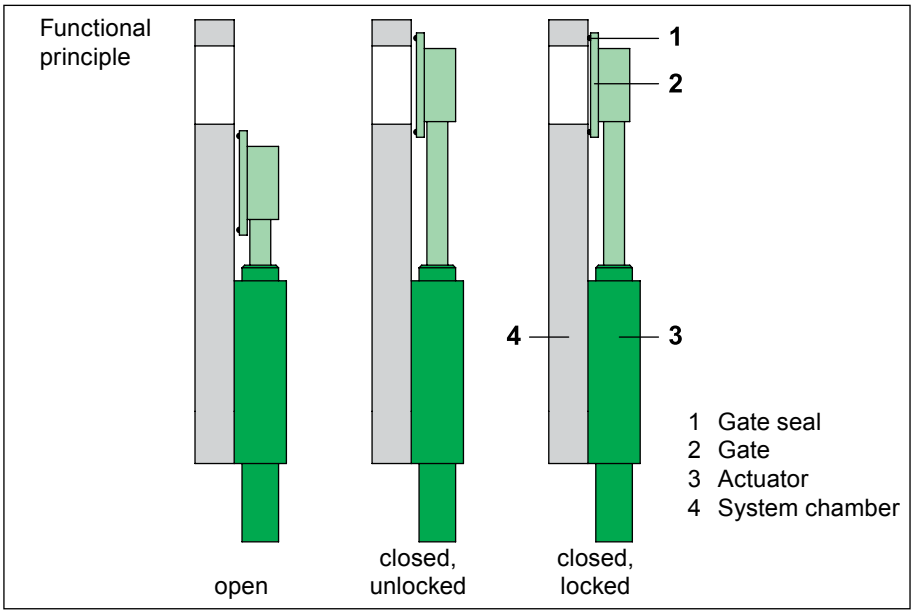
## Features

Gate material: aluminum

L-VAT sealing technology: see glossary

Virtually particle-free and vibration-free L-movement

Low cost of ownership




D

## Technical data

Further data on request

| | |
|---|---|
| Leak rate [1]: gate in closing direction | $< 1 \cdot 10^{-7}$ mbar ls$^{-1}$ ($\Delta p$ at gate = 1 bar) |
| Differential pressure on the gate | |
| – In closing direction | ≤1 bar |
| – In opening direction | ≤5 mbar |
| Differential pressure at opening | ≤5 mbar |
| Cycles until first service [1] [2] | 1 million |
| Closing or opening time [1] | ≤2.5 s |
| Temperature [1] | |
| – Gate | ≤120 °C |
| – Actuator, position indicator | ≤ 80 °C |
| Material | |
| – Gate | EN AW-5083 (3.3547) |
| – Actuator shafts | AISI 304 (1.4301) hard-chrome plated |
| – Connecting parts | EN AW-6082 (3.2315) |
| Seal | |
| – Gate | FKM (Viton®) |
| – Actuator, pressure plate | FKM (Viton®) and NBR |
| Mounting position [2] | actuator up or down |
| Position indicator: voltage | 10–30 V DC PNP (NPN optional) |

[1] Maximum values: depending on operating conditions and sealing materials

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

## Options

– Solenoid for impulse actuation 24 V DC (others on request)

– Surface treatment, e. g. aluminum, hard anodized or nickel-plated

– Other sealing materials

# Series 07.8

## Main applications

FPD and PV production systems



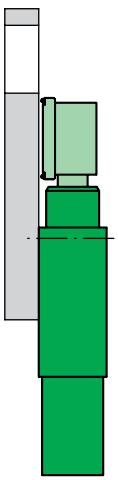
## Ordering information

**Door with pneumatic actuator**
double acting
with position indicator

| | |
|---|---|
| Opening sizes | 81 × 800 mm (3.19" × 31.50") to<br>250 × 3000 mm (9.84" × 118.11") |
| Ordering numbers | on request (example: 0780X-UA24- . . . .) |

## Type

**Door type U**



Actuator body mounted
to chamber wall

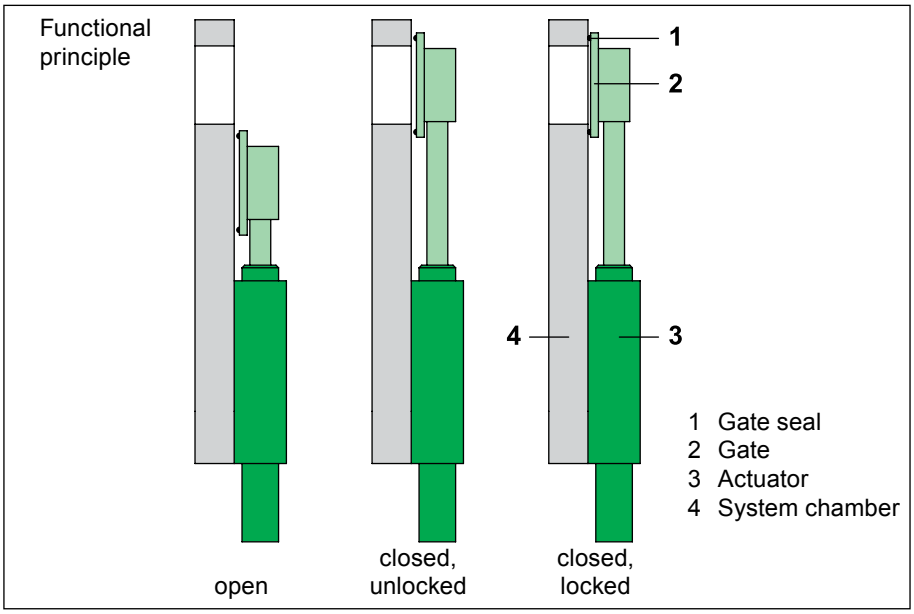
## Features

Gate material:
aluminum or stainless steel

L-VAT sealing technology: see glossary

Virtually particle and vibration-free L-movement

Low cost of ownership




D

## Technical data

Further data on request

| | |
|---|---|
| Leak rate [1]: gate in closing direction | $< 1 \cdot 10^{-7}$ mbar ls$^{-1}$ ($\Delta p$ at gate = 1 bar) |
| Differential pressure on the gate | |
| – In closing direction | ≤ 1 bar |
| – In opening direction | ≤ 5 mbar |
| Differential pressure at opening | ≤ 5 mbar |
| Cycles until first service [1] [2] | 1 million |
| Closing or opening time [1] | ≤ 3.5 s |
| Temperature [1] | |
| – Gate | |
| - aluminum | ≤ 120 °C |
| - stainless steel | ≤ 150 °C |
| – Actuator, position indicator | ≤ 80 °C |
| Material | |
| – Gate | |
| - aluminum | EN AW-5083 (3.3547) |
| - stainless steel | AISI 304 (1.4301), AISI 316L (1.4404) |
| – Actuator shafts | AISI 304 (1.4301) hard-chrome plated |
| – Connecting parts | EN AW-6082 (3.2315) |
| Seal | |
| – Gate | FKM (Viton®) |
| – Actuator, pressure plate | FKM (Viton®) and NBR |
| Mounting position [2] | actuator up, down or lateral |
| Position indicator: voltage | 10 – 30 V DC PNP (NPN optional) |

[1] Maximum values: depending on operating conditions and sealing materials

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

## Options

– Solenoid for impulse actuation 24 V DC (others on request)

– Surface treatment, e. g. aluminum, hard anodized or nickel-plated

– Other sealing materials

## Main applications

For roughing / backing line isolation and rough metering of gases and liquids



## Ordering information

**Valve with manual actuator**
handwheel

| DN | | Ordering numbers | |
|---|---|---|---|
| mm | inch | Valve ISO-KF | Spare diaphragm |
| 16 | ⅝ | 22024-KA01 | 100618-01 |
| 25 | 1 | 22028-KA01 | 100619-01 |
| 40 | 1½ | 22032-KA01 | 100620-01 |

## Technical data

| | |
|---|---|
| Leak rate: valve body, valve seat | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| Pressure range | $1 \cdot 10^{-7}$ mbar to 5 bar (abs) |
| Cycles until first service | 20 000 |
| Temperature [1] | |
| – Valve body | ≤ 100 °C |
| – Actuator | ≤ 50 °C |
| Material | |
| – Valve body | EN AW-6060 (3.3206), -6061 (3.3211), -6063 (3.3206, -6082 (3.2315) |
| – Actuator | plastic (POM) |
| Seal: diaphragm | FKM (Viton®) |
| Mounting position | any |
| Valve position indication | visual (mechanical) |
| Conductance (molecular flow) | |
| – DN 16 / 25 / 40 | 2 / 5 / 17 ls$^{-1}$ |
| Turns per stroke | |
| – DN 16 / 25 / 40 | 3.5 / 5 / 6.5 |
| Weight | |
| – DN 16 | 0.16 kg / 0.35 lbs |
| – DN 25 | 0.50 kg / 1.10 lbs |
| – DN 40 | 1.20 kg / 2.60 lbs |

[1] Maximum values: depending on operating conditions and sealing materials

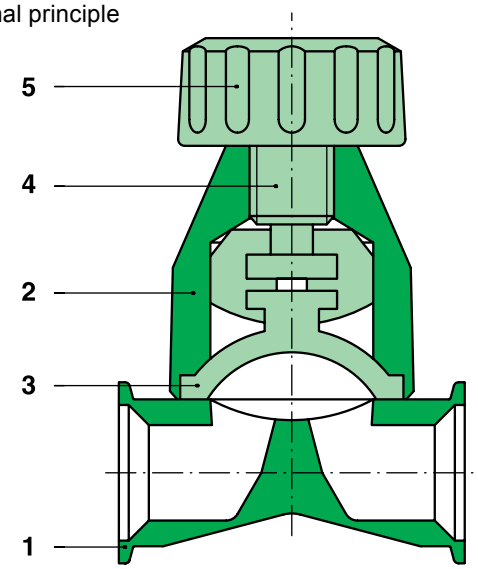
## Features

Body material: aluminum

Robust vacuum valve

Easy replacement of the diaphragm

Functional principle



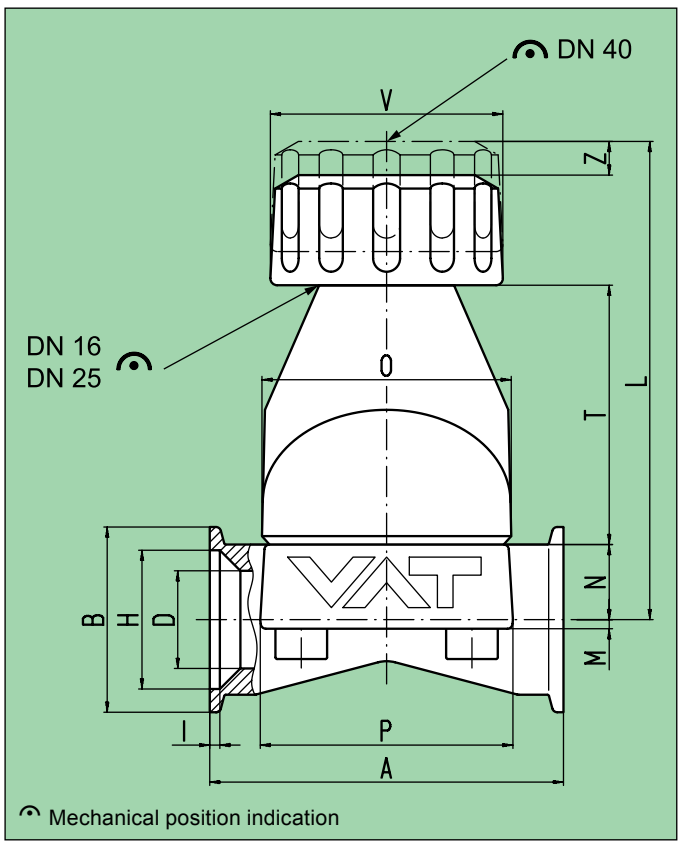

1 Valve body
2 Body cover
3 Diaphragm
4 Spindle
5 Handwheel

## Spare parts

– **Spare diaphragm**
See ordering information

E

## Dimensions




| DN | | 16<br>⅝ | 25<br>1 | 40<br>1 ½ |
|---|---|---|---|---|
| A | mm<br>inch | 52<br>2.05 | 80<br>3.15 | 105<br>4.13 |
| B | mm<br>inch | 30<br>1.18 | 40<br>1.57 | 55<br>2.17 |
| D | mm<br>inch | 15<br>0.59 | 19<br>0.75 | 29<br>1.14 |
| H | mm<br>inch | 17.20<br>0.68 | 26.20<br>1.03 | 41.20<br>1.62 |
| I | mm<br>inch | 3<br>0.12 | 3<br>0.12 | 3<br>0.12 |
| L | mm<br>inch | 66.50<br>2.62 | 111<br>4.37 | 132<br>5.20 |
| M | mm<br>inch | 10<br>0.39 | 2<br>0.08 | 2.70<br>0.11 |
| N | mm<br>inch | 10<br>0.39 | 14<br>0.55 | 22.30<br>0.88 |
| O | mm<br>inch | □ 32×32<br>□ 1.26×1.26 | □ 54×54<br>□ 2.13×2.13 | □ 74×79<br>□ 2.91×3.11 |
| P | mm<br>inch | □ 32×32<br>□ 1.26×1.26 | □ 54×54<br>□ 2.13×2.13 | □ 75×80<br>□ 2.95×3.15 |
| T | mm<br>inch | 27.50<br>1.08 | 56<br>2.20 | 77<br>3.03 |
| V | mm<br>inch | 30<br>1.18 | 47.50<br>1.87 | 69<br>2.72 |
| Z | mm<br>inch | 5.50<br>0.22 | 10<br>0.39 | – |

## Main applications

For pumping and venting of vacuum systems with large gas flows



## Ordering information

**Valve with manual actuator**
removable handwheel

| | DN | | Ordering numbers | | | |
|---|---|---|---|---|---|---|
| | | | Angle valve | | Inline valve | |
| | mm | inch | aluminum | stainless steel | aluminum | stainless steel |
| ISO-KF | 10 | ⅜ | – | 24420-KE01 | – | – |
| | 16 | ⅝ | 24424-KA01 | 24424-KE01 | 24524-KA01 | 24524-KE01 |
| | 25 | 1 | 24428-KA01 | 24428-KE01 | 24528-KA01 | 24528-KE01 |
| | 40 | 1½ | 24432-KA01 | 24432-KE01 | 24532-KA01 | 24532-KE01 |
| | 50 | 2 | 24434-KA01 | 24434-KE01 | 24534-KA01 | 24534-KE01 |
| ISO-K | 63 | 2½ | 24436-QA01 | 24436-QE01 | – | – |
| | 80 | 3 | 24438-QA01 | – | 24538-QA01 | – |

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

| | | | | | | |
|---|---|---|---|---|---|---|
| ISO-KF | 10 | ⅜ | – | 24420-KE11 | – | – |
| | 16 | ⅝ | 24424-KA11 | 24424-KE11 | 24524-KA11 | 24524-KE11 |
| | 25 | 1 | 24428-KA11 | 24428-KE11 | 24528-KA11 | 24528-KE11 |
| | 40 | 1½ | 24432-KA11 | 24432-KE11 | 24532-KA11 | 24532-KE11 |
| | 50 | 2 | 24434-KA11 | 24434-KE11 | 24534-KA11 | 24534-KE11 |
| ISO-K | 63 | 2½ | 24436-QA11 | 24436-QE11 | – | – |
| | 80 | 3 | 24438-QA11 | – | 24538-QA11 | – |
| | 100 | 4 | 24440-QA11 | – | – | – |
| | 160 | 6 | 24444-QA11 | – | – | – |

without solenoid valve, with position indicator: 24 . . . - . . **2**1
with solenoid valve, without position indicator: 24 . . . - . . **3**1 (specify control voltage)
with solenoid valve, with position indicator: 24 . . . - . . **4**1 (specify control voltage)

**Valve with pneumatic actuator**
single acting with opening spring (NO)
without solenoid valve
without position indicator

| | | | | | | |
|---|---|---|---|---|---|---|
| ISO-KF | 10 | ⅜ | – | 24420-KE12 | – | – |
| | 16 | ⅝ | 24424-KA12 | 24424-KE12 | 24524-KA12 | 24524-KE12 |
| | 25 | 1 | 24428-KA12 | 24428-KE12 | 24528-KA12 | 24528-KE12 |
| | 40 | 1½ | 24432-KA12 | 24432-KE12 | 24532-KA12 | 24532-KE12 |
| | 50 | 2 | 24434-KA12 | 24434-KE12 | 24534-KA12 | 24534-KE12 |

without solenoid valve, with position indicator: 24 . . . - . . **2**2
with solenoid valve, without position indicator: 24 . . . - . . **3**2 (specify control voltage)
with solenoid valve, with position indicator: 24 . . . - . . **4**2 (specify control voltage)

Further ordering information on next page

## Features

Body material:
aluminum or stainless steel

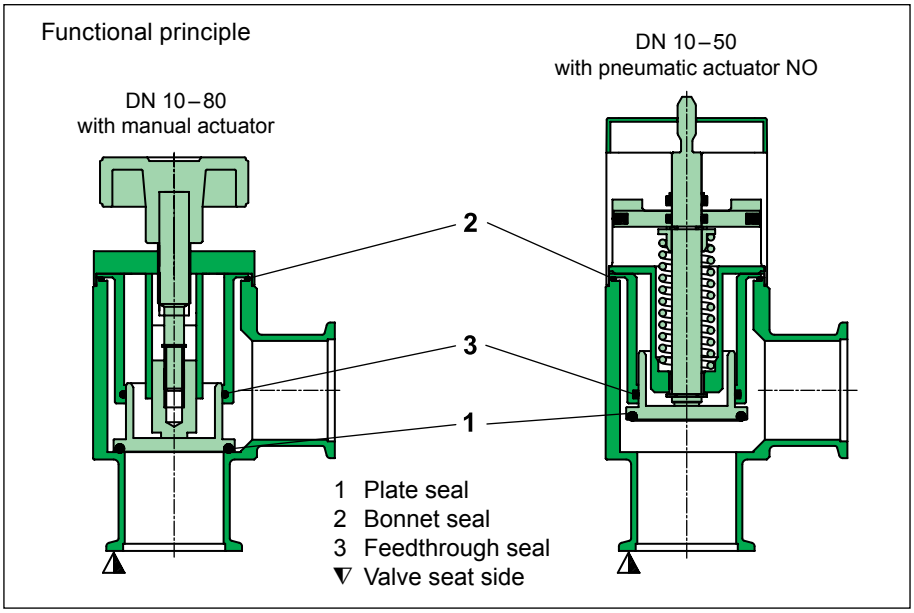
Angle and inline version

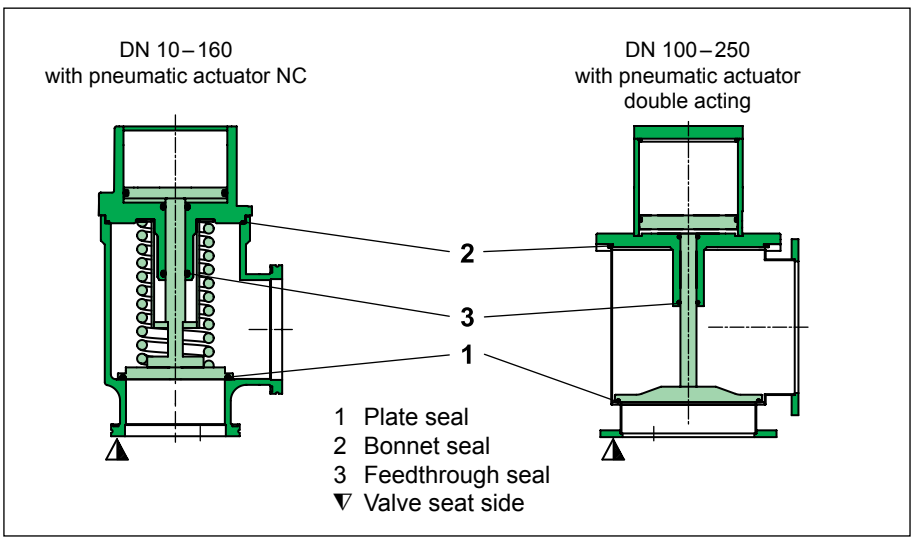
Shaft feedthrough

Resistant against differential pressure

Long lifetime

Functional principle




E

## Technical data

See series 26, pages 183 – 185

Continued Ordering information

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

| | DN | | Ordering numbers | |
|---|---|---|---|---|
| | | | Angle valve | |
| | mm | inch | aluminum | stainless steel |
| ISO-K | 100 | 4 | 24440-QA14 | 24440-QE14 |
| | 160 | 6 | 24444-QA14 | 24444-QE14 |
| | 200 | 8 | – | 24446-QE14 |
| | 250 | 10 | – | 24448-QE14 |

without solenoid valve, with position indicator: 244 . . -Q . **24**
with solenoid valve, without position indicator: 244 . . -Q . **34** (specify control voltage)
with solenoid valve, with position indicator: 244 . . -Q . **44** (specify control voltage)

**Valve with electromagnetic actuator** See pages 190 – 191

## Main applications

For pumping and venting of HV systems

(For large gas flows we recommend series 24)



## Ordering information

**Valve with manual actuator**
removable handwheel

| | DN | | Ordering numbers | | | |
|---|---|---|---|---|---|---|
| | | | Angle valve | | Inline valve | |
| | mm | inch | aluminum | stainless steel | aluminum | stainless steel |
| ISO-KF | 10 | ⅜ | – | 26420-KE01 | – | – |
| | 16 | ⅝ | 26424-KA01 | 26424-KE01 | 26524-KA01 | 26524-KE01 |
| | 25 | 1 | 26428-KA01 | 26428-KE01 | 26528-KA01 | 26528-KE01 |
| | 40 | 1½ | 26432-KA01 | 26432-KE01 | 26532-KA01 | 26532-KE01 |
| | 50 | 2 | 26434-KA01 | 26434-KE01 | 26534-KA01 | 26534-KE01 |
| ISO-K | 63 | 2½ | 26436-QA01 | 26436-QE01 | – | – |
| | 80 | 3 | 26438-QA01 | – | 26538-QA01 | – |
| | 100 | 4 | 26440-QA01 | 26440-QE01 | – | – |
| | 160 | 6 | 26444-QA01 | 26444-QE01 | – | – |

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

| | | | | | | |
|---|---|---|---|---|---|---|
| ISO-KF | 10 | ⅜ | – | 26420-KE11 | – | – |
| | 16 | ⅝ | 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 | – | 26538-QA11 | – |
| | 100 | 4 | 26440-QA11 | 26440-QE11 | – | – |
| | 160 | 6 | 26444-QA11 | 26444-QE11 | – | – |

without solenoid valve, with position indicator: 26 . . . - . . **21**
with solenoid valve, without position indicator: 26 . . . - . . **31** (specify control voltage)
with solenoid valve, with position indicator: 26 . . . - . . **41** (specify control voltage)

**Valve with pneumatic actuator**
single acting with opening spring (NO)
without solenoid valve
without position indicator

| | | | | | | |
|---|---|---|---|---|---|---|
| ISO-KF | 10 | ⅜ | – | 26420-KE12 | – | – |
| | 16 | ⅝ | 26424-KA12 | 26424-KE12 | 26524-KA12 | 26524-KE12 |
| | 25 | 1 | 26428-KA12 | 26428-KE12 | 26528-KA12 | 26528-KE12 |
| | 40 | 1½ | 26432-KA12 | 26432-KE12 | 26532-KA12 | 26532-KE12 |
| | 50 | 2 | 26434-KA12 | 26434-KE12 | 26534-KA12 | 26534-KE12 |

without solenoid valve, with position indicator: 26 . . . - . . **22**
with solenoid valve, without position indicator: 26 . . . - . . **32** (specify control voltage)
with solenoid valve, with position indicator: 26 . . . - . . **42** (specify control voltage)

Further ordering information on next page

## Features

Body material:
aluminum or stainless steel

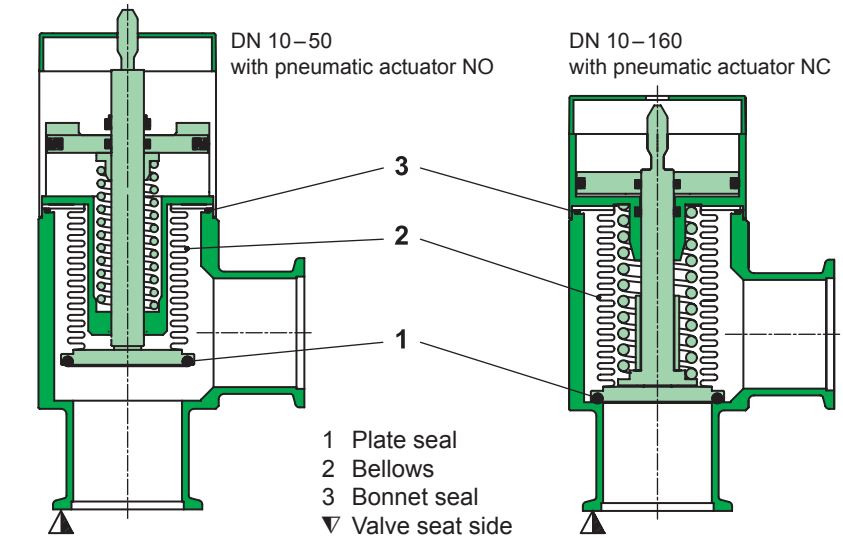
Angle and inline version

Bellows

Resistant against differential pressure

Long lifetime

Functional principle




## Technical data

| | |
|---|---|
| Leak rate: valve body, valve seat | $< 1 \cdot 10^{-9}$ mbar l/s$^{-1}$ |
| Pressure range, series 24 (shaft feedthrough) | |
| – DN 10– 50 | $1 \cdot 10^{-7}$ mbar to 5 bar (abs) |
| – DN 63– 80 | $1 \cdot 10^{-7}$ mbar to 4 bar (abs) |
| – DN 100–160 | $1 \cdot 10^{-7}$ mbar to 2 bar (abs) |
| – DN 200–250 | $1 \cdot 10^{-7}$ mbar to 1.6 bar (abs) |
| Pressure range, series 26 (bellows) | |
| – DN 10– 50 | $1 \cdot 10^{-8}$ mbar to 5 bar (abs) |
| – DN 63– 80 | $1 \cdot 10^{-8}$ mbar to 4 bar (abs) |
| – DN 100–160 | $1 \cdot 10^{-8}$ mbar to 2 bar (abs) |
| Differential pressure on the plate | |
| – In opening direction DN 10– 50 | ≤2.0 bar |
| DN 63–250 | ≤1.2 bar |
| – In closing direction DN 10– 50 | ≤5.0 bar |
| DN 63– 80 | ≤4.0 bar |
| DN 100–160 | ≤2.0 bar |
| DN 200–250 | ≤1.6 bar |
| Differential pressure at opening | ≤1 bar |

Further technical data on next page

Continued Ordering information

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

| | DN | | Ordering numbers | |
|---|---|---|---|---|
| | | | Angle valve | |
| | mm | inch | aluminum | stainless steel |
| ISO-K | 100 | 4 | 26440-QA14 | 26440-QE14 |
| | 160 | 6 | 26444-QA14 | 26444-QE14 |

without solenoid valve, with position indicator: 264 . . -Q . **24**
with solenoid valve, without position indicator: 264 . . -Q . **34** (specify control voltage)
with solenoid valve, with position indicator: 264 . . -Q . **44** (specify control voltage)

**Valve with electromagnetic actuator** See pages 190–191

Continued Technical data

| Cycles until first service | with manual actuator | with closing/ opening spring | double acting |
|---|---|---|---|
| – DN 10 – 80 | 10 000 | 3 million | – |
| – DN 100 – 160, series 24 | 10 000 | 1 million | 2 million |
| – DN 100 – 160, series 26 | 10 000 | 1 million [3] | 1 million [3] |
| – DN 200 – 250 | – | – | 1 million [1] [3] |

| | | |
|---|---|---|
| Temperature [2] | | |
| – Valve body | | ≤ 150 °C |
| – Manual and pneumatic actuator | | ≤ 120 °C |
| – Solenoid valve, position indicator | | |
| - DN 10 – 80 | | ≤ 80 °C |
| - DN 100 – 160 | | ≤ 50 °C |
| Material | | |
| – Valve body | | |
| - aluminum | DN 16 – 63 | EN AW-6060 (3.3206), -6061 (3.3211), -6063 (3.3206), -6082 (3.2315) |
| | DN 80 – 160 | EN AC-42000 |
| - stainless steel | DN 16 – 160 | AISI 304 (1.4301), AISI 316L (1.4404) |
| | DN 200 – 250 | AISI 321 (1.4541), AISI 304 (1.4301) |
| – Plate | DN 16 – 160 | AISI 316L (1.4404, 1.4435) |
| | DN 200 – 250 | AISI 304 (1.4301) |
| – Bellows | | AISI 316L (1.4404, 1.4435), AISI 316 Ti (1.4571) |
| Seal: bonnet, plate | | FKM (Viton®) |
| Feedthrough | | |
| – Series 24 | | shaft feedthrough |
| – Series 26 | | bellows |
| Mounting position | | any |
| Solenoid valve | | |
| – DN 10 – 80 | | 24 V DC, 2.5 W (others on request) |
| – DN 100 – 160 | | 24 V DC, 1.0 W (others on request) |

| Position indicator: contact rating | DN 10 – 160: | DN 200 – 250: |
|---|---|---|
| – Voltage | 5 – 50 V AC/DC | ≤ 50 V AC/DC |
| – Current | 5 – 100 mA | ≤ 1.2 A |
| Valve position indication | visual (mechanical) | |

[1] Reduced lifetime with venting applications

[2] Maximum values: depending on operating conditions and sealing materials

[3] Tested at room temperature under clean and static conditions

**Angle valves**

| DN (nominal I. D.) | | Conductance (molecular flow) | Valve with manual actuator | | | | | Valve with pneumatic actuator, single acting with closing spring (NC) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Turns per stroke | Weight | | | | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing time | Weight | | |
| | | | | Aluminum body | | Stainless steel body | | | | | | | Aluminum body | | Stainless steel body | |
| mm | inch | $l s^{-1}$ | n | kg | lbs | kg | lbs | bar | psi | l | $ft^3$ | s | kg | lbs | kg | lbs |
| 10 | ⅜ | 3 | 3.6 | – | – | 0.26 | 0.57 | 4 – 8 | 58 – 116 | 0.004 | 0.0001 | 0.10 | – | – | 0.34 | 0.75 |
| 16 | ⅝ | 5 | 3.6 | 0.20 | 0.44 | 0.26 | 0.57 | 4 – 8 | 58 – 116 | 0.004 | 0.0001 | 0.10 | 0.28 | 0.62 | 0.34 | 0.75 |
| 25 | 1 | 14 | 3.8 | 0.27 | 0.60 | 0.34 | 0.75 | 4 – 8 | 58 – 116 | 0.011 | 0.0004 | 0.20 | 0.41 | 0.90 | 0.51 | 1.12 |
| 40 | 1 ½ | 45 | 4.5 | 0.60 | 1.32 | 0.75 | 1.65 | 4 – 8 | 58 – 116 | 0.035 | 0.0012 | 0.55 | 0.97 | 2.14 | 1.13 | 2.49 |
| 50 | 2 | 80 | 4.8 | 0.94 | 2.07 | 1.10 | 2.43 | 4 – 8 | 58 – 116 | 0.047 | 0.0017 | 0.65 | 1.45 | 3.20 | 1.61 | 3.55 |
| 63 | 2 ½ | 160 | 6.6 | 2.90 | 6.39 | 1.70 | 3.75 | 4 – 8 | 58 – 116 | 0.112 | 0.0040 | 0.70 | 2.90 | 6.39 | 1.70 | 3.75 |
| 80 | 3 | 200 | 6.6 | 3.10 | 6.83 | 3.39 | 7.47 | 4 – 8 | 58 – 116 | 0.112 | 0.0040 | 0.70 | 3.10 | 6.83 | – | – |
| 100 | 4 | 440 | 11 | 5.79 | 12.76 | 4.85 | 10.69 | 4.5 – 7 | 65 – 102 | 0.330 | 0.0117 | 1 | 10 | 22 | 10 | 22 |
| 160 | 6 | 1000 | 11 | 8.83 | 19.47 | 7.35 | 16.20 | 4.5 – 7 | 65 – 102 | 0.650 | 0.0230 | 2 | 14 | 31 | 14 | 31 |

## Angle valves

| DN (nominal I. D.) | | Conductance (molecular flow) | | Valve with pneumatic actuator, single acting with opening spring (NO) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing time | Weight | |
| mm | inch | ls$^{-1}$ | | bar | psi | l | ft$^3$ | s | kg | lbs |
| 10 | ⅜ | 3 | | 4 – 8 | 58 – 116 | 0.004 | 0.0001 | 0.10 | 0.40 | 0.88 |
| 16 | ⅝ | 5 | | 4 – 8 | 58 – 116 | 0.004 | 0.0001 | 0.10 | 0.40 | 0.88 |
| 25 | 1 | 14 | | 4 – 8 | 58 – 116 | 0.011 | 0.0004 | 0.15 | 0.60 | 1.32 |
| 40 | 1½ | 45 | | 4 – 8 | 58 – 116 | 0.035 | 0.0012 | 0.20 | 1.36 | 3 |
| 50 | 2 | 80 | | 4 – 8 | 58 – 116 | 0.047 | 0.0017 | 0.25 | 2.10 | 4.63 |
| | | | | Valve with pneumatic actuator, double acting | | | | | | |
| 100 | 4 | 440 | | 4.5 – 7 | 65 – 102 | 0.330 | 0.0117 | 1 | 7.38 | 16.27 |
| 160 | 6 | 1000 | | 4.5 – 7 | 65 – 102 | 0.380 | 0.0134 | 2 | 12.54 | 27.65 |
| 200 | 8 | 2000 | | 5 – 7 | 73 – 102 | 3.100 | 0.1095 | 2 | 21 | 46.30 |
| 250 | 10 | 3100 | | 5 – 7 | 73 – 102 | 3.100 | 0.1095 | 2 | 24 | 52.91 |

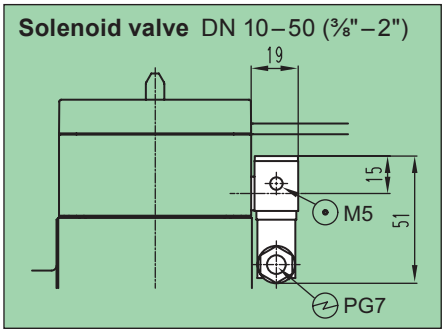
## Inline valves

| DN (nominal I. D.) | | Conductance (molecular flow) | Valve with manual actuator | | | | | Valve with pneumatic actuator, single acting with closing spring (NC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Turns per stroke | Weight | | | | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing time | Weight | | | |
| | | | | Aluminum body | | Stainless steel body | | | | | | | Aluminum body | | Stainless steel body | |
| mm | inch | ls$^{-1}$ | n | kg | lbs | kg | lbs | bar | psi | l | ft$^3$ | s | kg | lbs | kg | lbs |
| 16 | ⅝ | 5 | 3.6 | 0.28 | 0.62 | 0.26 | 0.57 | 4 – 8 | 58 – 116 | 0.004 | 0.0001 | 0.10 | 0.50 | 1.10 | 0.50 | 1.10 |
| 25 | 1 | 14 | 3.8 | 0.42 | 0.93 | 1.04 | 2.29 | 4 – 8 | 58 – 116 | 0.011 | 0.0004 | 0.20 | 0.60 | 1.32 | 0.60 | 1.32 |
| 40 | 1½ | 45 | 4.5 | 1 | 2.20 | 2.45 | 5.40 | 4 – 8 | 58 – 116 | 0.035 | 0.0012 | 0.55 | 1.40 | 3.09 | 1.20 | 2.65 |
| 50 | 2 | 80 | 4.8 | 1.61 | 3.55 | 4.71 | 10.38 | 4 – 8 | 58 – 116 | 0.047 | 0.0017 | 0.65 | 2.60 | 5.73 | 2.60 | 5.73 |
| 80 | 3 | 200 | 6.6 | 3 | 6.61 | – | – | 4 – 8 | 58 – 116 | 0.112 | 0.0040 | 0.70 | 3.75 | 8.27 | – | – |
| | | | | | | | | Valve with pneumatic actuator, single acting with opening spring (NO) | | | | | | | | |
| 16 | ⅝ | 5 | | | | | | 4 – 8 | 58 – 116 | 0.004 | 0.0001 | 0.10 | 0.45 | 0.99 | 0.47 | 1.04 |
| 25 | 1 | 14 | | | | | | 4 – 8 | 58 – 116 | 0.011 | 0.0004 | 0.15 | 0.70 | 1.54 | 0.60 | 1.32 |
| 40 | 1½ | 45 | | | | | | 4 – 8 | 58 – 116 | 0.035 | 0.0012 | 0.20 | 1.54 | 3.40 | 1.40 | 3.09 |
| 50 | 2 | 80 | | | | | | 4 – 8 | 58 – 116 | 0.047 | 0.0017 | 0.25 | 2.90 | 6.39 | 2.79 | 6.15 |

E

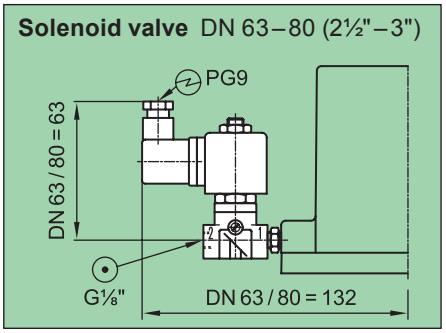
## Solenoid valve

**Solenoid valve** DN 10–50 (⅜"–2")



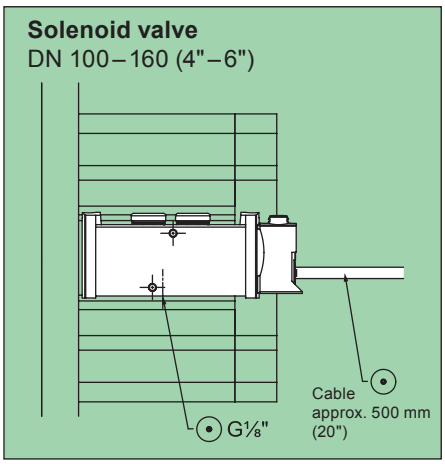

Ordering numbers: 24/26 . . . - . . **31**/**41**
24/26 . . . - . . **32**/**42**

**Solenoid valve** DN 63–80 (2½"–3")



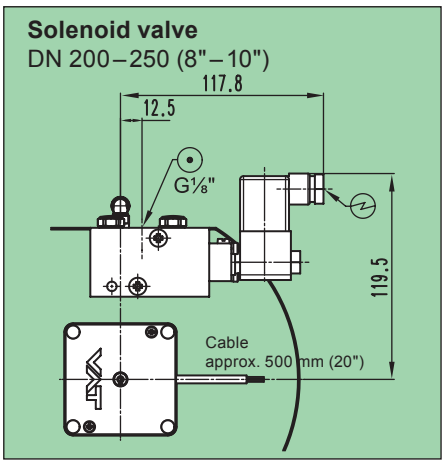

Ordering numbers: 24/26 . . . - . . **31**/**41**

**Solenoid valve**
DN 100–160 (4"–6")




Ordering numbers: 24/26 . . . - . . **31**/**41**
24/26 . . . - . . **34**/**44**

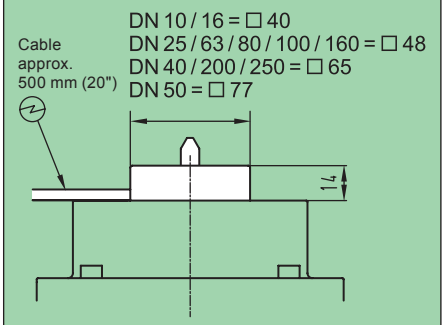
**Solenoid valve**
DN 200–250 (8"–10")




Ordering numbers: 24/26 . . . - . . **34**/**44**

## Position indicator

**Position indicator**
DN 10–250 (⅜"–10")




One closing contact each for the open and closed valve positions

Ordering numbers: 24/26 . . . - . . **21**/**41**
24/26 . . . - . . **22**/**42**
24/26 . . . - . . **24**/**44**

⊙ Compressed air connection
⊖ Electrical connection

## Options

**Actuator**

– Other solenoid valve voltage (standard: 24 V DC)
– Solenoid valve with manual emergency operation
– Position indicator bakeable to 120 °C or 200 °C
– Common connector for solenoid valve and position indicator (up to 48 V only)
– Customer specified actuators

**Valve**

– CF flanges
– Other sealing materials
– Customer specified bodies

**Ordering information for options:**
Ordering No. of valve-X (e. g. 26432-KA41-X, X = pos. indicator bakeable to 200 °C)

## Spare parts

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

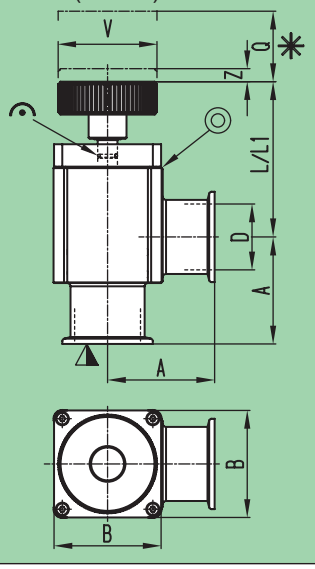
## Accessories

– **Heater**
on request (specify fabrication number of valve)

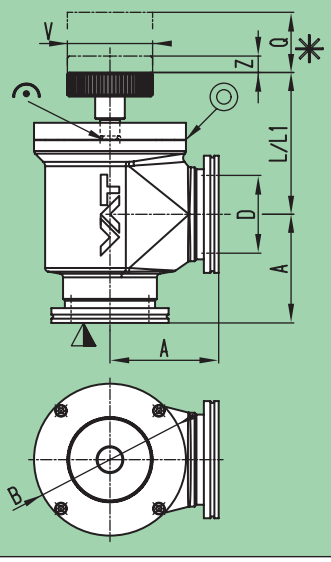
– **Flange connections**
for installation of the valve: see series 31 and 32

# Dimensions

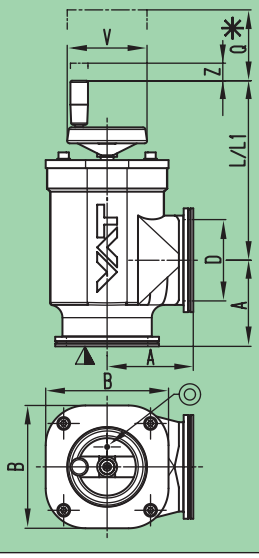
**Angle valve with manual actuator**
DN 10–50 (⅜"–2") ISO-KF




**Angle valve with manual actuator**
DN 63–80 (2½"–3") ISO-K




**Angle valve with manual actuator**
DN 100–160 (4"–6") ISO-K




| DN | | 10 | 16 | 25 | 40 | 50 | 63 | 80 | 100 | 160 |
|---|---|---|---|---|---|---|---|---|---|---|
| | inch | ⅜ | ⅝ | 1 | 1½ | 2 | 2½ | 3 | 4 | 6 |
| A | mm | 30 | 40 | 50 | 65 | 70 | 88 | 90 | 108 | 138 |
| | inch | 1.18 | 1.57 | 1.97 | 2.56 | 2.76 | 3.46 | 3.54 | 4.25 | 5.43 |
| B | mm | 40 | 40 | 48 | 65 | 77 | 123 | 123 | 154 | 215 |
| | inch | 1.57 | 1.57 | 1.89 | 2.56 | 3.03 | 4.84 | 4.84 | 6.06 | 8.46 |
| D | mm | 12 | 16 | 25 | 40 | 50 | 63 | 80 | 100 | 153 |
| | inch | 0.47 | 0.63 | 0.98 | 1.57 | 1.97 | 2.48 | 3.15 | 3.94 | 6.02 |
| L | mm | – | 64.90 | 60.90 | 94.30 | 101.10 | 112 | 111.70 | 225.10 | 240.50 |
| | inch | | 2.56 | 2.40 | 3.71 | 3.98 | 4.41 | 4.40 | 8.86 | 9.47 |
| L1 | mm | 67.40 | 67.40 | 64.30 | 97.30 | 104.10 | 111.70 | – | 215.60 | 244.70 |
| | inch | 2.65 | 2.65 | 2.53 | 3.83 | 4.10 | 4.40 | – | 8.49 | 9.63 |
| Q | mm | 46 | 46 | 44 | 73.50 | 85.50 | 105 | 105 | 170 | 195 |
| | inch | 1.81 | 1.81 | 1.73 | 2.89 | 3.37 | 4.13 | 4.13 | 6.69 | 7.68 |
| V | mm | 40 | 40 | 40 | 60 | 60 | 60 | 60 | 100 | 160 |
| | inch | 1.57 | 1.57 | 1.57 | 2.36 | 2.36 | 2.36 | 2.36 | 3.94 | 6.30 |
| Z [1] | mm | 3.60 | 3.60 | 4.70 | 7.90 | 9.30 | 13.30 | 13.30 | 22 | 27.20 |
| | inch | 0.14 | 0.14 | 0.19 | 0.31 | 0.37 | 0.52 | 0.52 | 0.87 | 1.07 |

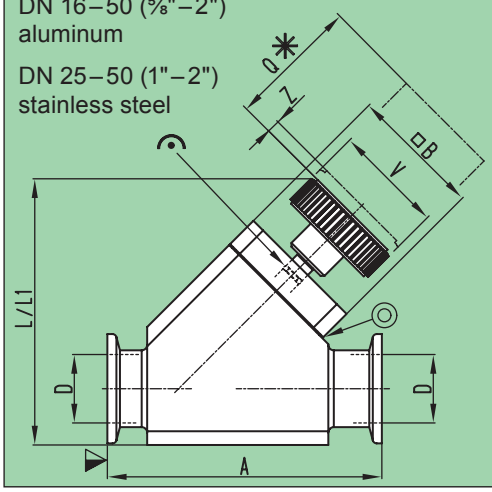
[1] Gate stroke is longer due to transmission

▽ Valve seat side
✳ Required for dismantling
Mechanical position indication
◎ Leak detection hole

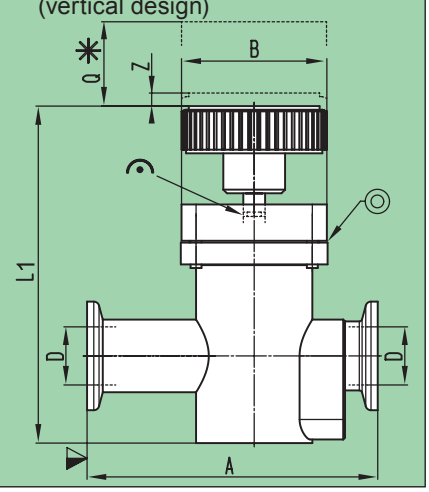
L = aluminum
L1 = stainless steel

**Inline valve with manual actuator** ISO-KF
DN 16–50 (⅝"–2")
aluminum

DN 25–50 (1"–2")
stainless steel




DN 16 (⅝") stainless steel
(vertical design)



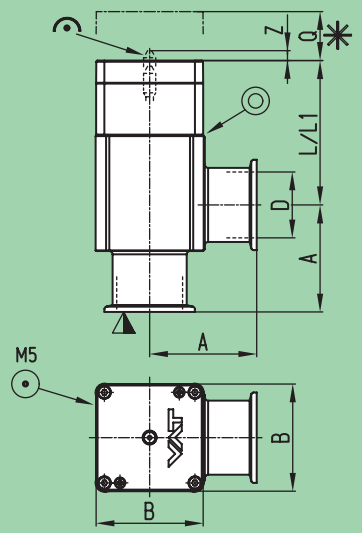

DN 80 on request

| DN | | 16 | 25 | 40 | 50 |
|---|---|---|---|---|---|
| | inch | ⅝ | 1 | 1½ | 2 |
| A | mm | 80 | 100 | 130 | 178 |
| | inch | 3.15 | 3.94 | 5.12 | 7.01 |
| B | mm | 40 | 48 | 65 | 77 |
| | inch | 1.57 | 1.89 | 2.56 | 3.03 |
| D | mm | 16 | 25 | 40 | 50 |
| | inch | 0.63 | 0.98 | 1.57 | 1.97 |
| L | mm | 90.60 | 97 | 143.50 | 167.20 |
| | inch | 3.57 | 3.82 | 5.65 | 6.58 |
| L1 | mm | 92.80 | 105.80 | 152.50 | 175.10 |
| | inch | 3.65 | 4.17 | 6 | 6.89 |
| Q | mm | 46 | 44 | 73.50 | 85.50 |
| | inch | 1.81 | 1.73 | 2.89 | 3.37 |
| V | mm | 40 | 40 | 60 | 60 |
| | inch | 1.57 | 1.57 | 2.36 | 2.36 |
| Z | mm | 3.60 | 4.70 | 7.90 | 9.30 |
| | inch | 0.14 | 0.19 | 0.31 | 0.37 |

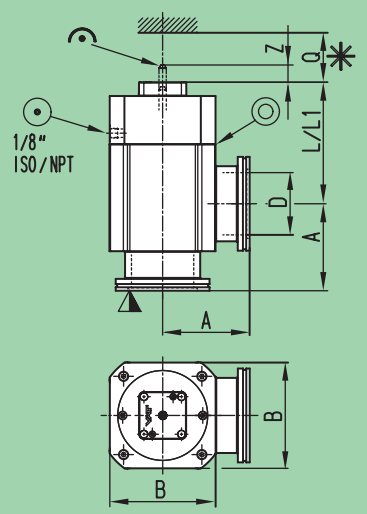
E

## Dimensions

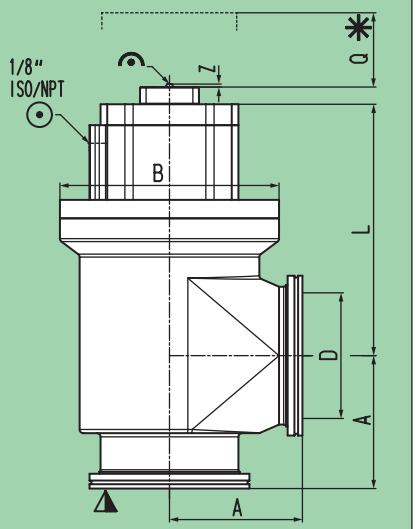
**Angle valve with pneumatic actuator, single acting with closing or opening spring**
DN 10–50 (⅜"–2") ISO-KF




**Angle valve with pneumatic actuator, single acting with closing spring**
DN 63 (2½") ISO-KF




**Angle valve with pneumatic actuator, single acting with closing spring**
DN 80–160 (3"–6") ISO-K



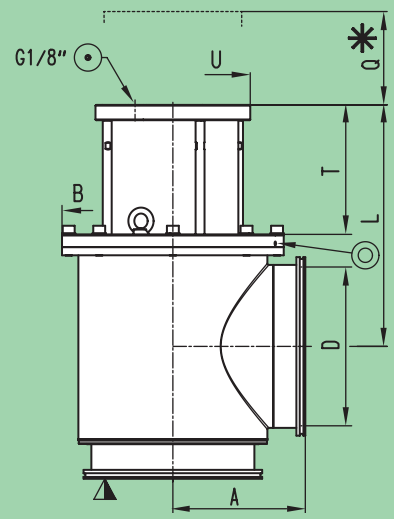

▽ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
◠ Mechanical position indication
◎ Leak detection hole

L = aluminum
L1 = stainless steel

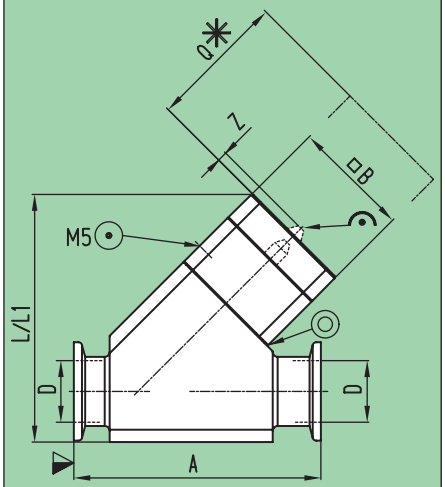
| DN | mm / inch | | 10 ⅜ | 16 ⅝ | 25 1 | 40 1½ | 50 2 | 63 2½ | 80 3 | 100 4 | 160 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | mm | | 30 | 40 | 50 | 65 | 70 | 88 | 90 | 108 | 138 |
| | inch | | 1.18 | 1.57 | 1.97 | 2.56 | 2.76 | 3.46 | 3.54 | 4.25 | 5.43 |
| B | mm | | 40 | 40 | 48 | 65 | 77 | 107.60 | 123 | 178 | 220 |
| | inch | | 1.57 | 1.57 | 1.89 | 2.56 | 3.03 | 4.24 | 4.84 | 7.01 | 8.66 |
| D | mm | | 12 | 16 | 25 | 40 | 50 | 63 | 80 | 102 | 153 |
| | inch | | 0.47 | 0.63 | 0.98 | 1.57 | 1.97 | 2.48 | 3.15 | 4.02 | 6.02 |
| L | mm | with closing spring | – | 65.20 | 60.60 | 87.70 | 96 | 123 | 109 | 218.30 | 221.50 |
| | inch | | | 2.57 | 2.39 | 3.45 | 3.78 | 4.84 | 4.29 | 8.59 | 8.72 |
| L1 | mm | | 67.70 | 67.70 | 64 | 90.70 | 99 | 118.40 | – | 211.70 | 228 |
| | inch | | 2.67 | 2.67 | 2.52 | 3.57 | 3.90 | 4.66 | – | 8.33 | 8.98 |
| L | mm | with opening spring | – | 78.90 | 79.10 | 110.20 | 96 | – | – | – | – |
| | inch | | | 3.11 | 3.11 | 4.34 | 3.78 | | | | |
| L1 | mm | | 67.70 | 81.30 | 82.50 | 113.20 | 124 | – | – | – | – |
| | inch | | 2.67 | 3.20 | 3.25 | 4.46 | 4.88 | | | | |
| Q | mm | | 46 | 46 | 44 | 73.50 | 85.50 | 105 | 115.60 | 170 | 200 |
| | inch | | 1.81 | 1.81 | 1.73 | 2.89 | 3.37 | 4.13 | 4.55 | 6.69 | 7.87 |
| Z | mm | | 2 | 2 | 4 | 9.50 | 10.50 | 31.40 | 31.40 | 2.40 | 2.40 |
| | inch | | 0.08 | 0.08 | 0.16 | 0.37 | 0.41 | 1.24 | 1.24 | 0.09 | 0.09 |

## Dimensions

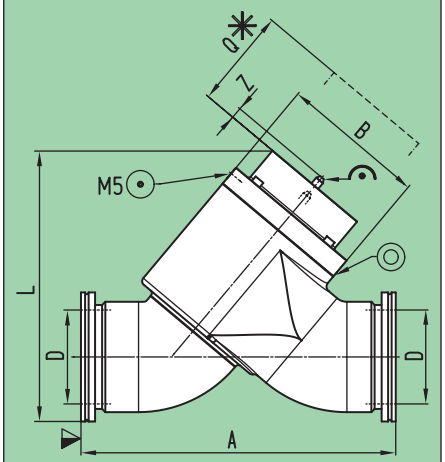
**Angle valve with pneumatic actuator, double acting**
DN 100–250 (4"–10") ISO-K




**Inline valve with pneumatic actuator, single acting with closing or opening spring**
DN 16–50 (⅝"–2") ISO-KF




**Inline valve with pneumatic actuator, single acting with closing spring**
DN 80 (3“) ISO-K




▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
◠ Mechanical position indication
◎ Leak detection hole

E

L = aluminum
L1 = stainless steel

| DN | mm / inch | 100 / 4 | 160 / 6 | 200 / 8 | 250 / 10 |
|---|---|---|---|---|---|
| A | mm | 108 | 138 | 178 | 208 |
| | inch | 4.25 | 5.43 | 7.01 | 8.19 |
| B | mm | 178 | 220 | 298 | 339 |
| | inch | 7.01 | 8.66 | 11.73 | 13.35 |
| D | mm | 102 | 153 | 213 | 261 |
| | inch | 4.02 | 6.02 | 8.39 | 10.28 |
| L | mm | 204.10 | 204.50 | 324.70 | 379.10 |
| | inch | 8.04 | 8.05 | 12.78 | 14.93 |
| Q | mm | 170 | 200 | 258 | 305 |
| | inch | 6.69 | 7.87 | 10.16 | 12.01 |
| T | mm | 77.50 | 84.50 | 174.10 | 204 |
| | inch | 3.03 | 3.30 | 6.80 | 7.97 |
| U | mm | 136 | 136 | 208 | 208 |
| | inch | 5.35 | 5.35 | 8.19 | 8.19 |

| DN | mm / inch | | 16 / ⅝ | 25 / 1 | 40 / 1½ | 50 / 2 | 80 / 3 |
|---|---|---|---|---|---|---|---|
| A | mm | | 80 | 100 | 130 | 178 | 268 |
| | inch | | 3.15 | 3.94 | 5.12 | 7.01 | 10.55 |
| B | mm | | 40 | 48 | 65 | 77 | 123 |
| | inch | | 1.57 | 1.89 | 2.56 | 3.03 | 4.84 |
| D | mm | | 16 | 25 | 40 | 50 | 80 |
| | inch | | 0.63 | 0.98 | 1.57 | 1.97 | 3.15 |
| L | mm | with closing spring | 91.50 | 100.30 | 140.90 | 170.10 | 230.50 |
| | inch | | 3.60 | 3.95 | 5.55 | 6.70 | 9.07 |
| L1 | mm | | 93 | 108.90 | 149.90 | 171.80 | – |
| | inch | | 3.66 | 4.29 | 5.90 | 6.76 | |
| L | mm | with opening spring | 102.10 | 118 | 157.20 | 187.80 | – |
| | inch | | 4.02 | 4.65 | 6.19 | 7.39 | |
| L1 | mm | | 106.70 | 123.20 | 166 | 189.70 | – |
| | inch | | 4.20 | 4.85 | 6.54 | 7.47 | |
| Q | mm | | 46 | 44 | 73.50 | 85.50 | 150 |
| | inch | | 1.81 | 1.73 | 2.89 | 3.37 | 5.91 |
| Z | mm | | 2 | 4 | 9.50 | 10.50 | 31.40 |
| | inch | | 0.08 | 0.16 | 0.37 | 0.41 | 1.24 |

## Main applications

For pumping and venting of HV systems where no compressed air is available



## Ordering information

**Valve with electromagnetic actuator**
single acting with closing spring (NC)
with control electronics
with position indicator

| | DN | | Ordering numbers | | | |
|---|---|---|---|---|---|---|
| | | | Angle valve | | Inline valve | |
| | mm | inch | aluminum | stainless steel | aluminum | stainless steel |
| ISO-KF | 10 | ⅜ | – | 26420-KE61 | – | – |
| | 16 | ⅝ | 26424-KA61 | 26424-KE61 | 26524-KA61 | 26524-KE61 |
| | 25 | 1 | 26428-KA61 | 26428-KE61 | 26528-KA61 | 26528-KE61 |
| | 40 | 1½ | 26432-KA61 | 26432-KE61 | 26532-KA61 | 26532-KE61 |

## Technical data

| | |
|---|---|
| Leak rate: valve body, valve seat | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| Pressure range | $10^{-8}$ mbar to 2 bar (abs) |
| Differential pressure on the plate | 2 bar |
| Cycles until first service | 200 000 |
| Temperature [1)] | |
| – Valve body, control electronics | ≤ 50 °C |
| Material | |
| – Valve body | |
| - aluminum | EN AW-6060 (3.3206), -6061 (3.3211), -6063 (3.3206), -6082 (3.2315) |
| - stainless steel | AISI 304 (1.4301, 1.4305) |
| Seal: bonnet, plate | FKM (Viton®) |
| Feedthrough | bellows |
| Mounting position | any |
| Mains voltage | 100 – 115 V AC / 200 – 240 V AC, 50 – 60 Hz |
| Starting power / holding power | 700 W / 10 W |
| Closing or opening time | 0.2 s |
| Operating frequency | max. 15 min$^{-1}$ at 20 °C |
| Conductance (molecular flow): DN 10/16/25/40 | 3 ls$^{-1}$ / 5 ls$^{-1}$ / 14 ls$^{-1}$ / 45 ls$^{-1}$ |
| Weight: angle valve, stainless steel DN 10/16/25/40 | 1.3/1.3/1.5/2.0 kg (2.9/2.9/3.3/4.4 lbs) |

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

## Features

Body material:
aluminum or stainless steel

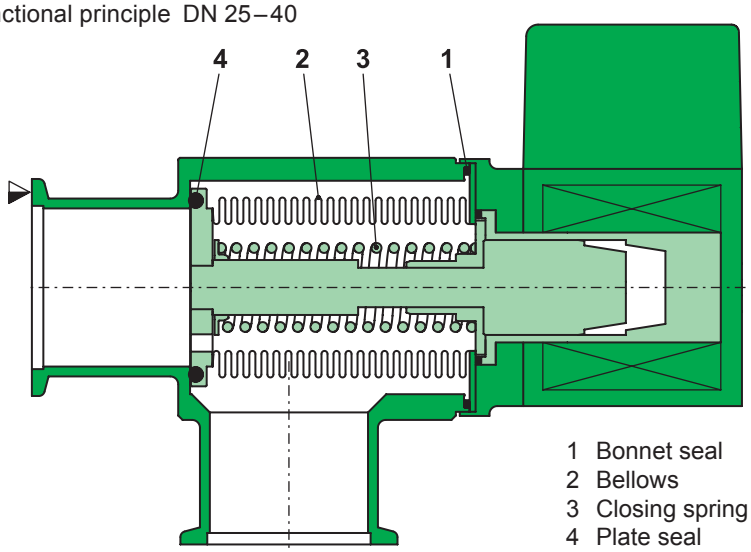
Angle and inline version

Best conductance in its class

Resistant against differential pressure

Long lifetime

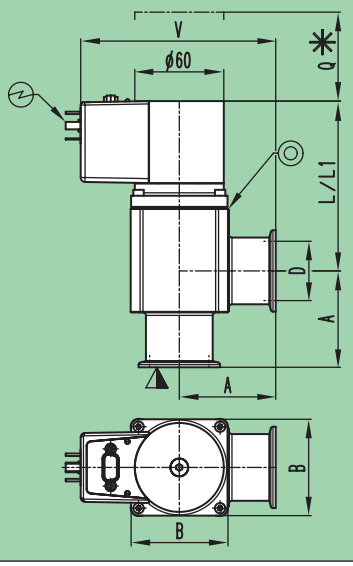
Functional principle DN 25–40



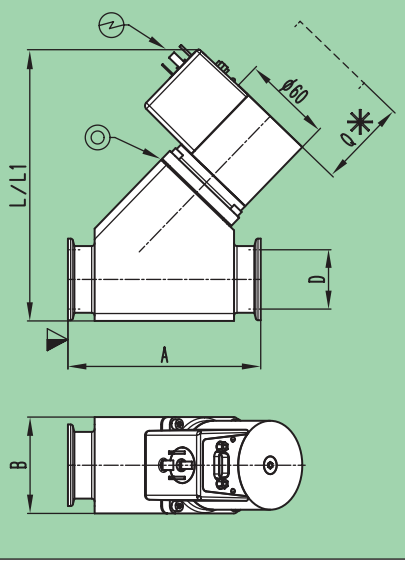

1 Bonnet seal
2 Bellows
3 Closing spring
4 Plate seal
▼ Valve seat side

## Dimensions

**Angle valve**
DN 10–40 (⅜"–1½") ISO-K




**Inline valve**
DN 16–40 (⅝"–1½") ISO-KF




▼ Valve seat side
✳ Required for dismantling
⏦ Control electronics connection
◎ Leak detection hole

| DN | mm / inch | 10 ⅜ | 16 ⅝ | 25 1 | 40 1½ |
|---|---|---|---|---|---|
| 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 | 102.50 | 102.50 | 103.40 | 117 |
| | inch | 4.04 | 4.04 | 4.07 | 4.61 |
| Q | mm | 46 | 46 | 44 | 73.50 |
| | inch | 1.81 | 1.81 | 1.73 | 2.89 |
| V | mm | 96.50 | 106.50 | 116.50 | 131.50 |
| | inch | 3.80 | 4.20 | 4.59 | 5.18 |

| DN | mm / inch | 16 ⅝ | 25 1 | 40 1½ |
|---|---|---|---|---|
| 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 | 7.20 |
| L1 | mm | 149.5 | 161 | 192 |
| | inch | 5.89 | 6.34 | 7.56 |
| Q | mm | 46 | 44 | 73.50 |
| | inch | 1.81 | 1.73 | 2.89 |
| | | | | |

L = aluminum
L1 = stainless steel

E

## Main applications

For pumping and venting of UHV systems when an extremely low out-gassing rate is important

Suitable for most corrosive gases



## Ordering information

**Valve with manual actuator**
removable handwheel

| DN | | Ordering numbers |
|---|---|---|
| mm | inch | CF-R |
| 16 | ⅝ | 28424-GE01 |
| 40 | 1½ | 28432-GE01 |
| 63 | 2½ | 28436-GE01 |

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

| DN | | Ordering numbers |
|---|---|---|
| mm | inch | CF-R |
| 16 | ⅝ | 28424-GE11 |
| 40 | 1½ | 28432-GE11 |
| 63 | 2½ | 28436-GE11 |

without solenoid valve, with position indicator: 284 . . -GE**2**1
with solenoid valve, without position indicator: 284 . . -GE**3**1 (specify control voltage)
with solenoid valve, with position indicator: 284 . . -GE**4**1 (specify control voltage)

## Features

Body material: stainless steel

Extremely low outgassing rate

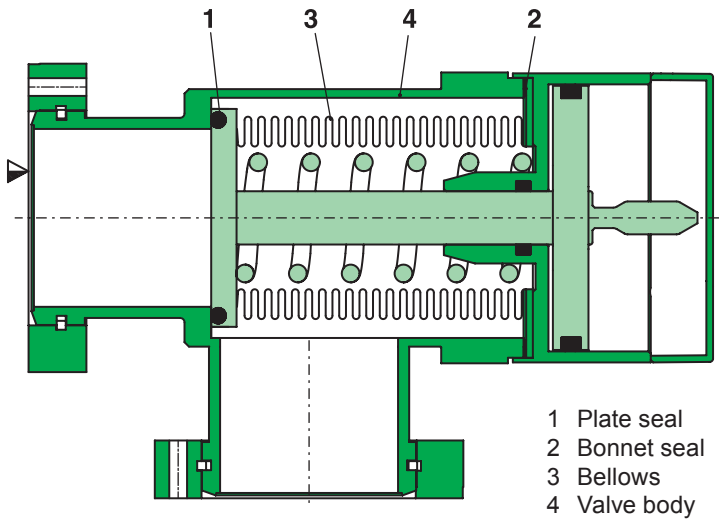
Resistant against differential pressure

Bellows

Metal bonnet seal

Rotatable CF flange

Functional principle




1 Plate seal
2 Bonnet seal
3 Bellows
4 Valve body
▽ Valve seat side

## Technical data

| | |
|---|---|
| Leak rate | |
| – Valve body | $< 5 \cdot 10^{-10}$ mbar ls$^{-1}$ |
| – Valve seat | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| Pressure range | $5 \cdot 10^{-10}$ mbar to 5 bar (abs) |
| Differential pressure on the plate | |
| – In opening direction | ≤2 bar |
| – In closing direction | ≤5 bar |
| Differential pressure at opening | ≤1 bar |
| Cycles until first service | 3 million |
| Temperature [1] | |
| – Valve body | ≤150 °C |
| – Manual actuator | ≤120 °C (without handwheel 150 °C) |
| – Pneumatic actuator | ≤150 °C |
| – Solenoid valve, position indicator | ≤ 80 °C |
| Material | |
| – Valve body | AISI 304 (1.4301) |
| – Plate | AISI 316L (1.4404, 1.4435) |
| – Bellows | AISI 316L (1.4404, 1.4435) |
| Seal | |
| – Bonnet | metal |
| – Plate | FKM (Viton®) |
| Feedthrough | bellows |
| Mounting position | any |
| Solenoid valve | 24 V DC (others on request) |
| Position indicator: contact rating | |
| – Voltage | 5–50 V AC/DC |
| – Current | 5–100 mA |
| Valve position indication | visual (mechanical) |

[1] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page

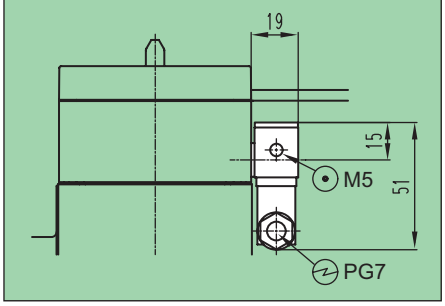
E

Continued Technical data

| DN (nominal I. D.) | | CF-R flange | Conductance (molecular flow) | Valve with manual actuator: Turns per stroke | Valve with manual actuator: Weight | | Valve with pneumatic actuator, single acting with closing spring (NC): Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing time | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | | $l s^{-1}$ | n | kg | lbs | bar | psi | l | $ft^3$ | s | kg | lbs |
| 16 | ⅝ | 1⅓ | 5 | 3.6 | 0.3 | 0.7 | 4 – 8 | 58 – 116 | 0.004 | 0.0001 | 0.10 | 0.4 | 0.9 |
| 40 | 1½ | 2¾ | 45 | 4.5 | 1.5 | 3.3 | 4 – 8 | 58 – 116 | 0.035 | 0.0012 | 0.55 | 1.6 | 3.5 |
| 63 | 2½ | 4½ | 160 | 6.6 | 5.3 | 11.7 | 4 – 8 | 58 – 116 | 0.112 | 0.0040 | 0.70 | 6.0 | 13.2 |

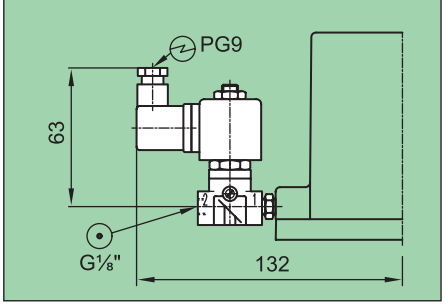
## Solenoid valve

**Solenoid valve** DN 16 – 40 (⅝" – 1½")




Ordering numbers: 284 . . -GE**3**1 / **4**1

**Solenoid valve** DN 63 (2½")

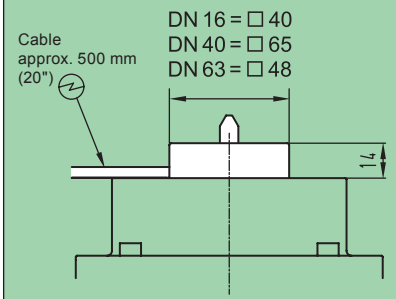



Ordering numbers: 284 . . -GE**3**1 / **4**1

⊙ Compressed air connection
⊖ Electrical connection

## Position indicator

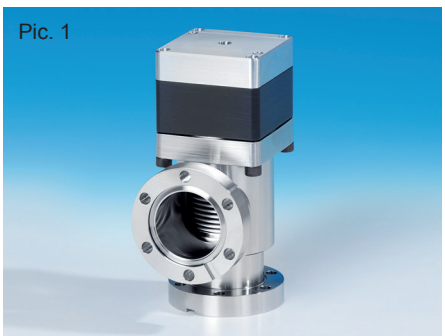
**Position indicator**
DN 16 – 63 (⅝" – 2½")




One closing contact each for the open and closed valve positions

Ordering numbers: 284 . . -GE**2**1 / **4**1

## Options




**Actuator**

– Other solenoid valve voltage (standard: 24 V DC)
– Position indicator bakeable to 120 °C or 150 °C (Pic. 1)
– Manual actuator bakeable to 200 °C
– Pneumatic actuator bakeable to 150 °C

**Valve**

– Customer specified flanges
– ISO-KF, ISO-K flanges
– Other sealing materials
– Customer specified bodies

**Ordering information for options:**
Ordering No. of valve-X (e. g. 28432-GE41-X, X = pos. indicator bakeable to 150 °C)

## Spare parts

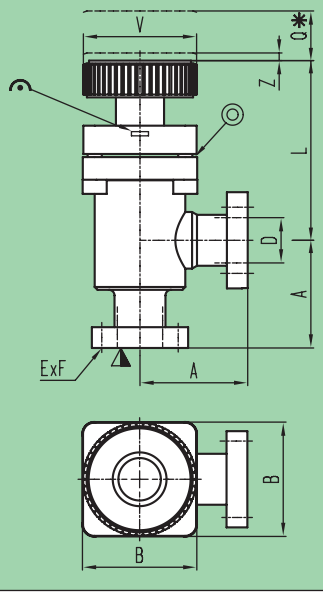
– **Seals**
on request (specify fabrication number of valve)

## Accessories

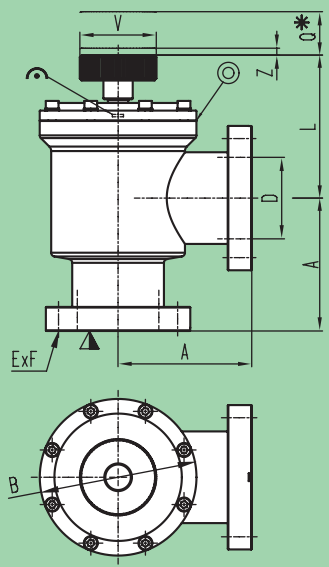
– **Flange connections**
for installation of the valve: see series 33

# Dimensions

**Valve with manual actuator**
DN 16–40 (⅝"–1½")

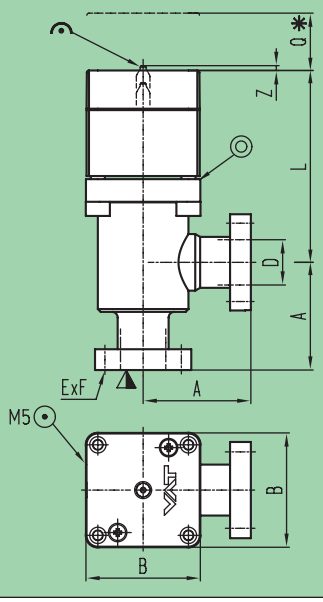



**Valve with manual actuator**
DN 63 (2½")

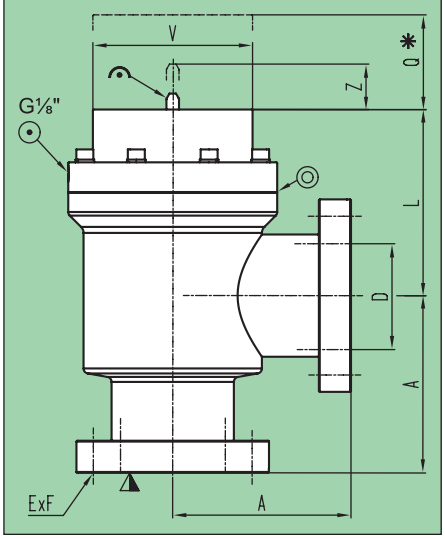



| DN | | 16 | 40 | 63 |
|---|---|---|---|---|
| | inch | ⅝ | 1½ | 2½ |
| A | mm | 38 | 63 | 105 |
| | inch | 1.50 | 2.48 | 4.13 |
| B | mm | 40 | 65 | 123 |
| | inch | 1.57 | 2.56 | 4.84 |
| D | mm | 16 | 40 | 64 |
| | inch | 0.63 | 1.57 | 2.52 |
| E × F | | 6 × 4.30<br>6 × 0.17 | 6 × 6.60<br>6 × 0.26 | 8 × 8.40<br>8 × 0.33 |
| L | mm | 67.30 | 97.40 | 111.70 |
| | inch | 2.65 | 3.83 | 4.40 |
| Q | mm | 45 | 73.50 | 105 |
| | inch | 1.77 | 2.89 | 4.13 |
| V | mm | 40 | 60 | 60 |
| | inch | 1.57 | 2.36 | 2.36 |
| Z | mm | 3.60 | 7.90 | 13.40 |
| | inch | 0.14 | 0.31 | 0.53 |

**Valve with pneumatic actuator, single acting with closing spring**
DN 16–40 (⅝"–1½")




**Valve with pneumatic actuator, single acting with closing spring**
DN 63 (2½")



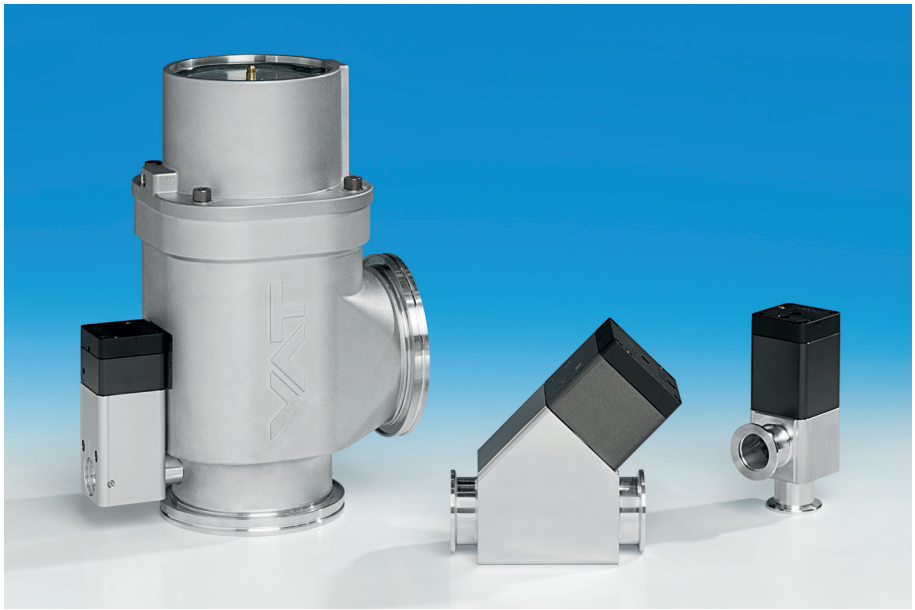

| DN | | 16 | 40 | 63 |
|---|---|---|---|---|
| | inch | ⅝ | 1½ | 2½ |
| A | mm | 38 | 63 | 105 |
| | inch | 1.50 | 2.48 | 4.13 |
| B | mm | 40 | 65 | – |
| | inch | 1.57 | 2.56 | |
| D | mm | 16 | 40 | 64 |
| | inch | 0.63 | 1.57 | 2.52 |
| E × F | | 6 × 4.30<br>6 × 0.17 | 6 × 6.60<br>6 × 0.26 | 8 × 8.40<br>8 × 0.33 |
| L | mm | 67.80 | 90.80 | 109.60 |
| | inch | 2.67 | 3.57 | 4.31 |
| Q | mm | 45 | 71 | 105 |
| | inch | 1.77 | 2.80 | 4.13 |
| V | mm | – | – | 94 |
| | inch | | | 3.70 |
| Z | mm | 2 | 9.50 | 31.40 |
| | inch | 0.08 | 0.37 | 1.24 |

E

▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
◠ Mechanical position indication
◎ Leak detection hole

## Main applications

For pumping and venting of HV systems when few turbulences, particles, substrate movements and condensation are important



## Ordering information

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

| | DN | | Ordering numbers | | | |
|---|---|---|---|---|---|---|
| | | | Angle valve | | Inline valve | |
| | mm | inch | aluminum | stainless steel | aluminum | stainless steel |
| ISO-KF | 25 | 1 | 29028-KA11 | 29028-KE11 | 29128-KA11 | 29128-KE11 |
| | 40 | 1½ | 29032-KA11 | 29032-KE11 | 29132-KA11 | 29132-KE11 |
| | 50 | 2 | 29034-KA11 | 29034-KE11 | 29134-KA11 | 29134-KE11 |
| ISO-K | 63 | 2½ | 29036-QA11 | 29036-QE11 | – | – |
| | 80 | 3 | 29038-QA11 | – | – | – |
| | 100 | 4 | 29240-QA11 | on request | – | – |
| | 160 | 6 | 29244-QA11 | on request | – | – |

without solenoid valve, with position indicator: 29 . . . - . . **2**1
with solenoid valve, without position indicator: 29 . . . - . . **3**1 (specify control voltage)
with solenoid valve, with position indicator: 29 . . . - . . **4**1 (specify control voltage)

**Valve with pneumatic actuator**
Main valve: double acting
Soft-pump valve: single acting (NC)
without solenoid valve
without position indicator

| | DN | | Ordering numbers | |
|---|---|---|---|---|
| | | | Angle valve | |
| | mm | inch | aluminum | stainless steel |
| ISO-K | 100 | 4 | 29240-QA14 | 29240-QE14 |
| | 160 | 6 | 29244-QA14 | 29244-QE14 |

without solenoid valve, with position indicator: 292 . . -Q . **2**4
with solenoid valve, without position indicator: 292 . . -Q . **3**4 (specify control voltage)
with solenoid valve, with position indicator: 292 . . -Q . **4**4 (specify control voltage)

## Features

Body material:
aluminum or stainless steel

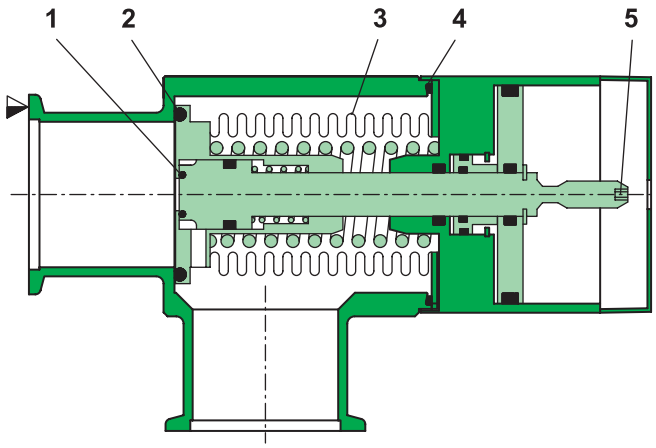
Angle and inline version

Setting of the orifice opening by means of a scale

Main valve
– DN 25– 80 with bellows
– DN 100–160 with shaft feedthrough

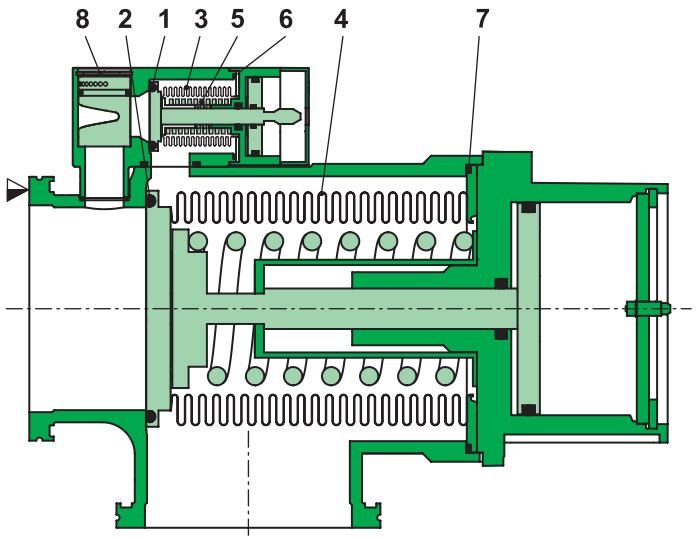
Resistant against differential pressure

Functional principle
DN 25–50
with bellows



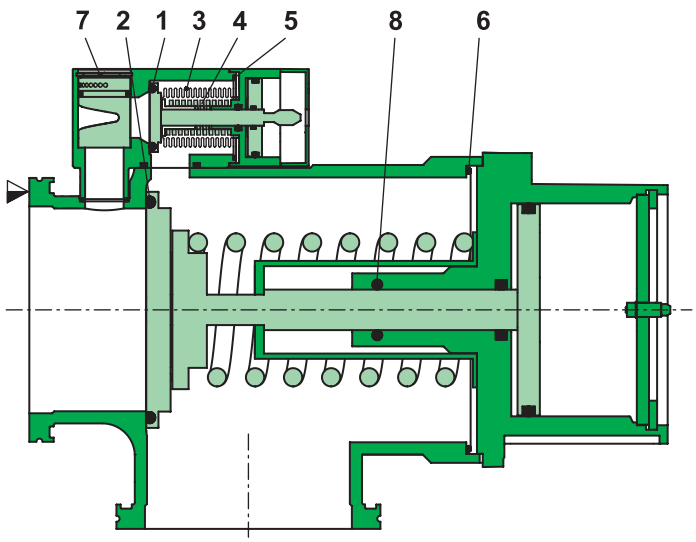

1 Plate seal (soft-pump function)
2 Plate seal (valve)
3 Bellows
4 Bonnet seal
5 Setting of the orifice opening
▼ Valve seat side

Functional principle
DN 63–80
with bellows




1 Plate seal (soft-pump valve)
2 Plate seal (main valve)
3 Bellows (soft-pump valve)
4 Bellows (main valve)
5 Closing spring (soft-pump valve)
6 Bonnet seal (soft-pump valve)
7 Bonnet seal (main valve)
8 Setting of the orifice opening
▼ Valve seat side

Functional principle
DN 100–160
with shaft feedthrough




1 Plate seal (soft-pump valve)
2 Plate seal (main valve)
3 Bellows (soft-pump valve)
4 Closing spring (soft-pump valve)
5 Bonnet seal (soft-pump valve)
6 Bonnet seal (main valve)
7 Setting of the orifice opening
8 Shaft feedthrough (main valve)
▼ Valve seat side

E

## Technical data

| | | |
|---|---|---|
| Leak rate: valve body, valve seat | | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| Pressure range | | |
| – DN 25 – 50 | | $1 \cdot 10^{-8}$ mbar to 1.2 bar (abs) |
| – DN 63 – 80 | | $1 \cdot 10^{-8}$ mbar to 4 bar (abs) |
| – DN 100 – 160 | | $1 \cdot 10^{-7}$ mbar to 2 bar (abs) |
| Differential pressure on the plate | | |
| – In opening direction | | ≤ 1.2 bar |
| – In closing direction | | |
| - DN 25 – 50 | | ≤ 1.2 bar |
| - DN 63 – 80 | | ≤ 4.0 bar |
| - DN 100 – 160 | | ≤ 2.0 bar |
| Differential pressure at opening | | ≤ 1 bar |
| Cycles until first service | | |
| – DN 25 – 50 | | 2 million |
| – DN 63 – 80 | | 3 million |
| – DN 100 – 160 | | 1 million |
| Temperature [1] | | |
| – Valve body | | ≤ 150 °C |
| – Actuator | | |
| - DN 25 – 50 | | ≤ 120 °C |
| - DN 63 – 160 | | ≤ 80 °C |
| – Solenoid valve, position indicator | | ≤ 80 °C |
| Material | | |
| – Valve body: main valve | | |
| - aluminum | DN 25 – 63 | EN AW-6060 (3.3206), -6061 (3.3211), -6063 (3.3206), -6082 (3.2315) |
| | DN 80 – 160 | EN AC-42000 |
| - stainless steel | DN 25 – 160 | AISI 304 (1.4301), AISI 316L (1.4404) |
| – Valve body: soft-pump valve | | EN AW-6060 (3.3206), -6061 (3.3211), -6063 (3.3206), -6082 (3.2315) |
| – Plate | | AISI 316L (1.4404, 1.4435) or AISI 304L (1.4306) |
| – Bellows | | AISI 316L (1.4404, 1.4435), AISI 316 Ti (1.4571) |
| Seal: bonnet, plate | | FKM (Viton®) |
| Feedthrough (main valve) | | |
| – DN 25 – 80 | | bellows |
| – DN 100 – 160 | | shaft feedthrough |
| Mounting position | | any |
| Solenoid valve | | |
| – DN 25 – 50 | | 24 V DC, 2.5 W |
| – DN 63 – 160 | | 24 V DC, 9.0 W (others on request) |
| Position indicator: contact rating | | |
| – Voltage | | 5 – 50 V AC / DC |
| – Current | | 5 – 100 mA |
| Valve position indication | | visual (mechanical) |

[1] Maximum values: depending on operating conditions and sealing materials

**Angle valves**

| DN (nominal I.D.) | | Conductance (molecular flow) | Opening range of orifice of the soft-pump valve | Valve with pneumatic actuator, single acting with closing spring (NC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing time | Weight | | | |
| | | | | | | | | | Aluminum body | | Stainless steel body | |
| mm | inch | $ls^{-1}$ | $mm^2$ | bar | psi | l | $ft^3$ | s | kg | lbs | kg | lbs |
| 25 | 1 | 14 | 1.7–20 | 4.5–7 | 65–102 | 0.011 | 0.0004 | 0.20 | 0.60 | 1.32 | 0.70 | 1.54 |
| 40 | 1½ | 45 | 1.2–40 | 4–8 | 58–116 | 0.035 | 0.0012 | 0.55 | 1.20 | 2.65 | 1.40 | 3.09 |
| 50 | 2 | 80 | 1.5–50 | 4–8 | 58–116 | 0.047 | 0.0017 | 0.65 | 1.90 | 4.19 | 2.10 | 4.63 |
| 63 | 2½ | 160 | 9–270 | 4–8 | 58–116 | 0.112 | 0.0040 | 0.70 | 4.20 | 9.26 | 2.60 | 5.73 |
| 80 | 3 | 200 | 9–270 | 4–8 | 58–116 | 0.112 | 0.0040 | 0.70 | 3.90 | 8.60 | – | – |
| 100 | 4 | 440 | 9–270 | 4.5–7 | 65–102 | 0.330 | 0.0117 | 1 | 9 | 19.84 | 10.22 | 22.53 |
| 160 | 6 | 1000 | 9–270 | 4.5–7 | 65–102 | 1.050 | 0.0371 | 2.50 | 15.10 | 33.29 | 13.04 | 28.75 |
| | | | | Valve with pneumatic actuator, double acting | | | | | | | | |
| 100 | 4 | 440 | 9–270 | 4.5–7 | 65–102 | 0.330 | 0.0117 | 1 | 8.50 | 18.74 | 10.50 | 23.15 |
| 160 | 6 | 1000 | 9–270 | 4.5–7 | 65–102 | 1.050 | 0.0371 | 2 | 12.50 | 27.56 | 15.50 | 34.17 |

**Inline valves**

| DN (nominal I.D.) | | Conductance (molecular flow) | Opening range of orifice of the soft-pump valve | Valve with pneumatic actuator, single acting with closing spring (NC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing time | Weight | | | |
| | | | | | | | | | Aluminum body | | Stainless steel body | |
| mm | inch | $ls^{-1}$ | $mm^2$ | bar | psi | l | $ft^3$ | s | kg | lbs | kg | lbs |
| 25 | 1 | 14 | 1.7–20 | 4.5–7 | 65–102 | 0.011 | 0.0004 | 0.20 | 0.76 | 1.68 | 0.45 | 0.99 |
| 40 | 1½ | 45 | 1.2–40 | 4–8 | 58–116 | 0.035 | 0.0012 | 0.55 | 1.60 | 3.53 | 1.45 | 3.20 |
| 50 | 2 | 80 | 1.5–50 | 4–8 | 58–116 | 0.047 | 0.0017 | 0.65 | 2.78 | 6.13 | 2.30 | 5.07 |

E

## Options

**Actuator**

– Other solenoid valve voltage (standard: 24 V DC)

– Position indicator bakeable to 120 °C

**Valve**

– CF flanges

– Other sealing materials

– Customer specified bodies

**Ordering information for options:**
Ordering No. of valve-X (e. g. 29028-KA41-X, X = pos. indicator bakeable to 120 °C)

## Spare parts

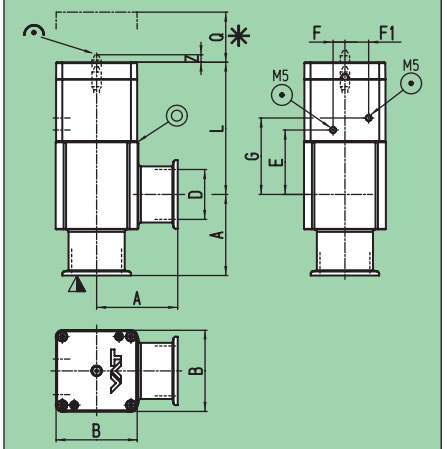
– **Seals**
on request (specify fabrication number of valve)

## Accessories

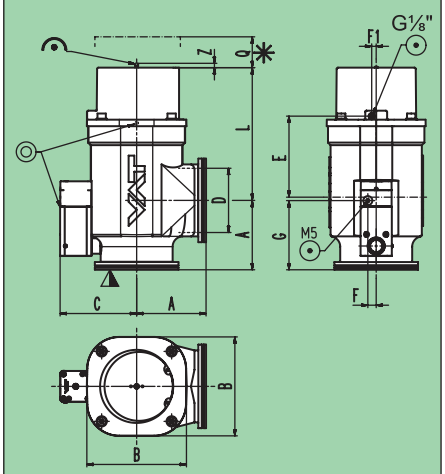
– **Flange connections**
for installation of the valve: see series 31

## Dimensions

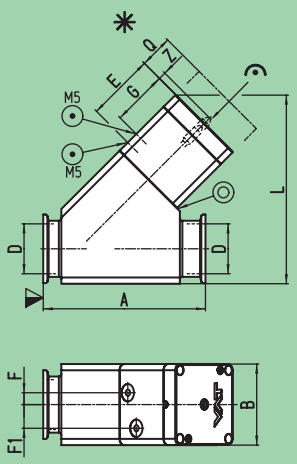
**Aluminum angle valve with pneumatic actuator, single acting with closing spring**
DN 25–50 (1"–2") ISO-KF




**Aluminum angle valve with pneumatic actuator, single acting with closing spring**
DN 63–160 (2½–6") ISO-K




**Aluminum inline valve with pneumatic actuator, single acting with closing spring**
DN 25–50 (1"–2") ISO-K




▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
◠ Mechanical position indication
◎ Leak detection hole

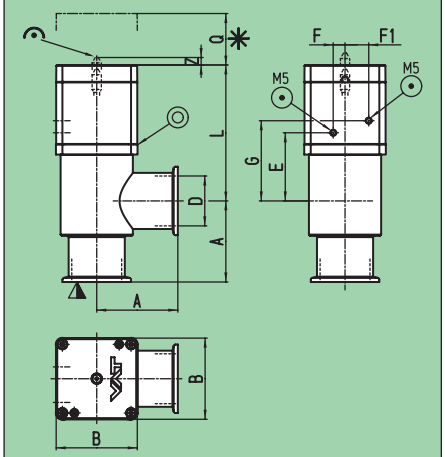
| DN | mm / inch | 25 / 1 | 40 / 1 ½ | 50 / 2 |
|---|---|---|---|---|
| A | mm | 50 | 65 | 70 |
| | inch | 1.97 | 2.56 | 2.76 |
| B | mm | 48 | 65 | 77 |
| | inch | 1.89 | 2.56 | 3.03 |
| | | | | |
| D | mm | 25 | 40 | 50 |
| | inch | 0.98 | 1.57 | 1.97 |
| E | mm | 40 | 51 | 59 |
| | inch | 1.57 | 2 | 2.32 |
| F | mm | 9.50 | 12.50 | 13.60 |
| | inch | 0.37 | 0.49 | 0.54 |
| F1 | mm | 13 | 15 | 15 |
| | inch | 0.51 | 0.59 | 0.59 |
| G | mm | 49 | 59 | 66 |
| | inch | 1.93 | 2.32 | 2.60 |
| L | mm | 89.50 | 106 | 115.70 |
| | inch | 3.52 | 4.17 | 4.56 |
| Q | mm | 46 | 77 | 85 |
| | inch | 1.81 | 3.03 | 3.35 |
| Z | mm | 5.60 | 11 | 12.50 |
| | inch | 0.22 | 0.43 | 0.49 |

| DN | mm / inch | 63 / 2 ½ | 80 / 3 | 100 / 4 | 160 / 6 |
|---|---|---|---|---|---|
| A | mm | 88 | 90 | 108 | 138 |
| | inch | 3.46 | 3.54 | 4.25 | 5.43 |
| B | mm | 123 | 126.60 | 154 | 216 |
| | inch | 4.84 | 4.98 | 6.06 | 8.50 |
| C | mm | 98.80 | 107.30 | 119 | 144 |
| | inch | 3.89 | 4.22 | 4.69 | 5.67 |
| D | mm | 63 | 80 | 102 | 153 |
| | inch | 2.48 | 3.15 | 4.02 | 6.02 |
| E | mm | 71.40 | 71.40 | 131 | 117 |
| | inch | 2.81 | 2.81 | 5.15 | 4.61 |
| F | mm | 13 | 13 | 13 | 13 |
| | inch | 0.51 | 0.51 | 0.51 | 0.51 |
| F1 | mm | – | – | 7 | – |
| | inch | | | 0.28 | |
| G | mm | 98 | 100 | 107.70 | 97.70 |
| | inch | 3.86 | 3.94 | 4.24 | 3.85 |
| L | mm | 109 | 109 | 206.50 | 202 |
| | inch | 4.29 | 4.29 | 8.13 | 7.95 |
| Q | mm | 115 | 115 | 170 | 195 |
| | inch | 4.53 | 4.53 | 6.69 | 7.68 |
| Z | mm | 31.40 | 31.40 | 6 | 6 |
| | inch | 1.24 | 1.24 | 0.24 | 0.24 |

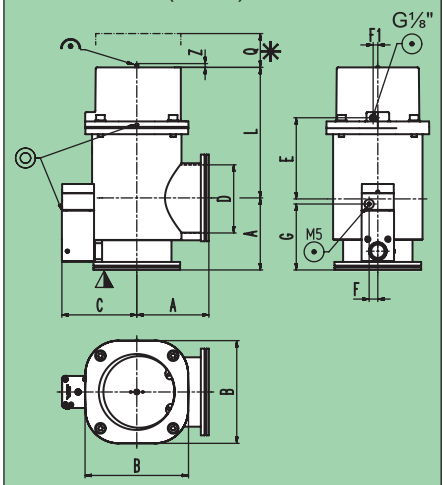
| DN | mm / inch | 25 / 1 | 40 / 1 ½ | 50 / 2 |
|---|---|---|---|---|
| A | mm | 100 | 130 | 178 |
| | inch | 3.94 | 5.12 | 7.01 |
| B | mm | 48 | 65 | 77 |
| | inch | 1.89 | 2.56 | 3.03 |
| | | | | |
| D | mm | 25 | 40 | 50 |
| | inch | 0.98 | 1.57 | 1.97 |
| E | mm | 49.50 | 55 | 57 |
| | inch | 1.95 | 2.17 | 2.24 |
| F | mm | 9.50 | 14 | 13.60 |
| | inch | 0.37 | 0.55 | 0.54 |
| F1 | mm | 13 | 15 | 15 |
| | inch | 0.51 | 0.59 | 0.59 |
| G | mm | 40.50 | 47 | 50 |
| | inch | 1.59 | 1.85 | 1.97 |
| L | mm | 121 | 154 | 184 |
| | inch | 4.76 | 6.06 | 7.24 |
| Q | mm | 46 | 77 | 85 |
| | inch | 1.81 | 3.03 | 3.35 |
| Z | mm | 5.60 | 11 | 12.50 |
| | inch | 0.22 | 0.43 | 0.49 |

## Dimensions

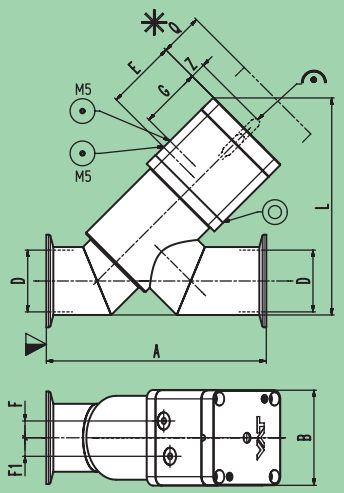
**Stainless steel angle valve with pneumatic actuator, single acting with closing spring**
DN 25–50 (1"–2") ISO-KF




**Stainless steel angle valve with pneumatic actuator, single acting with closing spring**
DN 63–160 (2½–6") ISO-K
**or double acting**
DN 100–160 (4"–6") ISO-K




**Stainless steel inline valve with pneumatic actuator, single acting with closing spring**
DN 25–50 (1"–2") ISO-K




▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
◠ Mechanical position indication
◎ Leak detection hole

E

| | | single acting with closing spring | | | | | | double acting | |
|---|---|---|---|---|---|---|---|---|---|
| DN | mm | 25 | 40 | 50 | 63 | 100 | 160 | 100 | 160 |
| | inch | 1 | 1½ | 2 | 2½ | 4 | 6 | 4 | 6 |
| A | mm | 50 | 65 | 70 | 88 | 108 | 138 | 108 | 138 |
| | inch | 1.97 | 2.56 | 2.76 | 3.46 | 4.25 | 5.43 | 4.25 | 5.43 |
| B | mm | 48 | 65 | 77 | 123 | 154 | 216 | 154 | 216 |
| | inch | 1.89 | 2.56 | 3.03 | 4.84 | 6.06 | 8.50 | 6.06 | 8.50 |
| C | mm | – | – | – | 98.30 | 116 | 138 | 119 | 144 |
| | inch | | | | 3.87 | 4.57 | 5.43 | 4.69 | 5.67 |
| D | mm | 25 | 40 | 50 | 63 | 102 | 153 | 102 | 153 |
| | inch | 0.98 | 1.57 | 1.97 | 2.48 | 4.02 | 6.02 | 4.02 | 6.02 |
| E | mm | 43 | 54 | 52 | 71 | 122 | 121 | 131 | 117 |
| | inch | 1.69 | 2.13 | 2.05 | 2.80 | 4.80 | 4.76 | 5.16 | 4.61 |
| F | mm | 9.50 | 12.50 | 13.60 | 13 | 13 | 13 | 13 | 13 |
| | inch | 0.37 | 0.49 | 0.54 | 0.51 | 0.51 | 0.51 | 0.51 | 0.51 |
| F1 | mm | 13 | 15 | 15 | – | 7 | – | 7 | – |
| | inch | 0.51 | 0.59 | 0.59 | | 0.28 | | 0.28 | |
| G | mm | 52 | 62 | 69 | 98 | 104 | 106 | 107.7 | 97.7 |
| | inch | 2.05 | 2.44 | 2.72 | 3.86 | 4.09 | 4.17 | 4.24 | 3.85 |
| L | mm | 92.80 | 109 | 118.70 | 109 | 197 | 207 | 206.5 | 202 |
| | inch | 3.65 | 4.29 | 4.67 | 4.29 | 7.75 | 8.15 | 8.13 | 7.95 |
| Q | mm | 46 | 77 | 85 | 115 | 170 | 195 | 170 | 195 |
| | inch | 1.81 | 3.03 | 3.35 | 4.53 | 6.69 | 7.68 | 6.69 | 7.68 |
| Z | mm | 5.60 | 11 | 12.50 | 31.40 | 6 | 6 | 6 | 6 |
| | inch | 0.22 | 0.43 | 0.49 | 1.24 | 0.24 | 0.24 | 0.24 | 0.24 |

| DN | mm | 25 | 40 | 50 |
|---|---|---|---|---|
| | inch | 1 | 1½ | 2 |
| A | mm | 100 | 130 | 178 |
| | inch | 3.94 | 5.12 | 7.01 |
| B | mm | 48 | 65 | 77 |
| | inch | 1.89 | 2.56 | 3.03 |
| C | mm | – | – | – |
| | inch | | | |
| D | mm | 25 | 40 | 50 |
| | inch | 0.98 | 1.57 | 1.97 |
| E | mm | 49.50 | 55 | 57 |
| | inch | 1.95 | 2.17 | 2.24 |
| F | mm | 9.50 | 14 | 13.60 |
| | inch | 0.37 | 0.55 | 0.54 |
| F1 | mm | 13 | 15 | 15 |
| | inch | 0.51 | 0.59 | 0.59 |
| G | mm | 40.50 | 47 | 50 |
| | inch | 1.59 | 1.85 | 1.97 |
| L | mm | 131 | 163 | 176 |
| | inch | 5.16 | 6.42 | 6.93 |
| Q | mm | 46 | 77 | 85 |
| | inch | 1.81 | 3.03 | 3.35 |
| Z | mm | 5.60 | 11 | 12.50 |
| | inch | 0.22 | 0.43 | 0.49 |

## Main applications

For pumping and venting of HV systems when maximum conductance is important

For harsh process environments (high resistance to corrosion and fluor)



Series 25.0
Angle valve

Series 25.1
Inline valve

Series 25.2
3/2-way valve

## Ordering information

**Series 25.0**
**Angle valve with pneumatic actuator**
double acting

| DN | | Ordering numbers ISO-KF | |
|---|---|---|---|
| mm | inch | without position indicator | with position indicator |
| 16 | ⅝ | 25024-KA14 | 25024-KA24 |
| 25 | 1 | 25028-KA14 | 25028-KA24 |
| 40 | 1½ | 25032-KA14 | 25032-KA24 |

**Series 25.1**
**Inline valve with pneumatic actuator**
double acting

| DN | | Ordering numbers ISO-KF | |
|---|---|---|---|
| mm | inch | without position indicator | with position indicator |
| 16 | ⅝ | 25124-KA14 | 25124-KA24 |
| 25 | 1 | 25128-KA14 | 25128-KA24 |
| 40 | 1½ | 25132-KA14 | 25132-KA24 |

**Series 25.2**
**3/2-way valve with pneumatic actuator**
double acting

| DN | | Ordering numbers ISO-KF «claw» | |
|---|---|---|---|
| mm | inch | without position indicator | with position indicator |
| 16 | ⅝ | 25224-EA14 | 25224-EA24 |
| 25 | 1 | 25228-EA14 | 25228-EA24 |
| 40 | 1½ | 25232-EA14 | 25232-EA24 |

## Features

Body material: aluminum

Parts in contact with vacuum: aluminum

Angle, inline and 3/2-way versions

Rotary feedthrough

Maximum conductance

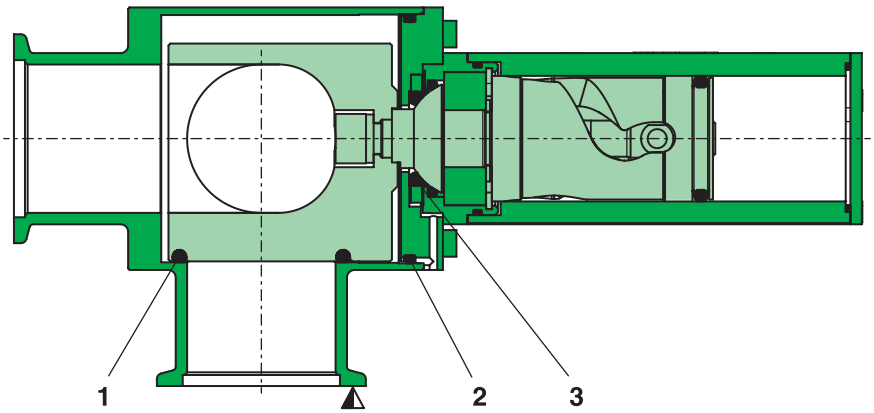
Protected gate seal

Resistant against differential pressure

Mechanically locked in open and closed position

Low particle count

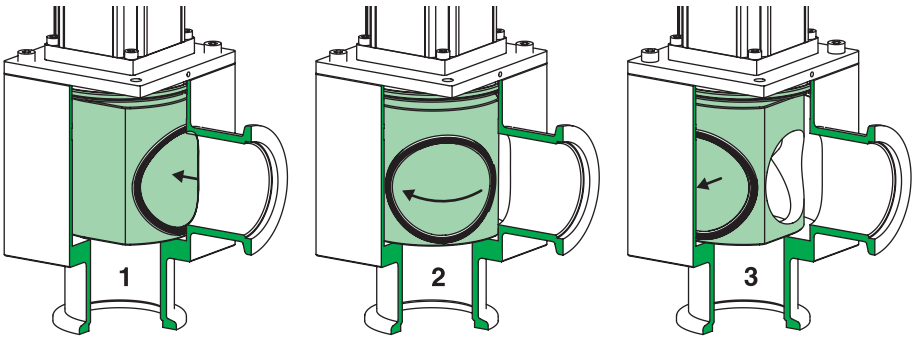
Functional principle




1 Gate seal
2 Bonnet seal
3 Feedthrough seal
▼ Valve seat side

## Function

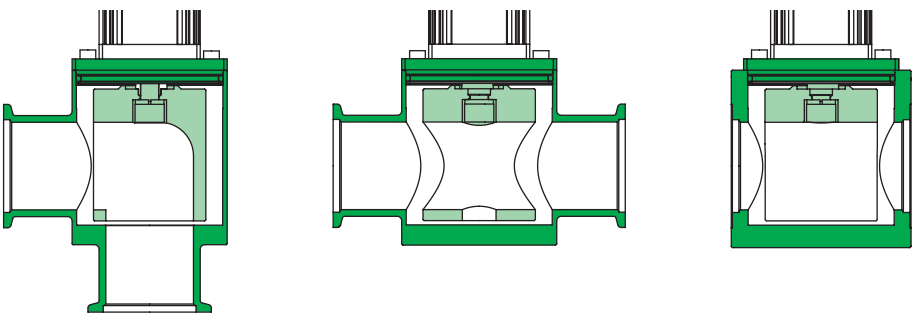
The cylinder-shaped gate performs a **tilt-turn-tilt** movement. This prevents the gate seal from sliding on the valve seat.



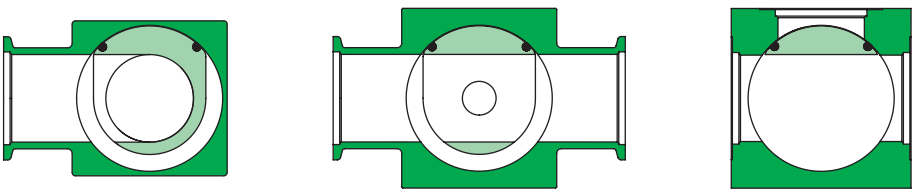

Valve closed → **Tilt** movement of gate. Gate seal lifts off from valve seat. → 90° **turn** of gate towards the open position. → **Tilt** movement of gate towards the valve body. Gate seal is protected. → Valve open

**Maximum conductance**
The conductance is comparable to a 90° elbow (angle valve) or a straight tube (in-line valve). The gas flow passes unobstructed by the gate.

Angle valve | Inline valve | 3/2-way valve



**Protected gate seal**
The gate seal is pressed against the valve body in closed and open position. The contact with the process gas is minimized.



E

## Technical data

| | |
|---|---|
| Leak rate: valve body, valve seat | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| Pressure range | $1 \cdot 10^{-8}$ mbar to 3 bar (abs) |
| Differential pressure on the gate | |
| – In opening direction | ≤ 1.2 bar |
| – In closing direction | ≤ 3.0 bar |
| Differential pressure at opening | ≤ 1.2 bar |
| Cycles until first service | 100 000 |
| Temperature [1] | |
| – Valve body | ≤ 120 °C |
| – Actuator | ≤ 120 °C |
| – Position indicator | ≤ 80 °C |
| Material | |
| – Valve body | EN AW-6060 (3.3206), -6082 (3.2315) |
| – Gate, bonnet flange | EN AW-6082 (3.2315) |
| – Shaft | AISI 316L (1.4435) with Ni-PTFE coating |
| – Gate fastening screw, washer | A4-80 with Ni-PTFE coating |
| Seal: bonnet, gate, feedthrough | FKM (Viton®) |
| Feedthrough | rotary feedthrough |
| Mounting position | any |
| Position indicator: contact rating | |
| – Voltage | 10 – 30 V DC |
| – Current | 5 – 100 mA |
| Valve position indication | LED [2] |

[1] Maximum values: depending on operating conditions and sealing materials

[2] Valves with position indicator

| DN (nominal I. D.) | | Standard flanges | | Conductance (molecular flow) | | | | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Closing or opening time | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | | | ls$^{-1}$ | | | | bar | psi | l | ft$^3$ | s | kg | lbs |
| | | Series 25.0 / 25.1 | Series 25.2 | Series 25.0 | Series 25.1 | Series 25.2 1→2 | Series 25.2 1→3 | | | | | | | |
| 16 | ⅝ | ISO-KF | ISO-KF «claw» | 5 | 6 | 8 | 7 | 4 – 8 | 58 – 116 | 0.032 | 0.0011 | 0.6 | 1.4 | 3.0 |
| 25 | 1 | ISO-KF | ISO-KF «claw» | 16 | 19 | 31 | 24 | 4 – 8 | 58 – 116 | 0.032 | 0.0011 | 0.6 | 1.4 | 3.0 |
| 40 | 1 ½ | ISO-KF | ISO-KF «claw» | 46 | 55 | 90 | 67 | 4 – 8 | 58 – 116 | 0.032 | 0.0011 | 0.6 | 1.7 | 3.7 |

[3] Flange ISO-KF «claw». See Dia. 1 on next page.

## Spare parts

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

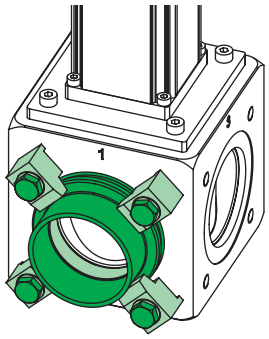
## Accessories

– **Solenoid valve**
for external mounting

– **Flange connections**
for installation of the valve: see series 31

## Options

Dia. 1



Flange ISO-KF «claw»

**Actuator**

– One-touch fitting for pneumatic tube

**Valve**

– Other sealing materials, e. g. FFKM

– Valve DN 40 with flange ISO-KF DN 50 «claw»

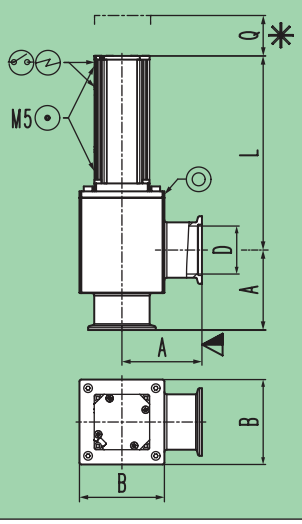
– Stainless steel version

– Heating cartridge for DN 40

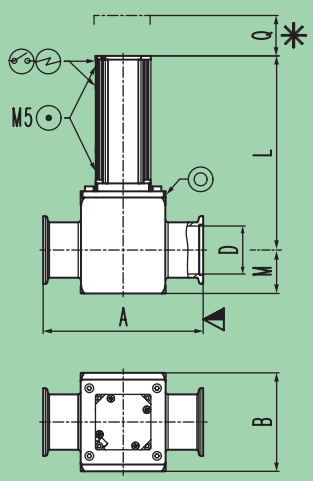
**Ordering information for options:**
Ordering No. of valve-X
(e. g. 25032-KA14-X, X = one-touch fitting for 4 mm pneumatic tube)

## Dimensions

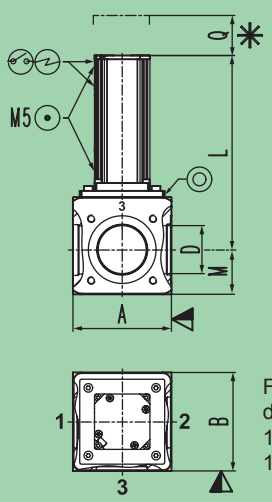
**Series 25.0**
**Angle valve with pneumatic actuator**
DN 16–40 (⅝"–1½") ISO-KF




**Series 25.1**
**Inline valve with pneumatic actuator**
DN 16–40 (⅝"–1½") ISO-KF




**Series 25.2**
**3/2-way valve with pneumatic actuator**
DN 16–40 (⅝"–1½") ISO-KF «claw»




| DN | | 16 | 25 | 40 |
|---|---|---|---|---|
| | mm | | | |
| | inch | ⅝ | 1 | 1½ |
| A | mm | 40 | 50 | 65 |
| | inch | 1.57 | 1.97 | 2.56 |
| B | mm | 54 | 54 | 69 |
| | inch | 2.13 | 2.13 | 2.72 |
| D | mm | 16 | 25 | 39 |
| | inch | 0.63 | 0.98 | 1.54 |
| L | mm | 150.80 | 150.80 | 157.80 |
| | inch | 5.94 | 5.94 | 6.21 |
| M | mm | – | – | – |
| | inch | | | |
| Q | mm | 55 | 55 | 68 |
| | inch | 2.17 | 2.17 | 2.68 |

| DN | | 16 | 25 | 40 |
|---|---|---|---|---|
| | mm | | | |
| | inch | ⅝ | 1 | 1½ |
| A | mm | 80 | 100 | 130 |
| | inch | 3.15 | 3.94 | 5.12 |
| B | mm | 60 | 60 | 80 |
| | inch | 2.36 | 2.36 | 3.15 |
| D | mm | 16 | 25 | 39 |
| | inch | 0.63 | 0.98 | 1.54 |
| L | mm | 150.80 | 150.80 | 157.80 |
| | inch | 5.94 | 5.94 | 6.21 |
| M | mm | 23.30 | 23.30 | 35.30 |
| | inch | 0.92 | 0.92 | 1.39 |
| Q | mm | 55 | 55 | 68 |
| | inch | 2.17 | 2.17 | 2.68 |

| DN | | 16 | 25 | 40 |
|---|---|---|---|---|
| | mm | | | |
| | inch | ⅝ | 1 | 1½ |
| A | mm | 60 | 60 | 80 |
| | inch | 2.36 | 2.36 | 3.15 |
| B | mm | 60 | 60 | 80 |
| | inch | 2.36 | 2.36 | 3.15 |
| D | mm | 16 | 25 | 39 |
| | inch | 0.63 | 0.98 | 1.54 |
| L | mm | 150.80 | 150.80 | 157.80 |
| | inch | 5.94 | 5.94 | 6.21 |
| M | mm | 29.30 | 29.30 | 36.30 |
| | inch | 1.15 | 1.15 | 1.43 |
| Q | mm | 55 | 55 | 68 |
| | inch | 2.17 | 2.17 | 2.68 |

▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⊖ Electrical connection
⊘ Position indicator
◎ Leak detection hole

E

## Main applications

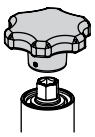
For vacuum processes with extreme UHV requirements

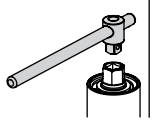


## Ordering information

**Valve with manual actuator**
hexagon head

| DN | | Ordering numbers | | | | |
|---|---|---|---|---|---|---|
| | | | Accessories | | | |
| mm | inch | Valve CF-R | handwheel [1] | T-bar tool [1] | service kit 1 [2] | service kit 2 [2] |
| 16 | ⅝ | 54124-GE02 | 240039 | 312699 | 529581 | 529582 |
| 40 | 1½ | 54132-GE02 | 531966 | 530026 | 530022 | 530023 |
| 63 | 2½ | 54136-GE02 | – | 312731 | 530024 | 530025 |





## Technical data

| | |
|---|---|
| Leak rate: valve body, valve seat | $< 1 \cdot 10^{-10}$ mbar ls$^{-1}$ |
| Pressure range | XHV to 2 bar (abs) |
| Differential pressure on the gate | ≤ 2 bar |
| Differential pressure at opening | ≤ 1 bar [3] |
| Lifetime | ≥ 1000 cycles |
| Bake-out temperature [4] | ≤ 300 °C open and closed |
| Heating and cooling rate | ≤ 60 °C h$^{-1}$ |
| Material: valve body, mechanism, bellows | AISI 316L (1.4404, 1.4435) |
| Seal: bonnet, plate | metal |
| Feedthrough | bellows |
| Mounting position | any |
| Valve position indication | visual (mechanical) |
| Conductance (molecular flow) | DN16: 5 ls$^{-1}$ / DN40: 50 ls$^{-1}$ / DN63: 105 ls$^{-1}$ |
| Closing force | closes at a mechanical stop |
| Weight: DN 16 / 40 / 63 kg (lbs) | 0.4 (0.9) / 1.9 (4.2) / 5.9 (13.0) |

[1] Handwheel or T-bar tool to put on hexagon head for convenient operation

[2] Service kits to exchange the FLEX VATRING without remachining the sealing surface on the valve seat. The FLEX VATRING may be replaced up to two times. The service kit 1 is for the first, the service kit 2 for the second exchange.

[3] >1 bar with reduced number of cycles

[4] Maximum values: depending on operating conditions and sealing materials

## Features

Body material: stainless steel

FLEX VATRING configuration: see glossary

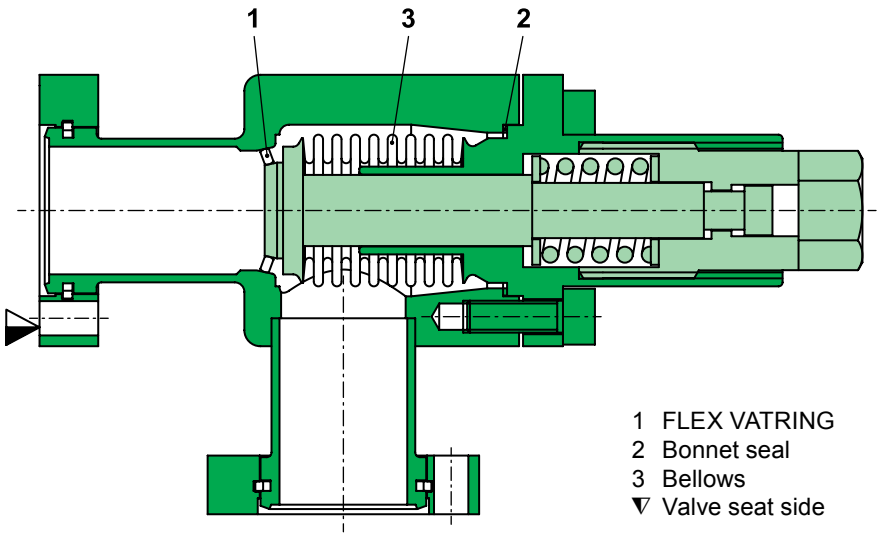
Sealing surfaces are only elastically deformed

Convenient operation with a standard hexagon wrench – no torque wrench required

High conductance

FLEX VATRING exchangeable twice

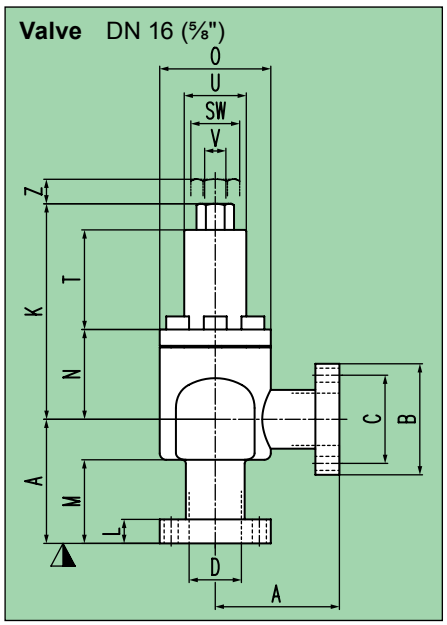
Functional principle



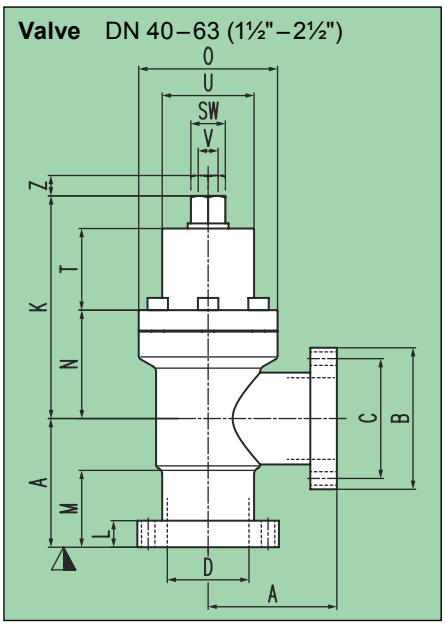

1 FLEX VATRING
2 Bonnet seal
3 Bellows
▼ Valve seat side

## Dimensions

**Valve** DN 16 (⅝")

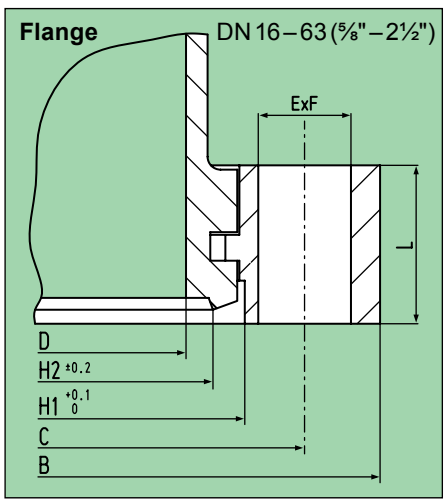



**Valve** DN 40–63 (1½"–2½")




▼ Valve seat side

**Flange** DN 16–63 (⅝"–2½")




| | | 16 ⅝ | 40 1½ | 63 2½ |
|---|---|---|---|---|
| DN | mm<br>inch | | | |
| A | mm<br>inch | 38<br>1.50 | 63<br>2.48 | 105<br>4.13 |
| B | mm<br>inch | 34<br>1.34 | 69.35<br>2.73 | 113.35<br>4.46 |
| C | mm<br>inch | 27<br>1.06 | 58.70<br>2.31 | 92.10<br>3.63 |
| D | mm<br>inch | 16<br>0.63 | 40<br>1.57 | 64<br>2.52 |
| E × F | mm<br>inch | 6 × 4.30<br>6 × 0.17 | 6 × 6.60<br>6 × 0.26 | 8 × 8.40<br>8 × 0.33 |
| H1 | mm<br>inch | 21.40<br>0.84 | 48.30<br>1.90 | 82.50<br>3.25 |
| H2 | mm<br>inch | 18.50<br>0.73 | 42<br>1.65 | 77.40<br>3.05 |
| K | mm<br>inch | 66<br>2.60 | 109.10<br>4.30 | 141.50<br>5.57 |
| L | mm<br>inch | 7.35<br>0.29 | 13<br>0.51 | 18.90<br>0.74 |
| M | mm<br>inch | 25.60<br>1.01 | 37.60<br>1.48 | 56.60<br>2.23 |
| N | mm<br>inch | 27.50<br>1.08 | 53.10<br>2.09 | 74<br>2.91 |
| O | mm<br>inch | 34<br>1.34 | 68<br>2.68 | 94<br>3.70 |
| SW | mm<br>inch | 10<br>0.39 | 17<br>0.67 | 22<br>0.87 |
| T | mm<br>inch | 30.50<br>1.20 | 40<br>1.57 | 51.50<br>2.03 |
| U | mm<br>inch | 19<br>0.75 | 45<br>1.77 | 54<br>2.13 |
| V | mm<br>inch | 6.35<br>0.25 | 9.53<br>0.38 | 12.70<br>0.50 |
| Z | mm<br>inch | 8.50<br>0.33 | 20<br>0.79 | 20<br>0.79 |

E

## Main applications

For vacuum processes with extreme UHV requirements and / or when using aggressive media



## Ordering information

**Valve with manual actuator**
hexagon head

| DN | | Ordering numbers CF-R | | |
|---|---|---|---|---|
| mm | inch | without position indicator | with position indicator 80 °C | with position indicator 200 °C |
| 16 | ⅝ | 57124-GE02 | 57124-GE08 | 57124-GE05 |
| 40 | 1½ | 57132-GE02 | 57132-GE08 | 57132-GE05 |
| 63 | 2½ | 57036-GE02 | 57036-GE08 | 57036-GE05 |
| 100 | 4 | 57040-GE02 | 57040-GE08 | 57040-GE05 |
| 160 | 6 | 57044-GE02 | 57044-GE08 | 57044-GE05 |

**Valve with pneumatic actuator**

single acting with closing spring (NC)

| DN | | Ordering numbers CF-R | | |
|---|---|---|---|---|
| mm | inch | without solenoid valve without position indicator | without solenoid valve with pos. indicator 80 °C | with solenoid valve with pos. indicator 80 °C |
| 10 | ⅜ | 57120-XE11 [1] | 57120-XE21 [1] | 57120-XE41 [1] |
| 16 | ⅝ | 57124-GE11 | 57124-GE21 | 57124-GE41 |
| 40 | 1½ | 57132-GE11 | 57132-GE21 | 57132-GE41 |
| 63 | 2½ | 57036-GE11 | 57036-GE21 | 57036-GE41 |
| 100 | 4 | 57040-GE11 | 57040-GE21 | 57040-GE41 |
| 160 | 6 | 57044-GE11 | 57044-GE21 | 57044-GE41 |

double acting

| | | | | |
|---|---|---|---|---|
| 16 | ⅝ | 57124-GE14 | 57124-GE24 | 57124-GE44 |
| 40 | 1½ | 57132-GE14 | 57132-GE24 | 57132-GE44 |
| 63 | 2½ | 57036-GE14 | 57036-GE24 | 57036-GE44 |
| 100 | 4 | 57040-GE14 | 57040-GE24 | 57040-GE44 |
| 160 | 6 | 57044-GE14 | 57044-GE24 | 57044-GE44 |

[1] CF-R 16 flanges (others on request)

Other versions: see pages 210 + 211

**Bake-out jacket**

See page 270: ordering information and technical data on request

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

## Features

Body material: stainless steel

VATRING configuration: see glossary

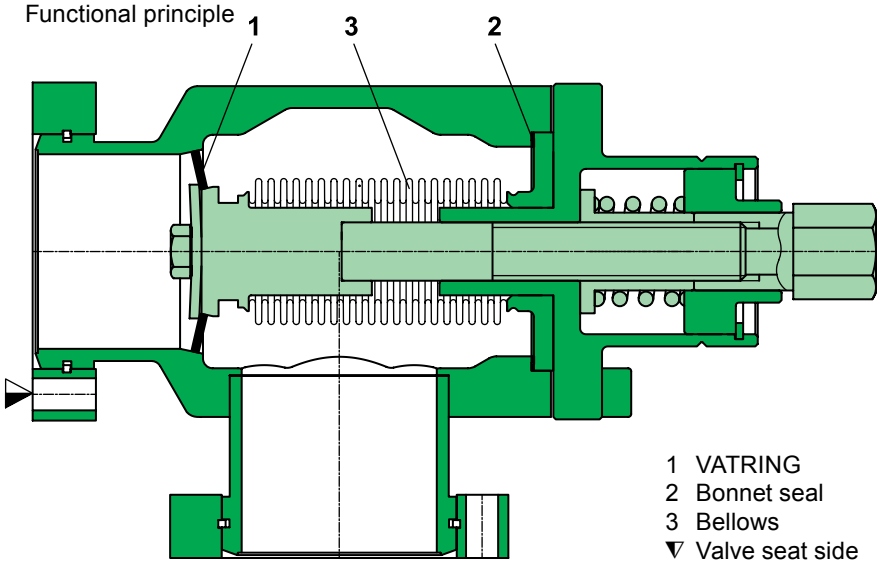
Sealing surfaces are only elastically deformed

Largest possible conductance for the nominal diameter

Radiation resistant to $10^8$ Gy

DN 16–40 closes at a mechanical stop – no torque wrench required

Functional principle




## Technical data

| | |
|---|---|
| Leak rate: valve body, valve seat | $< 1 \cdot 10^{-10}$ mbar $l s^{-1}$ |
| Pressure range | XHV to 5 bar (abs) |
| Differential pressure on the gate | ≤5 bar |
| Differential pressure at opening | ≤1 bar [1] |
| Cycles until first service | 10000 |
| Bake-out temperature [2] | |
| – Valve body | ≤450 °C open<br>≤350 °C closed |
| – Manual actuator [3]: | |
| - hexagon head DN 16– 40 | ≤450 °C open<br>≤350 °C closed |
| DN 63–160 | ≤300 °C open and closed |
| – Pneumatic actuator [3]: | |
| - single acting with closing spring | ≤150 °C |
| - double acting | ≤200 °C |
| – Solenoid valve [3] | ≤ 80 °C |
| – Position indicator [3] | ≤ 80 °C (option: 200 °C) |
| Heating and cooling rate | ≤60 °C $h^{-1}$ |
| Material | |
| – Valve body, mechanism | AISI 316L (1.4404, 1.4435) |
| – Bellows | AISI 316L (1.4435) |
| Seal: bonnet, gate | metal |
| Feedthrough | bellows |
| Mounting position | any |
| Solenoid valve | 24 V DC, 2.5 W (others on request) |
| Position indicator: contact rating | |
| – Voltage | ≤50 V AC/DC |
| – Current | 80 °C: ≤1.2 A<br>200 °C: ≤1 A |
| Valve position indication | visual (mechanical) |

[1] >1 bar with reduced number of cycles

[2] Maximum values: depending on operating conditions and sealing materials

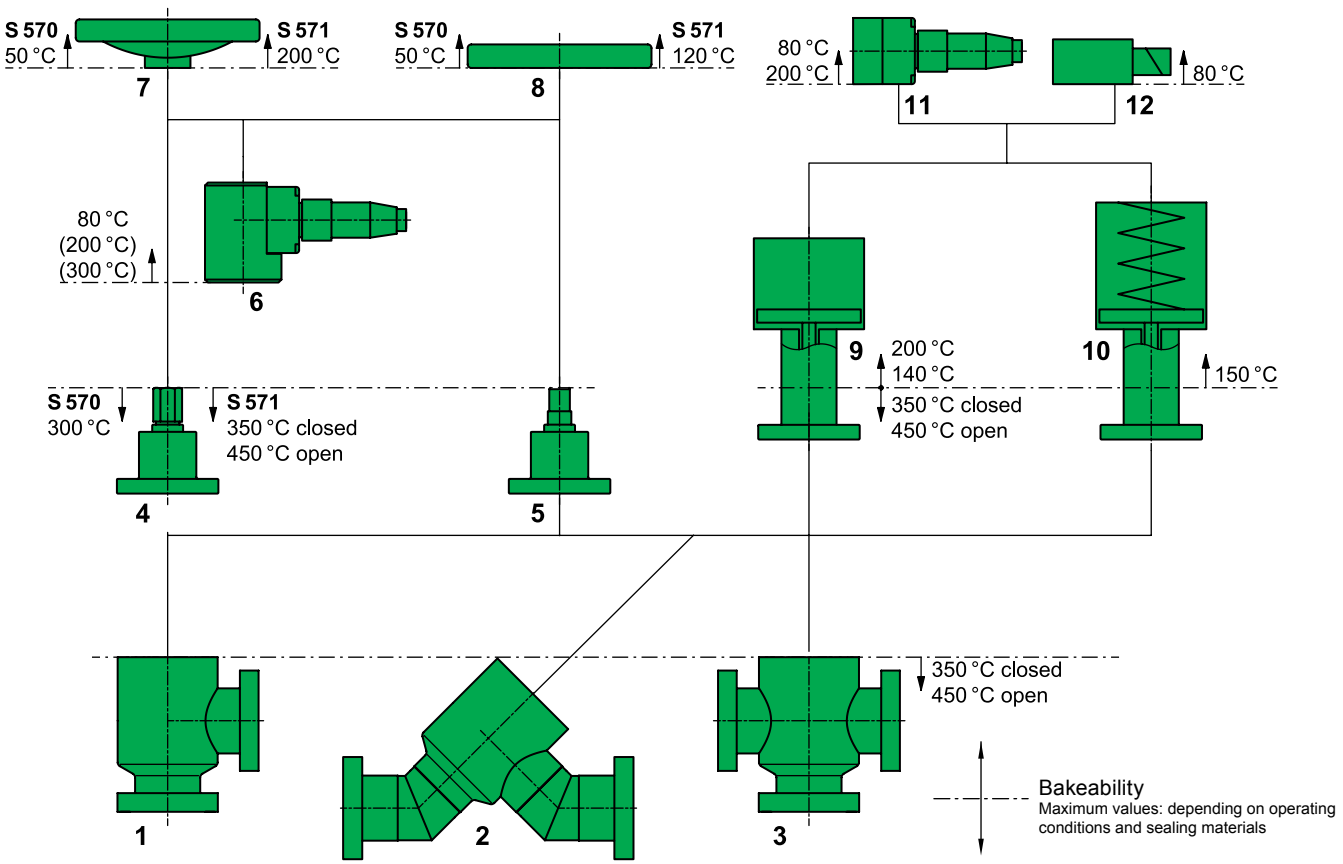
[3] Further details and options: see pages 210 + 211

Further technical data on next page

Continued Technical data

| DN (nominal I. D.) | | CF-F flange | Conductance (molecular flow) | Valve with manual actuator: Torque | | Turns per stroke | Weight | | Valve with pneumatic actuator, single acting with closing spring: Compressed air min. – max. overpressure | | Closing or opening time | Volume of pneumatic actuator | | Weight | | Valve with pneumatic actuator, double acting: Compressed air min. – max. overpressure | | Closing or opening time | Volume of pneumatic actuator | | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | O. D. | $l s^{-1}$ | Nm | ftlb | n | kg | lbs | bar | psi | s | l | $ft^3$ | kg | lbs | bar | psi | s | l | $ft^3$ | kg | lbs |
| 10 | ⅜ | 1⅓ | 2 | – | – | – | – | – | 6 – 9 | 87 – 131 | 0.5 | 0.07 | 0.002 | 1.75 | 3.9 | – | – | – | – | – | – | – |
| 16 | ⅝ | 1⅓ | 5 | 4 | 3 | 6 | 0.8 | 1.8 | 6 – 9 | 87 – 131 | 1 | 0.12 | 0.004 | 4.6 | 10.1 | 4 – 5 | 58 – 73 | 1 | 0.08 | 0.003 | 2.9 | 6.4 |
| 40 | 1½ | 2¾ | 50 | 10 | 7.5 | 8 | 2.3 | 5 | 6 – 9 | 87 – 131 | 2 | 0.35 | 0.01 | 9 | 19.8 | 4 – 5 | 58 – 73 | 2 | 0.32 | 0.011 | 6 | 13 |
| 63 | 2½ | 4½ | 125 | 45 | 33 | 4.5 | 8 | 17.8 | 6 – 9 | 87 – 131 | 4 | 0.8 | 0.028 | 26 | 57.3 | 4 – 5 | 58 – 73 | 2 | 0.55 | 0.02 | 17.2 | 37.3 |
| 100 | 4 | 6 | 380 | 90 | 66 | 6.4 | 16 | 35.2 | 6 – 9 | 87 – 131 | 4 | 2.4 | 0.085 | 35 | 77.2 | 4 – 5 | 58 – 73 | 4 | 1.5 | 0.053 | 26 | 57.3 |
| 160 | 6 | 8 | 940 | 125 | 92 | 8 | 36 | 79.2 | 6 – 9 | 87 – 131 | 7 | 4.8 | 0.17 | 136 | 299 | 4 – 5 | 58 – 73 | 7 | 3.3 | 0.116 | 65 | 143 |

## Bodies and actuators: modular selection




1 – 3 Valve body (angle, inline, T valve), plate, bellows — $10^8$ Gy, bakeable to 450 °C open / 350 °C closed

4 Manual actuator with hexagon head — DN 16 – 40 $10^8$ Gy, bakeable to 450 °C open / 350 °C closed; DN 63 – 160 $10^7$ Gy, bakeable to 300 °C open and closed

5 Manual actuator with cylindrical head — DN 16 – 40 $10^8$ Gy, bakeable to 450 °C open / 350 °C closed; DN 63 – 160 $10^7$ Gy, bakeable to 300 °C open and closed

| | | | |
|---|---|---|---|
| 6 | Position indicator for manual actuator | | $10^5$ Gy, bakeable to 80 °C<br>(options: $10^6$ Gy / 200 °C, $10^8$ Gy / 300 °C) |
| 7 | Handwheel for hexagon head | DN 16 – 40<br>DN 63 – 100 | $10^8$ Gy, bakeable to 200 °C<br>$10^4$ Gy, bakeable to 50 °C |
| 8 | Handwheel with free wheel for cylindrical head | DN 16 – 40<br>DN 63 – 100 | $10^5$ Gy, bakeable to 120 °C<br>$10^4$ Gy, bakeable to 50 °C |
| 9 | Pneumatic actuator, double acting | | $10^5$ Gy, bakeable to 200 °C (options: $10^6$ Gy / 140 °C) |
| 10 | Pneumatic actuator, single acting with closing spring | | $10^5$ Gy, bakeable to 150 °C (options: $10^6$ Gy / 140 °C) |
| 11 | Position indicator | | $10^5$ Gy, bakeable to 80 °C (option: $10^6$ Gy / 200 °C) |
| 12 | Solenoid valve | | $10^4$ Gy, bakeable to 80 °C |

## Options

**Actuator**

- Solenoid valve for impulse actuation:
  last valve position is maintained at power failure
- Other solenoid valve voltage (standard: 24 V DC)
- Position indicator for manual and pneumatic actuator bakeable to 200 °C [1)]
  (standard: 80 °C)
- Double position indicator
  (2 switches each for the positions «open» and «closed»)
- Pneumatic actuator radiation resistant to $10^6$ Gy, bakeable to 140 °C [1)]
- Manual actuator with cylindrical head

**Valve**

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

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

**Ordering information for options:**
Ordering No. of valve-X (e. g. 57132-GE02-X, X = T valve)

## Spare parts

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

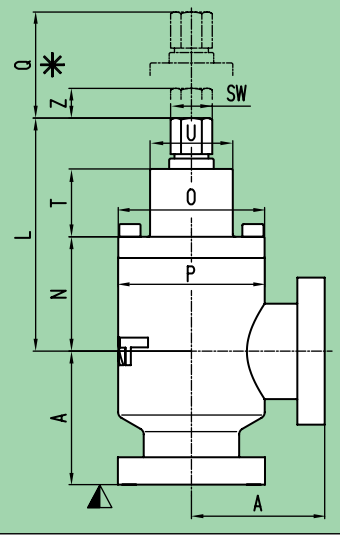
## Accessories

- **Flexible bake-out jacket**: see page 270
- **Flange connections**
  for installation of the valve: see series 33
- **Handwheel**
  - for hexagon head (DN 16 – 40)
  - with free wheel for cylindrical head (DN 16 – 40)
  - with sliding clutch for hexagon head (DN 63 – 100)
  - with sliding clutch and free wheel for cylindrical head (DN 63 – 100)

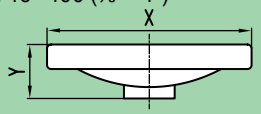
E

## Main dimensions

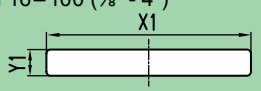
**Valve with manual actuator: hexagon head**
DN 16–160 (⅝"–6")



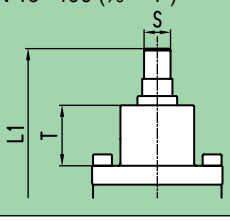

**handwheel for hexagon head**
DN 16–100 (⅝" - 4")



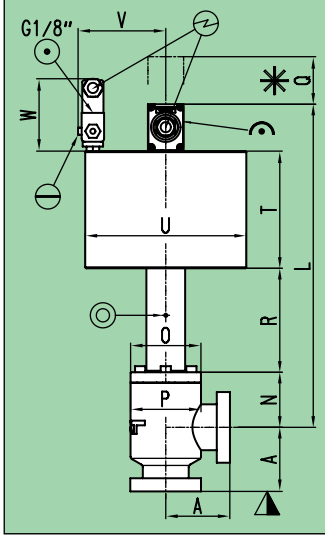

**handwheel for cylinder**
DN 16–100 (⅝" - 4")



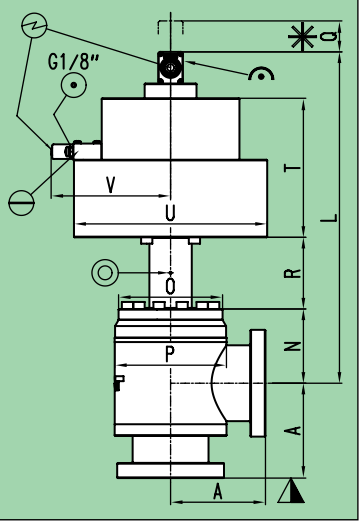

**cylindrical head**
DN 16–100 (⅝" - 4")




**Valve with pneumatic actuator: single acting with closing spring**
DN 10–63 (⅜"–2½")




DN 100–160 (4"–6")




▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⊖ Electrical connection
◠ Mechanical position indication
⊖ Emergency operation
◎ Leak detection hole

Flange dimensions: see page 213

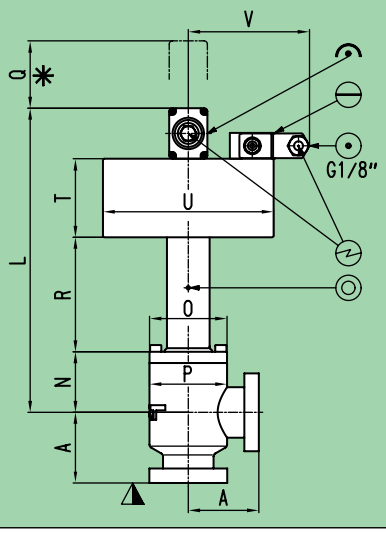
| DN | | 16 | 40 | 63 | 100 | 160 |
|---|---|---|---|---|---|---|
| | | ⅝ | 1½ | 2½ | 4 | 6 |
| A | mm | 38 | 63 | 105 | 135 | 167 |
| | inch | 1.50 | 2.48 | 4.13 | 5.31 | 6.57 |
| L | mm | 100.20 | 126 | 185.50 | 258.50 | 285.10 |
| | inch | 3.94 | 4.96 | 7.30 | 10.18 | 11.22 |
| L1 | mm | 115.70 | 133.50 | 185.50 | 258.50 | – |
| | inch | 4.55 | 5.26 | 7.30 | 10.18 | |
| N | mm | 52.60 | 54 | 88 | 106 | 134.60 |
| | inch | 2.07 | 2.13 | 3.46 | 4.17 | 5.30 |
| O | mm | 54 | 69 | 102 | 148 | 202 |
| | inch | 2.13 | 2.72 | 4.02 | 5.83 | 7.95 |
| P | mm | 52 | 69 | 102 | 159 | 206 |
| | inch | 2.05 | 2.72 | 4.02 | 6.26 | 8.11 |
| Q | mm | 60.80 | 78 | 134.50 | 163.50 | 264.90 |
| | inch | 2.39 | 3.07 | 5.29 | 6.44 | 10.43 |
| S | mm | 12 | 14 | 20 | 30 | – |
| | inch | 0.47 | 0.55 | 0.79 | 1.18 | |
| SW | mm | 13 | 17 | 22 | 27 | 36 |
| | inch | 0.51 | 0.67 | 0.87 | 1.06 | 1.42 |
| T | mm | 33 | 34 | 68.50 | 87 | 112 |
| | inch | 1.77 | 1.34 | 2.70 | 3.43 | 4.41 |
| U | mm | 32 | 39 | 60 | 68 | 78 |
| | inch | 1.26 | 1.54 | 2.36 | 2.68 | 3.07 |
| X | mm | 62 | 125 | 250 | 500 | – |
| | inch | 2.44 | 4.92 | 9.84 | 19.69 | |
| X1 | mm | 62 | 125 | 250 | 500 | – |
| | inch | 2.44 | 4.92 | 9.84 | 19.69 | |
| Y | mm | 23 | 33 | 72 | 80 | – |
| | inch | 0.91 | 1.30 | 2.83 | 3.25 | |
| Y1 | mm | 12 | 16 | 75 | 95 | – |
| | inch | 0.47 | 0.63 | 2.95 | 3.74 | |
| Z | mm | 7.50 | 14 | 20 | 32 | 44 |
| | inch | 0.30 | 0.55 | 0.79 | 1.26 | 1.73 |

Flange dimensions: see page 213

| DN | | 10 | 16 | 40 | 63 | 100 | 160 |
|---|---|---|---|---|---|---|---|
| | | ⅜ | ⅝ | 1½ | 2½ | 4 | 6 |
| A | mm | 38 | 38 | 63 | 105 | 135 | 167 |
| | inch | 1.50 | 1.50 | 2.48 | 4.13 | 5.31 | 6.57 |
| L | mm | 192.60 | 250.30 | 317 | 375 | 471.30 | 592 |
| | inch | 7.58 | 9.85 | 12.48 | 14.76 | 18.56 | 23.31 |
| N | mm | 35.90 | 52.60 | 54 | 88 | 105.70 | 135 |
| | inch | 1.41 | 2.07 | 2.13 | 3.46 | 4.16 | 5.31 |
| O | mm | 47 | 54 | 69 | 102 | 148 | 202 |
| | inch | 1.85 | 2.13 | 2.72 | 4.02 | 5.83 | 7.95 |
| P | mm | 28 | 36 | 69 | 102 | 159 | 206 |
| | inch | 1.10 | 1.42 | 2.72 | 4.02 | 6.26 | 8.11 |
| Q | mm | 41 | 83.70 | 93 | 115 | 138.70 | 183 |
| | inch | 1.61 | 3.30 | 3.66 | 4.53 | 5.46 | 7.20 |
| R | mm | 15.70 | 79.70 | 102 | 93 | 102 | 130 |
| | inch | 0.62 | 3.14 | 4.02 | 3.66 | 4.02 | 5.12 |
| T | mm | 57 | 72 | 115 | 148 | 198 | 250 |
| | inch | 2.24 | 2.83 | 4.53 | 5.83 | 7.80 | 9.84 |
| U | mm | 98 | 108 | 158 | 198 | 275 | 328 |
| | inch | 3.86 | 4.25 | 6.22 | 7.80 | 10.83 | 12.91 |
| V | mm | 84 | 61 | 86 | 131.5 | 170 | 196.5 |
| | inch | 3.31 | 2.40 | 3.39 | 5.18 | 6.69 | 7.74 |
| W | mm | – | 71 | 71 | 27 | 27 | 27 |
| | inch | | 2.80 | 2.80 | 1.06 | 1.06 | 1.06 |

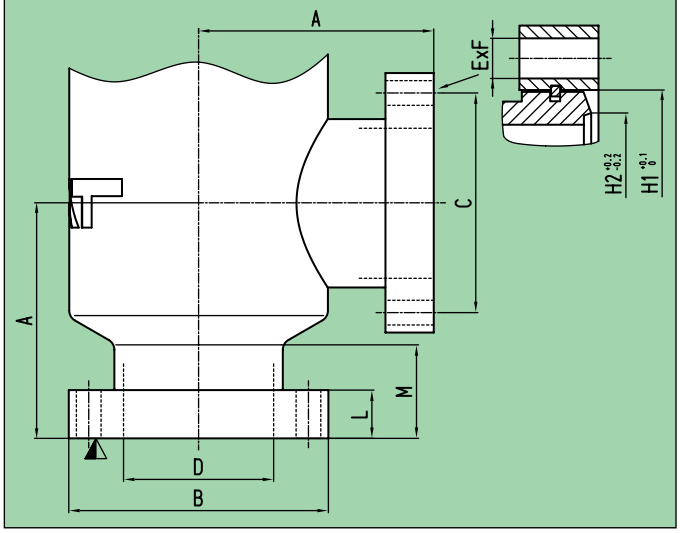
## Main dimensions

**Valve with pneumatic actuator: double acting**
DN 63–160 (2½"–6")




## Flange dimensions

**CF-R**
DN 16–160 (⅝"–6")




- Valve seat side
- Required for dismantling
- Compressed air connection
- Electrical connection
- Mechanical position indication
- Emergency operation
- Leak detection hole

| DN | | 16 | 40 | 63 | 100 | 160 |
|---|---|---|---|---|---|---|
| | inch | ⅝ | 1½ | 2½ | 4 | 6 |
| A | mm | 38 | 63 | 105 | 135 | 167 |
| | inch | 1.50 | 2.48 | 4.13 | 5.31 | 6.57 |
| L | mm | 232.30 | 272 | 317 | 382.70 | 460 |
| | inch | 9.15 | 10.71 | 12.48 | 15.07 | 18.11 |
| N | mm | 52.60 | 54 | 88 | 105.70 | 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 | 60.70 | 68 | 113 | 142.30 | 185 |
| | inch | 2.39 | 2.68 | 4.45 | 5.60 | 7.28 |
| R | mm | 79.70 | 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 | 3.70 | 4.25 | 5.12 | 5.94 | 6.75 |

| DN | | 10/16 | 40 | 63 | 100 | 160 |
|---|---|---|---|---|---|---|
| | inch | ⅜/⅝ | 1½ | 2½ | 4 | 6 |
| O.D. | inch | 1⅓/1⅓ | 2¾ | 4½ | 6 | 8 |
| A | mm | 38 | 63 | 105 | 135 | 167 |
| | inch | 1.50 | 2.48 | 4.13 | 5.31 | 6.57 |
| B | mm | 34 | 69.50 | 113.50 | 152 | 202.50 |
| | inch | 1.34 | 2.74 | 4.47 | 5.98 | 7.97 |
| C | mm | 27 | 58.70 | 92.10 | 130.30 | 181 |
| | inch | 1.06 | 2.31 | 3.62 | 5.13 | 7.12 |
| D | mm | 16 | 40 | 64 | 102 | 150 |
| | inch | 0.63 | 1.57 | 2.52 | 4.01 | 5.9 |
| E×F | mm | 6×4.30 | 6×6.60 | 8×8.40 | 16×8.40 | 20×8.40 |
| | inch | 6×0.17 | 6×0.26 | 8×0.33 | 16×0.33 | 20×0.33 |
| H1 | mm | 21.40 | 48.30 | 82.50 | 120.65 | 171.45 |
| | inch | 0.84 | 1.90 | 3.25 | 4.75 | 6.75 |
| H2 | mm | 18.50 | 42 | 77.40 | 115.50 | 166 |
| | inch | 0.73 | 1.62 | 3.05 | 4.55 | 6.53 |
| L | mm | 7.40 | 12 | 19 | 21.50 | 22 |
| | inch | 0.29 | 0.47 | 0.75 | 0.85 | 0.87 |
| M | mm | 22.60 | 25.60 | 46.60 | 60 | 62 |
| | inch | 0.89 | 1.01 | 1.83 | 2.36 | 2.44 |

## Main applications

Gas inlet valve for smallest gas flows to control the process pressure



## Ordering information

**Valve with manual actuator** (handwheel) **or stepper motor with integrated controller**

| DN | | Ordering numbers CF-R | | | |
|---|---|---|---|---|---|
| mm | inch | Valve with manual actuator | Valve with stepper motor and integrated controller | | |
| | | | RS232/1 sensor | Logic/1 sensor | RS485/1 sensor |
| 16 | ⅝ | 59024-GE01 | 59024-GEGG | 59024-GEGC | 59024-GEGJ |

## Technical data

Valve

| | |
|---|---|
| Leak rate: valve body, valve seat | $< 1 \cdot 10^{-10}$ mbar l s$^{-1}$ |
| Pressure range | UHV to 10 bar (abs) |
| Differential pressure at opening | ≤ 10 bar |
| Dead volume | |
| – Seat side | 2.7 cm$^3$ |
| – Side port | 1.1 cm$^3$ |
| Cycles | 20 000 |
| Bake-out temperature [1] | |
| – Valve body | ≤ 300 °C |
| – Manual actuator | ≤ 300 °C |
| – Stepper motor | ≤ 50 °C |
| Heating and cooling rate | ≤ 60 °C h$^{-1}$ |
| Material | |
| – Valve body | AISI 660 (1.4943), AISI 316L (1.4404) |
| – Diaphragm | AISI 301 (1.4310), gold-plated |
| Mounting position | any |
| Valve position indication | visual (scale) |
| Conductance (molecular flow) | 0.05 l s$^{-1}$ |
| Adjustable gas flow | $1 \cdot 10^{-10}$ mbar l s$^{-1}$ to 100 mbar l s$^{-1}$ |

[1] Maximum values: depending on operating conditions and sealing materials

Stepper motor with integrated controller

| | |
|---|---|
| Position resolution | 100 000 (steps = 0 – 90° rotation) |
| Closing time | 3.5 s |
| Further technical data | see pages 146 – 149 |

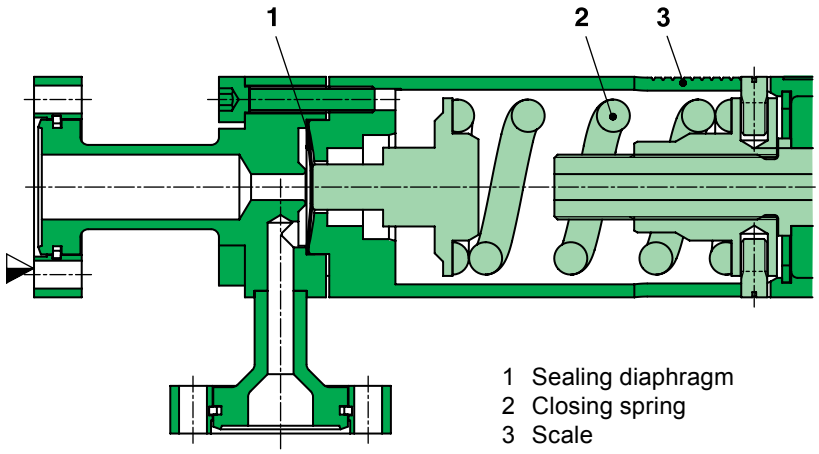
## Features

Body material: stainless steel

Resistant to corrosive and aggressive gases

Precise, reproducible adjustment of the gas flow

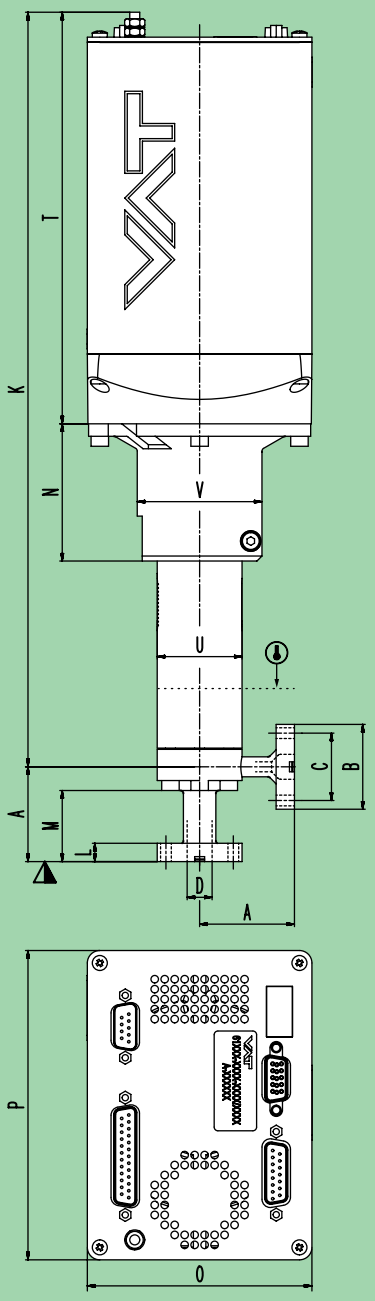
Functional principle




1 Sealing diaphragm
2 Closing spring
3 Scale
▽ Valve seat side

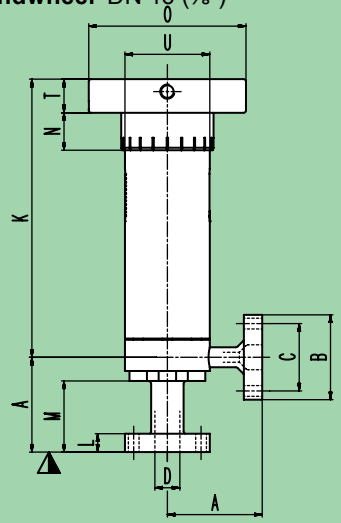
## Dimensions

**Valve with stepper motor and controller** DN 16 (⅝")




▽ Valve seat side ⏬ Bake-out area

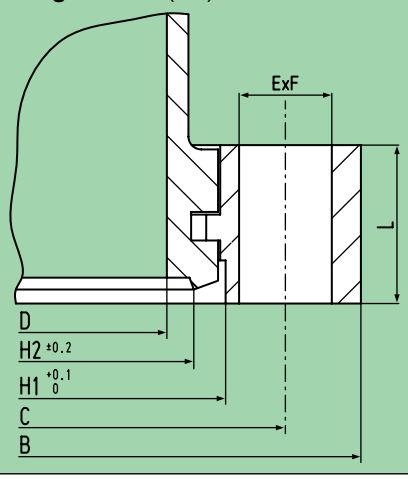
**Valve with manual actuator: handwheel** DN 16 (⅝")




▽ Valve seat side

| | | Manual actuator | Motor |
|---|---|---|---|
| DN | mm | 16 | 16 |
| | inch | ⅝ | ⅝ |
| A | mm | 38 | 38 |
| | inch | 1.50 | 1.50 |
| K | mm | 111.50 | 302.50 |
| | inch | 4.39 | 11.91 |
| M | mm | 28.50 | 28.50 |
| | inch | 1.12 | 1.12 |
| N | mm | 15 | 55 |
| | inch | 0.59 | 2.17 |
| O | mm | 63 | 90 |
| | inch | 2.48 | 3.54 |
| P | mm | – | 124 |
| | inch | | 4.88 |
| T | mm | 13.50 | 165 |
| | inch | 0.53 | 6.50 |
| U | mm | 34 | 34 |
| | inch | 1.34 | 1.34 |
| V | mm | – | 50 |
| | inch | | 1.69 |

**Flange** DN 16 (⅝")




| | | DN 16 | |
|---|---|---|---|
| DN | mm | 16 | CF-F DN 40 flange and inline version on request |
| | inch | ⅝ | |
| B | mm | 34 | |
| | inch | 1.34 | |
| C | mm | 27 | |
| | inch | 1.06 | |
| D | mm | 10 | |
| | inch | 0.39 | |
| E × F | mm | 6 × 4.30 | |
| | inch | 6 × 0.17 | |
| H1 | mm | 21.40 | |
| | inch | 0.84 | |
| H2 | mm | 18.50 | |
| | inch | 0.73 | |
| L | mm | 7.35 | |
| | inch | 0.29 | |

E

## Main applications

Sector valve for storage rings in accelerators and synchrotrons

Isolation valve in microwave transmission lines



## Ordering information

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

| DN | | Ordering numbers (specify control voltage) CF-F | |
|---|---|---|---|
| mm | inch | compact actuator: valve bakeable to 200 °C | extended actuator: valve bakeable to 300 °C |
| 63 | 2½ | 47236-CE74 | 47236-CE44 |
| 100 | 4 | 47240-CE74 | 47240-CE44 |
| 160 | 6 | 47244-CE74 | 47244-CE44 |
| 200 | 8 | 47146-CE74 | 47146-CE44 |

without solenoid valve, with position indicator 80 °C: compact actuator 47 . . . -CE7**2**
extended actuator 47 . . . -CE**2**4

Other versions: see pages 218 + 219

**Bake-out jacket**

See page 270: ordering information and technical data on request

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

**Special version**

Valve with gate seal made of FKM (Viton®) instead of metal: see page 221

## Features

Body material: stainless steel

VATRING configuration: see glossary

Mechanically locked in open and closed position

Radiation resistant

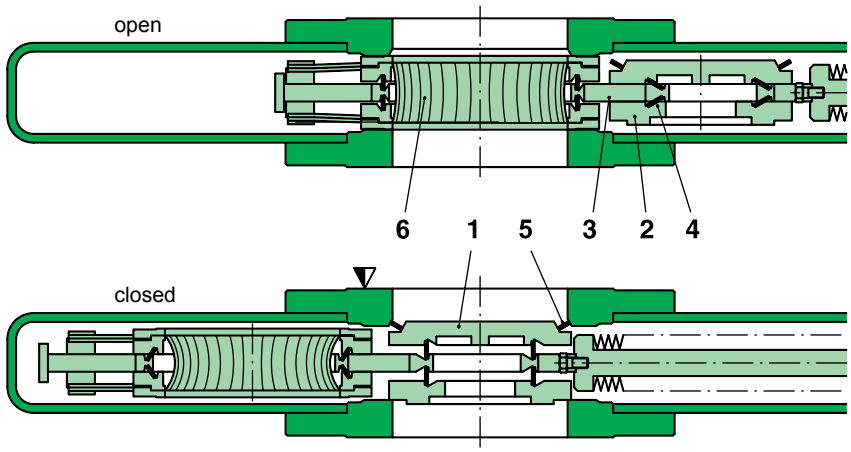
Low RF resistance

Customer specific RF aperture

Reproduceable RF contact due to mechanically loaded springs

Bakeable to 300 °C in open and closed position

Functional principle




1 Gate
2 Counter-plate
3 Guide plate
4 Support
5 VATRING
6 RF contact
▽ Valve seat side

## Technical data

| | |
|---|---|
| Leak rate: valve body, valve seat | $< 1 \cdot 10^{-10}$ mbar $l s^{-1}$ |
| Pressure range | XHV to 2 bar (abs) |
| Differential pressure on the gate | ≤ 1 bar |
| Differential pressure at opening | ≤ 500 mbar [1] |
| Cycles until first service | |
| – DN 63 – 160 | 10 000 |
| – DN 200 | 5 000 |
| Bake-out temperature [2] | |
| – Valve body | ≤ 300 °C |
| – Pneumatic actuator | ≤ 200 °C |
| – Solenoid valve | ≤ 80 °C |
| – Position indicator | ≤ 80 °C (option: 200 °C) |
| Heating and cooling rate | |
| – DN 63 – 160 | ≤ 50 °C $h^{-1}$ |
| – DN 200 | ≤ 25 °C $h^{-1}$ |
| Material | |
| – Valve body, mechanism | AISI 316L (1.4435, 1.4404) |
| – Bellows | AISI 316L (1.4435) |
| – RF contact | AISI 301 (1.4310), thermoresistant silver-coated |
| Seal: bonnet, gate | metal |
| Feedthrough | bellows |
| Mounting position | beam line horizontal, otherwise any |
| Solenoid valve | 24 V DC, 2.5 W (others on request) |
| Position indicator: contact rating | |
| – Voltage | ≤ 50 V AC / DC |
| – Current | 80 °C: ≤ 1.2 A<br>200 °C: ≤ 1 A |
| Valve position indication | visual (mechanical) |

[1] 1 bar with reduced number of cycles

[2] Maximum values: depending on operating conditions and sealing materials

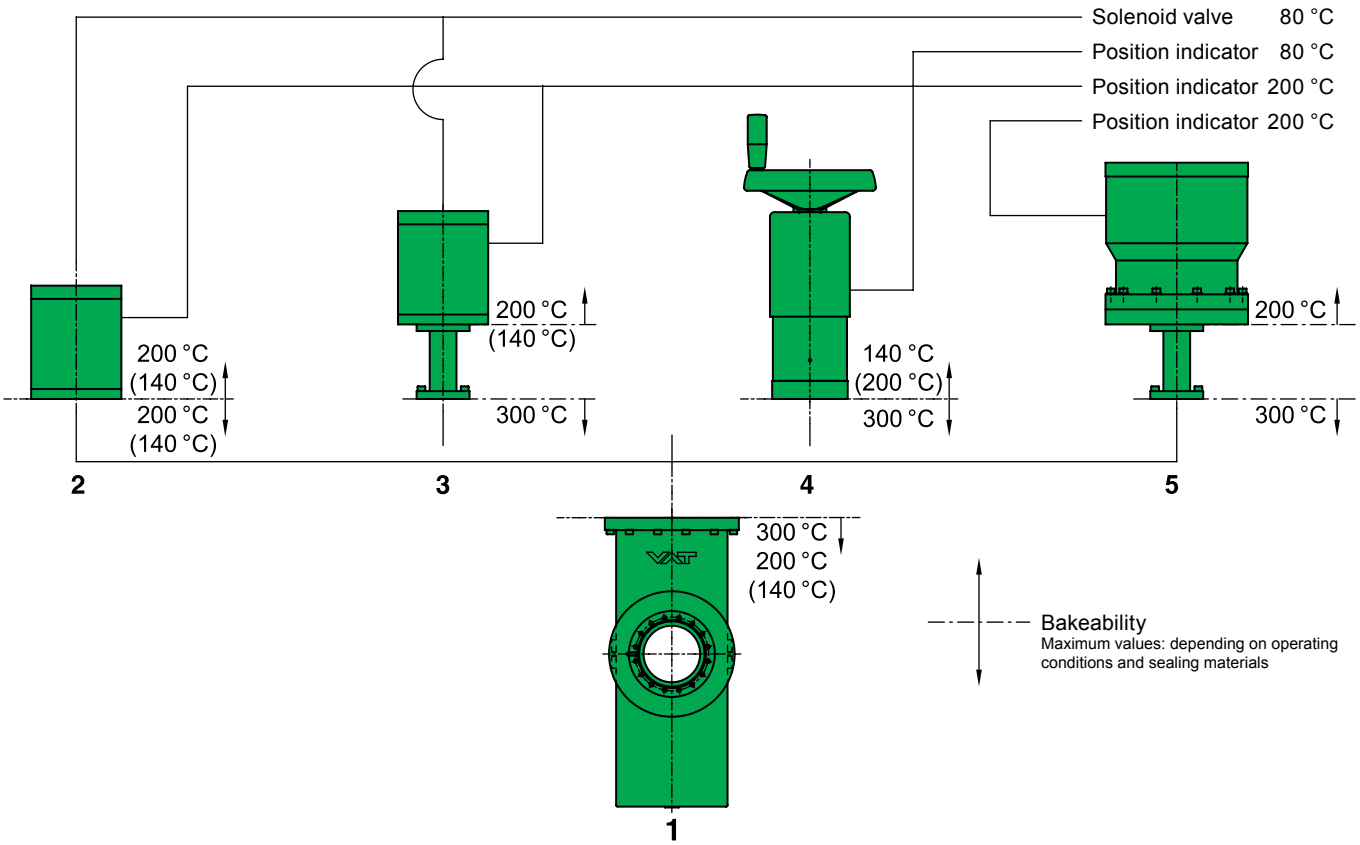
Further technical data on next page

F

Continued Technical data

| DN (nominal I. D.) | | CF-F flange | Conductance (molecular flow) | Compressed air min. – max. overpressure | | Volume of pneu-matic actuator | | Closing or opening time | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | O. D. | ls$^{-1}$ | bar | psi | l | ft$^3$ | s | kg | lbs |
| 63 | 2½ | 4½ | 400 | 4 – 8 | 58 – 116 | 0.7 | 0.024 | 2 | 21 | 46 |
| 100 | 4 | 6 | 1400 | 4 – 8 | 58 – 116 | 1.7 | 0.060 | 4 | 36 | 80 |
| 160 | 6 | 8 | 3700 | 4 – 8 | 58 – 116 | 5.0 | 0.180 | 9 | 59 | 130 |
| 200 | 8 | 10 | 6100 | 4 – 8 | 58 – 116 | 9.7 | 0.340 | 18 | 148 | 326 |

## Body and actuators: modular selection



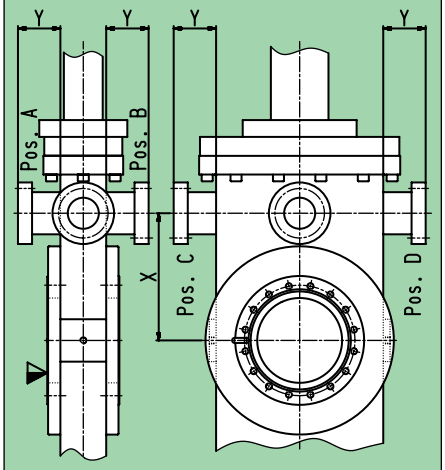

| | | | |
|---|---|---|---|
| 1 | Valve body, mechanism, bellows | : $10^8$ Gy, bakeable to 300 °C | |
| 2 | Pneumatic actuator: compact | : $10^5$ Gy, bakeable to 200 °C | Option: $10^6$ Gy, bakeable to 140 °C |
| 3 | Pneumatic actuator: extended | : $10^5$ Gy, bakeable to 200 °C | Option: $10^6$ Gy,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

## Options

### Actuator

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

Dia. 1




### Valve

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

| DN valve | mm<br>inch | 63<br>2½ | 100<br>4 | 160<br>6 | 200<br>8 |
|---|---|---|---|---|---|
| Recommended port CF-F | mm<br>inch | 16<br>⅝ | 40<br>1½ | 40<br>1½ | 40<br>1½ |
| X | mm<br>inch | 115<br>4.53 | 135<br>5.31 | 220<br>8.66 | 280<br>11.02 |
| Y | mm<br>inch | 20<br>0.79 | 50<br>1.97 | 50<br>1.97 | 50<br>1.97 |
| Other ports on request | | | | | |

- Customer specific RF aperture
- RF contact «finger type» made of CuBe
- RF contact «comb type» made of OFHC copper
- Waveguide

**Ordering information for options:**
Ordering No. of valve-X (e. g. 47240-CE44-X,
X = solenoid valve for impulse actuation 220 V 50 Hz)

[1] Maximum values: depending on operating conditions and sealing materials

## Spare parts

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

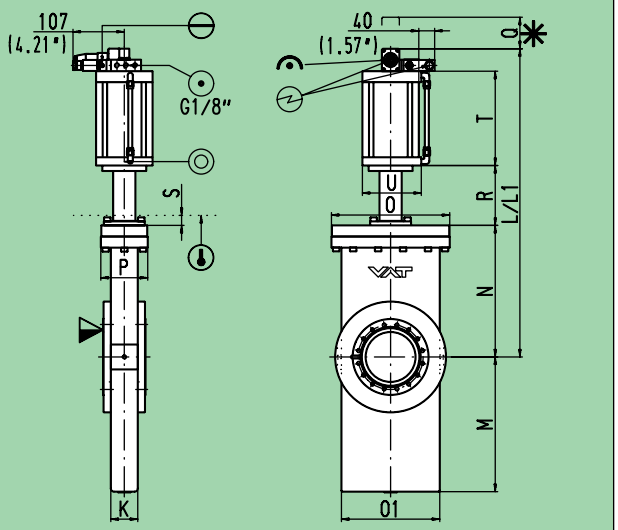
## Accessories

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

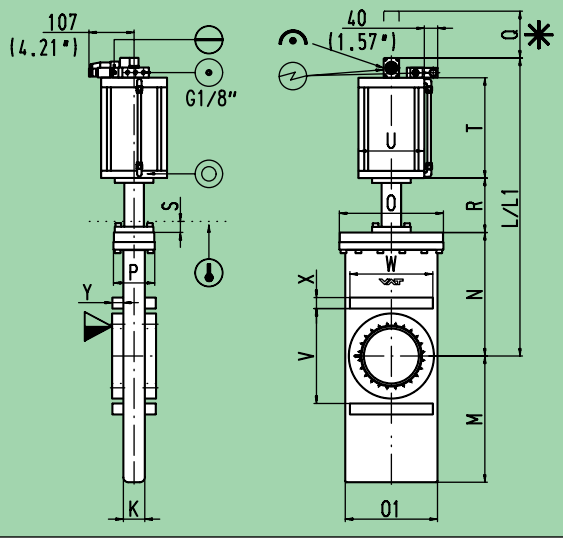
F

## Main dimensions

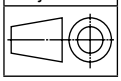
**Valve with pneumatic actuator: double acting**
DN 63–160 (2½"–6")




**Valve with pneumatic actuator: double acting**
DN 200 (8")




Projection E



- Valve seat side
- Required for dismantling
- Compressed air connection
- Electrical connection
- Mechanical position indication
- Leak detection hole
- Emergency operation
- Bake-out area

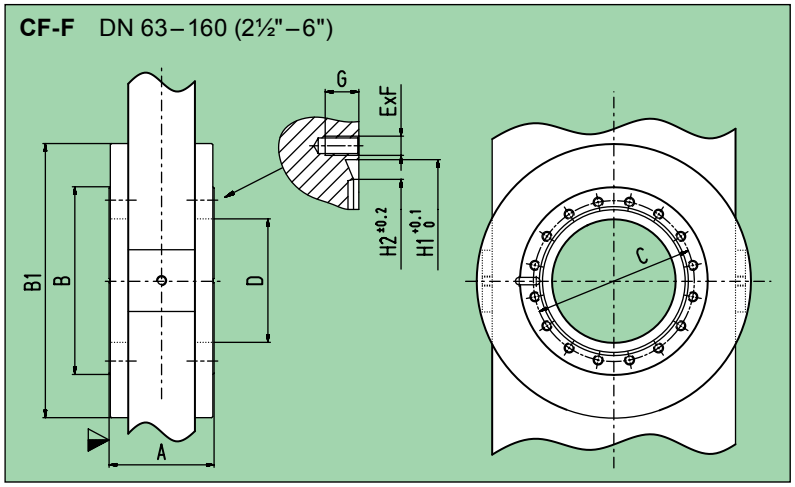
L1 and R for extended actuator
Flange dimensions: see page 221

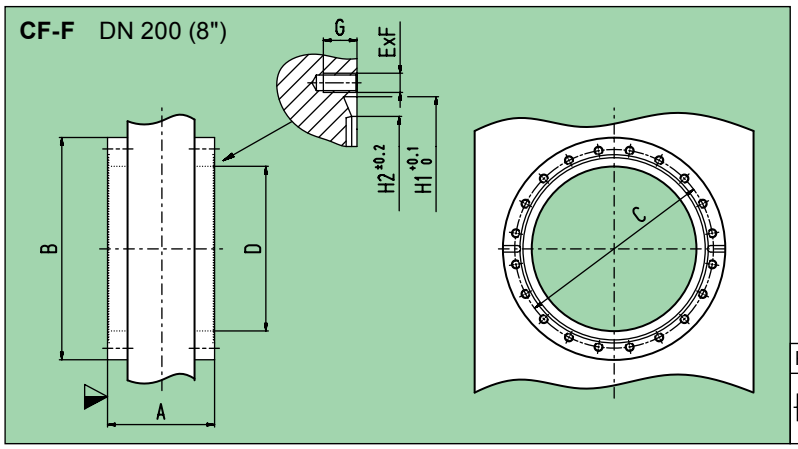
| DN | | 63<br>2½ | 100<br>4 | 160<br>6 |
|---|---|---|---|---|
| K | mm<br>inch | 46<br>1.81 | 54<br>2.13 | 70<br>2.76 |
| L | mm<br>inch | 459<br>18.07 | 537<br>21.14 | 702<br>27.64 |
| L1 | mm<br>inch | 583<br>22.95 | 661<br>26.02 | 826<br>32.52 |
| M | mm<br>inch | 215<br>8.46 | 272<br>10.70 | 356<br>14.02 |
| N | mm<br>inch | 231<br>9.09 | 264<br>10.39 | 370<br>14.57 |
| O | mm<br>inch | 189<br>7.44 | 237<br>9.33 | 287<br>11.30 |
| O1 | mm<br>inch | 156<br>6.14 | 197<br>7.76 | 253<br>9.96 |
| P | mm<br>inch | 77<br>3.03 | 94<br>3.70 | 93<br>3.66 |
| Q | mm<br>inch | 420<br>16.54 | 520<br>20.47 | 700<br>27.56 |
| R | mm<br>inch | 124<br>4.88 | 124<br>4.88 | 124<br>4.88 |
| S | mm<br>inch | 20<br>0.79 | 20<br>0.79 | 20<br>0.79 |
| T | mm<br>inch | 183<br>7.20 | 228<br>8.98 | 287<br>11.30 |
| U | mm<br>inch | 104<br>4.09 | 135<br>5.31 | 190<br>7.48 |

L1 and R for extended actuator
Flange dimensions: see page 221

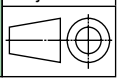
| DN | | 200<br>8 | | |
|---|---|---|---|---|
| K | mm<br>inch | 78<br>3.07 | | |
| L | mm<br>inch | 851<br>33.50 | | |
| L1 | mm<br>inch | 975<br>38.39 | | |
| M | mm<br>inch | 460<br>18.11 | | |
| N | mm<br>inch | 443<br>17.44 | | |
| O | mm<br>inch | 372<br>14.65 | | |
| O1 | mm<br>inch | 336<br>13.23 | | |
| P | mm<br>inch | 114<br>4.49 | | |
| Q | mm<br>inch | 880<br>34.65 | | |
| R | mm<br>inch | 124<br>4.88 | | |
| S | mm<br>inch | 20<br>0.79 | | |
| T | mm<br>inch | 363<br>14.29 | | |
| U | mm<br>inch | 230<br>9.06 | | |
| V | mm<br>inch | 346<br>10.24 | | |
| W | mm<br>inch | 302<br>14.89 | | |
| X | mm<br>inch | 40<br>1.57 | | |
| Y | mm<br>inch | 40<br>1.57 | | |

## Flange dimensions




Projection E



| DN | | | | | |
|---|---|---|---|---|---|
| | mm | 63 | 100 | 160 | 200 |
| | inch | 2½ | 4 | 6 | 8 |
| O.D. | inch | 4½ | 6 | 8 | 10 |
| A | mm | 75 | 85 | 110 | 160 |
| | inch | 2.95 | 3.35 | 4.33 | 6.30 |
| B | mm | 113.50 | 152 | 202.50 | 310 |
| | inch | 4.47 | 5.98 | 7.97 | 12.20 |
| B1 | mm | 180 | 222 | 288 | – |
| | inch | 7.08 | 8.74 | 11.34 | |
| C | mm | 92.10 | 130.30 | 181 | 231.80 |
| | inch | 3.63 | 5.13 | 7.13 | 9.13 |
| D | mm | 63 | 100 | 150 | 200 |
| | inch | 2.48 | 3.94 | 5.91 | 7.87 |
| E × F | mm | 8 × M8 | 16 × M8 | 20 × M8 | 24 × M8 |
| | inch | | | | |
| G | mm | 12 | 14 | 17 | 17 |
| | inch | 0.47 | 0.55 | 0.67 | 0.67 |
| H1 | mm | 82.50 | 120.65 | 171.45 | 222.30 |
| | inch | 3.25 | 4.75 | 6.75 | 8.75 |
| H2 | mm | 77.40 | 115.50 | 166 | 217 |
| | inch | 3.05 | 4.55 | 6.54 | 8.54 |

▼ Valve seat side

## Special version



**HF-UHV gate valve with gate seal made of FKM (Viton®)**

Technical data:

| | |
|---|---|
| Leak rate | |
| – Valve body | $< 5 \cdot 10^{-10}$ mbar ls$^{-1}$ |
| – Valve seat | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| Pressure range | UHV to 1 bar (abs) |
| Differential pressure on the gate | ≤1 bar |
| Cycles until first service | 10000 |
| Bake-out temperature [1] | |
| – Valve body | ≤200 °C |
| – Pneumatic actuator | ≤200 °C |
| – Solenoid valve | ≤ 80 °C |
| – Position indicator | ≤ 80 °C (option: 200 °C) |
| Seal | |
| – Bonnet | metal |
| – Gate | FKM (Viton®) |
| Further details | on request |

[1] Maximum values: depending on operating conditions and sealing materials

F

## Main applications

To preserve the vacuum in accelerators and storge rings in case of an air inrush



## Ordering information

**Series 75.2**
**Gate valve with pneumatic actuator**
double acting
without controller

| DN | | Ordering numbers |
|---|---|---|
| mm | inch | CF-F |
| 40 | 1½ | 75232-CE44 |

**Series 75.0**
**Flap valve with pneumatic actuator**
double acting
without controller

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

**Controller including accessories**

See page 230

## Features

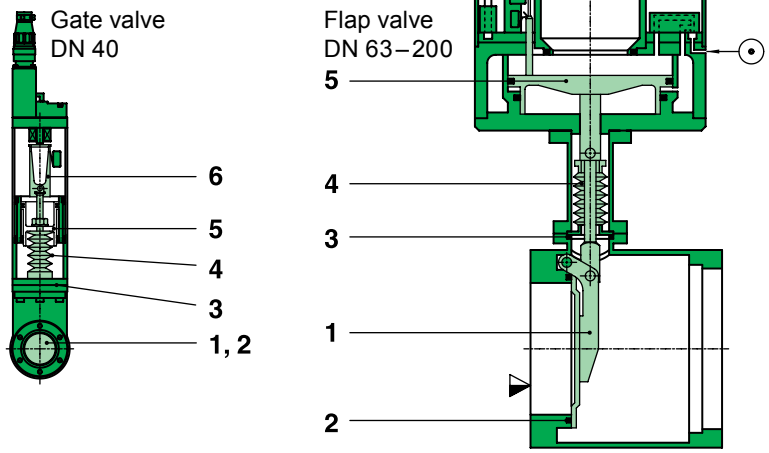
Body material: stainless steel

Closes vacuum-tight in a few milli-seconds

Pneumatic dampening during closing

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

Functional principle




1 Gate / plate
2 Plate seal
3 Bonnet seal
4 Bellows
5 Piston for closing
6 Trigger insert
⊙ Compressed air connection
▼ Valve seat side

## Technical data

| | |
|---|---|
| Leak rate | |
| – Valve body | $< 1 \cdot 10^{-10}$ mbar ls$^{-1}$ |
| – Valve seat | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| Pressure range | $1 \cdot 10^{-10}$ to 2 bar (abs) |
| Differential pressure | see table on next page |
| Cycles until first service | 2000 |
| Bake-out temperature [1] | |
| – Valve body | ≤200 °C<br>(DN 40: trigger insert removed) |
| – Pneumatic actuator | ≤ 50 °C |
| Radiation resistance | |
| – Valve body | $10^5$ Gy |
| – Pneumatic actuator | $10^4$ Gy |
| Material | |
| – Valve body | |
| - DN 40 | AISI 304 (1.4301) |
| - DN 63–200 | AISI 316L (1.4435) |
| – Mechanism | |
| - DN 40 | AISI 304 (1.4301) |
| - DN 63–200 | AISI 316L (1.4435) |
| – Bellows | AISI 316L (1.4404, 1.4435) |
| Seal | |
| – Bonnet | metal |
| – Gate / plate | FKM (Viton®) |
| Feedthrough | bellows |
| Mounting position | seat side marked ▼ in opposite direction of the air inrush |

[1] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

F

Continued Technical data

| DN (nominal I.D.) | | CF-F flange | Conductance (molecular flow) | Differential pressure: valve closed | | Differential pressure at opening | | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Total closing time *) | Opening time | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | In closing direction | In opening direction | In closing direction | In opening direction | | | | | | | | |
| mm | inch | O.D. | $l s^{-1}$ | bar | bar | mbar | bar | bar | psi | l | $ft^3$ | ms | s | kg | lbs |
| Gate valve Series 75.2 | | | | | | | | | | | | | | | |
| 40 | 1½ | 2¾ | 220 | ≤1.2 | ≤1.2 | ≤ 30 | ≤30 | 4–5 | 58–73 | 0.36 | 0.01 | <10 | 9 | 2 | 4.5 |
| Flap valve Series 75.0 | | | | | | | | | | | | | | | |
| 63 | 2½ | 4½ | 200 | ≤2 | ≤1.2 | ≤600 | ≤1 | 5–8 | 73–116 | 3 | 0.11 | 13 | 7 | 25 | 55 |
| 100 | 4 | 6 | 700 | ≤2 | ≤1.2 | ≤180 | ≤1 | 5–8 | 73–116 | 3 | 0.11 | 15 | 7 | 29 | 64 |
| 160 | 6 | 8 | 1700 | ≤2 | ≤0.5 | ≤ 50 | ≤1 | 5–8 | 73–116 | 3 | 0.11 | 23 | 7 | 36 | 80 |
| 200 | 8 | 10 | 2500 | ≤2 | ≤0.07 | ≤ 25 | ≤1 | 5–8 | 73–116 | 3 | 0.11 | 40 | 7 | 42 | 93 |

*) from sensor signal to leak tight valve

## Option

– Customer specified flanges

**Ordering information for option:**
Ordering No. of valve-X (e. g. 75040-CE44-X, X = special flanges)

## Spare parts

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

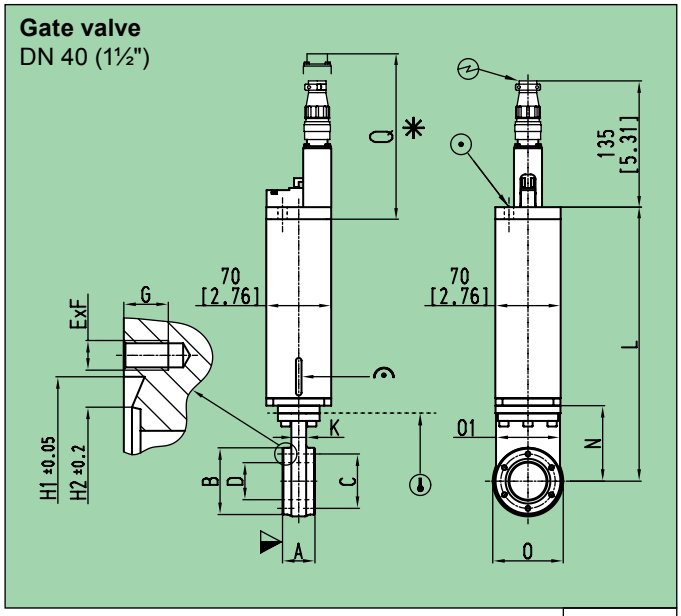
## Accessories

– **Controller**: see page 230

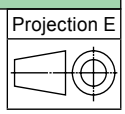
– **Flange connections**
for installation of the valve: see series 33

# Dimensions

**Gate valve**
DN 40 (1½")



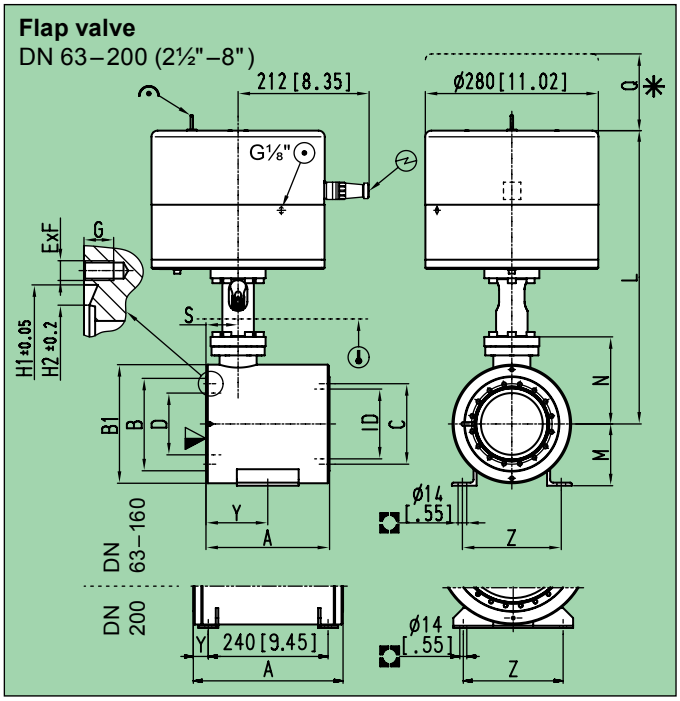

Projection E



- ▼ Valve seat side
- ✳ Required for dismantling
- ⊙ Compressed air connection
- ⊖ Electrical connection
- ◠ Mechanical position indication
- ⓘ Bake-out area
- ◘ For attachment

| DN | mm / inch | 40<br>1½ | | | |
|---|---|---|---|---|---|
| A | mm<br>inch | 35<br>1.38 | | | |
| B | mm<br>inch | 72<br>2.83 | | | |
| C | mm<br>inch | 58.70<br>2.31 | | | |
| D | mm<br>inch | 40<br>1.57 | | | |
| E × F | | 6 × M6 | | | |
| G | mm<br>inch | 7<br>0.28 | | | |
| H1 | mm<br>inch | 48.35<br>1.90 | | | |
| H2 | mm<br>inch | 42<br>1.65 | | | |
| K | mm<br>inch | 16<br>0.63 | | | |
| L | mm<br>inch | 295.50<br>11.63 | | | |
| N | mm<br>inch | 81.50<br>3.21 | | | |
| O | mm<br>inch | 76<br>2.99 | | | |
| O1 | mm<br>inch | 69<br>2.72 | | | |
| Q | mm<br>inch | 195<br>7.68 | | | |

**Flap valve**
DN 63–200 (2½"–8")




| DN | mm / inch | 63<br>2½ | 100<br>4 | 160<br>6 | 200<br>8 |
|---|---|---|---|---|---|
| A | mm<br>inch | 150<br>5.91 | 200<br>7.87 | 250<br>9.84 | 300<br>11.81 |
| B | mm<br>inch | 113.50<br>4.47 | 152<br>5.98 | 202.50<br>7.97 | 253<br>9.96 |
| B1 | mm<br>inch | 154<br>6.06 | 192<br>7.56 | 242<br>9.53 | 306<br>12.05 |
| C | mm<br>inch | 92.10<br>3.63 | 130.30<br>5.13 | 181<br>7.13 | 231.80<br>9.13 |
| D | mm<br>inch | 63<br>2.48 | 100<br>3.94 | 150<br>5.91 | 200<br>7.87 |
| E × F | | 8 × M8 | 16 × M8 | 20 × M8 | 24 × M8 |
| G | mm<br>inch | 12<br>0.47 | 12<br>0.47 | 12<br>0.47 | 12<br>0.47 |
| H1 | mm<br>inch | 82.55<br>3.25 | 120.65<br>4.75 | 171.50<br>6.75 | 222.35<br>8.75 |
| H2 | mm<br>inch | 77.40<br>3.05 | 115.50<br>4.55 | 166<br>6.54 | 217<br>8.54 |
| ID | mm<br>inch | 76<br>2.99 | 113<br>4.45 | 164<br>6.47 | 214<br>8.43 |
| L | mm<br>inch | 456<br>17.95 | 475<br>18.70 | 500<br>19.69 | 526<br>20.71 |
| M | mm<br>inch | 80<br>3.15 | 100<br>3.94 | 125<br>4.92 | 160<br>6.30 |
| N | mm<br>inch | 122<br>4.80 | 141<br>5.55 | 166<br>6.54 | 192<br>7.56 |
| Q | mm<br>inch | 83<br>3.27 | 83<br>3.27 | 85<br>3.35 | 84<br>3.31 |
| S | mm<br>inch | 52<br>2.05 | 52<br>2.05 | 52<br>2.05 | 52<br>2.05 |
| Y | mm<br>inch | 75<br>2.95 | 100<br>3.94 | 125<br>4.92 | 30<br>1.18 |
| Z | mm<br>inch | 120<br>4.72 | 160<br>6.30 | 160<br>6.30 | 200<br>7.87 |

F

## Main applications

To preserve the vacuum in accelerators and storge rings in case of an air inrush



## Ordering information

**Series 77.3**
**Slot shutter with pneumatic actuator**
double acting
without controller

| DN | | Circular opening | | Ordering numbers |
|---|---|---|---|---|
| mm | inch | mm | inch | CF-F |
| 40 | 1½ | Ø 40 | Ø 1½ | 77332-CE44 |

| DN | | Slot opening D × D1 (height × width) | | Ordering numbers |
|---|---|---|---|---|
| mm | inch | mm | inch | CF-F |
| 63 | 2½ | 35 × 50 | 1.38 × 1.97 | 77336-CE44 |
| 100 | 4 | 35 × 80 | 1.38 × 3.15 | 77340-CE44 |
| 160 | 6 | 35 × 130 | 1.38 × 5.12 | 77344-CE44 |

**Series 77.1**
**Flap shutter with pneumatic actuator**
double acting
without controller

| DN | | Circular opening | | Ordering numbers |
|---|---|---|---|---|
| mm | inch | mm | inch | CF-F |
| 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 page 230

## Features

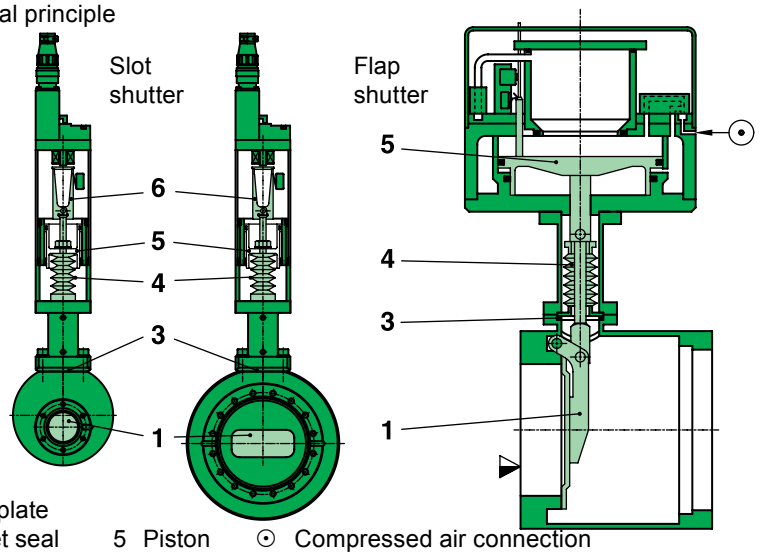
Body material: stainless steel

Closes to a small leak in a few milli-seconds

Pneumatic dampening during closing

Closing by releasing a mechanical latch (Series 77.3) or fast venting / evacuation of the pneumatic cylinder (Series 77.1)

Functional principle




1 Gate / plate
3 Bonnet seal
4 Bellows
5 Piston
6 Latch
⊙ Compressed air connection
▽ Valve seat side

## Technical data

| | |
|---|---|
| Leak rate | |
| – Valve body | < $1 \cdot 10^{-10}$ mbar $l s^{-1}$ |
| – Valve seat | |
| - Series 77.3 | < 1 mbar $l s^{-1}$ |
| - Series 77.1 | < 30 mbar $l s^{-1}$ |
| Pressure range | UHV to 1.2 bar (abs) |
| Differential pressure | see table on next page |
| Cycles until first service | |
| – Slot shutter | 5000 [1] |
| – Flap shutter | 2000 [1] |
| Bake-out temperature [2] | |
| – Valve body | ≤ 300 °C |
| – Pneumatic actuator | ≤ 50 °C |
| Radiation resistance | |
| – Valve body | $10^8$ Gy |
| – Pneumatic actuator | $10^4$ Gy |
| Material | |
| – Valve body | AISI 316L (1.4435, 1.4404) |
| – Mechanism | |
| - DN 40 | AISI 304 (1.4301) |
| - DN 63–160 | AISI 316L (1.4435) |
| – Bellows | |
| - Slot shutter | AISI 633 (AM 350) |
| - Flap shutter | AISI 316L (1.4404) |
| – Gate / plate | |
| - Slot shutter | AISI 316L (1.4404), silver-plated |
| - Flap shutter | Titanium |
| Seal: bonnet | metal |
| Feedthrough | bellows |
| Mounting position | seat side marked ▽ in opposite direction of the air inrush |

[1] At 5 bar compressed air

[2] Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

F

Continued Technical data

| DN (nominal I.D.) | | CF-F flange | Conductance (molecular flow) | Differential pressure: valve closed | | Differential pressure at opening | | Compressed air min. – max. overpressure | | Volume of pneumatic actuator | | Total closing time *) | Opening time | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | In closing direction | In opening direction | In closing direction | In opening direction | | | | | | | | |
| Slot shutter Series 77.3 | | | | | | | | | | | | | | | |
| mm | inch | O.D. | ls$^{-1}$ | bar | bar | mbar | mbar | bar | psi | l | ft$^3$ | ms | s | kg | lbs |
| 40 | 1½ | 2¾ | 110 | ≤1.2 | ≤1.2 | ≤300 | ≤300 | 4–6 | 58–87 | 0.36 | 0.01 | <10 | 9 | 8.1 | 18 |
| 63 | 2½ | 4½ | 240 | ≤1.2 | ≤1.2 | ≤200 | ≤200 | 4–6 | 58–87 | 0.36 | 0.01 | <10 | 9 | 11 | 24 |
| 100 | 4 | 6 | 450 | ≤1.2 | ≤1.2 | ≤150 | ≤150 | 4–6 | 58–87 | 0.36 | 0.01 | <10 | 9 | 14 | 30 |
| 160 | 6 | 8 | 830 | ≤1.2 | ≤1.2 | ≤100 | ≤100 | 4–6 | 58–87 | 0.36 | 0.01 | <10 | 9 | 20 | 44 |
| Flap shutter Series 77.1 | | | | | | | | | | | | | | | |
| mm | inch | O.D. | ls$^{-1}$ | bar | bar | mbar | bar | bar | psi | l | ft$^3$ | ms | s | kg | lbs |
| 63 | 2½ | 4½ | 200 | ≤2 | ≤1.2 | ≤600 | ≤1 | 5–8 | 73–116 | 3 | 0.11 | 13 | 7 | 25 | 55 |
| 100 | 4 | 6 | 700 | ≤2 | ≤1.2 | ≤180 | ≤1 | 5–8 | 73–116 | 3 | 0.11 | 15 | 7 | 29 | 64 |
| 160 | 6 | 8 | 1700 | ≤2 | ≤0.5 | ≤ 50 | ≤1 | 5–8 | 73–116 | 3 | 0.11 | 23 | 7 | 36 | 80 |

*) from sensor signal to closed shutter

## Options

– Customer specified flanges

– Special slot dimensions (slot shutter)

**Ordering information for options:**
Ordering No. of shutter-X (e. g. 77340-CE44-X, X = special flanges)

## Spare parts

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

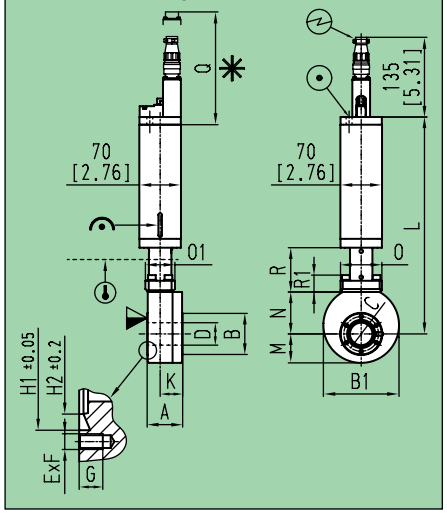
## Accessories

– **Controller**: see page 230

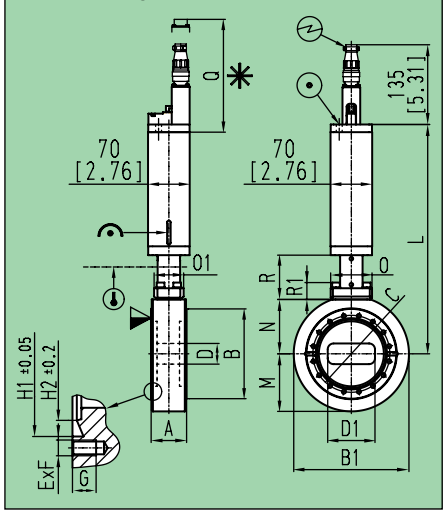
– **Flange connections**
for installation of the valve: see series 33

# Dimensions

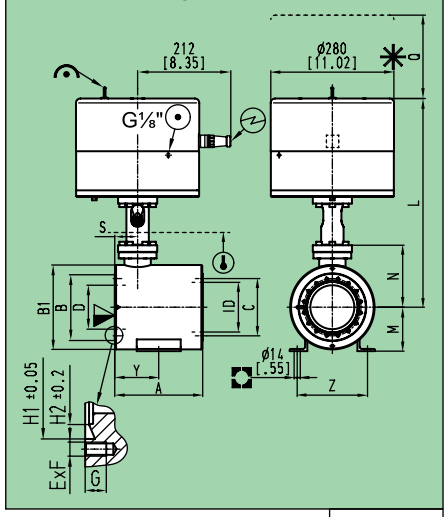
**Slot shutter**
DN 40 (1½")
circular opening




**Slot shutter**
DN 63–160 (2½"–6")
slot opening

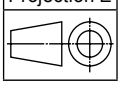



**Flap shutter**
DN 63–160 (2½"–6")
circular opening




Valve seat side
Required for dismantling
Compressed air connection
Electrical connection
Mech. position indication
Bake-out area
For attachment

Projection E



| DN | mm / inch | 40 1½ | | |
|---|---|---|---|---|
| A | mm | 60 | | |
| | inch | 2.36 | | |
| B | mm | 69.50 | | |
| | inch | 2.74 | | |
| B1 | mm | 128 | | |
| | inch | 5.04 | | |
| C | mm | 58.70 | | |
| | inch | 2.31 | | |
| D | mm | 38 | | |
| | inch | 1.50 | | |
| E × F | | 6 × M6 | | |
| G | mm | 12 | | |
| | inch | 0.47 | | |
| H1 | mm | 48.35 | | |
| | inch | 1.90 | | |
| H2 | mm | 42 | | |
| | inch | 1.65 | | |
| L | mm | 367 | | |
| | inch | 14.45 | | |
| M | mm | 49 | | |
| | inch | 1.93 | | |
| N | mm | 71 | | |
| | inch | 2.80 | | |
| O | mm | 70 | | |
| | inch | 2.76 | | |
| O1 | mm | 50 | | |
| | inch | 1.97 | | |
| Q | mm | 195 | | |
| | inch | 7.68 | | |
| R | mm | 75 | | |
| | inch | 2.95 | | |
| R1 | mm | 29 | | |
| | inch | 1.14 | | |

| DN | mm / inch | 63 2½ | 100 4 | 160 6 |
|---|---|---|---|---|
| A | mm | 60 | 60 | 60 |
| | inch | 2.36 | 2.36 | 2.36 |
| B | mm | 113.50 | 152 | 202.50 |
| | inch | 4.47 | 5.98 | 7.97 |
| B1 | mm | 158 | 195 | 245 |
| | inch | 6.22 | 7.67 | 9.65 |
| C | mm | 92.10 | 130.30 | 181 |
| | inch | 3.63 | 5.13 | 7.13 |
| D | mm | 35 | 35 | 35 |
| | inch | 1.38 | 1.38 | 1.38 |
| D1 | mm | 50 | 80 | 130 |
| | inch | 1.97 | 3.15 | 5.12 |
| E × F | | 8 × M8 | 16 × M8 | 20 × M8 |
| G | mm | 12 | 12 | 12 |
| | inch | 0.47 | 0.47 | 0.47 |
| H1 | mm | 82.55 | 120.70 | 171.50 |
| | inch | 3.25 | 4.75 | 6.75 |
| H2 | mm | 77.40 | 115.50 | 166 |
| | inch | 3.05 | 4.55 | 6.54 |
| L | mm | 369 | 388 | 414 |
| | inch | 14.52 | 15.28 | 16.30 |
| M | mm | 79 | 97.50 | 122.50 |
| | inch | 3.11 | 3.84 | 4.82 |
| N | mm | 73 | 92 | 118 |
| | inch | 2.87 | 3.62 | 4.65 |
| O | mm | 70 | 70 | 70 |
| | inch | 2.76 | 2.76 | 2.76 |
| O1 | mm | 50 | 50 | 50 |
| | inch | 1.97 | 1.97 | 1.97 |
| Q | mm | 195 | 195 | 195 |
| | inch | 7.68 | 7.68 | 7.68 |
| R | mm | 75 | 75 | 75 |
| | inch | 2.95 | 2.95 | 2.95 |
| R1 | mm | 29 | 29 | 29 |
| | inch | 1.14 | 1.14 | 1.14 |

| DN | mm / inch | 63 2½ | 100 4 | 160 6 |
|---|---|---|---|---|
| A | mm | 150 | 200 | 250 |
| | inch | 5.91 | 7.87 | 9.84 |
| B | mm | 113.50 | 152 | 202.50 |
| | inch | 4.47 | 5.98 | 7.97 |
| B1 | mm | 154 | 192 | 242 |
| | inch | 6.06 | 7.56 | 9.53 |
| C | mm | 92.10 | 130.30 | 181 |
| | inch | 3.63 | 5.13 | 7.13 |
| D | mm | 63 | 100 | 150 |
| | inch | 2.48 | 3.94 | 5.91 |
| E × F | | 8 × M8 | 16 × M8 | 20 × M8 |
| G | mm | 12 | 12 | 12 |
| | inch | 0.47 | 0.47 | 0.47 |
| H1 | mm | 82.55 | 120.65 | 171.5 |
| | inch | 3.25 | 4.75 | 6.75 |
| H2 | mm | 77.40 | 115.50 | 166 |
| | inch | 3.05 | 4.55 | 6.54 |
| ID | mm | 76 | 113 | 164 |
| | inch | 2.99 | 4.45 | 6.47 |
| L | mm | 456 | 475 | 500 |
| | inch | 17.95 | 18.70 | 19.69 |
| M | mm | 80 | 100 | 125 |
| | inch | 3.15 | 3.94 | 4.92 |
| N | mm | 122 | 141 | 166 |
| | inch | 4.80 | 5.55 | 6.54 |
| Q | mm | 83 | 83 | 83 |
| | inch | 3.27 | 3.27 | 3.27 |
| S | mm | 52 | 52 | 52 |
| | inch | 2.05 | 2.05 | 2.05 |
| Y | mm | 75 | 100 | 125 |
| | inch | 2.95 | 3.94 | 4.92 |
| Z | mm | 120 | 160 | 160 |
| | inch | 4.72 | 6.30 | 6.30 |

F

## Main applications

Controller for fast closing and controlled opening of the
– valves series 75
– shutters series 77

For fast processing of the sensor signal

To control further isolation valves



## Ordering information

Controller VF-2 combined with various modules
Ordering numbers on request

## Technical data

**Controller VF-2**
(basic device)

– 19" rack insert with power supply
– Storage spaces for max. 10 modules
– Mains voltage: 100 – 240 V ±10%, 50/60 Hz, max. 150 VA
– Key switch for «LOCAL», «LOCKED», «REMOTE»
– Ambient temperature: 0 – 50 °C
– Dimensions:
  - 19" rack insert, 3 height units
  - 445 × 132.5 × 300 mm / 17.5" × 5.2" × 11.8" (W × H × D)
  - Depth with plugs: 410 mm (16.1")
– Weight: 11 kg (24 lbs)

**Modules**
for controller VF-2

CONTROL
– Storage: space for 1 module required
– System control module for max. 6 sensors and 4 fast closing valves / shutters
– External trigger
– 8-pole plug for «REMOTE» control
– LED display «READY», «EXTERNAL TRIGGER»
– Push button «RESET»

FV SENSOR
– Storage: space for 1 module required
– Connection of a fine vacuum sensor by a triaxial connector (LEMO)
– Sensor voltage: 3.5 kV
– LED display «READY», «INRUSH», «EXTERNAL SIGNAL», «INTERLOCK»
– 8-pole plug for «REMOTE» control

HV SENSOR
– Storage: space for 2 modules required
– Connection of a high vacuum sensor by a triaxial connector (LEMO)
– Sensor voltage: 3.5 kV
– LED display for pressure
– Trigger pressure adjustable between $2 \cdot 10^{-8}$ and $8 \cdot 10^{-4}$ mbar
– Trigger time adjustable between 1 and 7 msec
– 8-pole plug for «REMOTE» control
– Analog pressure signal (optional)

VALVE
– 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
– Storage: space for 1 module required
– Connection of 1 isolation valve
– LED display «READY»
– Push buttons «OPEN», «CLOSE»
– 12-pole plug for connecting the isolation valve
– 12-pole plug for «REMOTE» control

2-GATE
– Storage: space for 1 module required
– Connection of 2 isolation valves
– LED display «READY» for each isolation valve
– Push buttons «OPEN», «CLOSE» for each isolation valve
– 12-pole plug (2 ×) for connecting the isolation valves
– 12-pole plug for «REMOTE» control

LINK
– Storage: space for 1 module per rack required
– To link two controllers VF-2 if the 10 storage spaces of one controller are insufficient

## Accessories

– **Cable**

- Sensor – SENSOR module: max. 300 m, triaxial cable
- Valve / shutter – VALVE module: max. 150 m, 12-pole cable 0.75 mm²
- Isolation valve – GATE module: max. 200 m, 7-pole cable 0.75 mm²

– **Vacuum sensor**

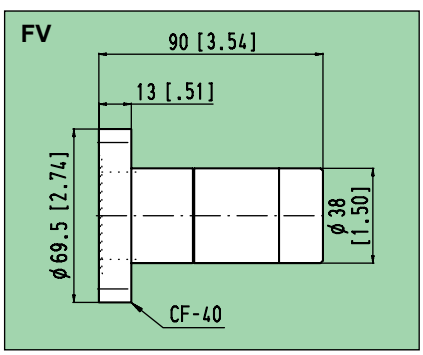
Fine vacuum sensor (FV)
glow discharge

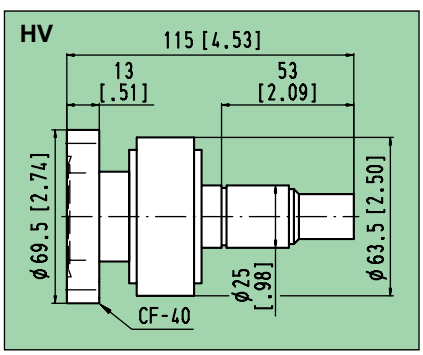


High vacuum sensor (HV)
cold cathode



| **Technical data** | **FV** | **HV** |
|---|---|---|
| Trigger pressure: | approx. $10^{-2}$ mbar | adjustable from $10^{-8}$ to $10^{-3}$ mbar |
| Response time: | approx. 1 ms | 2 ms (air inrush 1 bar) |
| Radiation resistance: | $10^{8}$ Gy ($10^{10}$ rad) | $10^{7}$ Gy ($10^{9}$ rad) |
| Flange: | CF-F 40 | CF-F 40 |
| Weight: | approx. 1 kg (2 lbs) | approx. 1 kg (2 lbs) |




F

## Main applications

Beam stopper for use in multiple applications, e. g. photon stopper

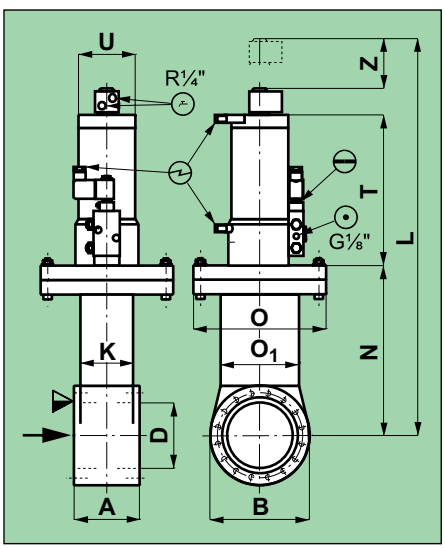


## Ordering information

**Beam stopper**
**with pneumatic actuator**
double acting

| DN | | Ordering numbers CF-F | |
|---|---|---|---|
| mm | inch | without solenoid valve with position indicator 80 °C | with solenoid valve with position indicator 80 °C |
| 63 | 2½ | 79036-CE24 | 79036-CE44 |
| 100 | 4 | 79040-CE24 | 79040-CE44 |
| 160 | 6 | 79044-CE24 | 79044-CE44 |

## Dimensions




| DN | | 63 2½ | 100 4 | 160 6 |
|---|---|---|---|---|
| A | mm | 100 | 100 | 100 |
| | inch | 3.94 | 3.94 | 3.94 |
| B | mm | 113.50 | 152 | 202.50 |
| | inch | 4.47 | 5.98 | 7.97 |
| D | mm | 65 | 100 | 150 |
| | inch | 2.56 | 3.94 | 6.91 |
| K | mm | 88.90 | 80 | 80 |
| | inch | 3.50 | 3.15 | 3.15 |
| L | mm | 502 | 639 | 841 |
| | inch | 19.76 | 25.16 | 33.11 |
| N | mm | 195 | 262 | 364 |
| | inch | 7.68 | 10.31 | 14.33 |
| O | mm | 152 | 202.50 | 253 |
| | inch | 5.98 | 7.97 | 9.96 |
| O1 | mm | 88.90 | 120 | 180 |
| | inch | 3.50 | 4.72 | 7.09 |

| DN | | 63 2½ | 100 4 | 160 6 |
|---|---|---|---|---|
| T | mm | 195.50 | 230.50 | 280.50 |
| | inch | 7.70 | 9.07 | 11.04 |
| U | mm | 87 | 87 | 87 |
| | inch | 3.43 | 3.43 | 3.43 |
| Z | mm | 71 | 106 | 156 |
| | inch | 2.80 | 4.17 | 6.14 |

→ Beam direction
▼ Valve seat side
⊙ Compressed air connection
⊕ Electrical connection
⊖ Emergency operation
⊛ Cooling water connection

## Accessories

– **Flexible bake-out jacket**: see page 270

– **Flange connections**
for installation of the beam stopper: see series 33

## Features

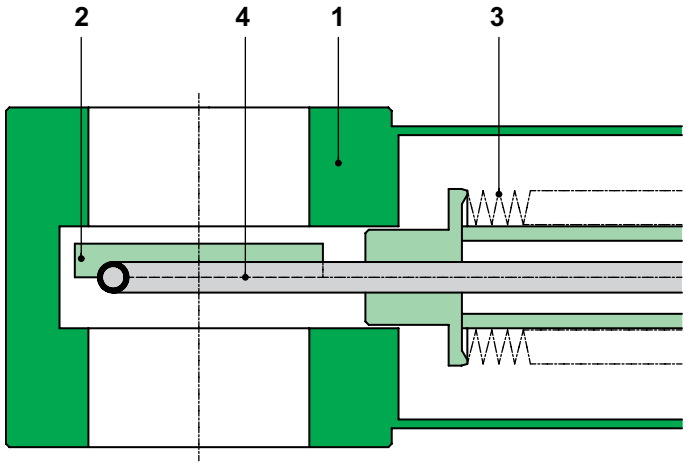
Body material: stainless steel

Up to 6 kW beam load due to water-cooled copper plate

No welding or brazing joint between water containment and vacuum

UHV compatible

Functional principle




1 Beam stopper body 2 Copper plate 3 Bellows 4 Watercooling

## Technical data

| | |
|---|---|
| Leak rate: beam stopper body | $< 5 \cdot 10^{-10}$ mbar ls$^{-1}$ |
| Pressure range | UHV to 1 bar (abs) |
| Cycles until first service | 5000 (option: 50000) |
| Bake-out temperature [1] | |
| – Beam stopper body | ≤250 °C |
| – Pneumatic actuator | ≤ 80 °C (option: 200 °C) |
| – Cooling water | ≤ 15 °C |
| Heating and cooling rate | ≤80 °C h$^{-1}$ |
| Material | |
| – Beam stopper body, mechanism | AISI 304 (1.4301) |
| – Bellows | AISI 316L (1.4404) |
| – Watercooled plate | copper |
| Seal: bonnet | metal |
| Feedthrough | bellows |
| Mounting position | any |
| Compressed air, min.–max. overpressure | 4–7 bar / 58–102 psi |
| Closing time | DN 63: 1 s / DN 100: 2 s / DN 160: 3 s |
| Load | |
| – Beam Ø <60 mm / >60 mm | max. 5 kW / 6 kW |
| Specific load | max. 25 W / mm$^2$ |
| Cooling water quantity | min. 15 l / min. |

[1] Maximum values: depending on operating conditions and sealing materials

## Options



– Without watercooling
– Pneumatic actuator and position indicator bakeable to 200 °C [1]
– Customer specified flanges
– Ports in beam stopper body for roughing (by-pass), venting or for gauges
– Beam stopper without body, for direct integration into the vacuum system (Picture)
Ordering number 793 . . - . E . . (number for nominal diameter refers to connection [bonnet] flange)

**Ordering information for options:** Ordering No. of valve-X
(e. g. 79 . . . - . E . . -X, X = actuator and position indicator for 200 °C)

F

## Main applications

For pressure reduction of the process gas by means of two by-pass valves with orifice

Analysis of the residual gases at base pressure with the open valve



## Features

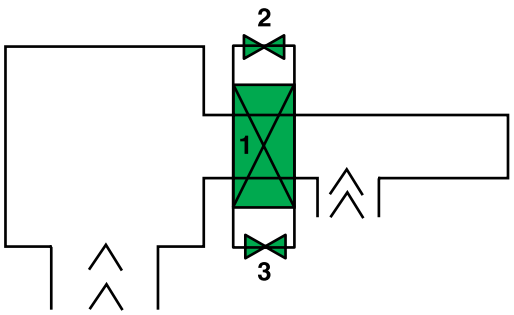
By-pass valves and orifices exchangeable

Very compact design

## Ordering information

| | |
|---|---|
| Available sizes | DN 25–50 (1"–2"): see series 01.0, page 14 |
| Ordering number | Ordering number of valve series 01.0-X<br><br>Example: 01032-CE44-X<br>X = with manually actuated Nupro valves, orifice A 0.2 mm, orifice B 0.4 mm |

## Function




1: Vacuum tight gate valve with manual or pneumatic actuator

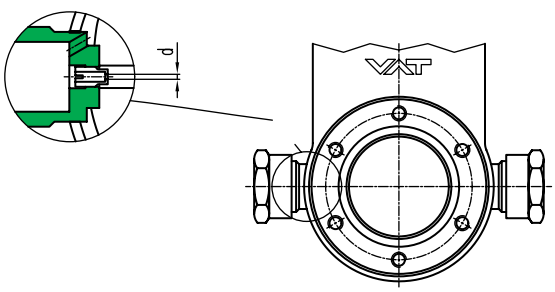
2, 3: By-pass valves with manual or pneumatic actuator and application specific, easily exchangeable orifice

## Technical data

Valve: see series 01.0, page 14

By-pass valve: exchangeable
- type Nupro with seat made of Kel-F (bakeable to 90 °C)
- with manual actuator, Typ SS-4BKT
- with pneumatic actuator, single acting with closing spring (NC), type SS-4BK-1C

## Available orifices




Size (d) in mm:
0.03
0.05
0.1
0.2
0.3
0.4
0.5
0.9
1
1.5

## Main applications

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

Analysis of the residual gases at base pressure with the open valves

## Features

Orifices exchangeable

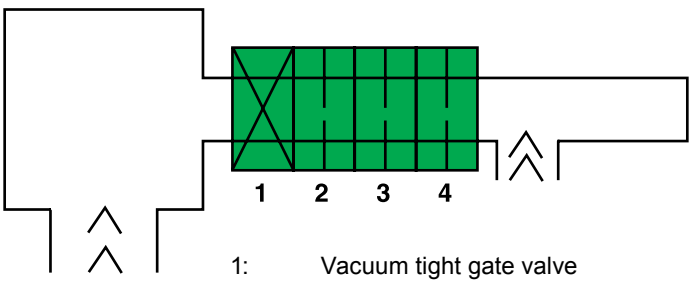
Line of sight between analyzer and process chamber



## Ordering information

| | |
|---|---|
| Available sizes | DN 25–50 (1"–2"): see series 01.0, page 14 |
| Ordering number | Ordering number of valve series 01.0-X<br><br>Example: 01032-CE44-X<br>X = 2 valves welded together, 1 valve rotated by 90°, orifice 0.1 mm |

## Function



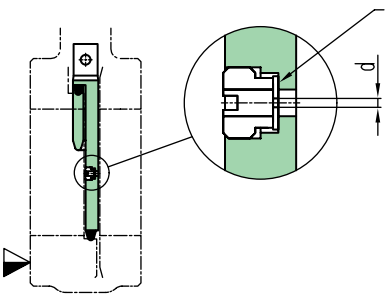

1: Vacuum tight gate valve with manual or pneumatic actuator

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

## Technical data

Valve: see series 01.0, page 14

## Available orifices




Size (d) in mm: 0.005
0.01
0.02
0.03
0.05
0.1

G

These products are subject to the Non Proliferation Treaty (NPT)

## Main applications

For processes with aggressive and corrosive gases




## Ordering information

**Valve with manual actuator**
hexagon head

| DN | | Ordering numbers | | | |
|---|---|---|---|---|---|
| | | with weld neck | | with ISO-KF flange [1] ISO-K flange [2] | |
| mm | inch | aluminum | stainless steel | aluminum | stainless steel |
| 16 | ⅝ | 27124-RA02 | 27124-RE02 | 27124-KA02 [1] | 27124-KE02 [1] |
| 25 | 1 | 27128-RA02 | 27128-RE02 | 27128-KA02 [1] | 27128-KE02 [1] |
| 40 | 1½ | 27132-RA02 | 27132-RE02 | 27132-KA02 [1] | 27132-KE02 [1] |
| 63 | 2½ | 27136-RA02 | 27136-RE02 | 27136-QA02 [2] | 27136-QE02 [2] |
| 100 | 4 | 27140-RA02 | 27140-RE02 | 27140-QA02 [2] | 27140-QE02 [2] |
| 160 | 6 | 27144-RA02 | 27144-RE02 | 27144-QA02 [2] | 27144-QE02 [2] |

**Valve with pneumatic actuator**
single acting with closing spring (NC)
with solenoid valve
with position indicator

| DN | | Ordering numbers (specify control voltage) | | | |
|---|---|---|---|---|---|
| | | with weld neck | | with ISO-KF flange [1] ISO-K flange [2] | |
| mm | inch | aluminum | stainless steel | aluminum | stainless steel |
| 16 | ⅝ | 27124-RA41 | 27124-RE41 | 27124-KA41 [1] | 27124-KE41 [1] |
| 25 | 1 | 27128-RA41 | 27128-RE41 | 27128-KA41 [1] | 27128-KE41 [1] |
| 40 | 1½ | 27132-RA41 | 27132-RE41 | 27132-KA41 [1] | 27132-KE41 [1] |
| 63 | 2½ | 27136-RA41 | 27136-RE41 | 27136-QA41 [2] | 27136-QE41 [2] |
| 100 | 4 | 27140-RA41 | 27140-RE41 | 27140-QA41 [2] | 27140-QE41 [2] |
| 160 | 6 | 27144-RA41 | 27144-RE41 | 27144-QA41 [2] | 27144-QE41 [2] |

## Options

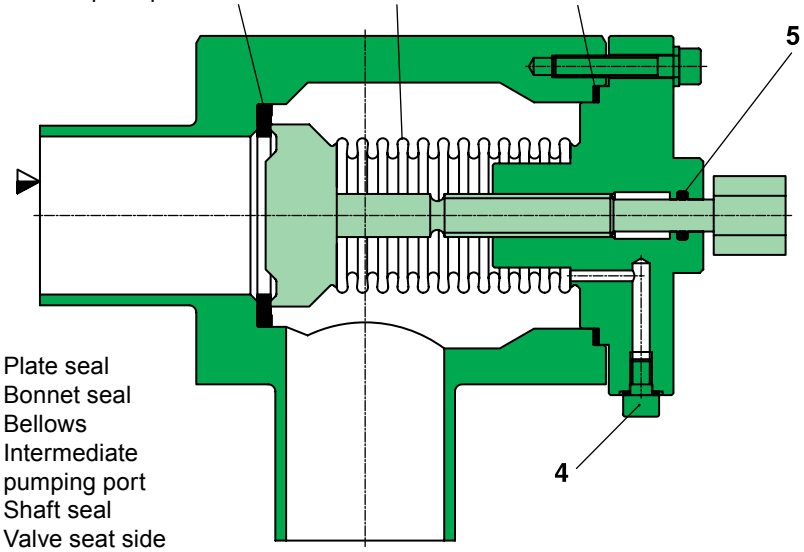
- Manual actuator with torque handwheel
- Manual actuator with electrical position indicator
- Pneumatic actuator, single acting with opening spring (NO)
- Customer specified flanges
- Inline version
- Other options on request

## Features

Body material:
aluminum or stainless steel

Bellows with intermediate pumping port

Functional principle




1 Plate seal
2 Bonnet seal
3 Bellows
4 Intermediate pumping port
5 Shaft seal
▼ Valve seat side

## Technical data

| | |
|---|---|
| Leak rate | |
| – Valve body | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| – Valve seat | $< 1 \cdot 10^{-7}$ mbar ls$^{-1}$ |
| Pressure range | $1 \cdot 10^{-7}$ mbar to 4 bar (abs) |
| Differential pressure on the plate | ≤4 bar |
| Differential pressure at opening | ≤1 bar |
| Cycles until first service | 5000 |
| Temperature [1] | |
| – Valve body | |
| - with copper bonnet seal | ≤120 °C |
| - with PFA bonnet seal | ≤100 °C |
| – Manual and pneumatic actuator | ≤100 °C |
| Material | |
| – Valve body | |
| - aluminum | EN AW-5049 (3.3527), -6082 (3.2315) |
| - stainless steel | AISI 316L (1.4404, 1.4435) |
| – Bellows | AISI 316L (1.4404), AISI 316Ti (1.4571) |
| Seal | |
| – Bonnet (aluminum body) | PFA |
| – Bonnet (stainless steel body) | |
| - DN 16 – 40 | copper |
| - DN 63 – 160 | PFA |
| – Plate | Tenic |
| Feedthrough | bellows with intermediate pumping port |
| Mounting position | any |
| Solenoid valve | 24 V DC (others on request) |
| Position indicator: contact rating | |
| – Voltage | 5 – 50 V AC / DC |
| – Current | 5 – 100 mA |
| Valve position indication | visual (mechanical) |

[1] Maximum values: depending on operating conditions and sealing materials

G

## Main applications

Pressure control and isolation valve for processes with high temperatures and high pressures (e. G. SEMI, MOCVD)



## Features

Body material:
aluminum or stainless steel

Pressure control and isolation

External pressure controller

## Ordering information

**Valve with stepper motor**
(external pressure controller)

| | |
|---|---|
| Nominal I. D. | 100 mm (4"), others on request |
| Ordering number | on request |

## Technical data

| | |
|---|---|
| Leak rate [1]: valve body, valve seat | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| Pressure range | $1 \cdot 10^{-8}$ mbar to 1.2 bar (abs) |
| Differential pressure on the plate | 1000 mbar |
| Cycles until first service [2] | |
| – Pressure control | 2 million |
| – Closing / opening | 100 000 |
| Temperature [2] | |
| – Valve body, plate, bellows | ≤ 200 °C |
| – Ambient | ≤ 50 °C [3] |
| Material | |
| – Valve body, plate | AISI 316L (1.4404 or 1.4435) |
| – Bellows | AISI 316Ti (1.4571) |
| Seal: bonnet, plate | FKM (Viton®) |
| Feedthrough | bellows |
| Mounting position | any [4] |
| Conductance (molecular flow) | 440 ls$^{-1}$ |
| Minimum controllable conductance (molecular flow) | 0.05 ls$^{-1}$ |
| Full stroke | 40 mm |
| Typical closing or opening time | 4 s |

[1] Unheated on delivery

[2] Maximum values: depending on operating conditions and sealing materials

[3] < 35 °C recommended

[4] Valve seat towards chamber recommended

Pressure controller: see pages 146 – 149

# Series 66.0

These products are subject to the Non Proliferation Treaty (NPT)



## Main applications

Pressure control and isolation valve for processes with aggressive and corrosive gases

## Features

Body material: stainless steel

Pressure control and isolation

Evacuation of bellows interior possible

External pressure controller

## Ordering information

**Valve with stepper motor**
(external pressure controller
**or with manual actuator**

| | |
|---|---|
| Nominal I.D. | 16 – 50 mm (⅝" – 2") |
| Ordering numbers | on request |

## Technical data

| | |
|---|---|
| Leak rate [1] | |
| – Valve body | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| – Valve seat | $< 1 \cdot 10^{-6}$ mbar ls$^{-1}$ |
| Pressure range | $1 \cdot 10^{-8}$ mbar to 5 bar (abs) |
| Differential pressure on the plate | ≤ 1 bar |
| Cycles until first service [2] | 20 000 |
| Temperature [2] | |
| – Valve body, ambient | ≤ 120 °C |
| Material | |
| – Valve body, plate | AISI 316L (1.4404 or 1.4435) |
| – Bellows | AISI 316L (1.4404) |
| Seal | |
| – Bonnet (valve with stepper motor) | metal (2.0040.26) |
| – Bonnet (valve with manual actuator) | PFA |
| – Plate | Tenic |
| Feedthrough | bellows |
| Mounting position | any |
| Flow range | |
| – $Kv_{min}$ | ≥ 0.01 m$^3$/h |
| – $Kv_{max}$ | ≤ 8 m$^3$/h |
| Control range | |
| – for 1 decade at $Kv_{min}$ | 0.01 – 0.1 m$^3$/h |
| – for 2 decades at $Kv_{min}$ | > 0.1 m$^3$/h |
| Typical closing or opening time | < 4 s |

Pressure controller: data on request

[1] Unheated on delivery

[2] Maximum values: depending on operating conditions and sealing materials

G

# Series 66.3

These products are subject to the Non Proliferation Treaty (NPT)



## Main applications

Pressure control valve for processes with aggressive and corrosive gases

## Features

Body material:
aluminum or stainless steel

Pressure control

Evacuation of bellows interior possible

External pressure controller

## Ordering information

**Valve with stepper motor**
(external pressure controller)

| | |
|---|---|
| Nominal I. D. | 40 – 100 mm (1½" – 4") |
| Ordering numbers | on request |

## Technical data

| | |
|---|---|
| Leak rate [1]: valve body | $< 1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| Pressure range | $1 \cdot 10^{-8}$ mbar to 1 bar (abs) |
| Differential pressure on the plate | |
| – DN 40 – 65 | 1000 mbar |
| – DN 100 | 250 mbar |
| Cycles until first service [2] | 125 000 |
| Temperature [2]: valve body, ambient | ≤ 70 °C |
| Material | |
| – Valve body aluminum | EN AW-5083 (3.3547) |
| stainless steel | AISI 304 (1.4301) or AISI 316L (1.4404 or 1.4435) |
| – Plate | AISI 316L (1.4404 or 1.4435) |
| – Bellows | AISI 316L (1.4404) |
| Seal: bonnet | PFA |
| Feedthrough | bellows |
| Mounting position | any |
| Flow range | |
| – $Kv_{min}$ | ≥ 0.05 m$^3$/h |
| – $Kv_{max}$ | ≤ 80 m$^3$/h |
| Control range | |
| – To 1 decade at $Kv_{min}$ | 0.05 – 0.1 m$^3$/h |
| – To 2 decades at $Kv_{min}$ | > 0.1 m$^3$/h |
| Typical closing or opening time | |
| – DN 40 – 65 | < 8 s |
| – DN 100 | < 10 s |
| Pressure controller: data on request | |

[1] Unheated on delivery

[2] Maximum values: depending on operating conditions and sealing materials

## Main applications

Downstream pressure control and isolation valve for SEMI and FPD processes if symmetrical gas flows are required

Optimal for demanding processes (e. g. uniformity)



## Features

Body material:
aluminum or
aluminum, hard anodized

External pressure controller

## Ordering information

**Valve with stepper motor**
(external pressure controller)

| | |
|---|---|
| Nominal I. D. | 320 – 450 mm (12" – 18") |
| Ordering numbers | on request |

## Technical data

| | |
|---|---|
| Leak rate [1]: valve body | |
| – Aluminum | $1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| – Aluminum, hard anodized | $1 \cdot 10^{-5}$ mbar ls$^{-1}$ |
| Leak rate [1]: valve seat | |
| – Aluminum | $1 \cdot 10^{-9}$ mbar ls$^{-1}$ |
| – Aluminum, hard anodized | $1 \cdot 10^{-4}$ mbar ls$^{-1}$ |
| Pressure range [1] | |
| – Aluminum | $1 \cdot 10^{-8}$ mbar to 1.2 bar (abs) |
| – Aluminum, hard anodized | $1 \cdot 10^{-6}$ mbar to 1.2 bar (abs) |
| Differential pressure on the plate | |
| – Chamber side → plate | 1200 mbar (valve closed)<br>10 mbar (during operation) |
| – Pump side → plate | 10 mbar |
| Cycles until first service [2] | |
| – Pressure control | 2 million |
| – Closing / opening | 200 000 |
| Temperature [2] | |
| – Valve body | ≤ 120 °C |
| – Ambient | ≤ 50 °C |
| Material | |
| – Flange, plate | EN AW-6082 (3.2315) |
| – Actuator shaft | AISI 316L (1.4404 or 1.4435) |
| – Bellows | AISI 633 (AM 350) |
| Seal: flange, plate | FKM (Viton®) |
| Feedthrough | bellows |
| Mounting position | actuator down |

Pressure controller: see pages 146 – 149

[1] Unheated on delivery

[2] Maximum values: depending on operating conditions and sealing materials

G

Clamping rings, clamping chains
Claws
Centering rings
Seals
Blank-off flanges
Weld neck flanges
Elbows
T-Pieces
Intermediate pieces
Bellows
Adapters
Soft-start throttles

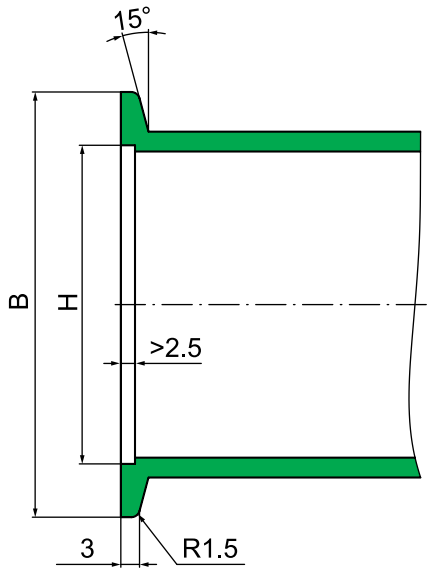


| Seal | FKM (Viton®) | Indium |
|---|---|---|
| Suitable flange material | A, E | A, E |
| Temperature [1] | ≤200 °C | ≤80 °C |
| Leak rate for Helium (mbar ls$^{-1}$) | $<1\cdot10^{-9}$ | $<1\cdot10^{-10}$ |
| Sealing force (N per cm sealing line) | 10–50 | 50–500 |
| Multiple use of seal | yes | yes |

A: aluminim
E: stainless steel

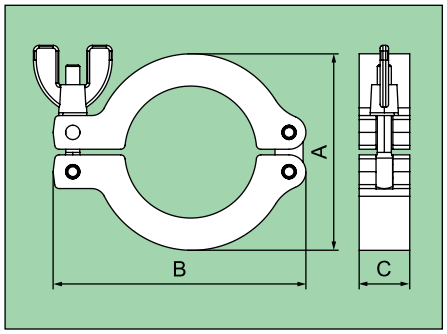
[1] Maximum values: depending on operating conditions and sealing materials

ISO-KF flange




| DN | | 10 | 16 | 25 | 40 | 50 |
|---|---|---|---|---|---|---|
| | mm | | | | | |
| | inch | ⅜ | ⅝ | 1 | 1½ | 2 |
| B | mm | 30 | 30 | 40 | 55 | 75 |
| | inch | 1.18 | 1.18 | 1.57 | 2.17 | 2.95 |
| H | mm | 12.20 | 17.20 | 26.20 | 41.20 | 52.20 |
| | inch | 0.48 | 0.68 | 1.03 | 1.62 | 2.06 |

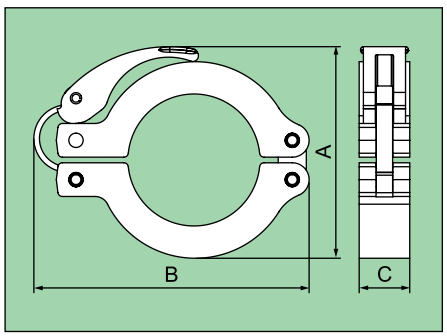
# Technical data and ordering information




### Clamping ring complete

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 10/16 | ⅜/⅝ | 45 | 1.77 | 61 | 2.40 | 16 | 0.63 | 31024-KASR-0001 |
| 25 | 1 | 55 | 2.17 | 72 | 2.83 | 16 | 0.63 | 31028-KASR-0001 |
| 40 | 1½ | 70 | 2.76 | 90 | 3.54 | 18 | 0.71 | 31032-KASR-0001 |
| 50 | 2 | 95 | 3.74 | 123 | 4.84 | 25 | 0.98 | 31034-KASR-0001 |

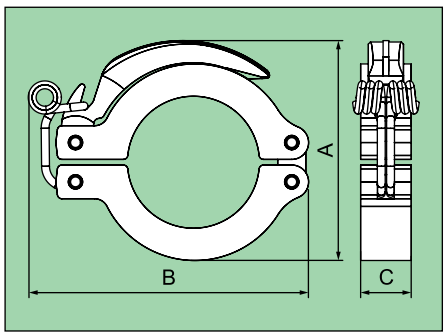
Clamping ring: aluminum EN AC-46200 (3.2162)
Screw: steel, nickel-plated
Nut: zinc, nickel-plated




### Rapid clamping ring

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 10/16 | ⅜/⅝ | 52 | 2.05 | 70 | 2.76 | 16 | 0.63 | 31024-KASP-0001 |
| 25 | 1 | 61 | 2.40 | 81 | 3.19 | 16 | 0.63 | 31028-KASP-0001 |
| 40 | 1½ | 75 | 2.95 | 98 | 3.86 | 18 | 0.71 | 31032-KASP-0001 |

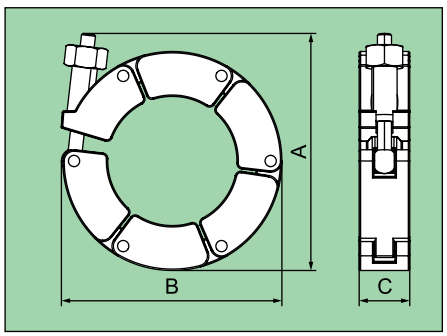
Clamping ring: aluminum EN AC-46200 (3.2162)
Spring: steel
Lever: polyamide




### Rapid clamping ring, metal

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 10/16 | ⅜/⅝ | 53 | 2.09 | 72 | 2.83 | 16 | 0.63 | 31024-KASM-0001 |
| 25 | 1 | 61 | 2.40 | 83 | 3.27 | 16 | 0.63 | 31028-KASM-0001 |
| 40 | 1½ | 78 | 3.07 | 99 | 3.90 | 18 | 0.71 | 31032-KASM-0001 |

Clamping ring: aluminum EN AC-46200 (3.2162)
Spring: stainless steel
Lever: aluminum EN AC-47100 (3.2982)

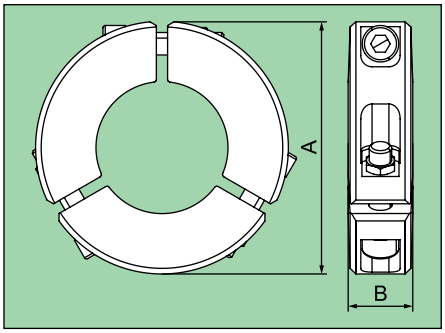



### Clamping chain

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 10/16 | ⅜/⅝ | 71 | 2.80 | 52.5 | 2.07 | 18 | 0.71 | 31024-KASA-0001 |
| 25 | 1 | 74 | 2.91 | 64 | 2.52 | 18 | 0.71 | 31028-KASA-0001 |
| 40 | 1½ | 98 | 3.86 | 79 | 3.11 | 18 | 0.71 | 31032-KASA-0001 |
| 50 | 2 | 99 | 3.90 | 97.5 | 3.84 | 20 | 0.79 | 31034-KASA-0001 |

Chain: aluminium EN AW-6081 (3.2215)
Screw, nut: stainless steel

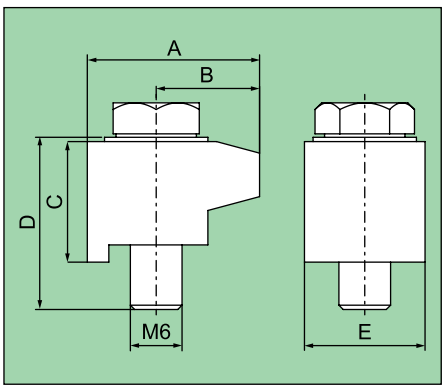
H




### Clamping device

| DN mm | DN inch | A mm | A inch | B mm | B inch | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| 10/16 | ⅜/⅝ | 52 | 2.05 | 18 | 0.71 | | 31024-KASE-0001 |
| 25 | 1 | 75 | 2.95 | 20 | 0.79 | | 31028-KASE-0001 |
| 40 | 1½ | 90 | 3.54 | 23 | 0.91 | | 31032-KASE-0001 |
| 50 | 2 | 115 | 4.53 | 28 | 1.10 | | 31034-KASE-0001 |

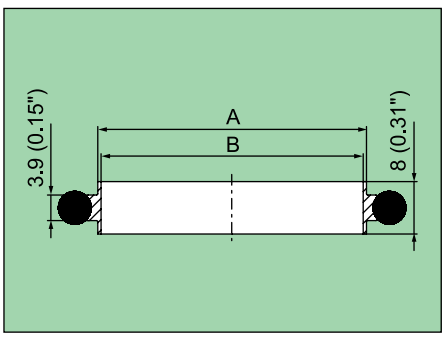
Chain: aluminum EN AC-46200 (3.2162)
Screw: stainless steel
Nut: zinc, nickel-plated




### Claw

| DN mm | DN inch | A mm | A inch | B mm | B inch | C mm | C inch | D mm | D inch | E mm | E inch | Ordering numbers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10–50 | ⅜–2 | 20 | 0.79 | 12 | 0.47 | 14 | 0.55 | 20 | 0.79 | 14 | 0.55 | 310XX-KAPR-0001 |

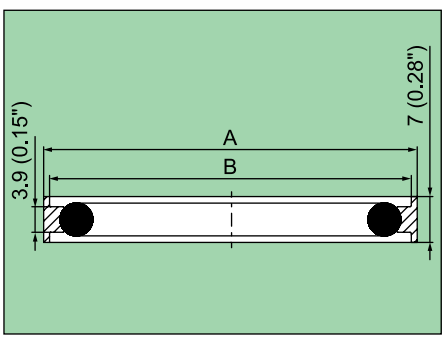
Claw: aluminum EN AW-6082 (3.2315)
Screw, washer: stainless steel




### Centering ring

| DN mm | DN inch | A mm | A inch | B mm | B inch | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| 10 | ⅜ | 12 | 0.47 | 10 | 0.39 | | 31020-KAZV-0001 [1] |
| 16 | ⅝ | 17 | 0.67 | 16 | 0.63 | | 31024-KAZV-0001 [1] |
| 25 | 1 | 26 | 1.02 | 25 | 0.98 | | 31028-KAZV-0001 [1] |
| 40 | 1½ | 41 | 1.61 | 40 | 1.57 | | 31032-KAZV-0001 [1] |
| 50 | 2 | 52 | 2.05 | 50 | 1.97 | | 31034-KAZV-0001 [1] |
| 10 | ⅜ | 12 | 0.47 | 10 | 0.39 | | 31020-KEZV-0001 [2] |
| 16 | ⅝ | 17 | 0.67 | 16 | 0.63 | | 31024-KEZV-0001 [2] |
| 25 | 1 | 26 | 1.02 | 25 | 0.98 | | 31028-KEZV-0001 [2] |
| 40 | 1½ | 41 | 1.61 | 40 | 1.57 | | 31032-KEZV-0001 [2] |
| 50 | 2 | 52 | 2.05 | 50 | 1.97 | | 31034-KEZV-0001 [2] |

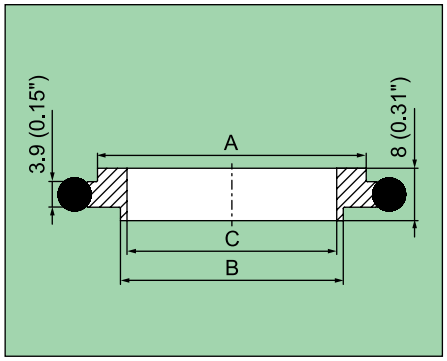
Seal: elastomer FKM (Viton®)
Ring: [1] aluminum EN AW-6082 (3.2315)
[2] stainless steel AISI 303 (1.4305)




### Outer centering ring

| DN mm | DN inch | A mm | A inch | B mm | B inch | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| 16 | ⅝ | 32 | 1.26 | 30.2 | 1.19 | | 31024-KAUR-0001 |
| 25 | 1 | 42 | 1.65 | 40.2 | 1.58 | | 31028-KAUR-0001 |
| 40 | 1½ | 57 | 2.24 | 55.2 | 2.17 | | 31032-KAUR-0001 |
| 50 | 2 | 77 | 3.03 | 75.2 | 2.96 | | 31034-KAUR-0001 |

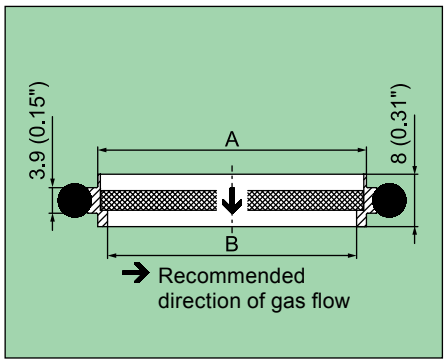
Seal: elastomer FKM (Viton®)
Ring: aluminum EN AW-6082 (3.2315)




## Reducing centering ring

| DN mm | DN inch | A mm | A inch | B mm | B inch | C mm | C inch | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| 16/10 | 5/8/3/8 | 17 | 0.67 | 12 | 0.47 | 10 | 0.39 | 31024-KAZR-0001 [1] |
| 25/20 | 1/3/4 | 26 | 1.02 | 22 | 0.87 | 20 | 0.79 | 31028-KAZR-0001 [1] |
| 40/32 | 1/1 1/8 | 41 | 1.61 | 34 | 1.34 | 32 | 1.26 | 31032-KAZR-0001 [1] |
| 16/10 | 5/8/3/8 | 17 | 0.67 | 12 | 0.47 | 10 | 0.39 | 31024-KEZR-0001 [2] |
| 25/20 | 1/3/4 | 26 | 1.02 | 22 | 0.87 | 20 | 0.79 | 31028-KEZR-0001 [2] |
| 40/32 | 1/1 1/8 | 41 | 1.61 | 34 | 1.34 | 32 | 1.26 | 31032-KEZR-0001 [2] |

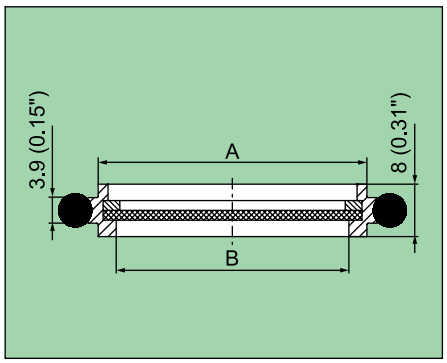
Seal: elastomer FKM (Viton®)
Ring: [1] aluminum EN AW-6082 (3.2315)
[2] stainless steel AISI 303 (1.4305)




## Centering ring with filter

| DN mm | DN inch | A mm | A inch | B mm | B inch | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| 10 | 3/8 | 12 | 0.47 | 8 | 0.31 | | 31020-KEZF-0001 |
| 16 | 5/8 | 17 | 0.67 | 14 | 0.55 | | 31024-KEZF-0001 |
| 25 | 1 | 26 | 1.02 | 23 | 0.91 | | 31028-KEZF-0001 |
| 40 | 1 1/2 | 41 | 1.61 | 38 | 1.50 | | 31032-KEZF-0001 |
| 50 | 2 | 52 | 2.05 | 48 | 1.89 | | 31034-KEZF-0001 |

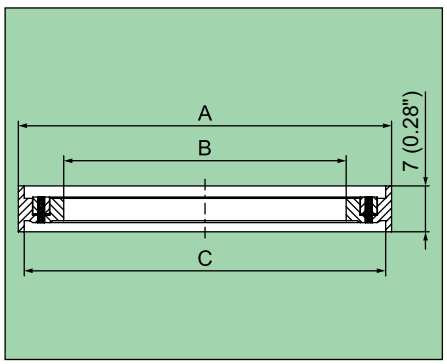
Seal: elastomer FKM (Viton®)
Ring: stainless steel AISI 303 (1.4305)
Filter: stainless steel AISI 316L (1.4435), pore size: 0.02 mm




## Centering ring with fine filter

| DN mm | DN inch | A mm | A inch | B mm | B inch | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| 10 | 3/8 | 12 | 0.47 | 9 | 0.35 | | 31020-KEZG-0001 |
| 16 | 5/8 | 17 | 0.67 | 13 | 0.51 | | 31024-KEZG-0001 |
| 25 | 1 | 26 | 1.02 | 22 | 0.87 | | 31028-KEZG-0001 |
| 40 | 1 1/2 | 41 | 1.61 | 35.5 | 1.40 | | 31032-KEZG-0001 |
| 50 | 2 | 52 | 2.05 | 45.7 | 1.80 | | 31034-KEZG-0001 |

Seal: elastomer FKM (Viton®)
Inner ring: stainless steel AISI 303 (1.4305)
Snap ring: stainless steel AISI 304 (1.4301)
Filter: stainless steel AISI 316L (1.4435), pore size: 0.004 mm




## Indium seal with outer centering

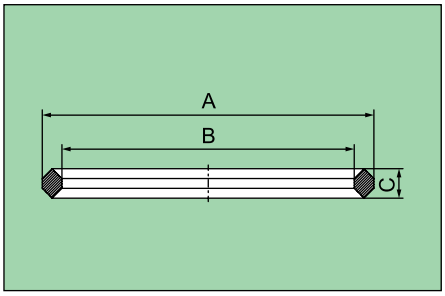
(with inner centering on request)

| DN mm | DN inch | A mm | A inch | B mm | B inch | C mm | C inch | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| 10/16 | 3/8/5/8 | 32 | 1.26 | 18.1 | 0.71 | 30.2 | 1.19 | 31024-KETR-0001 |
| 25 | 1 | 42 | 1.65 | 28.1 | 1.11 | 40.2 | 1.58 | 31028-KETR-0001 |
| 40 | 1 1/2 | 57 | 2.24 | 43.1 | 1.70 | 55.2 | 2.17 | 31032-KETR-0001 |
| 50 | 2 | 77 | 3.03 | 63.1 | 2.48 | 75.2 | 2.96 | 31034-KETR-0001 |

Seal: indium
Inner ring: stainless steel AISI 304 (1.4301)
Outer ring: aluminum EN AW-6082 (3.2315)
Temperature: max. 80 °C

Multiple use

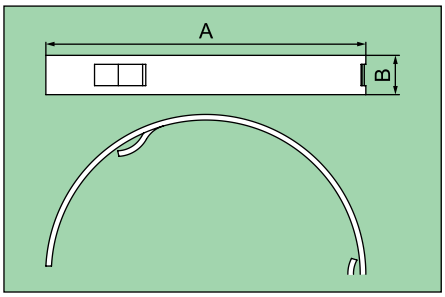
H




### Aluminum seal

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 10/16 | ⅜/⅝ | 25.6 | 1.01 | 19.6 | 0.77 | 4.5 | 0.18 | 31024-KADK-0001 |
| 25 | 1 | 35.6 | 1.40 | 29.6 | 1.17 | 4.5 | 0.18 | 31028-KADK-0001 |
| 40 | 1½ | 50.6 | 1.99 | 44.6 | 1.76 | 4.5 | 0.18 | 31032-KADK-0001 |
| 50 | 2 | 65.6 | 2.58 | 59.6 | 2.35 | 4.5 | 0.18 | 31034-KADK-0001 |

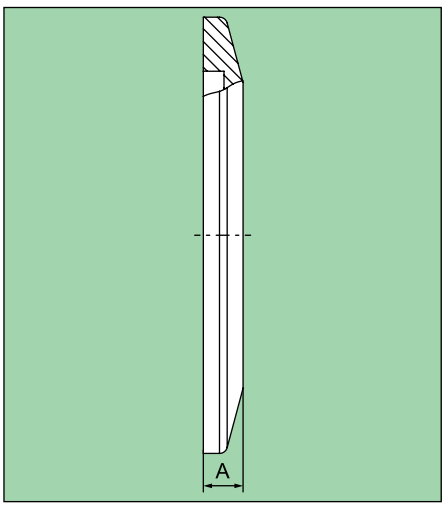
Aluminum EN AW-6082 (3.2315), annealed




### Bracket for aluminum seal

| DN | | A | | B | | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | | |
| 10/16 | ⅜/⅝ | 32 | 1.30 | 7 | 0.28 | | 31024-KEDH-0001 |
| 25 | 1 | 42 | 1.65 | 7 | 0.28 | | 31028-KEDH-0001 |
| 40 | 1½ | 57 | 2.24 | 7 | 0.28 | | 31032-KEDH-0001 |
| 50 | 2 | 77 | 3.03 | 7 | 0.28 | | 31034-KEDH-0001 |

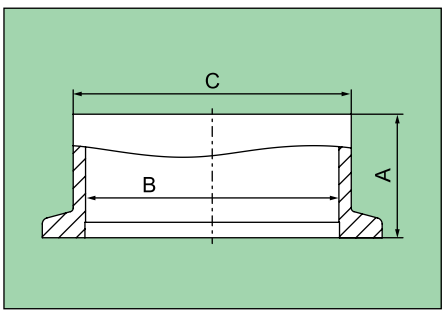
Stainless steel AISI 301 (1.4310), reusable




### Blank-off flange

| DN | | A | | | Ordering numbers |
|---|---|---|---|---|---|
| mm | inch | mm | inch | | |
| 10 | ⅜ | 5 | 0.20 | | 31020-KAFB-0001 [1] |
| 16 | ⅝ | 5 | 0.20 | | 31024-KAFB-0001 [1] |
| 25 | 1 | 5 | 0.20 | | 31028-KAFB-0001 [1] |
| 40 | 1½ | 5 | 0.20 | | 31032-KAFB-0001 [1] |
| 50 | 2 | 6 | 0.24 | | 31034-KAFB-0001 [1] |
| 10 | ⅜ | 5 | 0.20 | | 31020-KEFB-0001 [2] |
| 16 | ⅝ | 5 | 0.20 | | 31024-KEFB-0001 [2] |
| 25 | 1 | 5 | 0.20 | | 31028-KEFB-0001 [2] |
| 40 | 1½ | 5 | 0.20 | | 31032-KEFB-0001 [2] |
| 50 | 2 | 6 | 0.24 | | 31034-KEFB-0001 [2] |

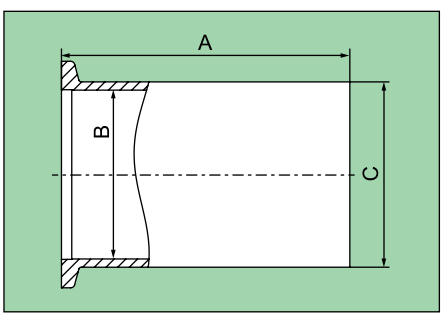
[1] Aluminum EN AW-6082 (3.2315)
[2] Stainless steel AISI 304 (1.4301)




### Weld neck flange, short

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 10 | ⅜ | 20 | 0.79 | 12 | 0.47 | 16 | 0.63 | 31020-KESK-0001 |
| 16 | ⅝ | 20 | 0.79 | 16 | 0.63 | 20 | 0.79 | 31024-KESK-0001 |
| 25 | 1 | 20 | 0.79 | 26 | 1.02 | 30 | 1.18 | 31028-KESK-0001 |
| 40 | 1½ | 20 | 0.79 | 41 | 1.61 | 45 | 1.77 | 31032-KESK-0001 |
| 50 | 2 | 20 | 0.79 | 50 | 1.97 | 54 | 2.13 | 31034-KESK-0001 |

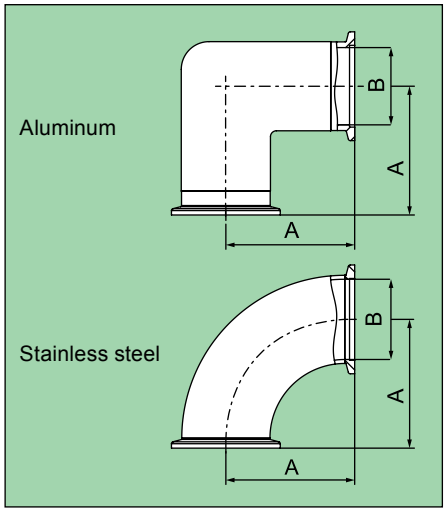
Stainless steel AISI 304 (1.4301)




### Weld neck flange, long

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 10 | ⅜ | 70 | 2.76 | 12 | 0.47 | 16 | 0.63 | 31020-KESL-0001 |
| 16 | ⅝ | 70 | 2.76 | 16 | 0.63 | 20 | 0.79 | 31024-KESL-0001 |
| 25 | 1 | 70 | 2.76 | 26 | 1.02 | 30 | 1.18 | 31028-KESL-0001 |
| 40 | 1½ | 70 | 2.76 | 41 | 1.61 | 45 | 1.77 | 31032-KESL-0001 |
| 50 | 2 | 70 | 2.76 | 50 | 1.97 | 54 | 2.13 | 31034-KESL-0001 |

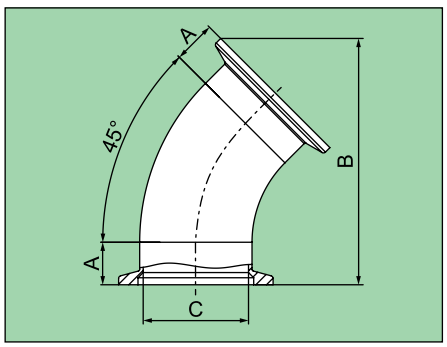
Stainless steel AISI 304 (1.4301)




## Elbow 90°

| DN | | A | | B | | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | | |
| 10 | ⅜ | 30 | 1.18 | 12 | 0.47 | | 31020-KAKR-0001 [1] |
| 16 | ⅝ | 40 | 1.57 | 16 | 0.63 | | 31024-KAKR-0001 [1] |
| 25 | 1 | 50 | 1.97 | 25 | 0.98 | | 31028-KAKR-0001 [1] |
| 40 | 1½ | 65 | 2.56 | 39 | 1.54 | | 31032-KAKR-0001 [1] |
| 10 | ⅜ | 30 | 1.18 | 9 | 0.35 | | 31020-KEKR-0001 [2] |
| 16 | ⅝ | 40 | 1.57 | 15 | 0.59 | | 31024-KEKR-0001 [2] |
| 25 | 1 | 50 | 1.97 | 25 | 0.98 | | 31028-KEKR-0001 [2] |
| 40 | 1½ | 65 | 2.56 | 40.5 | 1.59 | | 31032-KEKR-0001 [2] |
| 50 | 2 | 70 | 2.76 | 49 | 1.93 | | 31034-KEKR-0001 [2] |

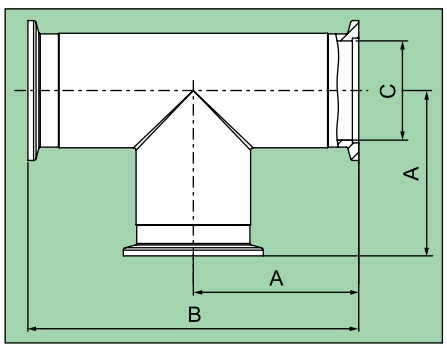
[1] Aluminum EN AW-6082 (3.2315)
[2] Stainless steel AISI 304 (1.4301)




## Elbow 45°

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 26 | 1.02 | 55 | 2.17 | 15 | 0.59 | 31024-KEKH-0001 |
| 25 | 1 | 32 | 1.26 | 68.8 | 2.71 | 25 | 0.98 | 31028-KEKH-0001 |
| 40 | 1½ | 40 | 1.57 | 87.7 | 3.45 | 37 | 1.46 | 31032-KEKH-0001 |

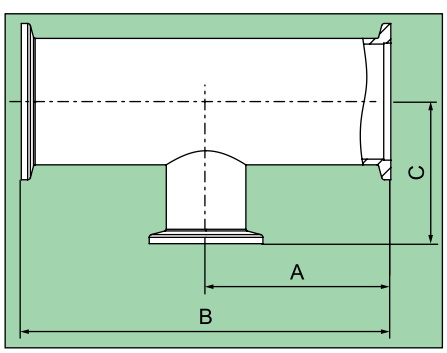
Stainless steel AISI 304 (1.4301)




## T-Piece

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 10 | ⅜ | 30 | 1.18 | 60 | 2.36 | 12 | 0.47 | 31020-KATS-0001 [1] |
| 16 | ⅝ | 40 | 1.57 | 80 | 3.15 | 16 | 0.63 | 31024-KATS-0001 [1] |
| 25 | 1 | 50 | 1.97 | 100 | 3.94 | 25 | 0.98 | 31028-KATS-0001 [1] |
| 40 | 1½ | 65 | 2.56 | 130 | 5.12 | 39 | 1.54 | 31032-KATS-0001 [1] |
| 10 | ⅜ | 30 | 1.18 | 60 | 2.36 | 12 | 0.47 | 31020-KETS-0001 [2] |
| 16 | ⅝ | 40 | 1.57 | 80 | 3.15 | 16 | 0.63 | 31024-KETS-0001 [2] |
| 25 | 1 | 50 | 1.97 | 100 | 3.94 | 25 | 0.98 | 31028-KETS-0001 [2] |
| 40 | 1½ | 65 | 2.56 | 130 | 5.12 | 40.5 | 1.59 | 31032-KETS-0001 [2] |
| 50 | 2 | 70 | 2.76 | 140 | 5.51 | 53 | 2.09 | 31034-KETS-0001 [2] |

[1] Aluminum EN AW-6082 (3.2315)
[2] Stainless steel AISI 304 (1.4301)

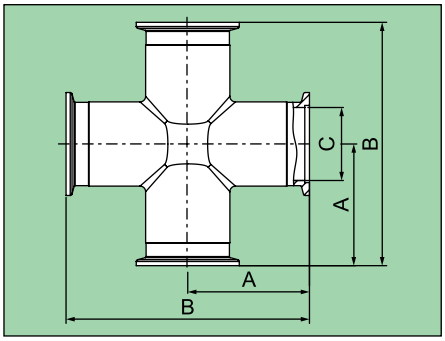



## Reducing T-piece

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 25/16 | 1/⅝ | 50 | 1.97 | 100 | 3.94 | 32 | 1.26 | 31028-KETV-ACK1 |
| 40/16 | 1½/⅝ | 65 | 2.56 | 130 | 5.12 | 40 | 1.57 | 31032-KETV-ACK1 |
| 40/25 | 1½/1 | 65 | 2.56 | 130 | 5.12 | 50 | 1.97 | 31032-KETV-ABW1 |
| 50/16 | 2/⅝ | 70 | 2.76 | 140 | 5.51 | 50 | 1.97 | 31034-KETV-ACK1 |
| 50/25 | 2/1 | 70 | 2.76 | 140 | 5.51 | 65 | 2.56 | 31034-KETV-ABW1 |
| 50/40 | 2/1½ | 70 | 2.76 | 140 | 5.51 | 65 | 2.56 | 31034-KETV-ABJ1 |

Stainless steel AISI 304 (1.4301)

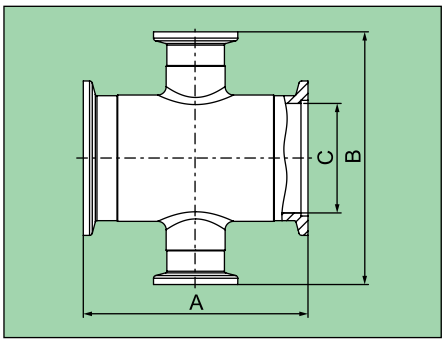
H




### Cross

| DN mm | DN inch | A mm | A inch | B mm | B inch | C mm | C inch | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| 10 | ⅜ | 30 | 1.18 | 60 | 2.36 | 12 | 0.47 | 31020-KAKX-0001 [1] |
| 16 | ⅝ | 40 | 1.57 | 80 | 3.15 | 16 | 0.63 | 31024-KAKX-0001 [1] |
| 25 | 1 | 50 | 1.97 | 100 | 3.94 | 25 | 0.98 | 31028-KAKX-0001 [1] |
| 40 | 1½ | 65 | 2.56 | 130 | 5.12 | 39 | 1.54 | 31032-KAKX-0001 [1] |
| 10 | ⅜ | 30 | 1.18 | 60 | 2.36 | 12 | 0.47 | 31020-KEKX-0001 [2] |
| 16 | ⅝ | 40 | 1.57 | 80 | 3.15 | 16 | 0.63 | 31024-KEKX-0001 [2] |
| 25 | 1 | 50 | 1.97 | 100 | 3.94 | 25 | 0.98 | 31028-KEKX-0001 [2] |
| 40 | 1½ | 65 | 2.56 | 130 | 5.12 | 40.5 | 1.59 | 31032-KEKX-0001 [2] |
| 50 | 2 | 70 | 2.76 | 140 | 5.51 | 53 | 2.09 | 31034-KEKX-0001 [2] |

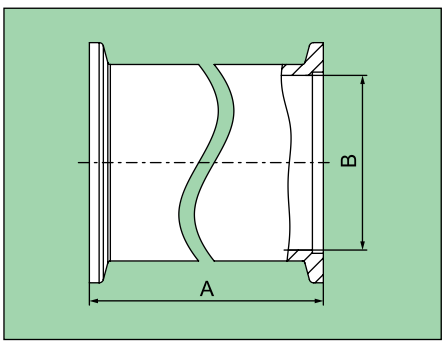
[1] Aluminum EN AW-6082 (3.2315)
[2] Stainless steel AISI 304 (1.4301)




### Reducing cross

| DN mm | DN inch | A mm | A inch | B mm | B inch | C mm | C inch | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| 25/16 | 1/⅝ | 70 | 2.76 | 70 | 2.76 | 25 | 0.98 | 31028-KAKZ-0001 [1] |
| 40/16 | 1½/⅝ | 80 | 3.15 | 90 | 3.54 | 39 | 1.54 | 31032-KAKZ-0001 [1] |
| 25/16 | 1/⅝ | 70 | 2.76 | 70 | 2.76 | 25 | 0.98 | 31028-KEKZ-0001 [2] |
| 40/16 | 1½/⅝ | 80 | 3.15 | 90 | 3.54 | 40.5 | 1.59 | 31032-KEKZ-0001 [2] |
| 50/16 | 2/⅝ | 100 | 3.94 | 100 | 3.94 | 53 | 2.09 | 31034-KEKX-0001 [2] |

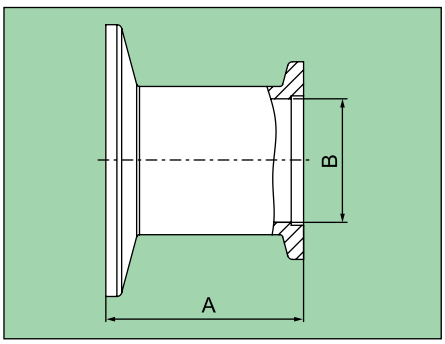
[1] Aluminum EN AW-6082 (3.2315)
[2] Stainless steel AISI 304 (1.4301)




### Intermediate piece

| DN mm | DN inch | A mm | A inch | B mm | B inch | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| 16 | ⅝ | 80 | 3.15 | 16 | 0.63 | | 31024-KAZS-0001 [1] |
| 25 | 1 | 100 | 3.94 | 25 | 0.98 | | 31028-KAZS-0001 [1] |
| 40 | 1½ | 130 | 5.12 | 40 | 1.57 | | 31032-KAZS-0001 [1] |
| 16 | ⅝ | 80 | 3.15 | 16 | 0.63 | | 31024-KEZS-0001 [2] |
| 25 | 1 | 100 | 3.94 | 25 | 0.98 | | 31028-KEZS-0001 [2] |
| 40 | 1½ | 130 | 5.12 | 40.5 | 1.59 | | 31032-KEZS-0001 [2] |
| 50 | 2 | 140 | 5.51 | 53 | 2.09 | | 31034-KEZS-0001 [2] |

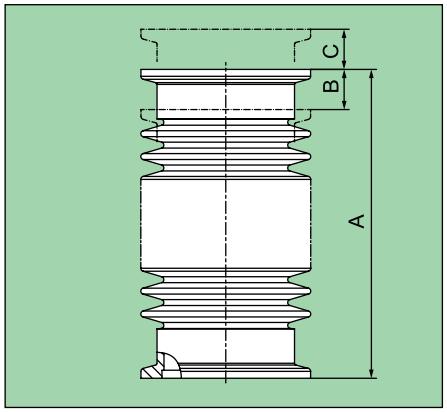
[1] Aluminum EN AW-6082 (3.2315)
[2] Stainless steel AISI 304 (1.4301)




### Reducing piece

| DN mm | DN inch | A mm | A inch | B mm | B inch | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| 25/16 | 1/⅝ | 40 | 1.57 | 16 | 0.63 | | 31028-KAUP-ACK1 [1] |
| 40/16 | 1½/⅝ | 40 | 1.57 | 16 | 0.63 | | 31032-KAUP-ACK1 [1] |
| 40/25 | 1½/1 | 40 | 1.57 | 25 | 0.98 | | 31032-KAUP-ABW1 [1] |
| 50/40 | 2/1½ | 40 | 1.57 | 40 | 1.57 | | 31034-KAUP-ABJ1 [1] |
| 25/16 | 1/⅝ | 40 | 1.57 | 16 | 0.63 | | 31028-KEUP-ACK1 [2] |
| 40/16 | 1½/⅝ | 40 | 1.57 | 16 | 0.63 | | 31032-KEUP-ACK1 [2] |
| 40/25 | 1½/1 | 40 | 1.57 | 26 | 1.02 | | 31032-KEUP-ABW1 [2] |
| 50/16 | 2/⅝ | 40 | 1.57 | 16 | 0.63 | | 31034-KEUP-ACK1 [2] |
| 50/25 | 2/1 | 40 | 1.57 | 26 | 1.02 | | 31034-KEUP-ABW1 [2] |
| 50/40 | 2/1½ | 40 | 1.57 | 40 | 1.57 | | 31034-KEUP-ABJ1 [2] |

[1] Aluminum EN AW-6082 (3.2315)
[2] Stainless steel AISI 303 (1.4305)

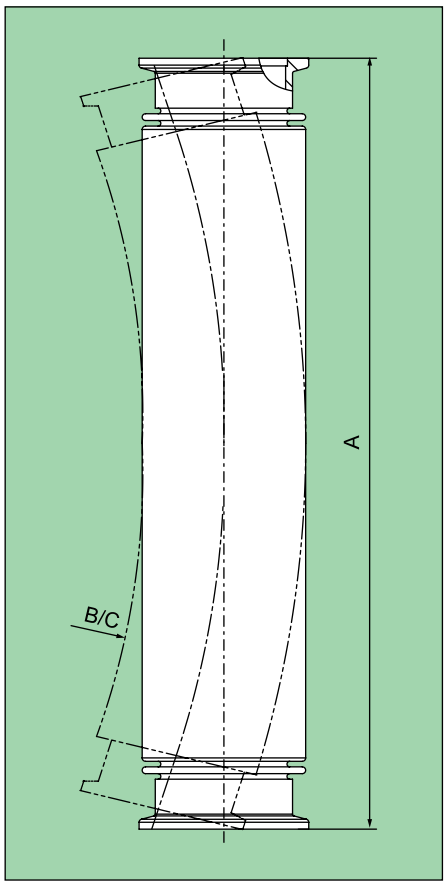



## Spring bellows, short

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 10 | ⅜ | 70 | 2.76 | 3.5 | 0.14 | 3 | 0.12 | 31020-KEFK-0001 |
| 16 | ⅝ | 70 | 2.76 | 6.4 | 0.25 | 4.1 | 0.16 | 31024-KEFK-0001 |
| 25 | 1 | 80 | 3.15 | 8 | 0.31 | 5 | 0.20 | 31028-KEFK-0001 |
| 40 | 1½ | 100 | 3.94 | 11 | 0.43 | 7 | 0.28 | 31032-KEFK-0001 |
| 50 | 2 | 100 | 3.94 | 10 | 0.39 | 6 | 0.24 | 31034-KEFK-0001 |

A = Uncompressed length

Flange: stainless steel AISI 304 (1.4301)
Bellows: stainless steel AISI 316Ti (1.4571)
Internal pressure: max. 4 bar



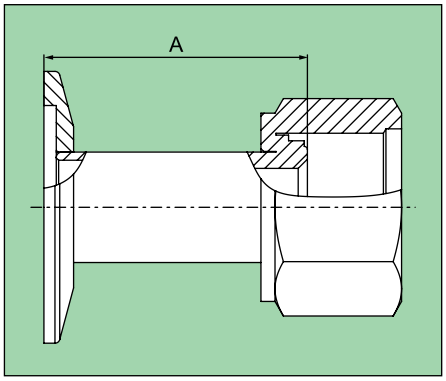

## Spring bellows, long

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 10 | ⅜ | 250 | 9.84 | 70 | 2.76 | 32 | 1.26 | 31020-KEFK-ABR1 |
| 10 | ⅜ | 500 | 19.69 | 70 | 2.76 | 32 | 1.26 | 31020-KEFK-ABS1 |
| 10 | ⅜ | 750 | 29.53 | 70 | 2.76 | 32 | 1.26 | 31020-KEFK-ABT1 |
| 10 | ⅜ | 1000 | 39.37 | 70 | 2.76 | 32 | 1.26 | 31020-KEFK-ABP1 |
| 16 | ⅝ | 250 | 9.84 | 70 | 2.76 | 50 | 1.97 | 31024-KEFK-ABR1 |
| 16 | ⅝ | 500 | 19.69 | 70 | 2.76 | 50 | 1.97 | 31024-KEFK-ABS1 |
| 16 | ⅝ | 750 | 29.53 | 70 | 2.76 | 50 | 1.97 | 31024-KEFK-ABT1 |
| 16 | ⅝ | 1000 | 39.37 | 70 | 2.76 | 50 | 1.97 | 31024-KEFK-ABP1 |
| 16 | ⅝ | 1500 | 59.06 | 70 | 2.76 | 50 | 1.97 | 31024-KEFK-ACH1 |
| 16 | ⅝ | 2000 | 78.74 | 70 | 2.76 | 50 | 1.97 | 31024-KEFK-ACI1 |
| 25 | 1 | 250 | 9.84 | 100 | 3.94 | 60 | 2.36 | 31028-KEFK-ABR1 |
| 25 | 1 | 500 | 19.69 | 100 | 3.94 | 60 | 2.36 | 31028-KEFK-ABS1 |
| 25 | 1 | 750 | 29.53 | 100 | 3.94 | 60 | 2.36 | 31028-KEFK-ABT1 |
| 25 | 1 | 1000 | 39.37 | 100 | 3.94 | 60 | 2.36 | 31028-KEFK-ABP1 |
| 25 | 1 | 1500 | 59.06 | 100 | 3.94 | 103 | 4.06 | 31028-KEFK-ACH1 |
| 25 | 1 | 2000 | 78.74 | 100 | 3.94 | 103 | 4.06 | 31028-KEFK-ACI1 |
| 40 | 1½ | 250 | 9.84 | 130 | 5.12 | 100 | 3.94 | 31032-KEFK-ABR1 |
| 40 | 1½ | 500 | 19.69 | 130 | 5.12 | 100 | 3.94 | 31032-KEFK-ABS1 |
| 40 | 1½ | 750 | 29.53 | 130 | 5.12 | 100 | 3.94 | 31032-KEFK-ABT1 |
| 40 | 1½ | 1000 | 39.37 | 130 | 5.12 | 100 | 3.94 | 31032-KEFK-ABP1 |
| 40 | 1½ | 1500 | 59.06 | 130 | 5.12 | 129 | 5.08 | 31032-KEFK-ACH1 |
| 40 | 1½ | 2000 | 78.74 | 130 | 5.12 | 129 | 5.08 | 31032-KEFK-ACI1 |
| 50 | 2 | 250 | 9.84 | 200 | 7.87 | 130 | 5.12 | 31034-KEFK-ABR1 |
| 50 | 2 | 500 | 19.69 | 200 | 7.87 | 130 | 5.12 | 31034-KEFK-ABS1 |
| 50 | 2 | 750 | 29.53 | 200 | 7.87 | 130 | 5.12 | 31034-KEFK-ABT1 |
| 50 | 2 | 1000 | 39.37 | 200 | 7.87 | 130 | 5.12 | 31034-KEFK-ABP1 |

B = Radius for several bendings
C = Radius for one bending

Flange: stainless steel AISI 304 (1.4301)
Bellows: stainless steel AISI 316Ti (1.4571)
Internal pressure: max. 4 bar

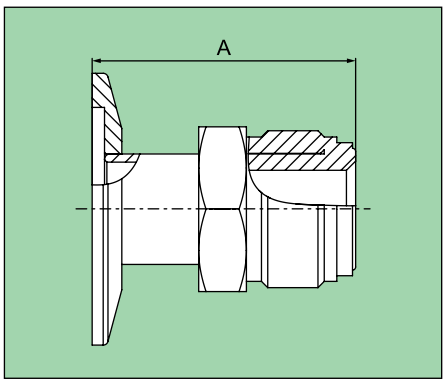
H




### Adapter flange VCR with internal thread

| DN ISO-KF mm | DN ISO-KF inch | DN VCR mm | DN VCR inch | A mm | A inch | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| 16 | ⅝ | 6.35 | ¼ | 35.8 | 1.41 | | 31024-KEAW-ACP1 |
| 25 | 1 | 6.35 | ¼ | 35.8 | 1.41 | | 31028-KEAW-ACP1 |
| 25 | 1 | 12.70 | ½ | 40.6 | 1.60 | | 31028-KEAW-ACQ1 |
| 40 | 1½ | 19.05 | ¾ | 53.3 | 2.10 | | 31032-KEAW-ACR1 |

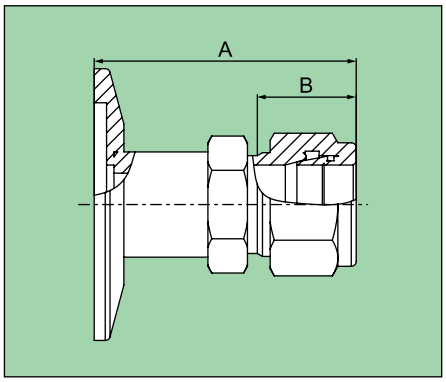
Flange: stainless steel AISI 304 (1.4301)
Nut: stainless steel AISI 316L (1.4435)
Wrench size: inch




### Adapter flange VCR with external thread

| DN ISO-KF mm | DN ISO-KF inch | DN VCR mm | DN VCR inch | A mm | A inch | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| 16 | ⅝ | 6.35 | ¼ | 35.8 | 1.41 | | 31024-KEAM-ACP1 |
| 25 | 1 | 6.35 | ¼ | 35.8 | 1.41 | | 31028-KEAM-ACP1 |
| 25 | 1 | 12.70 | ½ | 40.6 | 1.60 | | 31028-KEAM-ACQ1 |
| 40 | 1½ | 19.05 | ¾ | 53.3 | 2.10 | | 31032-KEAM-ACR1 |

Flange: stainless steel AISI 304 (1.4301)
Wrench size: inch




### Adapter flange Swagelok

| DN ISO-KF mm | DN ISO-KF inch | DN Swagelok mm | DN Swagelok inch | A mm | A inch | B mm | B inch | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| 16 | ⅝ | 6 | 0.24 | 37 | 1.46 | 15.3 | 0.60 | 31024-KEAS-ACL1 [1] |
| 25 | 1 | 10 | 0.39 | 45 | 1.77 | 17.2 | 0.68 | 31028-KEAS-ACM1 [1] |
| 40 | 1½ | 16 | 0.63 | 53 | 2.09 | 24.4 | 0.96 | 31032-KEAS-ACN1 [1] |
| 16 | ⅝ | 3.18 | ⅛ | 34.5 | 1.36 | 12.7 | 0.50 | 31024-KEAS-ACO1 [2] |
| 25 | 1 | 6.35 | ¼ | 37 | 1.46 | 15.3 | 0.60 | 31028-KEAS-ACP1 [2] |
| 40 | 1½ | 6.35 | ¼ | 37 | 1.46 | 15.3 | 0.60 | 31032-KEAS-ACP1 [2] |
| 40 | 1½ | 12.70 | ½ | 47.5 | 1.87 | 22.8 | 0.90 | 31032-KEAS-ACQ1 [2] |

Flange: stainless steel AISI 304 (1.4301)
Nut: stainless steel AISI 316L (1.4435)
Wrench size: [1] metric
[2] inch

# Soft-start throttle

to reduce the gas flow in pump forelines



Protection device against

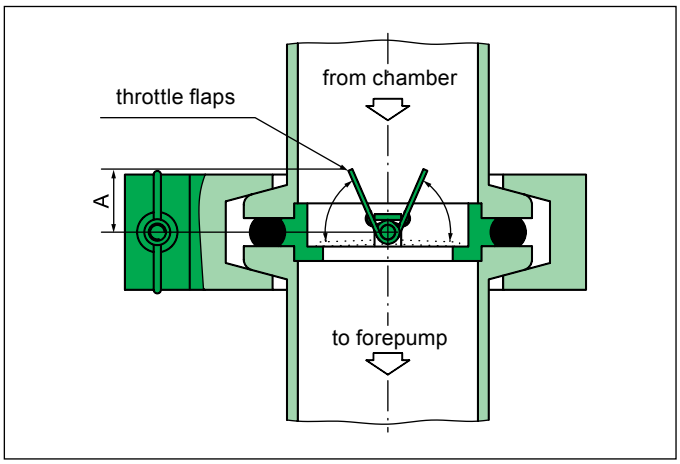
– turbulence in piping and chambers

– particle contamination in vacuum systems

– movement of substrates caused by turbulence

Soft-start throttle valves consist of two halves of throttle flaps supported on a common axis and maintained in the open position by a spring. The axis is held in an ISO-KF centering ring that is formed as a body with valve seat.

When mounting them between two ISO-KF flanges (instead of a centering ring), the open flaps must be orientated against the air flow in the vacuum line. When the roughing system goes into operation, a strong air flow occurs in the forevacuum line, which immediately closes the valve and reduces the pipe section by about 99%. When reaching a differential pressure of approx. 15 mbar, the valve opens abruptly and leaves the pipe section nearly unobstructed for further pumping.




## Technical data & ordering information

| DN | | Dimensions | | Open section | | | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| | | A | | Throttle open | | Throttle closed | | |
| mm | inch | mm | inch | mm² | inch² | mm² | inch² | |
| 16 | ⅝ | 6.2 | 0.24 | 90 | 0.14 | 4 | 0.006 | 31124-KASO |
| 25 | 1 | 9.0 | 0.35 | 200 | 0.31 | 5.5 | 0.0085 | 31128-KASO |
| 40 | 1½ | 14.3 | 0.56 | 570 | 0.88 | 8 | 0.012 | 31132-KASO |
| 50 | 2 | 19.9 | 0.78 | 1190 | 1.84 | 10.5 | 0.016 | 31134-KASO |

| | |
|---|---|
| Behavior | |
| – Fast closing | when pumping is started |
| – Opening | at Δp approx. 15 mbar [1] |
| Temperature [2] | 150 °C |
| Mounting position | any |
| Lifetime | 100 000 cycles |
| 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

H

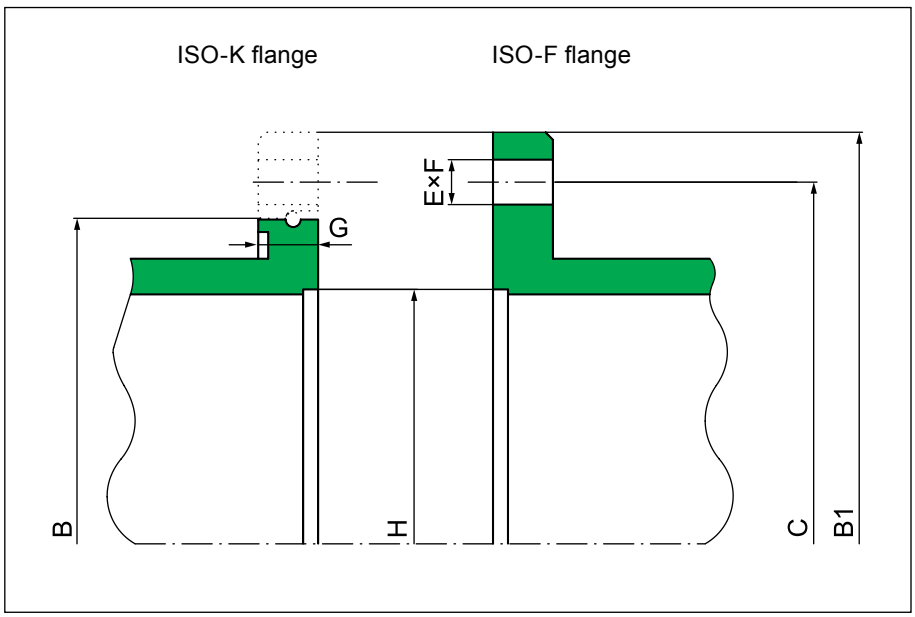
Clamps
Claws
Screws
Centering rings
Seals
Flanges
Ports
Elbows
T-Pieces
Reducting pieces
Cross pieces
Bellows



| Seal | FKM (Viton®) |
|---|---|
| Suitable flange material | A, E |
| Temperature [1] | ≤200 °C |
| Leak rate for Helium (mbar ls$^{-1}$) | $<1 \cdot 10^{-9}$ |
| Sealing force (N per cm sealing line) | 10–50 |
| Multiple use of seal | yes |

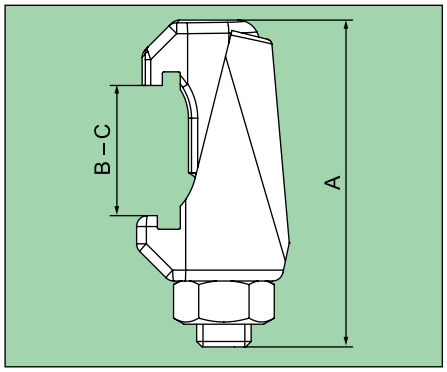
A: aluminum
E: stainless steel

[1] Maximum values: depending on operating conditions and sealing materials




| DN | | 63 | 80 | 100 | 160 | 200 | 250 | 320 | 400 | 500 | 630 | 800 | 1000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | inch | 2½ | 3 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 60 |
| B | mm | 95 | 110 | 130 | 180 | 240 | 290 | 370 | 450 | 550 | 690 | – | – |
| | inch | 3.74 | 4.33 | 5.12 | 7.09 | 9.45 | 11.42 | 14.57 | 17.72 | 21.65 | 27.17 | | |
| B1 | mm | 130 | 145 | 165 | 225 | 285 | 335 | 425 | 510 | 610 | 750 | 920 | 1120 |
| | inch | 5.12 | 5.71 | 6.50 | 8.86 | 11.22 | 13.19 | 16.73 | 20.08 | 24.02 | 29.53 | 36.22 | 44.09 |
| C | mm | 110 | 125 | 145 | 200 | 260 | 310 | 395 | 480 | 580 | 720 | 890 | 1090 |
| | inch | 4.33 | 4.92 | 5.71 | 7.87 | 10.24 | 12.20 | 15.55 | 18.90 | 22.83 | 28.35 | 35.04 | 42.91 |
| E × F | mm | 4 × 9 | 8 × 9 | 8 × 9 | 8 × 11 | 12 × 11 | 12 × 11 | 12 × 14 | 16 × 14 | 16 × 14 | 20 × 14 | 24 × 14 | 32 × 14 |
| | inch | 4 × 0.35 | 8 × 0.35 | 8 × 0.35 | 8 × 0.43 | 12 × 0.43 | 12 × 0.43 | 12 × 0.55 | 16 × 0.55 | 16 × 0.55 | 20 × 0.55 | 24 × 0.55 | 32 × 0.55 |
| G | mm | 12 | 12 | 12 | 12 | 12 | 12 | 17 | 17 | 17 | 22 | – | – |
| | inch | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.67 | 0.67 | 0.67 | 0.87 | | |
| H | mm | 70 | 83 | 102 | 153 | 213 | 261 | 318 | 400 | 501 | 651 | 800 | 1000 |
| | inch | 2.76 | 3.27 | 4.02 | 6.02 | 8.39 | 10.28 | 12.52 | 15.75 | 19.72 | 25.63 | 31.50 | 39.37 |

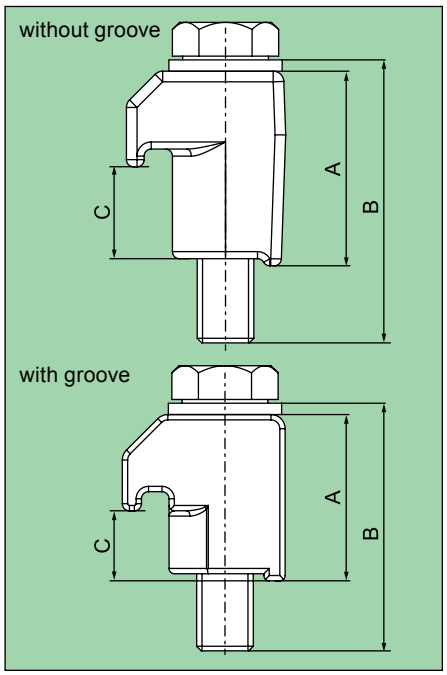
# Technical data and ordering information




### Clamp, ISO-K

| DN mm | DN inch | A mm | A inch | B mm | B inch | C mm | C inch | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| 63 – 250 | 2½ – 10 | 60 | 2.36 | 17 | 0.67 | 27 | 1.06 | 32036-QNKS-0001 [1] |
| 320 – 500 | 12 – 20 | 78 | 3.07 | 27 | 1.06 | 39 | 1.54 | 32050-QNKS-0001 [1] |
| 630 | 25 | 88 | 3.66 | 31 | 1.22 | 49 | 1.93 | 32056-QNKS-0001 [1] |
| 63 – 250 | 2½ – 10 | 61 | 2.40 | 18 | 0.71 | 28 | 1.10 | 32036-QEKS-0001 [2] |
| 320 – 630 | 12 – 25 | 82 | 3.23 | 29 | 1.14 | 47 | 1.85 | 32050-QEKS-0001 [2] |

[1] Steel, zinc-plated 1045
[2] Stainless steel AISI 316 (1.4401)

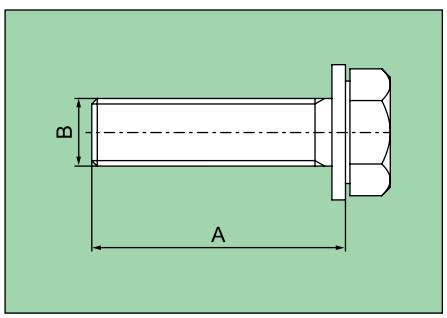



### Claw with screw and washer, ISO-K

| DN mm | DN inch | A mm | A inch | B mm | B inch | C mm | C inch | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| 63 – 100 | 2½ – 4 | 27.5 | 1.08 | 40 | 1.57 | 14 | 0.55 | 32040-QAPR-0001 [1] |
| 160 – 250 | 6 – 10 | 28.5 | 1.12 | 45 | 1.77 | 14 | 0.55 | 32044-QAPR-0001 [1] |
| 320 – 500 | 12 – 20 | 36.5 | 1.44 | 55 | 2.17 | 20.3 | 0.80 | 32050-QAPR-0001 [1] |
| 63 – 100 | 2½ – 4 | 23.5 | 0.93 | 35 | 1.38 | 10 | 0.39 | 320XX-QAPR-0001 [2] |

[1] Clamp flange, base plate without groove
[2] Clamp flange, base plate with groove
Claw: aluminum
Screw: steel 8.8, zinc-plated

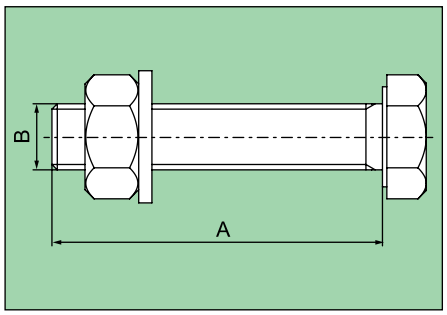
| mm | inch | screw | pieces per flange |
|---|---|---|---|
| 63 | 2½ | M8 × 40 | 4 |
| 80 – 100 | 3 – 4 | M8 × 40 | 8 |
| 160 | 6 | M10 × 45 | 8 |
| 200 – 250 | 8 – 10 | M10 × 45 | 12 |
| 320 | 12 | M12 × 55 | 12 |
| 400 – 500 | 16 – 20 | M12 × 55 | 16 |




### Screw with washer, ISO-F

| DN mm | DN inch | A mm | A inch | B thread | pieces per flange | Ordering numbers |
|---|---|---|---|---|---|---|
| 63 | 2½ | 30 | 1.18 | M8 | 4 | 32036-QNSU-0001 |
| 80 – 100 | 3 – 4 | 30 | 1.18 | M8 | 8 | 32036-QNSU-0001 |
| 160 | 6 | 35 | 1.38 | M10 | 8 | 32044-QNSU-0001 |
| 200 – 250 | 8 – 10 | 35 | 1.38 | M10 | 12 | 32044-QNSU-0001 |
| 320 | 12 | 45 | 1.77 | M12 | 12 | 32050-QNSU-0001 |

Steel, zinc-plated

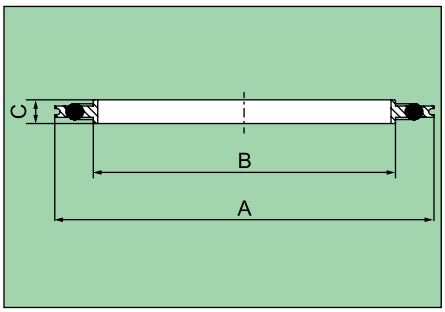



### Screw with washer and nut, ISO-F

| DN mm | DN inch | A mm | A inch | B thread | pieces per flange | Ordering numbers |
|---|---|---|---|---|---|---|
| 63 | 2½ | 40 | 1.57 | M8 | 4 | 32036-QNSS-0001 |
| 80 – 100 | 3 – 4 | 40 | 1.57 | M8 | 8 | 32036-QNSS-0001 |
| 160 | 6 | 50 | 1.97 | M10 | 8 | 32044-QNSS-0001 |
| 200 – 250 | 8 – 10 | 50 | 1.97 | M10 | 12 | 32044-QNSS-0001 |
| 320 | 12 | 60 | 2.36 | M12 | 12 | 32050-QNSS-0001 |

Steel, zinc-plated

H

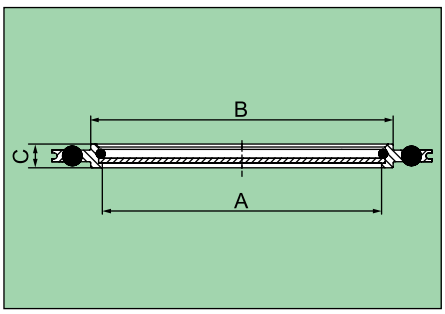



### Centering ring, ISO-K / ISO-F

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 63 | 2½ | 96 | 3.78 | 70 | 2.76 | 8 | 0.31 | 32036-QAZV-0001 [1] |
| 80 | 3 | 109 | 4.29 | 83 | 3.27 | 8 | 0.31 | 32038-QAZV-0001 [1] |
| 100 | 4 | 128 | 5.04 | 102 | 4.02 | 8 | 0.31 | 32040-QAZV-0001 [1] |
| 160 | 6 | 179 | 7.05 | 153 | 6.02 | 8 | 0.31 | 32044-QAZV-0001 [1] |
| 200 | 8 | 239 | 9.41 | 213 | 8.39 | 8 | 0.31 | 32046-QAZV-0001 [1] |
| 250 | 10 | 287 | 11.30 | 261 | 10.28 | 8 | 0.31 | 32048-QAZV-0001 [1] |
| 320 | 12 | 358 | 14.09 | 318 | 12.52 | 14 | 0.55 | 32050-QAZV-0001 [1] |
| 400 | 16 | 440 | 17.32 | 400 | 15.75 | 14 | 0.55 | 32052-QAZV-0001 [1] |
| 500 | 20 | 541 | 21.30 | 501 | 19.72 | 14 | 0.55 | 32054-QAZV-0001 [1] |
| 630 | 25 | 691 | 27.20 | 651 | 25.63 | 14 | 0.55 | 32056-QAZV-0001 [1] |
| 800 | 32 | 840 | 33.07 | 800 | 31.50 | 14 | 0.55 | 32058-QAZV-0001 [1] |
| 1000 | 60 | 1040 | 40.94 | 1000 | 39.37 | 14 | 0.55 | 32060-QAZV-0001 [1] |
| 63 | 2½ | 96 | 3.78 | 70 | 2.76 | 8 | 0.31 | 32036-QEZV-0001 [2] |
| 80 | 3 | 109 | 4.29 | 83 | 3.27 | 8 | 0.31 | 32038-QEZV-0001 [2] |
| 100 | 4 | 128 | 5.04 | 102 | 4.02 | 8 | 0.31 | 32040-QEZV-0001 [2] |
| 160 | 6 | 179 | 7.05 | 153 | 6.02 | 8 | 0.31 | 32044-QEZV-0001 [2] |
| 200 | 8 | 239 | 9.41 | 213 | 8.39 | 8 | 0.31 | 32046-QEZV-0001 [2] |
| 250 | 10 | 287 | 11.30 | 261 | 10.28 | 8 | 0.31 | 32048-QEZV-0001 [2] |

[1] Inner and outer ring: aluminum EN AW-6082 (3.2315)
Seal: elastomer FKM (Viton®)

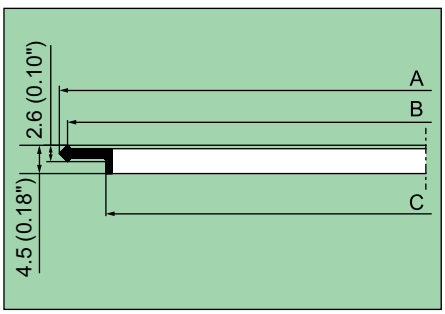
[2] Inner ring: stainless steel AISI 304 (1.4301)
Outer ring: aluminum EN AW-6082 (3.2315)
Seal: elastomer FKM (Viton®)




### Centering ring with fine filter, ISO-K / ISO-F

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 63 | 2½ | 62 | 2.44 | 69.8 | 2.75 | 8 | 0.31 | 32036-QEZG-0001 |
| 100 | 4 | 94 | 3.70 | 101.8 | 4.01 | 8 | 0.31 | 32040-QEZG-0001 |

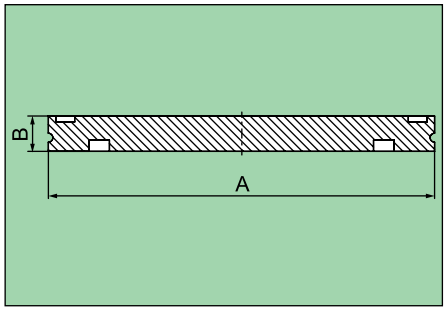
Inner ring: stainless steel AISI 304 (1.4301)
Spring ring: stainless steel AISI 304 (1.4301)
Seal: elastomer FKM (Viton®)
Filter: stainless steel AISI 316L (1.4435), pore size: 0.004 mm
Degree of separation: 0.001 mm to 98%




### Aluminum seal, ISO-K / ISO-F

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 63 | 2½ | 85.6 | 3.37 | 83 | 3.27 | 69.8 | 2.75 | 32036-QADK-0001 |
| 100 | 4 | 116.6 | 4.59 | 114 | 4.49 | 101.8 | 4.01 | 32040-QADK-0001 |
| 160 | 6 | 166.6 | 6.56 | 164 | 6.46 | 152.8 | 6.02 | 32044-QADK-0001 |
| 250 | 10 | 276.6 | 10.89 | 274 | 10.79 | 260.8 | 10.27 | 32048-QADK-0001 |

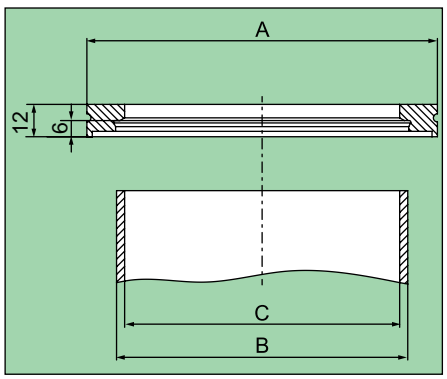
Aluminum EN AW-6082 (3.2315), annealed




## Blank-off flange, ISO-K

| DN | | A | | B | | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | | |
| 63 | 2½ | 95 | 3.74 | 12 | 0.47 | | 32036-QAFB-0001 [1] |
| 100 | 4 | 130 | 5.12 | 12 | 0.47 | | 32040-QAFB-0001 [1] |
| 160 | 6 | 180 | 7.09 | 12 | 0.47 | | 32044-QAFB-0001 [1] |
| 200 | 8 | 240 | 9.45 | 12 | 0.47 | | 32046-QAFB-0001 [1] |
| 250 | 10 | 290 | 11.42 | 12 | 0.47 | | 32048-QAFB-0001 [1] |
| 320 | 12 | 370 | 14.57 | 17 | 0.67 | | 32050-QAFB-0001 [1] |
| 63 | 2½ | 95 | 3.74 | 12 | 0.47 | | 32036-QNFB-0001 [2] |
| 100 | 4 | 130 | 5.12 | 12 | 0.47 | | 32040-QNFB-0001 [2] |
| 160 | 6 | 180 | 7.09 | 12 | 0.47 | | 32044-QNFB-0001 [2] |
| 250 | 10 | 290 | 11.42 | 12 | 0.47 | | 32048-QNFB-0001 [2] |
| 63 | 2½ | 95 | 3.74 | 12 | 0.47 | | 32036-QEFB-0001 [3] |
| 80 | 3 | 110 | 4.33 | 12 | 0.47 | | 32038-QEFB-0001 [3] |
| 100 | 4 | 130 | 5.12 | 12 | 0.47 | | 32040-QEFB-0001 [3] |
| 160 | 6 | 180 | 7.09 | 12 | 0.47 | | 32044-QEFB-0001 [3] |
| 200 | 8 | 240 | 9.45 | 12 | 0.47 | | 32046-QEFB-0001 [3] |
| 250 | 10 | 290 | 11.42 | 12 | 0.47 | | 32048-QEFB-0001 [3] |
| 320 | 12 | 370 | 14.57 | 17 | 0.67 | | 32050-QEFB-0001 [3] |
| 400 | 16 | 450 | 17.72 | 17 | 0.67 | | 32052-QEFB-0001 [3] |
| 500 | 20 | 550 | 21.65 | 17 | 0.67 | | 32054-QEFB-0001 [3] |
| 630 | 25 | 690 | 27.17 | 22 | 0.87 | | 32056-QEFB-0001 [3] |

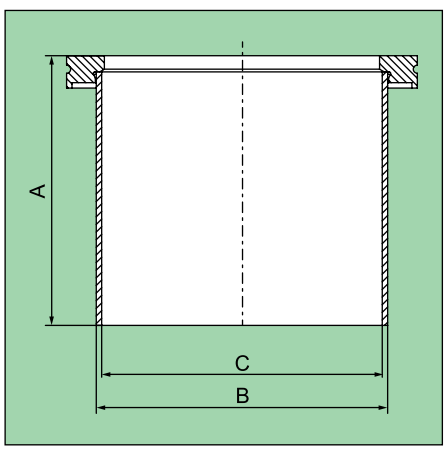
[1] Aluminum EN AW-6082 (3.2315)
[2] Steel, nickel-plated A570
[3] Stainless steel AISI 304 (1.4301)




## Weld neck flange, ISO-K

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 63 | 2½ | 95 | 3.74 | 76.1 | 3.00 | 71.5 | 2.81 | 32036-QEFF-0001 |
| 80 | 3 | 110 | 4.33 | 88.9 | 3.50 | 84.9 | 3.34 | 32038-QEFF-0001 |
| 100 | 4 | 130 | 5.12 | 108 | 4.25 | 102 | 4.02 | 32040-QEFF-0001 |
| 160 | 6 | 180 | 7.09 | 159 | 6.26 | 155 | 6.10 | 32044-QEFF-0001 |
| 200 | 8 | 240 | 9.45 | 219.1 | 8.63 | 213.1 | 8.39 | 32046-QEFF-0001 |
| 250 | 10 | 290 | 11.42 | 267 | 10.51 | 261 | 10.28 | 32048-QEFF-0001 |
| 320 | 12 | 370 | 14.57 | 324 | 12.76 | 318 | 12.52 | 32050-QEFF-0001 |

Stainless steel AISI 304 (1.4301)

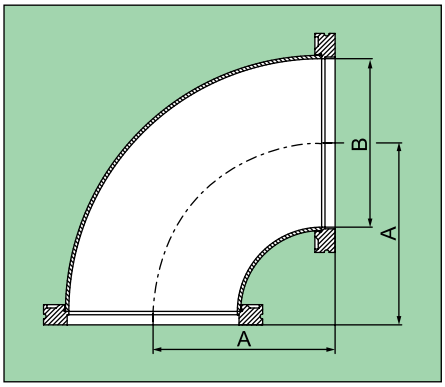



## Weld neck flange, ISO-K

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 63 | 2½ | 100 | 3.94 | 76.1 | 3.00 | 71.5 | 2.81 | 32036-QESK-0001 |
| 100 | 4 | 100 | 3.94 | 108 | 4.25 | 104 | 4.09 | 32040-QESK-0001 |
| 160 | 6 | 100 | 3.94 | 159 | 6.26 | 155 | 6.10 | 32044-QESK-0001 |
| 200 | 8 | 100 | 3.94 | 219.1 | 8.63 | 213.7 | 8.41 | 32046-QESK-0001 |
| 250 | 10 | 100 | 3.94 | 267 | 10.51 | 261 | 10.28 | 32048-QESK-0001 |
| 320 | 12 | 100 | 3.94 | 324 | 12.76 | 318 | 12.52 | 32050-QESK-0001 |
| 400 | 16 | 100 | 3.94 | 406 | 15.98 | 400 | 15.75 | 32052-QESK-0001 |
| 500 | 20 | 100 | 3.94 | 508 | 20.00 | 500 | 19.69 | 32054-QESK-0001 |
| 630 | 25 | 100 | 3.94 | 660 | 25.98 | 650 | 25.59 | 32056-QESK-0001 |

Stainless steel AISI 304 (1.4301)

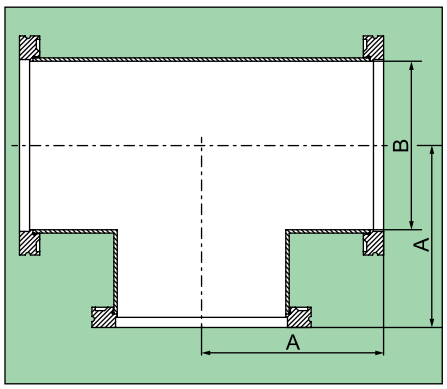
H




### Elbow 90°, ISO-K

| DN | | A | | B | | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | | |
| 63 | 2 ½ | 88 | 3.46 | 66 | 2.60 | | 32036-QEKR-0001 |
| 100 | 4 | 108 | 4.25 | 100 | 3.94 | | 32040-QEKR-0001 |
| 160 | 6 | 138 | 5.43 | 150 | 5.91 | | 32044-QEKR-0001 |
| 200 | 8 | 178 | 7.01 | 213 | 8.39 | | 32046-QEKR-0001 |
| 250 | 10 | 208 | 8.19 | 250 | 9.84 | | 32048-QEKR-0001 |
| 320 | 12 | 250 | 9.84 | 318 | 12.52 | | 32050-QEKR-0001 |

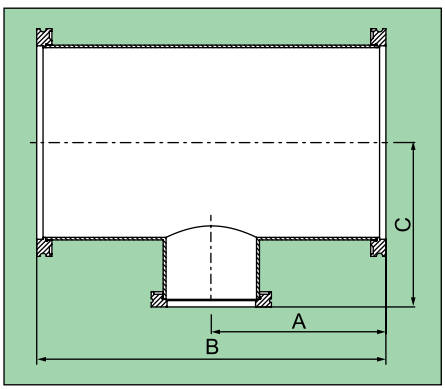
Stainless steel AISI 304 (1.4301)




### T-Piece, ISO-K

| DN | | A | | B | | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | | |
| 63 | 2 ½ | 88 | 3.46 | 66 | 2.60 | | 32036-QETS-0001 |
| 100 | 4 | 108 | 4.25 | 100 | 3.94 | | 32040-QETS-0001 |
| 160 | 6 | 138 | 5.43 | 150 | 5.91 | | 32044-QETS-0001 |
| 200 | 8 | 178 | 7.01 | 213 | 8.39 | | 32046-QETS-0001 |
| 250 | 10 | 208 | 8.19 | 250 | 9.84 | | 32048-QETS-0001 |
| 320 | 12 | 250 | 9.84 | 318 | 12.52 | | 32050-QETS-0001 |

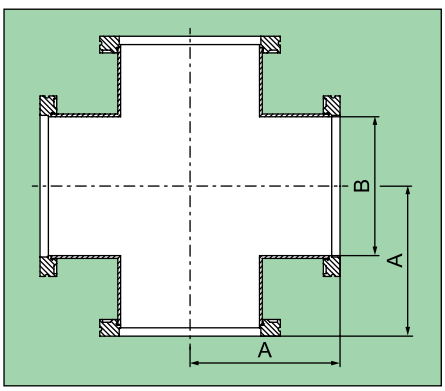
Stainless steel AISI 304 (1.4301)




### Reducing T-piece, ISO-K

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 160/ 63 | 6/2½ | 138 | 5.43 | 276 | 10.87 | 130 | 5.12 | 32044-QETV-ABU1 |
| 160/100 | 6/4 | 138 | 5.43 | 276 | 10.87 | 131 | 5.16 | 32044-QETV-ACS1 |
| 250/200 | 10/8 | 190 | 7.48 | 380 | 14.96 | 208 | 8.19 | 32048-QETV-ACT1 |

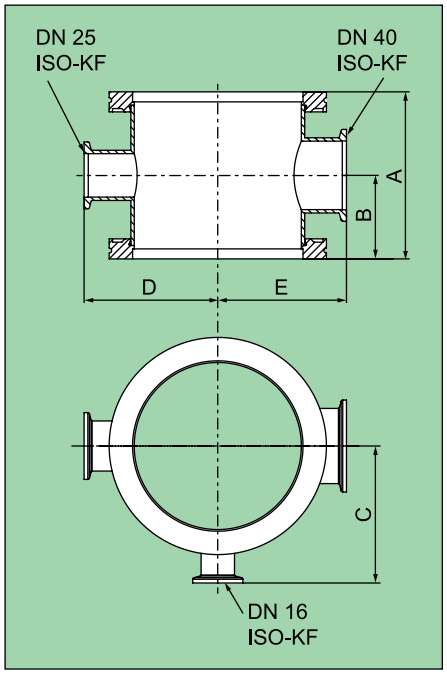
Stainless steel AISI 304 (1.4301)




### Cross, ISO-K

| DN | | A | | B | | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | | |
| 63 | 2 ½ | 88 | 3.46 | 66 | 2.60 | | 32036-QEKX-0001 |
| 100 | 4 | 108 | 4.25 | 100 | 3.94 | | 32040-QEKX-0001 |
| 160 | 6 | 138 | 5.43 | 150 | 5.91 | | 32044-QEKX-0001 |
| 200 | 8 | 178 | 7.01 | 213 | 8.39 | | 32046-QEKX-0001 |
| 250 | 10 | 208 | 8.19 | 250 | 9.84 | | 32048-QEKX-0001 |

Stainless steel AISI 304 (1.4301)

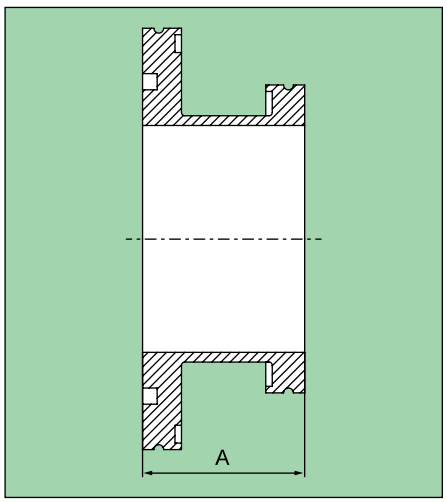



### Reducing cross, ISO-K

| DN | | A | | B | | C | | D | | E | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | |
| 63 | 2½ | 88 | 3.46 | 44 | 1.73 | 66 | 2.60 | 64 | 2.52 | 59 | 2.32 | 32036-QEKZ-0001 |
| 100 | 4 | 100 | 3.94 | 50 | 1.97 | 82 | 3.23 | 80 | 3.15 | 77 | 3.03 | 32040-QEKZ-0001 |
| 160 | 6 | 100 | 3.94 | 50 | 1.97 | 107 | 4.21 | 107 | 4.21 | 105 | 4.13 | 32044-QEKZ-0001 |

Stainless steel AISI 304 (1.4301)

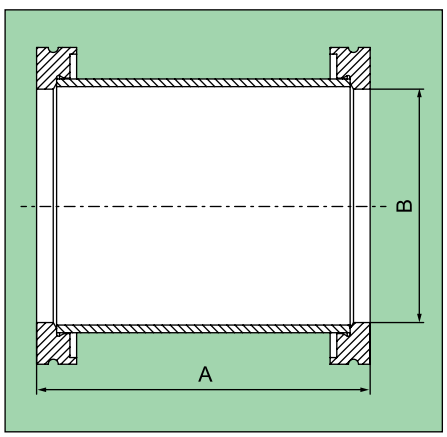
1 × DN 16 ISO-KF
1 × DN 25 ISO-KF
1 × DN 40 ISO-KF




### Reducing piece, ISO-K

| DN | | A | | | Ordering numbers |
|---|---|---|---|---|---|
| mm | inch | mm | inch | | |
| 80/ 63 | 3/2½ | 50 | 1.97 | | 32038-QEUP-ABU1 |
| 100/ 63 | 4/2½ | 50 | 1.97 | | 32040-QEUP-ABU1 |
| 160/100 | 6/4 | 50 | 1.97 | | 32044-QEUP-ACS1 |
| 200/160 | 8/6 | 50 | 1.97 | | 32046-QEUP-ACU1 |
| 250/160 | 10/6 | 50 | 1.97 | | 32048-QEUP-ACU1 |
| 250/200 | 10/8 | 50 | 1.97 | | 32048-QEUP-ACT1 |

Stainless steel AISI 303 (1.4305)

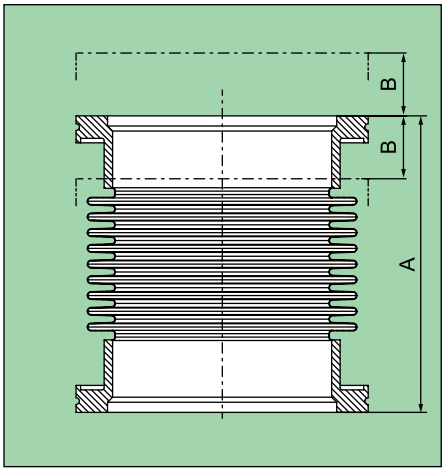



### Intermediate piece, ISO-K

| DN | | A | | B | | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | | |
| 63 | 2½ | 100 | 3.94 | 70 | 2.76 | | 32036-QEZS-0001 |

Stainless steel AISI 304 (1.4301)

H

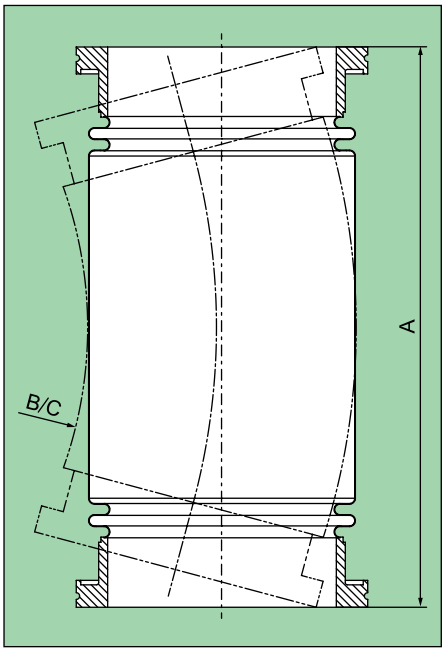



### Spring bellows, short, ISO-K

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | | | |
| 63 | 2 ½ | 132 | 5.20 | 20 | 0.79 | 30° | | 32036-QEFK-0001 |
| 100 | 4 | 132 | 5.20 | 28 | 1.10 | 30° | | 32040-QEFK-0001 |
| 160 | 6 | 150 | 5.91 | 22 | 0.87 | 14° | | 32044-QEFK-0001 |
| 200 | 8 | 150 | 5.91 | 20 | 0.79 | 12° | | 32046-QEFK-0001 |
| 250 | 10 | 200 | 7.87 | 30 | 1.18 | 13° | | 32048-QEFK-0001 |
| 320 | 12 | 250 | 9.84 | 50 | 1.97 | 12° | | 32050-QEFK-0001 |

A = Uncompressed length
C = Max. deviation from axis

Flange: stainless steel AISI 304 (1.4301)
Bellows: stainless steel AISI 316Ti (1.4571)
Internal pressure: max. 1.5 bar

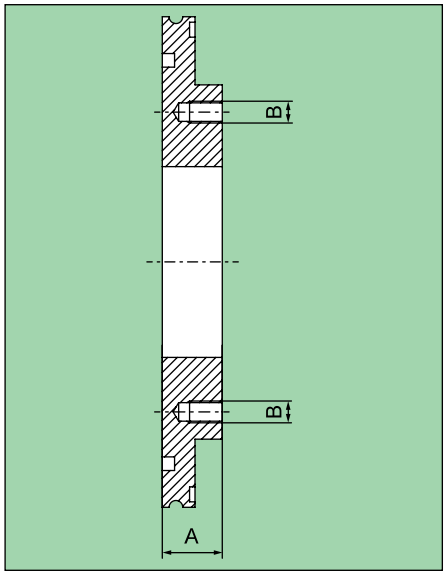



### Spring bellows, long, ISO-K

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | | | |
| 63 | 2 ½ | 250 | 9.84 | 250 | 9.84 | 160 | 6.30 | 32036-QEFK-ABR1 |
| 63 | 2 ½ | 500 | 19.69 | 250 | 9.84 | 160 | 6.30 | 32036-QEFK-ABS1 |
| 63 | 2 ½ | 750 | 29.53 | 250 | 9.84 | 160 | 6.30 | 32036-QEFK-ABT1 |
| 63 | 2 ½ | 1000 | 39.37 | 250 | 9.84 | 160 | 6.30 | 32036-QEFK-ABP1 |
| 100 | 4 | 250 | 9.84 | 370 | 14.57 | 240 | 9.45 | 32040-QEFK-ABR1 |
| 100 | 4 | 500 | 19.69 | 370 | 14.57 | 240 | 9.45 | 32040-QEFK-ABS1 |
| 100 | 4 | 750 | 29.53 | 370 | 14.57 | 240 | 9.45 | 32040-QEFK-ABT1 |
| 100 | 4 | 1000 | 39.37 | 370 | 14.57 | 240 | 9.45 | 32040-QEFK-ABP1 |

B = Radius for several bendings
C = Radius for one bending

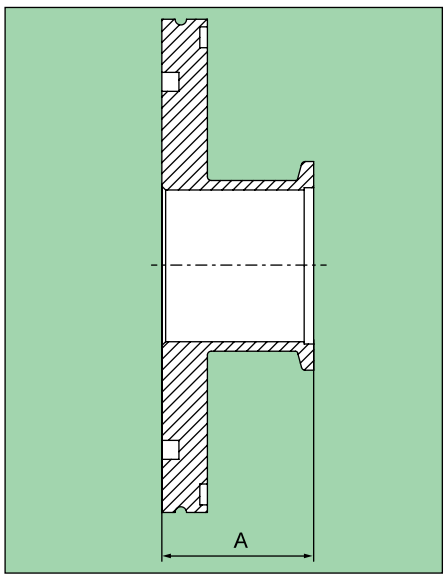
Flange: stainless steel AISI 304 (1.4301)
Bellows: stainless steel AISI 316Ti (1.4571)
Internal pressure: max. 1.5 bar




### Adapter flange, ISO-K / ISO-F

| DN ISO-K mm | DN ISO-K inch | DN ISO-F mm | DN ISO-F inch | A mm | A inch | B Gewinde | Ordering numbers |
|---|---|---|---|---|---|---|---|
| 160 | 6 | 63 | 2½ | 22 | 0.87 | M8 | 32044-QEAO-ACA1 |
| 160 | 6 | 100 | 4 | 25 | 0.98 | M8 | 32044-QEAO-ACB1 |
| 200 | 8 | 100 | 4 | 20 | 0.79 | M8 | 32046-QEAO-ACB1 |
| 200 | 8 | 160 | 6 | 25 | 0.98 | M8 | 32046-QEAO-ACC1 |
| 250 | 10 | 160 | 6 | 22 | 0.87 | M10 | 32048-QEAO-ACC1 |

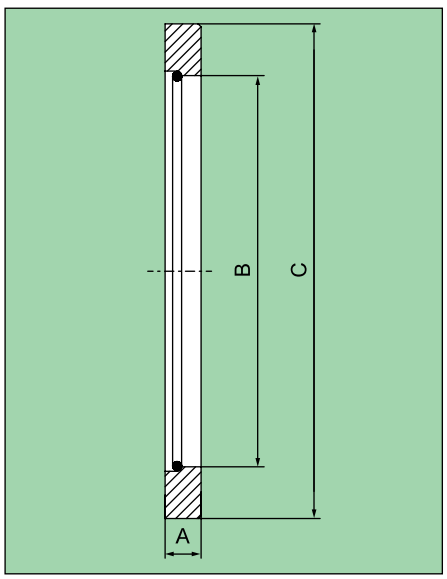
Stainless steel AISI 304 (1.4301)




### Adapter flange, ISO-K / ISO-F

| DN ISO-K mm | DN ISO-K inch | DN ISO-KF mm | DN ISO-KF inch | A mm | A inch | | Ordering numbers |
|---|---|---|---|---|---|---|---|
| 63 | 2½ | 40 | 1½ | 40 | 1.57 | | 32036-QAAK-ABJ1 [1] |
| 63 | 2½ | 50 | 2 | 45 | 1.77 | | 32036-QAAK-ABX1 [1] |
| 63 | 2½ | 25 | 1 | 50 | 1.97 | | 32036-QEAK-ABW1 [2] |
| 63 | 2½ | 40 | 1½ | 40 | 1.57 | | 32036-QEAK-ABJ1 [2] |
| 63 | 2½ | 50 | 2 | 45 | 1.77 | | 32036-QEAK-ABX1 [2] |
| 100 | 4 | 40 | 1½ | 40 | 1.57 | | 32040-QEAK-ABJ1 [2] |

[1] Aluminum EN AW-6082 (3.2315)
[2] Stainless steel AISI 304 (1.4301)




### Rotatable flange, ISO-F

| DN mm | DN inch | A mm | A inch | B mm | B inch | C mm | C inch | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| 63 | 2½ | 12 | 0.47 | 95.5 | 3.76 | 130 | 5.12 | 32036-QNUF-0001 [1] |
| 80 | 3 | 12 | 0.47 | 110.5 | 4.35 | 145 | 5.71 | 32038-QNUF-0001 [1] |
| 100 | 4 | 12 | 0.47 | 130.5 | 5.14 | 165 | 6.50 | 32040-QNUF-0001 [1] |
| 160 | 6 | 16 | 0.63 | 180.7 | 7.11 | 225 | 8.86 | 32044-QNUF-0001 [1] |
| 200 | 8 | 16 | 0.63 | 240.7 | 9.48 | 285 | 11.22 | 32046-QNUF-0001 [2] |
| 250 | 10 | 16 | 0.63 | 290.7 | 11.44 | 335 | 13.19 | 32048-QNUF-0001 [2] |
| 320 | 12 | 20 | 0.79 | 370.8 | 14.60 | 425 | 16.73 | 32050-QNUF-0001 [2] |
| 400 | 16 | 20 | 0.79 | 450.8 | 17.75 | 510 | 20.08 | 32052-QNUF-0001 [2] |
| 500 | 20 | 20 | 0.79 | 550.8 | 21.69 | 610 | 24.02 | 32054-QNUF-0001 [2] |
| 630 | 25 | 24 | 0.94 | 691.0 | 27.20 | 750 | 29.53 | 32056-QNUF-0001 [2] |

[1] Flange: steel 1.0831, nickel-plated
[2] Flange: steel 1.0037, nickel-plated
Retaining ring: steel, nickel-plated

H

Screws, bolts

Copper seals

Flanges

Reducing pieces

Intermediate pieces

Elbows

T-Pieces

Cross pieces

Bellows

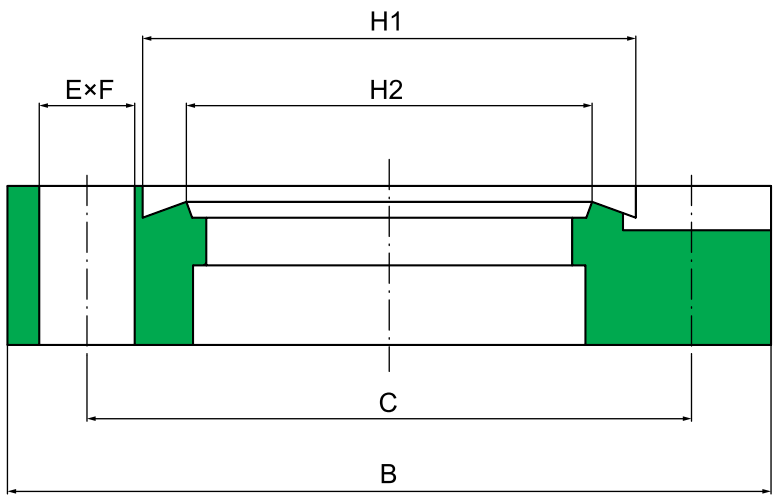
Adapters



| Seal | Cu (copper) |
|---|---|
| Suitable flange material | stainless steel |
| Temperature [1] | ≤400 °C |
| Leak rate for Helium (mbar ls$^{-1}$) | $<1 \cdot 10^{-10}$ |
| Sealing force (N per cm sealing line) | 3000–5000 |
| Multiple use of seal | no |

[1] Maximum values: depending on operating conditions and sealing materials

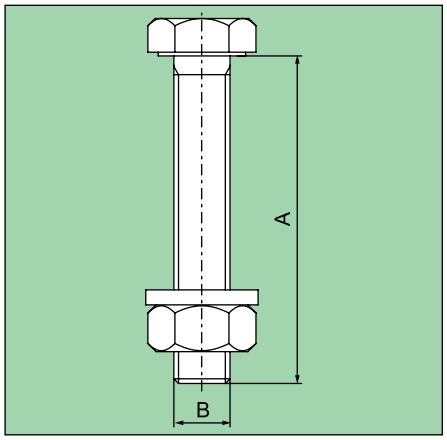
CF flange




| DN | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | mm | 16 | 25 | 40 | 63 | 100 | 160 | 200 | 250 |
| | inch | ⅝ | 1 | 1½ | 2½ | 4 | 6 | 8 | 10 |
| O.D. | inch | 1⅓ | 2⅛ | 2¾ | 4½ | 6 | 8 | 10 | 12 |
| B | mm | 34 | 54 | 69.50 | 113.50 | 152 | 202.50 | 253 | 305 |
| | inch | 1.34 | 2.13 | 2.74 | 4.47 | 5.98 | 7.97 | 9.96 | 12.01 |
| C | mm | 27 | 41.30 | 58.70 | 92.20 | 130.30 | 181 | 231.80 | 284 |
| | inch | 1.06 | 1.63 | 2.31 | 3.63 | 5.13 | 7.13 | 9.13 | 11.18 |
| E × F | mm | 6 × 4.30 | 4 × 6.60 | 6 × 6.60 | 8 × 8.40 | 16 × 8.40 | 20 × 8.40 | 24 × 8.40 | 32 × 8.40 |
| | inch | 6 × 0.17 | 4 × 0.26 | 6 × 0.26 | 8 × 0.33 | 16 × 0.33 | 20 × 0.33 | 24 × 0.33 | 32 × 0.33 |
| H1 | mm | 21.40 | 32.90 | 48.30 | 82.50 | 120.60 | 171.40 | 222.20 | 273.10 |
| | inch | 0.84 | 1.3 | 1.9 | 3.25 | 4.75 | 6.75 | 8.75 | 10.75 |
| H2 | mm | 18.50 | 27.60 | 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

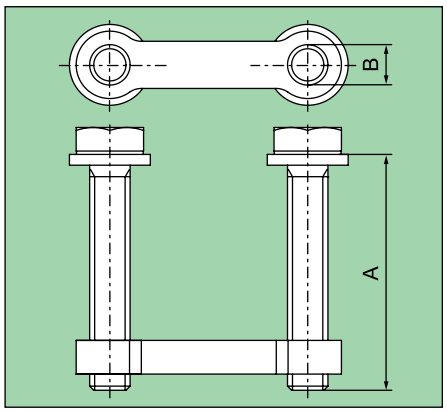
# Technical data and ordering information




### Screw with washer and nut

| DN | | A | | B | | Ordering numbers |
|---|---|---|---|---|---|---|
| mm | inch | mm | inch | thread | | |
| 16 | ⅝ | 20 | 0.79 | M4 | | 33024-CESS-0001 |
| 25 | 1 | 35 | 1.38 | M6 | | 33028-CESS-0001 |
| 40 | 1½ | 35 | 1.38 | M6 | | 33032-CESS-0001 |
| 63 | 2½ | 50 | 1.97 | M8 | | 33036-CESS-0001 |
| 100 | 4 | 55 | 2.17 | M8 | | 33040-CESS-0001 |
| 160 | 6 | 55 | 2.17 | M8 | | 33044-CESS-0001 |
| 200 | 8 | 60 | 2.36 | M8 | | 33046-CESS-0001 |
| 250 | 10 | 60 | 2.36 | M8 | | 33048-CESS-0001 |

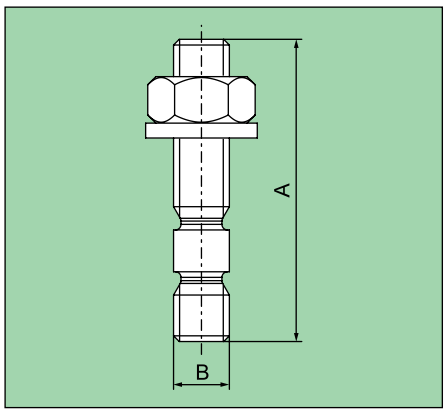
Stainless steel




### Screw with double nut

| DN | | A | | B | | Ordering numbers |
|---|---|---|---|---|---|---|
| mm | inch | mm | inch | thread | | |
| 16 | ⅝ | 20 | 0.79 | M4 | | 33024-CESX-0001 |
| 40 | 1½ | 35 | 1.38 | M6 | | 33032-CESX-0001 |
| 63 | 2½ | 45 | 1.77 | M8 | | 33036-CESX-0001 |
| 100 | 4 | 50 | 1.97 | M8 | | 33040-CESX-0001 |
| 160 | 6 | 55 | 2.17 | M8 | | 33044-CESX-0001 |

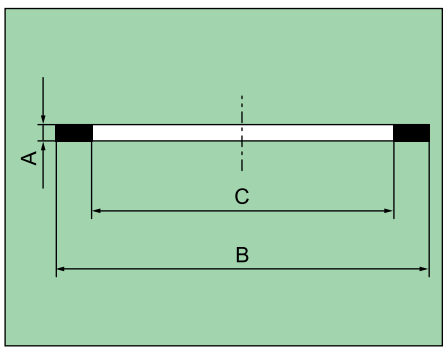
Stainless steel




### Stud bolt with washer and nut

| DN | | A | | B | | Ordering numbers |
|---|---|---|---|---|---|---|
| mm | inch | mm | inch | thread | | |
| 16 | ⅝ | 20 | 0.79 | M4 | | 33024-CEST-0001 |
| 25 | 1 | 32.5 | 1.28 | M6 | | 33028-CEST-0001 |
| 40 | 1½ | 32.5 | 1.28 | M6 | | 33032-CEST-0001 |
| 63 | 2½ | 40 | 1.57 | M8 | | 33036-CEST-0001 |
| 100 | 4 | 45 | 1.77 | M8 | | 33040-CEST-0001 |
| 160 | 6 | 50 | 1.97 | M8 | | 33044-CEST-0001 |
| 200 | 8 | 50 | 1.97 | M8 | | 33046-CEST-0001 |
| 250 | 10 | 50 | 1.97 | M8 | | 33048-CEST-0001 |

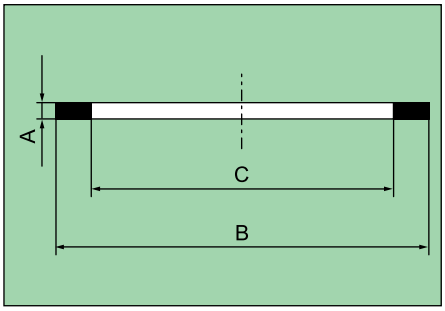
Stainless steel




### Copper seal

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 2 | 0.08 | 21.3 | 0.84 | 16.2 | 0.64 | 33024-CKDF-0001 |
| 40 | 1½ | 2 | 0.08 | 48.1 | 1.89 | 39 | 1.54 | 33032-CKDF-0001 |
| 63 | 2½ | 2 | 0.08 | 82.4 | 3.24 | 63.6 | 2.50 | 33036-CKDF-0001 |
| 100 | 4 | 2 | 0.08 | 120.5 | 4.74 | 101.8 | 4.01 | 33040-CKDF-0001 |
| 160 | 6 | 2 | 0.08 | 171.3 | 6.74 | 152.6 | 6.01 | 33044-CKDF-0001 |
| 200 | 8 | 2 | 0.08 | 222.1 | 8.74 | 203.4 | 8.01 | 33046-CKDF-0001 |
| 250 | 10 | 2 | 0.08 | 272.9 | 10.74 | 254.2 | 10.01 | 33048-CKDF-0001 |

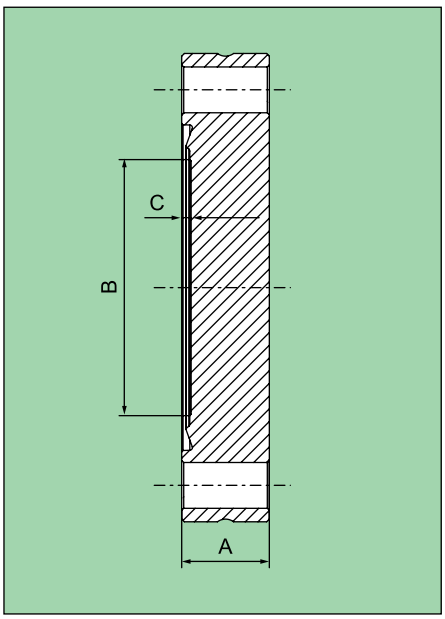
H




### Copper seal

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 2 | 0.08 | 21.3 | 0.84 | 16.2 | 0.64 | 33024-CSDF-0001 |
| 40 | 1½ | 2 | 0.08 | 48.1 | 1.89 | 39 | 1.54 | 33032-CSDF-0001 |
| 63 | 2½ | 2 | 0.08 | 82.4 | 3.24 | 63.6 | 2.50 | 33036-CSDF-0001 |
| 100 | 4 | 2 | 0.08 | 120.5 | 4.74 | 101.8 | 4.01 | 33040-CSDF-0001 |
| 160 | 6 | 2 | 0.08 | 171.3 | 6.74 | 152.6 | 6.01 | 33044-CSDF-0001 |
| 200 | 8 | 2 | 0.08 | 222.1 | 8.74 | 203.4 | 8.01 | 33046-CSDF-0001 |
| 250 | 10 | 2 | 0.08 | 272.9 | 10.74 | 254.2 | 10.01 | 33048-CSDF-0001 |

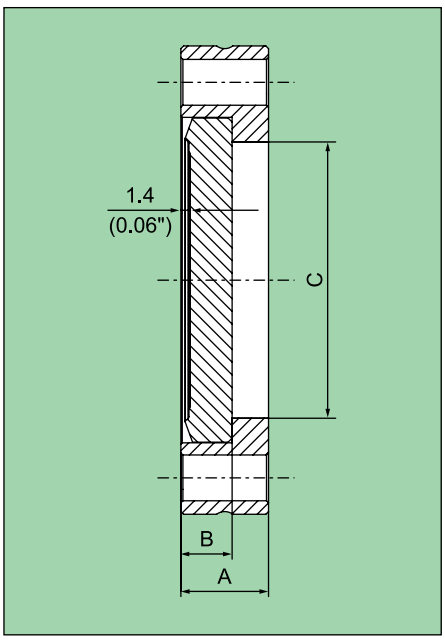
Silver-plated




### Blank-off flange

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 7.5 | 0.30 | 14 | 0.55 | 1.4 | 0.06 | 33024-CEFB-0001 [1] |
| 40 | 1½ | 13 | 0.51 | 38 | 1.50 | 1.4 | 0.06 | 33032-CEFB-0001 [1] |
| 63 | 2½ | 17.5 | 0.69 | 66 | 2.60 | 1.4 | 0.06 | 33036-CEFB-0001 [1] |
| 100 | 4 | 20 | 0.79 | 104 | 4.09 | 1.4 | 0.06 | 33040-CEFB-0001 [1] |
| 160 | 6 | 22 | 0.87 | 155 | 6.10 | 1.4 | 0.06 | 33044-CEFB-0001 [1] |
| 200 | 8 | 24.5 | 0.96 | 205 | 8.07 | 1.4 | 0.06 | 33046-CEFB-0001 [1] |
| 250 | 10 | 24.5 | 0.96 | 256 | 10.08 | 1.4 | 0.06 | 33048-CEFB-0001 [1] |
| 16 | ⅝ | 7.5 | 0.30 | 14 | 0.55 | 1.4 | 0.06 | 33024-CEFB-AAH1 [2] |
| 40 | 1½ | 13 | 0.51 | 38 | 1.50 | 1.4 | 0.06 | 33032-CEFB-AAH1 [2] |
| 63 | 2½ | 17.5 | 0.69 | 66 | 2.60 | 1.4 | 0.06 | 33036-CEFB-AAH1 [2] |
| 100 | 4 | 20 | 0.79 | 104 | 4.09 | 1.4 | 0.06 | 33040-CEFB-AAH1 [2] |
| 160 | 6 | 22 | 0.87 | 155 | 6.10 | 1.4 | 0.06 | 33044-CEFB-AAH1 [2] |
| 200 | 8 | 24.5 | 0.96 | 205 | 8.07 | 1.4 | 0.06 | 33046-CEFB-AAH1 [2] |
| 250 | 10 | 24.5 | 0.96 | 256 | 10.08 | 1.4 | 0.06 | 33048-CEFB-AAH1 [2] |

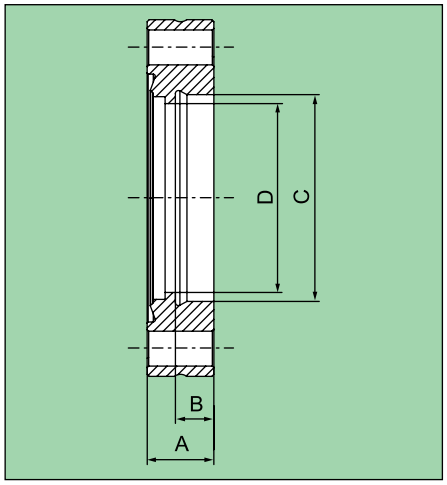
[1] Stainless steel AISI 304 (1.4301)
[2] Stainless steel AISI 316LN (1.4429)




### Blank-off flange, rotatable

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 7.5 | 0.30 | 5.8 | 0.23 | 18.6 | 0.73 | 33024-GEBD-0001 [1] |
| 40 | 1½ | 13 | 0.51 | 7.6 | 0.30 | 41 | 1.61 | 33032-GEBD-0001 [1] |
| 63 | 2½ | 17.5 | 0.69 | 12.6 | 0.50 | 71 | 2.80 | 33036-GEBD-0001 [1] |
| 100 | 4 | 20 | 0.79 | 14.3 | 0.56 | 109 | 4.29 | 33040-GEBD-0001 [1] |
| 160 | 6 | 22 | 0.87 | 15.8 | 0.62 | 160 | 6.30 | 33044-GEBD-0001 [1] |
| 200 | 8 | 24.5 | 0.96 | 17.1 | 0.67 | 206 | 8.11 | 33046-GEBD-0001 [1] |
| 250 | 10 | 24.5 | 0.96 | 18 | 0.71 | 257 | 10.12 | 33048-GEBD-0001 [1] |
| 16 | ⅝ | 7.5 | 0.30 | 5.8 | 0.23 | 18.6 | 0.73 | 33024-GEBD-AAH1 [2] |
| 40 | 1½ | 13 | 0.51 | 7.6 | 0.30 | 41 | 1.61 | 33032-GEBD-AAH1 [2] |
| 63 | 2½ | 17.5 | 0.69 | 12.6 | 0.50 | 71 | 2.80 | 33036-GEBD-AAH1 [2] |
| 100 | 4 | 20 | 0.79 | 14.3 | 0.56 | 109 | 4.29 | 33040-GEBD-AAH1 [2] |
| 160 | 6 | 22 | 0.87 | 15.8 | 0.62 | 160 | 6.30 | 33044-GEBD-AAH1 [2] |
| 200 | 8 | 24.5 | 0.96 | 17.1 | 0.67 | 206 | 8.11 | 33046-GEBD-AAH1 [2] |
| 250 | 10 | 24.5 | 0.96 | 18 | 0.71 | 257 | 10.12 | 33048-GEBD-AAH1 [2] |

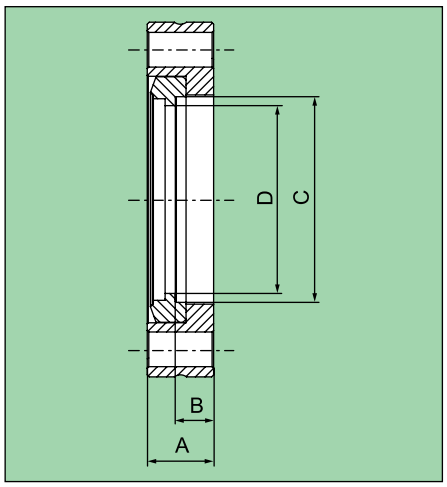
[1] Stainless steel AISI 304 (1.4301)
[2] Stainless steel AISI 316LN (1.4429)




## Weld flange

| DN | | A | | B | | C | | D | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 7.5 | 0.30 | 3.3 | 0.13 | 18.3 | 0.72 | 16 | 0.63 | 33024-CEFF-0001 [1] |
| 40 | 1½ | 13 | 0.51 | 7.5 | 0.30 | 40.3 | 1.59 | 36.8 | 1.45 | 33032-CEFF-0001 [1] |
| 63 | 2½ | 17.5 | 0.69 | 8 | 0.31 | 70.3 | 2.77 | 66 | 2.60 | 33036-CEFF-0001 [1] |
| 100 | 4 | 20 | 0.79 | 9 | 0.35 | 108.5 | 4.27 | 104 | 4.09 | 33040-CEFF-0001 [1] |
| 160 | 6 | 22 | 0.87 | 10 | 0.39 | 159.5 | 6.28 | 155 | 6.10 | 33044-CEFF-0001 [1] |
| 200 | 8 | 24.5 | 0.96 | 12 | 0.47 | 205.5 | 8.09 | 200 | 7.87 | 33046-CEFF-0001 [1] |
| 250 | 10 | 24.5 | 0.96 | 12 | 0.47 | 256.5 | 10.19 | 250 | 9.84 | 33048-CEFF-0001 [1] |
| 16 | ⅝ | 7.5 | 0.30 | 3.3 | 0.13 | 18.3 | 0.72 | 16 | 0.63 | 33024-CEFF-AAH1 [2] |
| 40 | 1½ | 13 | 0.51 | 7.5 | 0.30 | 40.3 | 1.59 | 36.8 | 1.45 | 33032-CEFF-AAH1 [2] |
| 63 | 2½ | 17.5 | 0.69 | 8 | 0.31 | 70.3 | 2.77 | 66 | 2.60 | 33036-CEFF-AAH1 [2] |
| 100 | 4 | 20 | 0.79 | 9 | 0.35 | 108.5 | 4.27 | 104 | 4.09 | 33040-CEFF-AAH1 [2] |
| 160 | 6 | 22 | 0.87 | 10 | 0.39 | 159.5 | 6.28 | 155 | 6.10 | 33044-CEFF-AAH1 [2] |
| 200 | 8 | 24.5 | 0.96 | 12 | 0.47 | 205.5 | 8.09 | 200 | 7.87 | 33046-CEFF-AAH1 [2] |
| 250 | 10 | 24.5 | 0.96 | 12 | 0.47 | 256.5 | 10.19 | 250 | 9.84 | 33048-CEFF-AAH1 [2] |

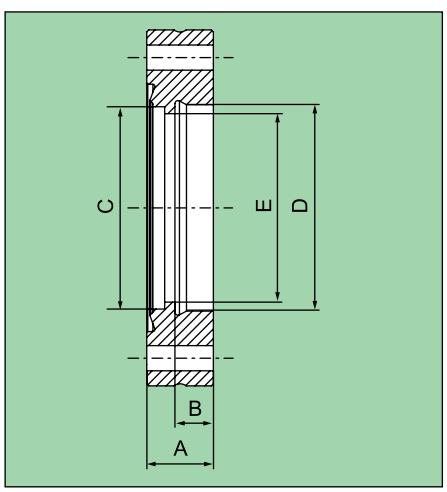
[1] Stainless steel AISI 304 (1.4301) [2] Stainless steel AISI 316LN (1.4429)




## Weld flange, rotatable

| DN | | A | | B | | C | | D | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 7.5 | 0.30 | 3.3 | 0.13 | 18.3 | 0.72 | 16 | 0.63 | 33024-GEFD-0001 [1] |
| 40 | 1½ | 13 | 0.51 | 7.5 | 0.30 | 40.3 | 1.59 | 36.8 | 1.45 | 33032-GEFD-0001 [1] |
| 63 | 2½ | 17.5 | 0.69 | 8 | 0.31 | 70.3 | 2.77 | 66 | 2.60 | 33036-GEFD-0001 [1] |
| 100 | 4 | 20 | 0.79 | 9 | 0.35 | 108.5 | 4.27 | 104 | 4.09 | 33040-GEFD-0001 [1] |
| 160 | 6 | 22 | 0.87 | 10 | 0.39 | 159.5 | 6.28 | 155 | 6.10 | 33044-GEFD-0001 [1] |
| 200 | 8 | 24.5 | 0.96 | 12 | 0.47 | 205.5 | 8.09 | 200 | 7.87 | 33046-GEFD-0001 [1] |
| 250 | 10 | 24.5 | 0.96 | 12 | 0.47 | 256.5 | 10.19 | 250 | 9.84 | 33048-GEFD-0001 [1] |
| 16 | ⅝ | 7.5 | 0.30 | 3.3 | 0.13 | 18.3 | 0.72 | 16 | 0.63 | 33024-GEFD-AAH1 [2] |
| 40 | 1½ | 13 | 0.51 | 7.5 | 0.30 | 40.3 | 1.59 | 36.8 | 1.45 | 33032-GEFD-AAH1 [2] |
| 63 | 2½ | 17.5 | 0.69 | 8 | 0.31 | 70.3 | 2.77 | 66 | 2.60 | 33036-GEFD-AAH1 [2] |
| 100 | 4 | 20 | 0.79 | 9 | 0.35 | 108.5 | 4.27 | 104 | 4.09 | 33040-GEFD-AAH1 [2] |
| 160 | 6 | 22 | 0.87 | 10 | 0.39 | 159.5 | 6.28 | 155 | 6.10 | 33044-GEFD-AAH1 [2] |
| 200 | 8 | 24.5 | 0.96 | 12 | 0.47 | 205.5 | 8.09 | 200 | 7.87 | 33046-GEFD-AAH1 [2] |
| 250 | 10 | 24.5 | 0.96 | 12 | 0.47 | 256.5 | 10.19 | 250 | 9.84 | 33048-GEFD-AAH1 [2] |

[1] Stainless steel AISI 304 (1.4301) [2] Stainless steel AISI 316LN (1.4429)



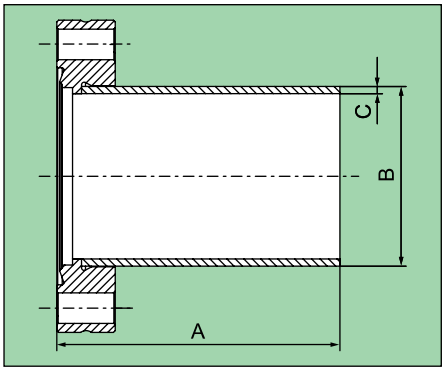

## Weld flange with thread

| DN | | A | | B | | C | | D | | E | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 7.5 | 0.30 | 3.3 | 0.13 | 17.2 | 0.68 | 18.3 | 0.72 | 16 | 0.63 | 33024-CEFF-ABN1 |
| 40 | 1½ | 13 | 0.51 | 7.5 | 0.30 | 39.5 | 1.56 | 40.3 | 1.59 | 36.8 | 1.45 | 33032-CEFF-ABN1 |
| 63 | 2½ | 17.5 | 0.69 | 8 | 0.31 | 66 | 2.60 | 70.3 | 2.77 | 66 | 2.60 | 33036-CEFF-ABN1 |
| 100 | 4 | 20 | 0.79 | 9 | 0.35 | 104 | 4.09 | 108.5 | 4.27 | 104 | 4.09 | 33040-CEFF-ABN1 |

DN 16 = 6×M4 DN 63 = 8×M8
DN 40 = 6×M6 DN 100 = 16×M8

Stainless steel AISI 304 (1.4301)

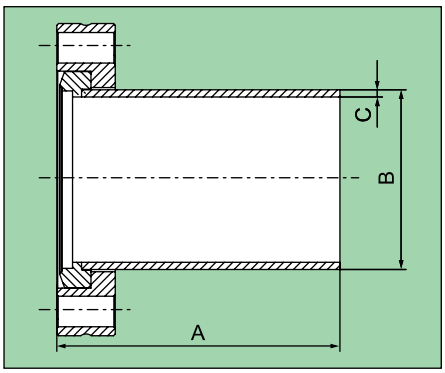
H




### Weld neck flange

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 38 | 1.50 | 18 | 0.71 | 1 | 0.04 | 33024-CESK-0001 |
| 40 | 1½ | 63 | 2.48 | 40 | 1.57 | 1.6 | 0.06 | 33032-CESK-0001 |
| 63 | 2½ | 105 | 4.13 | 70 | 2.76 | 2 | 0.08 | 33036-CESK-0001 |
| 100 | 4 | 135 | 5.31 | 108 | 4.25 | 2 | 0.08 | 33040-CESK-0001 |
| 160 | 6 | 167 | 6.61 | 159 | 6.26 | 2 | 0.08 | 33044-CESK-0001 |

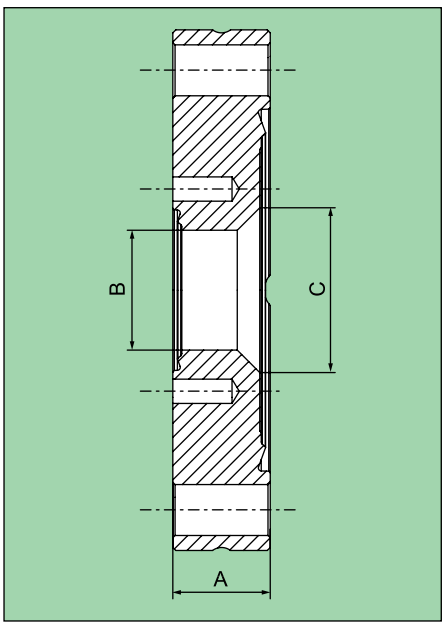
Stainless steel AISI 304 (1.4301)




### Weld neck flange, rotatable

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 38 | 1.50 | 18 | 0.71 | 1 | 0.04 | 33024-GESD-0001 |
| 40 | 1½ | 63 | 2.48 | 40 | 1.57 | 1.6 | 0.06 | 33032-GESD-0001 |
| 63 | 2½ | 105 | 4.13 | 70 | 2.76 | 2 | 0.08 | 33036-GESD-0001 |
| 100 | 4 | 135 | 5.31 | 108 | 4.25 | 2 | 0.08 | 33040-GESD-0001 |
| 160 | 6 | 167 | 6.61 | 159 | 6.26 | 2 | 0.08 | 33044-GESD-0001 |

Stainless steel AISI 304 (1.4301)

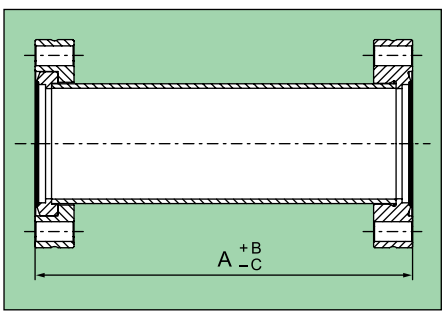



### Reducing flange

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 40/ 16 | 1½/⅝ | 13 | 0.51 | 16 | 0.63 | 22 | 0.87 | 33032-CEUC-ACZ1 [1] |
| 63/ 40 | 2½/1½ | 17.5 | 0.69 | 39 | 1.54 | 50 | 1.97 | 33036-CEUC-ABQ1 [1] |
| 100/ 40 | 4/1½ | 20 | 0.79 | 39 | 1.54 | 55 | 2.17 | 33040-CEUC-ABQ1 [1] |
| 100/ 63 | 4/2½ | 20 | 0.79 | 66 | 2.60 | 85 | 3.35 | 33040-CEUC-ADA1 [1] |
| 160/ 40 | 6/1½ | 22 | 0.87 | 39 | 1.54 | 60 | 2.36 | 33044-CEUC-ABQ1 [1] |
| 160/100 | 6/4 | 22 | 0.87 | 104 | 4.09 | 120 | 4.72 | 33044-CEUC-ADB1 [1] |
| 40/ 16 | 1½/⅝ | 13 | 0.51 | 16 | 0.63 | 22 | 0.87 | 33032-CEUC-ADC1 [2] |
| 63/ 40 | 2½/1½ | 17.5 | 0.69 | 39 | 1.54 | 50 | 1.97 | 33036-CEUC-ADD1 [2] |
| 100/ 40 | 4/1½ | 20 | 0.79 | 39 | 1.54 | 55 | 2.17 | 33040-CEUC-ADD1 [2] |
| 100/ 63 | 4/2½ | 20 | 0.79 | 66 | 2.60 | 85 | 3.35 | 33040-CEUC-ADE1 [2] |
| 160/ 40 | 6/1½ | 22 | 0.87 | 39 | 1.54 | 60 | 2.36 | 33044-CEUC-ADD1 [2] |
| 160/100 | 6/4 | 22 | 0.87 | 104 | 4.09 | 120 | 4.72 | 33044-CEUC-ADF1 [2] |

DN 40/16 = 6×M4 DN 100/40 = 6×M6 DN 160/ 40 = 6×M6
DN 63/40 = 6×M6 DN 100/63 = 8×M8 DN 160/100 = 16×M8

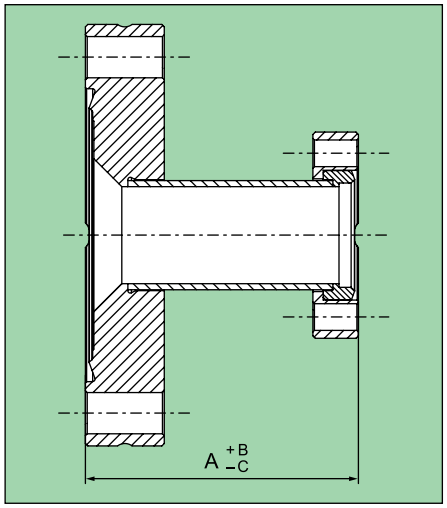
[1] Stainless steel AISI 304 (1.4301) [2] Stainless steel AISI 316LN (1.4429)




### Intermediate piece

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 76 | 2.99 | 0.5 | 0.02 | 0.5 | 0.02 | 33024-GEZS-0001 |
| 40 | 1½ | 126 | 4.96 | 1 | 0.04 | 1 | 0.04 | 33032-GEZS-0001 |
| 63 | 2½ | 210 | 8.27 | 1 | 0.04 | 1 | 0.04 | 33036-GEZS-0001 |
| 100 | 4 | 270 | 10.63 | 1 | 0.04 | 1 | 0.04 | 33040-GEZS-0001 |
| 160 | 6 | 334 | 13.15 | 1.5 | 0.06 | 1.5 | 0.06 | 33044-GEZS-0001 |

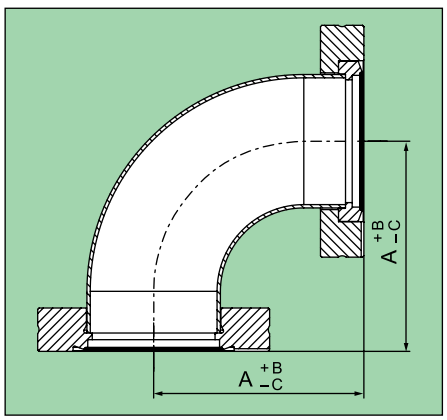
Stainless steel AISI 304 (1.4301)




## Reducing piece

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 40/ 16 | 1½/⅝ | 45 | 1.77 | 1 | 0.04 | 1 | 0.04 | 33032-CEUP-ACW1 |
| 63/ 40 | 2½/1½ | 75 | 2.95 | 1 | 0.04 | 1 | 0.04 | 33036-CEUP-ACV1 |
| 100/ 40 | 4/1½ | 75 | 2.95 | 1 | 0.04 | 1 | 0.04 | 33040-CEUP-ACV1 |
| 100/ 63 | 4/2½ | 95 | 3.74 | 1 | 0.04 | 1 | 0.04 | 33040-CEUP-ACX1 |
| 160/100 | 6/4 | 105 | 4.13 | 1.5 | 0.06 | 1.5 | 0.06 | 33044-CEUP-ACY1 |

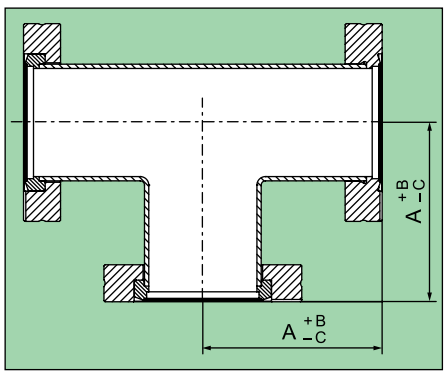
Stainless steel AISI 304 (1.4301)




## Elbow 90°

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 38 | 1.50 | 0.5 | 0.02 | 0.5 | 0.02 | 33024-GEKR-0001 |
| 40 | 1½ | 63 | 2.48 | 0.5 | 0.02 | 0.5 | 0.02 | 33032-GEKR-0001 |
| 63 | 2½ | 105 | 4.13 | 1 | 0.04 | 1 | 0.04 | 33036-GEKR-0001 |
| 100 | 4 | 135 | 5.31 | 1 | 0.04 | 1 | 0.04 | 33040-GEKR-0001 |
| 160 | 6 | 167 | 6.57 | 1.5 | 0.06 | 1.5 | 0.06 | 33044-GEKR-0001 |

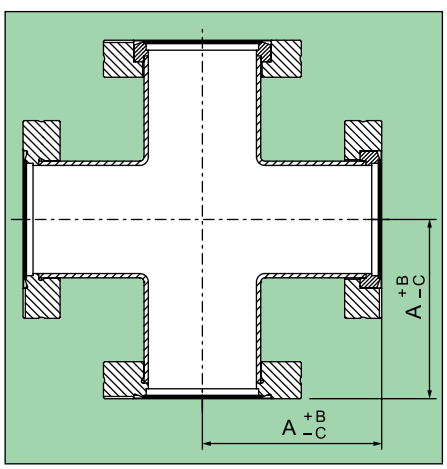
Stainless steel AISI 304 (1.4301)




## T-Piece

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 38 | 1.50 | 0.5 | 0.02 | 0.5 | 0.02 | 33024-GETS-0001 |
| 40 | 1½ | 63 | 2.48 | 0.5 | 0.02 | 0.5 | 0.02 | 33032-GETS-0001 |
| 63 | 2½ | 105 | 4.13 | 1 | 0.04 | 1 | 0.04 | 33036-GETS-0001 |
| 100 | 4 | 135 | 5.31 | 1 | 0.04 | 1 | 0.04 | 33040-GETS-0001 |
| 160 | 6 | 167 | 6.57 | 1.5 | 0.06 | 1.5 | 0.06 | 33044-GETS-0001 |

Stainless steel AISI 304 (1.4301)

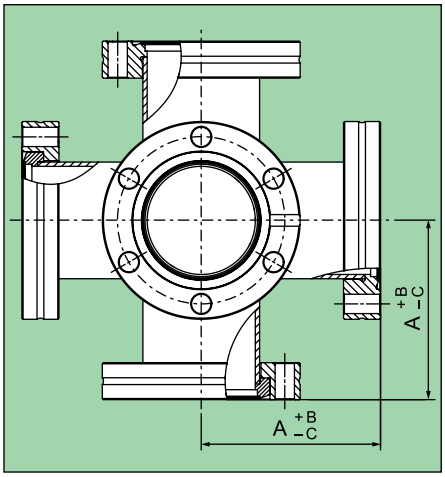



## Cross

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 38 | 1.50 | 0.5 | 0.02 | 0.5 | 0.02 | 33024-GEKX-0001 |
| 40 | 1½ | 63 | 2.48 | 0.5 | 0.02 | 0.5 | 0.02 | 33032-GEKX-0001 |
| 63 | 2½ | 105 | 4.13 | 1 | 0.04 | 1 | 0.04 | 33036-GEKX-0001 |
| 100 | 4 | 135 | 5.31 | 1 | 0.04 | 1 | 0.04 | 33040-GEKX-0001 |
| 160 | 6 | 167 | 6.57 | 1.5 | 0.06 | 1.5 | 0.06 | 33044-GEKX-0001 |

Stainless steel AISI 304 (1.4301)

H

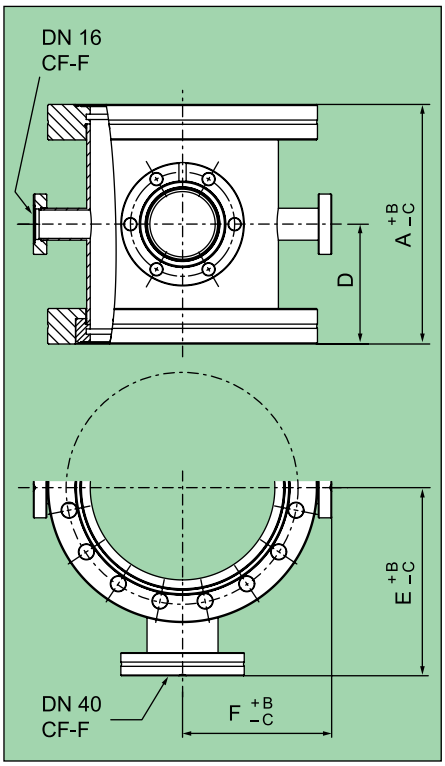



### Double cross

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 40 | 1½ | 63 | 2.48 | 0.5 | 0.02 | 0.5 | 0.02 | 33032-GEKY-0001 |
| 63 | 2½ | 105 | 4.13 | 1 | 0.04 | 1 | 0.04 | 33036-GEKY-0001 |
| 100 | 4 | 135 | 5.31 | 1 | 0.04 | 1 | 0.04 | 33040-GEKY-0001 |
| 160 | 6 | 167 | 6.57 | 1.5 | 0.06 | 1.5 | 0.06 | 33044-GEKY-0001 |

Stainless steel AISI 304 (1.4301)

3 × rotatable flange, 3 × fixed flange

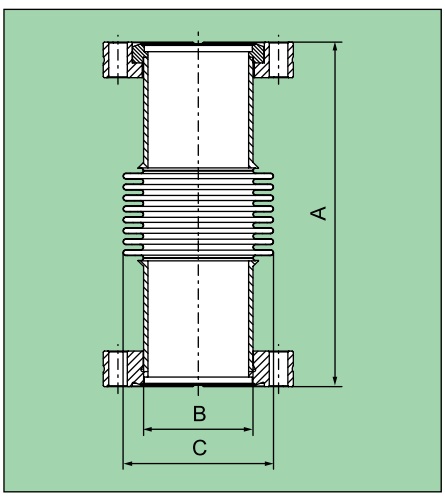



### Reducing cross

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 100 | 4 | 135 | 5.31 | 1 | 0.04 | 1 | 0.04 | 33040-GEKZ-0001 |
| | | D | | E | | F | | |
| | | mm | inch | mm | inch | mm | inch | |
| | | 67.5 | 2.66 | 106 | 4.17 | 84 | 3.31 | |

Stainless steel AISI 304 (1.4301)

2 × DN 16 CF-F
2 × DN 40 CF-F

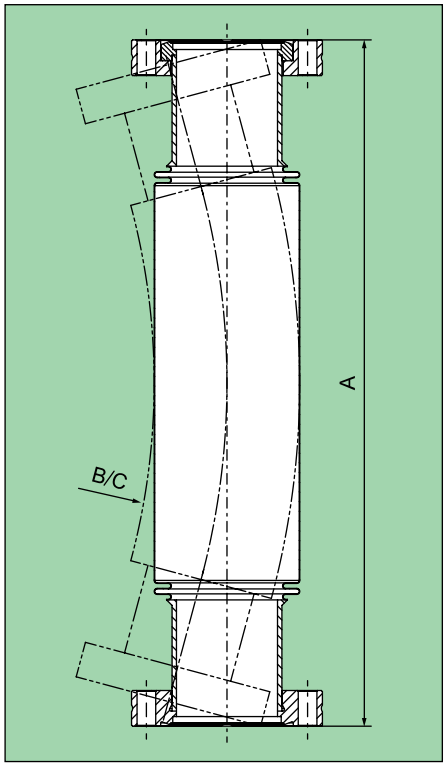



### Spring bellows, short

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 76 | 2.99 | 15 | 0.59 | 22 | 0.87 | 33024-GEFK-0001 |
| 40 | 1½ | 126 | 4.96 | 40 | 1.57 | 55 | 2.17 | 33032-GEFK-0001 |
| 63 | 2½ | 139 | 5.47 | 62 | 2.44 | 80 | 3.15 | 33036-GEFK-0001 |
| 100 | 4 | 142 | 5.59 | 92 | 3.62 | 116 | 4.57 | 33040-GEFK-0001 |
| 160 | 6 | 250 | 9.84 | 154 | 6.06 | 187 | 7.36 | 33044-GEFK-0001 |

A = Uncompressed length

Flange: stainless steel AISI 304 (1.4301)
Bellows: stainless steel AISI 316Ti (1.4571)
Internal pressure: DN 16– 40: max. 4.0 bar
DN 63–160: max. 1.5 bar

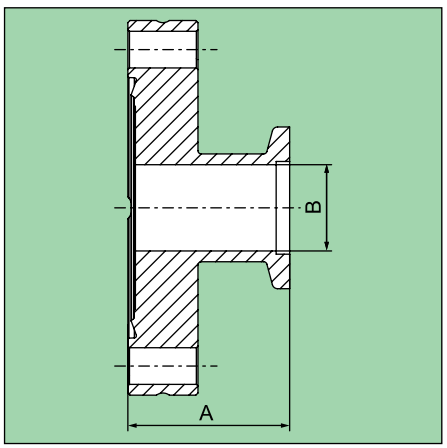



## Spring bellows, long

| DN | | A | | B | | C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 250 | 9.84 | 70 | 2.76 | 50 | 1.97 | 33024-GEFK-ABR1 |
| 16 | ⅝ | 500 | 19.69 | 70 | 2.76 | 50 | 1.97 | 33024-GEFK-ABS1 |
| 16 | ⅝ | 750 | 29.53 | 70 | 2.76 | 50 | 1.97 | 33024-GEFK-ABT1 |
| 16 | ⅝ | 1000 | 39.37 | 70 | 2.76 | 50 | 1.97 | 33024-GEFK-ABP1 |
| 40 | 1½ | 250 | 9.84 | 130 | 5.12 | 100 | 3.94 | 33032-GEFK-ABR1 |
| 40 | 1½ | 500 | 19.69 | 130 | 5.12 | 100 | 3.94 | 33032-GEFK-ABS1 |
| 40 | 1½ | 1000 | 39.37 | 130 | 5.12 | 100 | 3.94 | 33032-GEFK-ABT1 |

B = Radius for several bendings
C = Radius for one bending

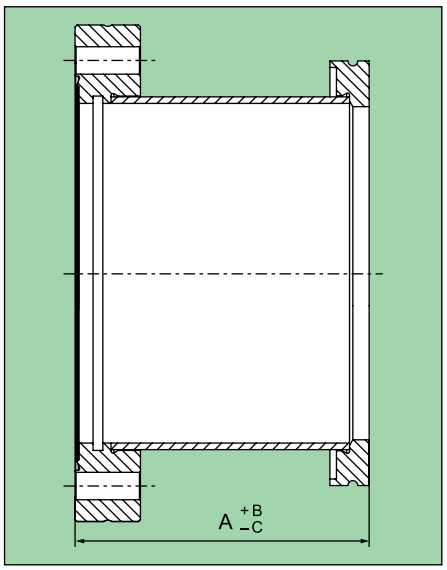
Flange: stainless steel AISI 304 (1.4301)
Bellows: stainless steel AISI 316Ti (1.4571)
Internal pressure: max. 5 bar




## Adapter flange ISO-KF

| DN | | | | A | | B | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| CF-F | | ISO-KF | | | | | | |
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 16 | ⅝ | 16 | ⅝ | 35 | 1.38 | 16 | 0.63 | 33024-CEAK-ACK1 |
| 16 | ⅝ | 25 | 1 | 35 | 1.38 | 16 | 0.63 | 33024-CEAK-ABW1 |
| 40 | 1½ | 16 | ⅝ | 30 | 1.18 | 16 | 0.63 | 33032-CEAK-ACK1 |
| 40 | 1½ | 25 | 1 | 30 | 1.18 | 26 | 1.02 | 33032-CEAK-ABW1 |
| 40 | 1½ | 40 | 1½ | 50 | 1.97 | 37 | 1.46 | 33032-CEAK-ABJ1 |
| 63 | 2½ | 40 | 1½ | 35 | 1.38 | 41 | 1.61 | 33036-CEAK-ABJ1 |
| 100 | 4 | 40 | 1½ | 50 | 1.97 | 41 | 1.61 | 33040-CEAK-ABJ1 |

Stainless steel AISI 304 (1.4301)




## Adapter flange ISO-K

| DN | | | | A | | B, C | | Ordering numbers |
|---|---|---|---|---|---|---|---|---|
| CF-F | | ISO-K | | | | | | |
| mm | inch | mm | inch | mm | inch | mm | inch | |
| 63 | 2½ | 63 | 2½ | 90 | 3.54 | 1 | 0.04 | 33036-CEAF-ABJ1 |
| 100 | 4 | 100 | 4 | 90 | 3.54 | 1 | 0.04 | 33040-CEAF-ACS1 |
| 160 | 6 | 160 | 6 | 90 | 3.54 | 1.5 | 0.06 | 33044-CEAF-ACU1 |

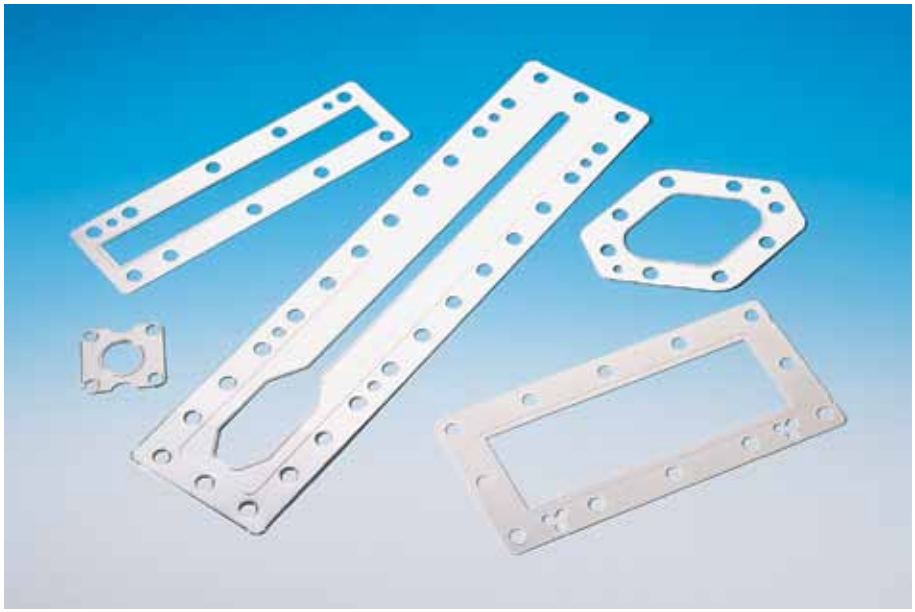
Stainless steel AISI 304 (1.4301)

H

## Main applications

Metal seals suited for demanding applications requiring specific geometries

Especially suited to RF applications, cryogenics and high temperatures



## Ordering information

**Metal seal**

| | |
|---|---|
| Possible sizes | max. 500 × 700 mm (19.69" × 27.56") |
| Ordering numbers | on request |

Metal seals are used instead of elastomer seals if

– permeation through an elastomer seal is not acceptable

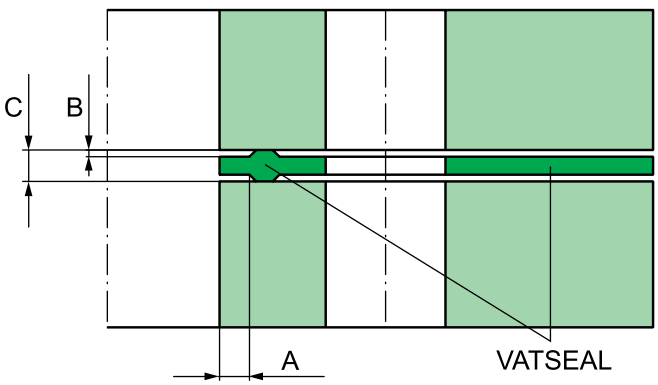
– outgassing must be very low

– the temperature exceeds 150 °C

– process gases are not compatible with elastomer seals

– high radiation resistance is required

## Installation




| | | |
|---|---|---|
| A | mm<br>inch | 1<br>0.039 |
| B | mm<br>inch | 0.070<br>0.003 |
| C [1] | mm<br>inch | 0.600<br>0.024 |
| C [2] | mm<br>inch | 0.450<br>0.018 |

[1] Uncompressed
[2] Compressed

## Features

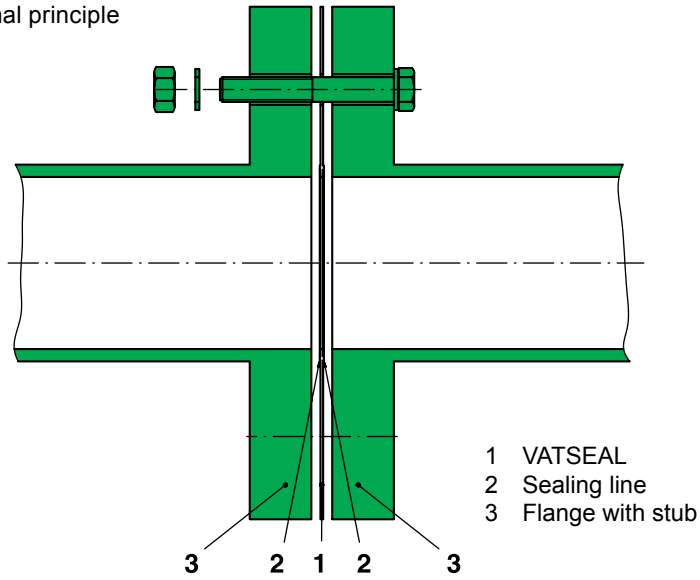
Excellent vacuum tightness

Reliable, low resistance RF contact

Sealing line any shape

Flanges require only flat sealing surfaces

Functional principle




## Technical data

| | | |
|---|---|---|
| **VATSEAL** | Leak rate | $< 1 \cdot 10^{-10}$ mbar ls$^{-1}$ |
| | Pressure range | $10^{-13}$ mbar to 10 bar (depending on flange) |
| | Temperature [1] | -271 °C (2K) to +300 °C |
| | Heating and cooling rate | ≤ 50 °C h$^{-1}$ |
| | Material [2] | silver-plated copper, hardness 70–90 HV |
| | Thickness | |
| | – Uncompressed | 0.60 mm |
| | – Compressed | 0.45 mm |
| | Sealing force | min. 2000 N per cm sealing line |
| | Sealing line | |
| | – Shape | any |
| | – Distance to edge of flange | > 1 mm |
| **Flanges for VATSEAL** | Material | stainless steel<br>e. g.<br>AISI 304 (1.4301)<br>AISI 304L (1.4306)<br>AISI 316L (1.4435) |
| | Sealing surface requirements | |
| | – Flatness over largest length | max. 0.2 mm |
| | – Flatness over 50 mm | max. 0.02 mm |
| | – Surface finish | N4 (Ra = 0.2 µm) |
| | – Thickness | 10–22 mm, depending on size |
| | – Distance between holes | max. 50 mm |

[1] Maximum values: depending on operating conditions

[2] Other materials on request
e. g. – Copper
– Gold-plated copper
– Silver-plated stainless steel

H

**To prevent process contamination and gases from condensing**

**To minimize cleaning intervals, resulting in less maintenance work**

The valves shown in this picture are for

- CVD systems
- plasma etching systems



**To reduce the pumping time by conditioning the valves**

**Increased process safety due to lower residual gas pressure**

The valves shown in this picture are for

- UHV systems
- sputtering systems
- research systems



**Engineering with VAT**

Our engineers are experienced in solutions concerning

- integration into system concepts
- application in cleanrooms
- regular temperature distribution
- valves with integrated heating controller
- protection against accidental contact
- simple mounting

Please contact VAT to determine the best heating solution for your specific application.

**Minimum contamination due to corrosion resistant surface treatment**

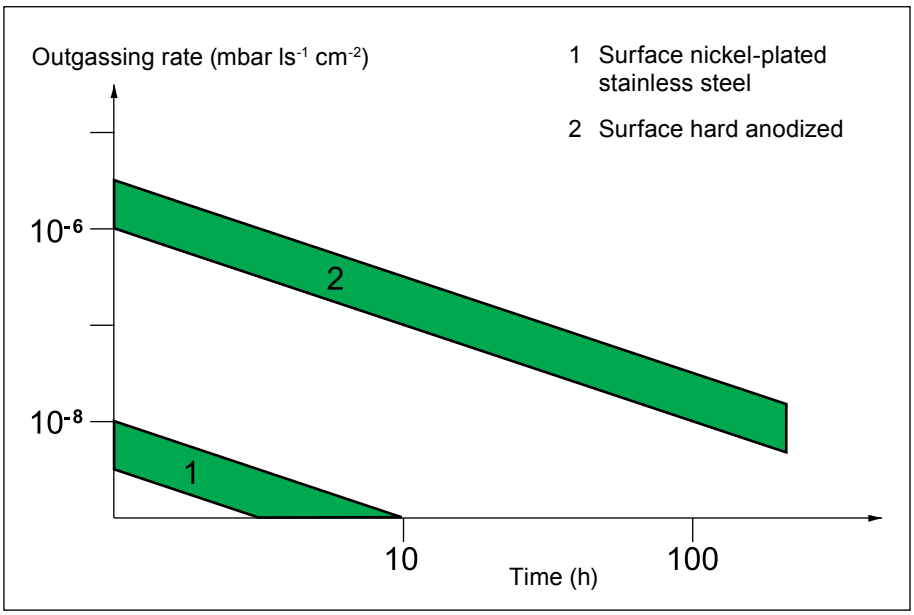
**Low cost of ownership due to longer lifetime**

The valves shown in this picture are for plasma etching systems



The surface coating is selected according to the application. The increased outgassing rate has to be considered when defining the pumps.

Minimum contamination can be obtained by surface treatment and / or using a valve heater.




**Engineering with VAT**

Our engineers are experienced in solutions concerning

- sealing technology with surface treated valves
- selection and treatment of corrosion resistant sealing materials
- reduction of maintenance costs by means of modular spare parts concept

# Multi-valve modules

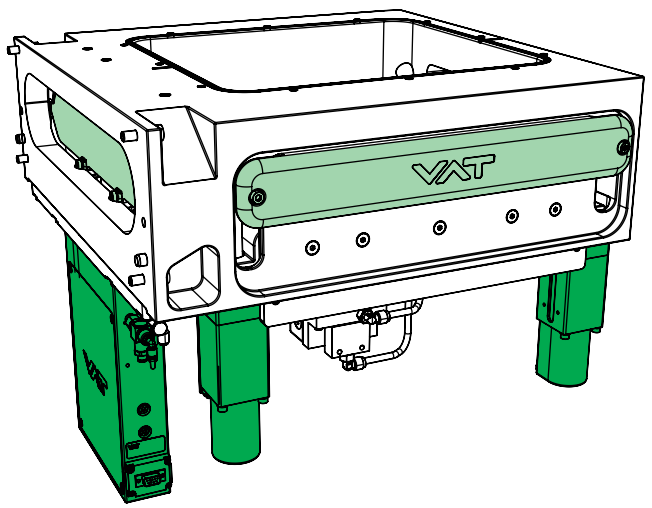
Multi-valve modules are customer-specific bodies with various integrated valves. The modules are installed directly into the customer system.

The benefits are
- improved system performance, e. g. higher throughput due to smaller chamber volume
- reduced system footprint
- simplified procurement (only one part with one ordering number)
- lower cost

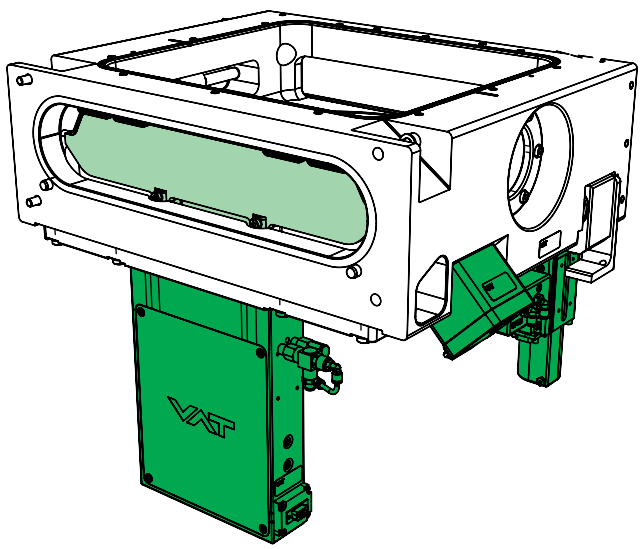
VAT offers
- development of the module according to the customer's specification
- manufacturing of the individual components
- assembling and testing of the module

## Integration of transfer valves, doors, angle valves and gate valves

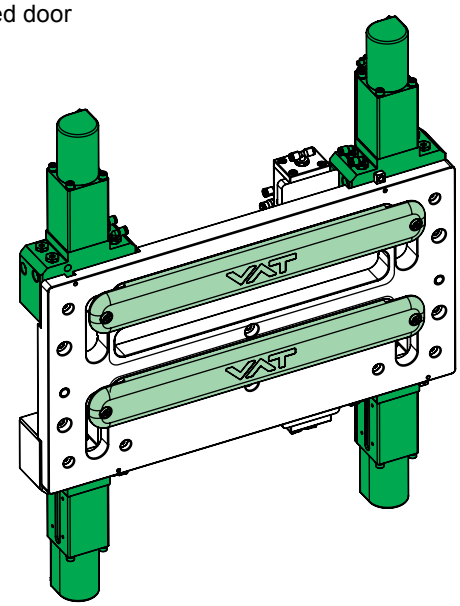
Loading module



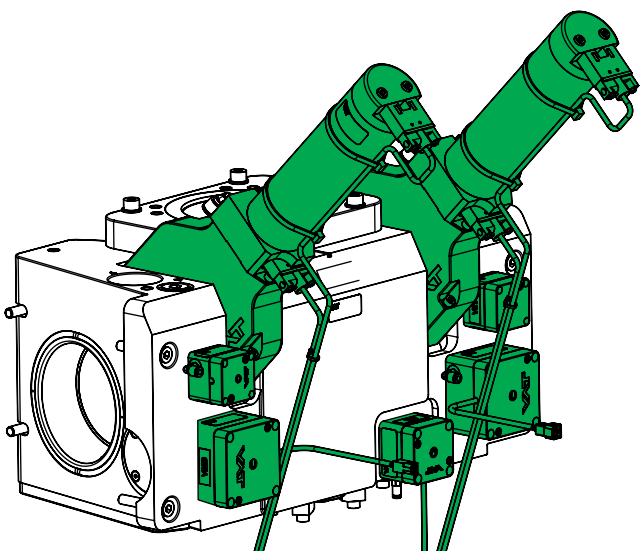
Integrated transfer valve



Integrated door



Pump block



# Examples of customer-specific multi-valve modules



## Loading module for analysis system

Integrated are

– gate valve, series 12.1
– door mechanism
– angle valves for evacuation and venting
– sensors
– docking device for transport and positioning module



## Pump manifold

Integrated are

– butterfly control valve DN 100
– 2 angle valves DN 100
– 4 angle valves DN 25/40
– various ports
– pressure control valves
– bore holes for liquid heating




## Loading module for semiconductor systems

Integrated are

– 2 atmospheric doors 30 × 336 mm
– 2 vacuum transfer valves 30 × 336 mm
– 2 softpump valves DN 40
– 2 venting diffusers
– various ports

## Introduction

The glossary explains some technical terms and trade names used in this catalogue. These terms are explained in a way consistent with vacuum valve technology.

## Adaptive controller

A controller adapting itself to changes in pressure, gas flow, and pumping speed without any manual adjustments. This allows for a completely automatic operation of the system.

## All-metal valve

The static seals and the seat seal are made of metal.

Because these valves are free of lubricants and do not contain any elastomers or plastomers, their outgassing rate is very small and they can be baked at higher temperatures. They are therefore used for extreme UHV applications. With a special actuator they are radiation resistant to higher levels ($10^8$ Gy) than elastomer sealed valves.

## Antimagnetic

Short form for «not ferromagnetic».

The relative magnetic permeability μr is measured with a permeameter.

Most VAT valves can optionally be supplied in an antimagnetic version. We distinguish between two classes of antimagnetic valves:

| | | |
|---|---|---|
| Class 1: | parts | μr < 1.05 |
| | welds | μr < 1.08 |
| Class 2: | parts | μr < 1.3 |
| | welds | μr < 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 μr values above 2.

## ASA / ASA-LP flange

ASA flanges were originally developed for high pressure applications. Later on, they have been used in vacuum technology. ASA flanges have a larger distance between the mounting holes and the nominal diameter (DN) than other vacuum flanges.

ASA-LP (ASA Large Port) flanges are ASA flanges with an increased nominal diameter. The outer diameter (O. D.) and the mounting holes are identical to those of the ASA flange. ASA-LP flanges are available for the nominal diameters 2½" to 12".

| | | |
|---|---|---|
| Example: | ASA 6" | has a nominal diameter of 6" |
| | ASA-LP 6" | has a nominal diameter of 8" |

## Bellows

Bellows are used to seal the actuating shaft. Only formed and welded metal bellows are used in VAT valves. This sealing technology offers the following advantages:

– Small leak rate during actuation
– Free of lubricants
– Bakeable

## Closing direction

The closing direction is defined as the direction in which the gate approaches the seat during closing.

## Closing / opening time

Time between the switching of solenoid voltage and the arriving of the gate in the fully closed, vacuum tight resp. open position.

The data in the catalog shows typical values. They are dependent on the compressed air pressure, the mounting position of the valve, the cross sections and lengths of the compressed air lines as well as on the measuring method and measuring system.

For fast closing systems the expression «total closing time» is used. This is the time between the triggering of the sensor (without sensor response time) and the arrival of the plate in the fully closed position.

## Compressed air pressure

The specified compressed air pressures are always overpressures in bar.

## Compression set

Lasting deformation of an elastomer seal after relief. The compression set is depending on the kind of material and has to be considered when defining dynamic seals.

$CS = 100 \cdot (h_o - h_2) / (h_o - h_1)$

CS … Compression set (%)

$h_o$ … 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.

$q = L \cdot \Delta p$ (mbar ls$^{-1}$)

q … Gas flow (mbar ls$^{-1}$)

L … Conductance (ls$^{-1}$)

Δp … Pressure difference (mbar)

There is molecular flow in high vacuum. In this case, the conductance is only dependent on the size of the component.

The inner diameter of an open VAT valve is at each position equal to or larger than the corresponding tube diameter. The conductance of a VAT valve is hence roughly equal to a tube of the same configuration, diameter, and length.

The molecular flow conductance specified in the catalogue is calculated with the long tube formula. This is valid for valves mounted in a tube of the same diameter.

Formula for gate valves:

$L_v = 12.2 \cdot D^3 / l$

Formula for angle valves:

$L_v = 12.2 \cdot D^3 / (2 \cdot e + 0.7 \cdot D)$

Approximate formula for rectangular valves:

$L_v = 40 \cdot a^2 \cdot b^2 / ((a + b) \cdot l)$

a = Length of the slit (cm)

b = Width of the slit (cm)

D = Inner diameter of the valve (cm)

e = Corner – flange distance (cm)
(dimension A in dimensional drawing)
(0.7 D is the correction factor for 90° bend)

l = Flange-to-flange dimension of valve (cm)

$L_v$ = Molecular flow conductance (ls$^{-1}$)

## Conductance calculation in the vacuum system

The conductance L of a tube is composed of the conductance of the opening (orifice) $L_B$ and the conductances of the tube elements $L_{Ri}$.

$1 / L = 1 / L_B + \Sigma_i \, 1 / L_{Ri}$

$L_B = 9.2 \cdot D^2$

$L_R = 12.2 \cdot D^3 / l$ (long tube formula)

D = Inner diameter (cm)

l = Length of a tube element (cm)

L, $L_B$, $L_R$ = Conductance (ls$^{-1}$)

The short tube formula contains the conductances of the orifice and of the tube. It is normally not applicable to valves.

Formula for the effective pumping speed of a pump:

$1 / S_{eff} = 1 / S_o + \Sigma_i \, 1 / L_{Ri}i$

$S_o$ = Nominal pumping speed ls$^{-1}$)

$L_{Ri}$ = Conductances of tubes and valves (ls$^{-1}$)

$S_o$ accounts for the orifice. All conductanes of tubes and valves have to be calculated with the long tube formula.

## Cycle

An open – close – open movement of the valve.

## Cycles until first service

Numbers of cycles (open – close – open) for which a valve can be safely operated under clean conditions without any maintenance. After the required maintenance the valve can again be operated for the specified numbers of cycles. Process induced contamination and increased temperatures can reduce the time between maintenance.

## Desorption

The desorption of physically or chemically bound gases from the interior surfaces of a vacuum container is the last step of the processes «diffusion» and «permeation».

In valve manufacturing, a small desorption rate is achieved by:

– Selection of material
– Surface treatment
– Cleaning
– Vacuum bake of valves and delivery with blank-off flanges on special request

### DeviceNet®

DeviceNet® is a digital network serving as a communication network between industrial controllers and I/O devices. It is based on the CAN standard (Controller Area Network). Originally developed by Allen Bradley, it is now supervised by the non-profit organization DeviceNet Vendors Association (ODVA).

### Differential pressure

The differential pressure is the pressure difference at the closed valve gate.

– With the higher pressure on seat side, the differential pressure acts in the opening direction

– With the higher pressure on the reverse side, the differential pressure acts in the closing direction

(See also Valve seat side, Opening direction, Closing direction).

### Diffusion

Diffusion is the transport of one material through another material. Hydrogen is dissolved in stainless steel. It diffuses to the interior surface and limits the vacuum when desorbing.

By vacuum annealing ($H_2$ firing) a zone depleted of hydrogen can be created in special cases during the valve manufacturing. This reduces the diffusion of hydrogen to the interior surface and hence the desorption into the vacuum is diminished.

### DN

See «Nominal I. D.».

### Elastomer

Elastomers are materials with properties similar to rubber. They are very well suited for gaskets [e. g. FKM (Viton®)].

### FFKM

See «Perfluoro elastomer».

### FKM

See «Fluoro elastomer».

### FlapVAT

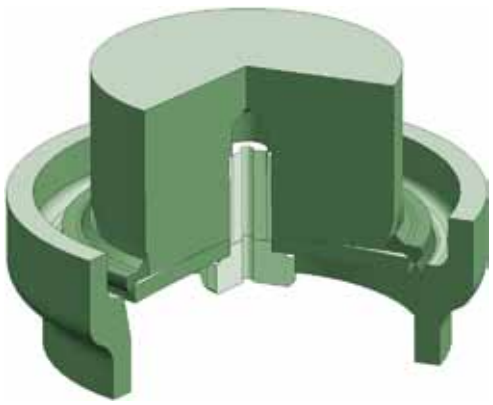
The FlapVAT transfer valve is offered for opening heights up to 100 mm as a low-cost supplement to the SolVAT transfer valve. The applied valve technology is referred to as a flapper. Compared to other flapper valves the FlapVAT transfer valve has a long seal lifetime and is mechanically locked in the closed position. Optionally, it is also available in the version «differential pressure resistant in either direction».

Function:

A shaft to which a mechanism is mounted is rotated by a pneumatic actuator. Depending on the rotation direction of the shaft, the mechanism with the valve gate is either moved to the open or to the closed valve position.

### FLEX VATRING

This dynamic, all-metal sealing system is characterized by consistent sealing and closing forces. It enables to reach high sealing forces with comparably low axial forces. The sealing partners are in stainless steel and deformed elastically only. The FLEX VATRING system is suitable for extreme UHV. It may be baked to 300 °C in open and closed position and reaches a lifetime of > 1 000 cycles if operated under clean conditions.



### Fluoro elastomer

Fluoro (FKM or FPM) is an elastomer with high chemical resistance. Fluoro elastomers from different manufacturers have slightly different properties regarding chemical resistance, temperature resistance, mechanical properties and cleanliness.

### FPD

Short term for Flat Panel Display. Designates flat screens that are, for instance, used in TV sets or computers.

### Free of lubricants (dry)

The lubricant used in the vacuum is a fluoro based vacuum grease. Solid lubricants and metal films are normally not mentioned as lubricants.

Free of lubricants or dry means that friction problems in the vacuum are solved in a way not to emit any hydrocarbon or silicone vapours into the vacuum.

### Gas purge

Additional gas flow directly into the valve. A low overpressure reduces the gas penetration into the valve interior to a large extent, and valve mechanism and seal are protected against contamination.

Gas purge is only useful in combination with protective rings. The protective ring minimizes the additional gas penetration and the influence on the process. The kind of gas and volume of gas flow depend on the process. Usually, the gas purge is about 5 % of the process gas flow.

Series 17 valves are available with a port for gas purging.

### Gray (Gy)

Unit for the energy dose in the SI system (international measuring system). The energy dose is the radiation energy absorbed by the material per unit of mass.

1 Gy = 1 J/kg = 100 rad

### Hot zone

Area with (locally) increased radiation level and increased temperature. The radiation level is higher than normally used materials can withstand during the expected time of use.

Valves are typically radiation resistant between $10^3$ and $10^6$ Gy depending on the sealing materials used. Actuators are typically suited for $10^1$ to $10^5$ Gy.

Only all-metal valves with a special actuator are suited for higher radiation levels.

### Impulse actuation

Most pneumatically actuated VAT valves can optionally be equipped with an impulse solenoid. For actuation the valve needs only a short electric pulse of > 50 ms. Between actuations the solenoid is currentless (but can also stay under voltage). This ensures no change of valve position at power failure.

### Intermediate pumping

To reduce the leak rate static seals, rotary and shaft feedthroughs can be double sealed in order to evacuate the space between the two seals. This intermediate space is typically pumped to a pressure of 0.1 to 10 mbar. The lower differential pressure reduces the permeation through the seal and the gas carrying during actuation.

### Leak rate

Helium gas flow in mbar $ls^{-1}$ leaking through a sealing arrangement or a body. During the measurement the difference of the helium partial pressure is in the order of 1000 mbar. The rise of the helium gas flow during the test time (typically 1 minute) is the leak rate. The test time depends on the permeation rate of helium through the gasket and the vacuum time constant of the system.

### Lifetime

Numbers of cycles (open – close – open) for which a valve can be safely operated under clean conditions and normal temperatures without any maintenance.

### L-MOTION

L-MOTION stands for a mechanically triggered real L-actuation of the gate in combination with a patented gate / shaft connection which enables a uniform seal compression.

### Locking

A valve mechanism is mechanically locked if the sealing force remains intact at the failure of the closing force. This is normally accomplished by a joint going over center.

### L-VAT

Especially designed for aggressive semiconductor applications. This L-movement transfer valve comes with vulcanized or O-ring gate seals and its L-motion is mechanically ensured. L-VAT features a very reliable single-shaft actuator, a bellows-sealed feedthrough and enables quick and simple maintenance.

### MONOVAT

Sealing configuration for elastomer sealed gate valves and transfer valves developed and patented by VAT. It features shock-free and virtually particle-free actuation and a very long lifetime.



### Nitrile

Short form for nitrile-butadiene rubber (NBR). It is an elastomer material for gaskets.

### Nominal I. D. (DN)

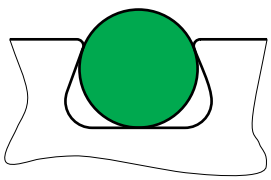
Size denomination of a flange. The nominal I.D. (DN) does not always correspond to the smallest diameter of a flange or tube.

### Opening direction

The opening direction is defined as the direction in which the gate is retracted from the seat during opening.

### O-ring seal

O-ring seals are made of materials with properties similar to rubber. They are put into grooves. Due to the compression the O-ring is pressed into the groove. Small voids remain between the seal groove and the O-ring.



Also see «Vulcanized seal».

### Outgassing rate

The outgassing rate (in mbar $ls^{-1}$) is the sum of all gas loads caused by:

– Desorption
– Diffusion
– Permeation
– Outgassing of voids and crevices
– Disintegration of surface layers

A small outgassing rate is essential for efficient pump down and low base pressure. In valve manufacturing, a small outgassing rate is achieved by:

– Use of materials with as small desorption, diffusion, and permeation rates as possible
– Preventing crevices and unvented voids
– Vacuum compatible cleaning

### Particle

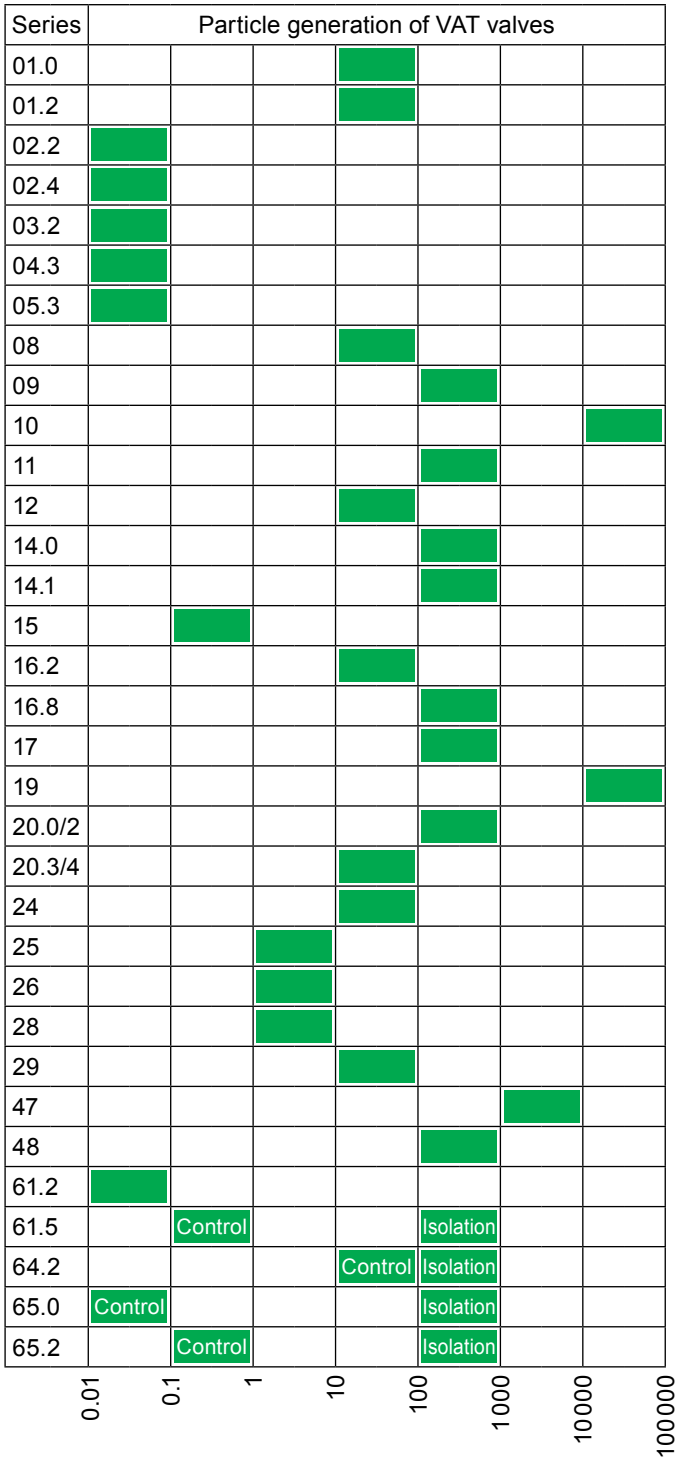
Particles in valves are mainly generated by friction of the valve components. VAT develops and uses a variety of inspection devices to detect particles. The inspections take place in VAT's own laboratory. This makes it possible to get profound knowledge about the particle emission of our valves and to improve the quality of the valve components accordingly.

Depending on the field of application of the valves, particle emissions are either detected by means of optical measuring devices (particles > 300 nm) or by using a differential mobility analyzer (particles > 10 nm) .



VAT particle test stand for particles > 10 nm

The following table gives you a survey about the magnitude of the particle emission of our valves. For detailed information please contact your VAT representative.




Particles per valve cycle > 300 nm,
measured by an optical particle counter

## PEEK

Short form for polyetheretherketone, a high temperature resistant thermoplast.

## Perfluoro elastomer

Perfluoro (FFKM or FFPM) is fully fluorinated hydrogen-free FKM. Its chemical resistance is even higher than that of FKM.

## Permeation (gas permeability)

Permeation is a multi-stage process. Gas adsorbed at the outer wall is dissolved in the material, diffuses through the material and desorbs from the inner wall. For stainless steel gas flows due to permeation can be neglected for the temperature used in vacuum technology. These gas flows have however to be taken into account for elastomer and plastomer gaskets.

For FKM (Viton®) the permeation rates «P» have approx. the following values after a long time at room temperature:

– He $P = 10 \cdot 10^{-8}$ cm$^2$ s$^{-1}$

– $O_2$ $P = 1 \cdot 10^{-8}$ cm$^2$ s$^{-1}$

– $N_2$ $P = 0.6 \cdot 10^{-8}$ cm$^2$ s$^{-1}$

For a body with the area «A» (cm$^2$) and the average diffusion length «l» (cm) the gas flow «Q» due to permeation at a pressure difference «Δp» (mbar) is around:

$Q = P \cdot A \ / \ l \cdot \Delta p$ (mbar ls$^{-1}$)

For air at atmospheric pressure the partial pressures «p» of the relevant gases are:

– He $p = 5.0 \cdot 10^{-3}$ mbar

– $O_2$ $p = 2.1 \cdot 10^{2}$ mbar

– $N_2$ $p = 7.8 \cdot 10^{2}$ mbar

For well degassed O-rings the permeation of nitrogen and oxygen of the air through the FKM (Viton®) is the major contributor to outgassing.

The helium gas flow due to permeation can simulate large leaks during leak testing after a test time depending on the gasket.

## PFA

There are three types of Teflon®: PTFE, FEP and PFA. In this catalogue the word Teflon® is only used for Teflon PTFE.

High chemical resistance (similar to PTFE), but higher mechanical stability and hardness. PFA is used for chemically very resistant gaskets.

## Plastomer

Name for materials which are used for predominantly plastically deformable gaskets (e. g. PFA, Tenic®).

## Pneumatic actuator

VAT valves are available with various types of compressed air cylinders and various solenoid valves.

Even for non mechanically locked valves the valve position can be maintained for a certain period of time at compressed air failure by installing a check valve at the compressed air inlet.

## POM

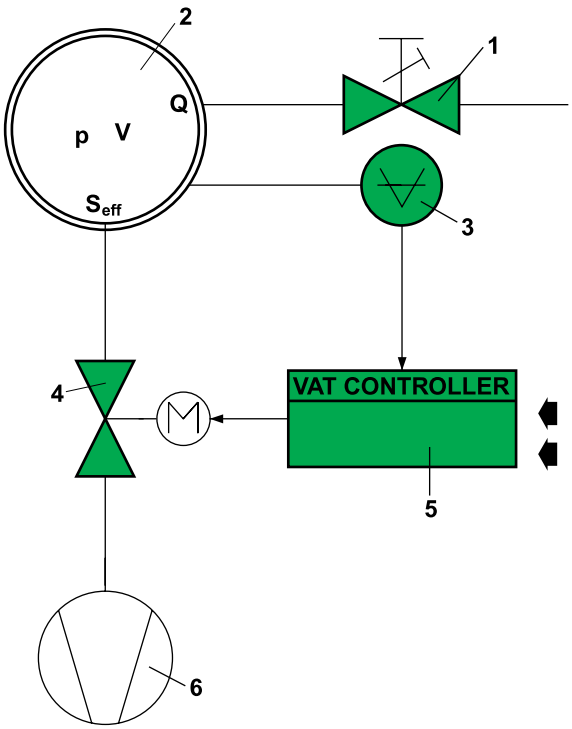
Short form for Polyoxymethylene, a thermoplastic material.

## Pressure

| | |
|---|---|
| Vacuum pressures | are always absolute pressures unless explicitly specified as pressure differences. |
| Compressed air pressures | are always pressure differences to the atmospheric pressure, i.e. overpressures. |

## Pressure closed-loop control

Elements:




1 Gas flow meter
2 Process chamber
3 Pressure sensor
4 Control valve
5 Pressure controller
6 Vacuum pump

In stationary condition the following formula is applicable:

$S_{eff}$ … Q / p

$S_{eff}$ … Effective pumping speed ($ls^{-1}$)

Q … Gas flow (mbar $ls^{-1}$)

p … Pressure (mbar)

or units used in USA

$S_{eff}$ = 12.7 · Q / p

$S_{eff}$ … Effective pumping speed ($ls^{-1}$)

Q … Gas flow (sccm)

p … Pressure (mTorr)

Principle of operation:

The controller compares the actual pressure in the process chamber given by the pressure sensor with the preset pressure. The controller uses the difference between actual and set pressure to calculate the correct position of the control valve. The controller drives the control valve into the correct position and the actual pressure again equals the set pressure.

This control operation is performed continuously. Pressure changes in the process chamber due to leaks, desorption, gas flow, reaction products, variations in pumping speed etc. are always corrected at once.

## Pressure control

In a vacuum system which is pumped and into which gas is admitted at the same time, the pressure can be controlled in two ways:

1. Downstream control

   The pressure is controlled by changing the conductance of a control valve between pump and process chamber. This changes the effective pumping speed at the process chamber. Pressure and gas flow can be independently controlled over a wide range.

2. Upstream control

   The pressure is controlled by changing the gas flow into the process chamber, while the pumping speed remains constant.

## Protective ring

In an open gate valve the protective ring bridges the opening between the flanges. To the gas flow the open valve looks like a tube i.e. has no changes in inner diameter.

The protective ring improves the gas flow, reduces the contamination of the valve interior and protects the gate seal from heat radiation (e.g. if the gate valve is used as a lock for hot items). An additional gas purge helps to protect the valve interior completely.

## PV

Short term for photovoltaics. Designates the technology for transforming sunlight into electrical energy.

## Quality assurance

The high quality level of VAT valves is planned according to the TQM (Total Quality Management) system and constantly monitored during manufacturing and assembly. Monitoring is performed with SPC (Statistical Process Control) in combination with modern measuring machines such as 3D coordinate measuring instruments and automated valve testing machines with automatic data recording.

The following tests are performed on each VAT valve:

Parts / subassemblies:

– Visual examination
– Verification of dimensions
– Functional test
– Helium leak test

Complete valve:

– Visual examination
– Functional test
– Helium leak test

Additional tests can be performed and certificates of conformity, acceptance test certificates, inspection certificates and material certificates can be supplied on customer request.

## Radiation resistance

Use of special materials increases the service life under ionizing radiation over that of normal valves. The radiation resistance in Gray is the dose up to which the valve functions safely (1 Gray = 100 Rad).

## RF contact

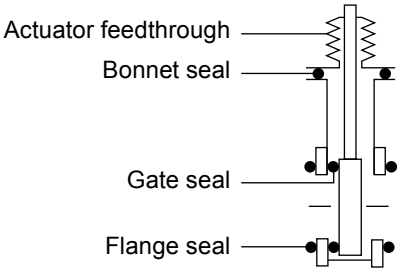
This guarantees a small RF resistance through the open valve. In the open valve position a metal ring, having the geometric shape of the beam tube, is spread between the two connecting flanges and ensures a direct electrically conducting connection between the two flanges.

## Rotary feedthrough

A rotary feedthrough is an element to transmit a rotation or pivoting motion into the valve interior. VAT's rotary feedthroughs are elastomer sealed and lubricated with a fluoro based vacuum grease. The gas carry-over into the valve interior is much smaller than for a shaft feedthrough of the same diameter.

The operating costs are substantially lower than for a bellows feedthrough due to the long cycle life and the low costs for spare parts (no bellows).

## Seals of valves




Some valves also have a seal between the bonnet flange and the actuator assembly. This seal is made of the same material as the bonnet seal.

## Shaft feedthrough

A shaft feedthrough consists of an O-ring and a stem and transmits a linear motion into the valve interior. The elastomer gasket is lubricated with a fluoro based high vacuum grease.

During closing a short-term pressure rise may occur.

## Shutter

A shutter reduces the full conductance in a very short time to a small leak (not vacuum tight). This prevents the shock wave of an air inrush from spreading. Shutters are compatible with all-metal systems.

## Silicone

In connection with gaskets a short form for silicone rubber.

## SolVAT

A valve primarily developed for the solar module production featuring a special, VAT-invented locking system. Leaktight closing is performed by a plate provided with an O-ring seal. The SolVAT valve is based on a modular design. Scaling for the required substrate size is hence easy. The valve is very robust against aggressive media and high temperatures and may be supplied in a variety of materials and material combinations.

## Stepper motor

The stepper motor is well suited for exact positioning. It is hence often used as actuator for control valves.

## Tenic®

Teflon® (PTFE) filled with nickel powder. Sealing material for the chemical industry.

### Vacuum brazing

Joining technique for void-free joints.

In addition vacuum brazing is an ideal way of cleaning and degassing the brazed parts.

### Vacuum grease

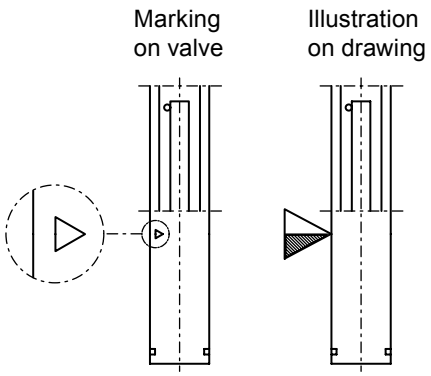
For valves with lubricants VAT uses a fluoro based vacuum grease with very low vapour pressure ($< 5 \cdot 10^{-13}$ mbar at 20 °C).

### Vacuum levels

See page 285.

### Valve seat side (A side)

Side of the gate seal indicated with the sign ▼ in the dimensional drawings. Each VAT valve has a triangle ▽ stamped into the flange on the seat side. The tip of the triangle points towards the seat. This information is important in connection with differential pressure (see Differential pressure).




### VATLOCK

Gate valve mechanism (e.g. used in series 10, 11, 12, 14) developed by VAT.

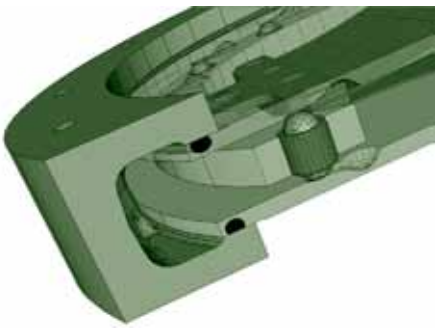
Gate valves with VATLOCK system are mechanically locked in the closed position.

In the open position the mechanism is not locked. Leaf springs hold gate and counter plate against the carriage with the ball retainers. The ball pairs are in the detents.

For closing, the mechanism is moved forward into the closing position.

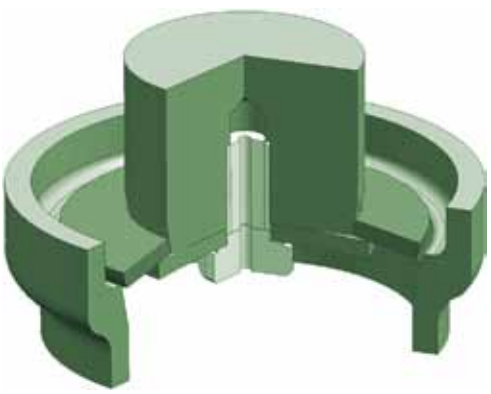
The locking starts after the leaf spring stop touches the body. The ball retainers move the ball pairs out of the detents. Gate and counter plate are spread apart. The gate seal is pressed against the sealing surface without scuffing. The arrangement of ball pairs ensures an increase of the sealing force with vacuum on either side of the gate.

During opening the movements proceed in the reverse order.



### VATRING

This dynamic, all-metal sealing system is characterized by consistent sealing and closing forces. It enables to reach high sealing forces with comparably low closing resp. axial forces. The sealing partners are in stainless steel and deformed elastically only. The VATRING system is suitable for extreme UHV. It may be baked to 450 °C in open and 350 °C in closed position and reaches a lifetime of > 100 000 cycles if operated under clean conditions.



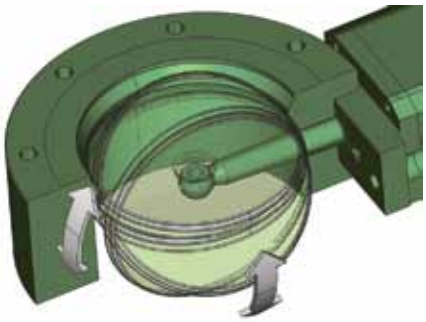
## VATSEAL

This metal flange seal developed and patented by VAT requires only parallel flanges with carefully prepared flat sealing surfaces.

## VATTERFLY

VATTERFLY valves can – at first look – be easily mistaken for butterfly valves. They are pivoting plate valves that in many cases are a compact economical alternative to a gate valve. In VATTERFLY valves the gate first swings to the closing position without any friction of the gate seal. For vacuum tight closing and locking the plate pivots. The sealing procedure is similar to that of a gate valve.

VATTERFLY valves of the Series 20.0 / 20.2 feature a bellows feedthrough, those of the Series 20.3 / 20.4 a rotary feedthrough.



## Viton®

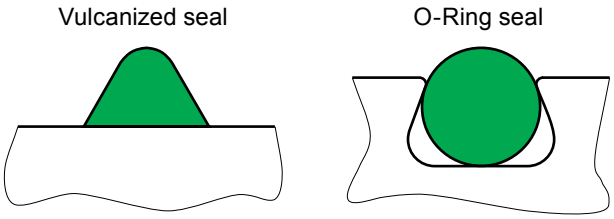
Trade name for a fluoroelastomer (FKM). Viton® has a small desorption rate.

The maximum temperature for valves in open position is 220 °C (250 °C for a short while), for valves in closed position 150 °C due to the strong sticking properties and compression set.

Viton® decomposes at temperatures exceeding 220 °C and the lifetime of the seal is reduced.

## Vulcanized seal

Is used as a dynamic seal for UHV valves and MONOVAT systems (e. g. series 01, 02, 03, 04, 05, 10.8, 15, 20).




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

– Increased reliability of operation:
  Seal cannot be pulled out of the groove due to sticking or differential pressure

– Easy maintenance:
  No seal groove, seal remains on gate, flat surfaces in the sealing area ensure easy cleaning

– Improved vacuum properties:
  Only one sealing line, no voids that cause outgassing, no hidden impurities

Vulcanized seals can be made of fluoroelastomer, perfluoro-elastomers, silicones or EPDM. Outgassing rate, permeation and bakeability are equal to selected high quality O-rings.

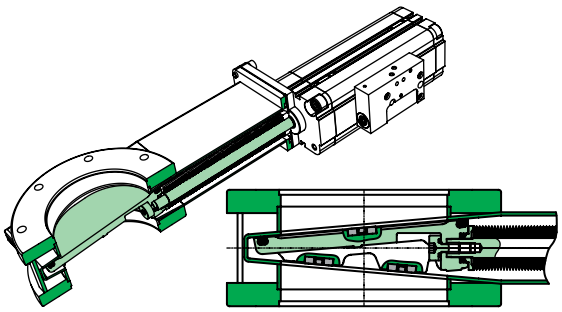
## Waveguide

In the open position a tube is placed between the flanges. Only a small gap remains between the ends of the tube and the flanges. The RF resistance of the open valve is hence greatly reduced.

### Wedge sealing system

Sealing system developed by VAT for the Series 09 gate valves.

This extremely robust system is provided with a wedge-shaped gate which is pressed on an appropriate seat in the body. O-ring compression is limited by PEEK sliding elements. This enables a combination of a good leak rate with a corresponding cycle life, even if exposed to multiple differential pressure openings of up to 1 bar. Furthermore, the sliding elements prevent dynamic metal-to-metal contact and consequently reduce particle generation. This may be crucial for sensitive applications.



### Weld neck (weld stub)

A valve can be equipped with a weld neck instead of a flange. Such a valve can be welded directly into a tubing or a specific flange can be attached by the customer. Care has to be taken not to warp or contaminate the valve.

### XL-VAT

L-movement transfer valve with an O-ring gate seal, primarily developed for the flat screen production. The XL-VAT valve is based on a modular design. Scaling for the required substrate size is hence easy. The required locking pressure may be controlled via the control unit. Overstraining of the gate O-ring may therefore be prevented. Furthermore, the XL-VAT valve is designed for very easy maintenance.

# Vacuum levels

Different applications require different technical designs of the valves. VAT valves can roughly be divided into 4 vacuum levels. This table shows the major features.

| Vacuum level | Pressure range (mbar) | Maximum temperature (°C) | Seals | | Feedthrough |
|---|---|---|---|---|---|
| | | | Gate | Bonnet | |
| **Vacuum** | to $1 \cdot 10^{-7}$ | 150 | FKM (Viton®) | FKM (Viton®) | Shaft feedthrough, sealed with O-ring made of FKM (Viton®) |
| **HV** (high vacuum) | to $1 \cdot 10^{-8}$ | 150 | FKM (Viton®) | FKM (Viton®) | Rotary feedthrough, sealed with O-ring made of FKM (Viton®) or bellows |
| **UHV** (ultra high vacuum) | to $1 \cdot 10^{-10}$ | 200/250 | FKM (Viton®) | metal | Bellows |
| **XHV** (extreme UHV) | better than $10^{-10}$ | 300/450 | metal | metal | Bellows |

The following tables present the official denomination and the composition of materials used in VAT valves.

| Stainless steel | | | | | | |
|---|---|---|---|---|---|---|
| Material No. | | Abbreviated designation | Composition (%) | | | |
| AISI | EN | DIN | C | Cr | Ni | Mo |
| 301 | 1.4310 | X 10 CrNi 18 8 | 0.05–0.15 | 16.0–19.0 | 6.0– 9.5 | ≤0.8 |
| 303 | 1.4305 | X 8 CrNiS 18 9 | ≤0.10 | 17.0–19.0 | 8.0–10.0 | – |
| 304 | 1.4301 | X 5 CrNi 18 10 | ≤0.07 | 17.5–19.5 | 8.0–10.5 | – |
| 304L | 1.4306 | X 2 CrNi 19 11 | ≤0.03 | 18.0–20.0 | 10.0–12.0 | – |
| 305 | 1.4303 | X 4 CrNi 18 12 | ≤0.06 | 17.0–19.0 | 11.0–13.0 | – |
| – | 1.4308 | G X 6 CrNi 19 10 | ≤0.07 | 18.0–20.0 | 8.0–12.0 | – |
| 316 | 1.4401 | X 5 CrNiMo 17 12 2 | ≤0.07 | 16.5–18.5 | 10.0–13.0 | 2.0–2.5 |
| 316L | 1.4404 | X 2 CrNiMo 17 12 2 | ≤0.03 | 16.5–18.5 | 10.0–13.0 | 2.0–2.5 |
| 316L | 1.4435 | X 2 CrNiMo 18 14 3 | ≤0.03 | 17.0–19.0 | 12.5–15.0 | 2.5–3.0 |
| 316LN | 1.4429 | X 2 CrNiMo 17 13 3 | ≤0.03 | 16.5–18.5 | 11.0–14.0 | 2.5–3.0 |
| 316Ti | 1.4571 | X 6 CrNiMoTi 17 12 2 | ≤0.08 | 16.5–18.5 | 10.5–13.5 | 2.0–2.5 |
| 420 | 1.4034 | X 46 Cr 13 | 0.43–0.50 | 12.5–14.5 | – | – |
| 420C | 1.3541 | X 47 Cr 14 | 0.43–0.50 | 12.5–14.5 | – | – |
| 420D | 1.4037 | X 65 Cr 14 | 0.60–0.70 | 12.5–14.5 | – | ≤0.75 |
| 430 | 1.4016 | X 6 Cr 17 | ≤0.08 | 16.0–18.0 | – | – |
| 440 | 1.4122 | X 39 CrMo 17 1 | 0.33–0.45 | 15.5–17.5 | ≤1.0 | 0.8–1.3 |
| 440C | 1.4125 | X 105 CrMo 17 | 0.95–1.20 | 16.0–18.0 | – | 0.4–0.8 |
| 631 | 1.4568 | X 7 CrNiAl 17 7 | ≤0.09 | 16.0–18.0 | – | 6.5–7.8 |
| 660 | 1.4943 | X 4 NiCrTi 25 15 | ≤0.08 | 13.0–16.0 | 24.0–27.0 | 1.0–1.5 |

| Aluminum alloys | | | | | | |
|---|---|---|---|---|---|---|
| Material No. | | Abbreviated designation | Composition (%) | | | |
| EN | DIN | EN | Mg | Si | Mn | |
| EN AC-42000 | – | EN AC-AlSi7Mg | 0.20–0.65 | 6.5– 7.5 | ≤0.35 | ≤0.05 |
| EN AC-42100 | 3.2371 | EN AC-AlSi7Mg0.3 | 0.20–0.40 | 6.5– 7.5 | ≤0.05 | ≤0.05 |
| EN AC-46200 | 3.2162 | EN AC-AlSi8Cu3 | 0.05–0.55 | 7.5– 9.5 | 0.15–0.65 | 2.0–3.5 |
| EN AC-47100 | 3.2982 | EN AC-AlSi12Cu1 (Fe) | ≤0.35 | 10.5–13.5 | 0.55 | 0.7–1.2 |
| EN AW-5083 | 3.3547 | EN AW-AlMg4.5Mn0.7 | 4.00–4.90 | ≤0.4 | 0.40–1.00 | ≤0.10 |
| EN AW-5049 | 3.3527 | EN AW-AlMg2Mn0.8 | 1.60–0.50 | ≤0.4 | 0.50–1.10 | ≤0.10 |
| EN AW-5754 | 3.3535 | EN AW-AlMg3 | 2.60–3.60 | ≤0.4 | ≤0.50 | ≤0.10 |
| EN AW-6014 | – | EN AW-AlMg0.6Si0.6V | 0.40–0.80 | 0.3– 0.6 | 0.05–0.20 | ≤0.25 |
| EN AW-6060 | 3.3206 | EN AW-AlMgSi | 0.45–0.60 | 0.5– 0.6 | ≤0.10 | ≤0.10 |
| EN AW-6061 | 3.3211 | EN AW-AlMg1SiCu | 0.80–1.20 | 0.4– 0.8 | ≤0.15 | 0.15–0.40 |
| EN AW-6063 | 3.3206 | EN AW-AlMg0.7Si | 0.45–0.90 | 0.2– 0.6 | ≤0.10 | ≤0.10 |
| EN AW-6081 | 3.2215 | EN AW-AlSi0.9MgMn | 0.60–1.00 | 0.7– 1.1 | 0.10–0.45 | ≤0.10 |
| EN AW-6082 | 3.2315 | EN AW-AlSi1MgMn | 0.60–1.20 | 0.7– 1.3 | 0.40–1.00 | ≤0.10 |

| Other materials | |
|---|---|
| Material | Composition |
| AISI 633 (AM 350) | Iron with 16–17% Cr, 4–5% Ni, 2.5–3.3% Mo, 0.5–1.4% Mn, 0.08–0.17% C |
| Nimonic 90 | Nickel with 15–21% Co, 18–21% Cr, 2–3% Ti, 1–2% Al |
| Titan 3.7035 | >99.2% Ti (grade 2) |

# Conversion tables

## Pressure

| | Pa ($N\ m^{-2}$) | bar | mbar | µbar ($dyn\ cm^{-2}$) | Torr (mm Hg) | micron (µ, mTorr) | atm | psi ($lbf\ inch^{-2}$) | psf ($lbf\ ft^{-2}$) |
|---|---|---|---|---|---|---|---|---|---|
| **1 Pa ($N\ m^{-2}$) =** | 1 | $1 \cdot 10^{-5}$ | $1 \cdot 10^{-2}$ | 10 | $7.5 \cdot 10^{-3}$ | 7.5 | $9.87 \cdot 10^{-6}$ | $1.45 \cdot 10^{-4}$ | $2.09 \cdot 10^{-2}$ |
| **1 bar =** | $1 \cdot 10^{5}$ | 1 | 1000 | $1 \cdot 10^{6}$ | 750 | $7.5 \cdot 10^{5}$ | 0.987 | 14.5 | $2.09 \cdot 10^{3}$ |
| **1 mbar =** | 100 | $1 \cdot 10^{-3}$ | 1 | 1000 | 0.75 | 750 | $9.87 \cdot 10^{-4}$ | $1.45 \cdot 10^{-2}$ | 2.09 |
| **1 µbar ($dyn\ cm^{-2}$) =** | 0.1 | $1 \cdot 10^{-6}$ | $1 \cdot 10^{-3}$ | 1 | $7.5 \cdot 10^{-4}$ | 0.75 | $9.87 \cdot 10^{-7}$ | $1.45 \cdot 10^{-5}$ | $2.09 \cdot 10^{-3}$ |
| **1 Torr (mm Hg) =** | 133.3 | $1.333 \cdot 10^{-3}$ | 1.333 | 1333 | 1 | 1000 | $1.32 \cdot 10^{-3}$ | $1.93 \cdot 10^{-2}$ | 2.78 |
| **1 micron (µ, mTorr) =** | 0.1333 | $1.333 \cdot 10^{-6}$ | $1.333 \cdot 10^{-3}$ | 1.333 | $1 \cdot 10^{-3}$ | 1 | $1.32 \cdot 10^{-6}$ | $1.93 \cdot 10^{-5}$ | $2.78 \cdot 10^{-3}$ |
| **1 atm =** | $1.01 \cdot 10^{5}$ | 1.013 | 1013 | $1.01 \cdot 10^{6}$ | 760 | $7.6 \cdot 10^{5}$ | 1 | 14.7 | $2.12 \cdot 10^{3}$ |
| **1 psi ($lbf\ inch^{-2}$) =** | $6.89 \cdot 10^{3}$ | $6.89 \cdot 10^{-2}$ | 68.9 | $6.89 \cdot 10^{4}$ | 51.71 | $5.17 \cdot 10^{4}$ | $6.8 \cdot 10^{-2}$ | 1 | 144 |
| **1 psf ($lbf\ ft^{-2}$) =** | 47.8 | $4.78 \cdot 10^{-4}$ | 0.478 | 478 | 0.359 | 359 | $4.72 \cdot 10^{-4}$ | $6.94 \cdot 10^{-3}$ | 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 | $7.5 \cdot 10^{3}$ | 592 | 0.592 | $4.41 \cdot 10^{-4}$ |
| **1 mbar $ls^{-1}$ =** | 0.1 | 1 | 0.75 | 0.987 | 750 | 59.2 | $5.92 \cdot 10^{-2}$ | $4.41 \cdot 10^{-5}$ |
| **1 Torr $ls^{-1}$ =** | 0.1333 | 1.333 | 1 | 1.32 | 1000 | 78.9 | $7.89 \cdot 10^{-2}$ | $5.85 \cdot 10^{-5}$ |
| **1 atm $cm^3\ s^{-1}$ =** | 0.101 | 1.01 | 0.76 | 1 | 760 | 60 | $6 \cdot 10^{-2}$ | $4.45 \cdot 10^{-5}$ |
| **1 lusec =** | $1.333 \cdot 10^{-4}$ | $1.333 \cdot 10^{-3}$ | $10^{-3}$ | $1.32 \cdot 10^{-3}$ | 1 | $7.89 \cdot 10^{-2}$ | $7.89 \cdot 10^{-5}$ | $5.86 \cdot 10^{-8}$ |
| **1 sccm =** | $1.69 \cdot 10^{-3}$ | $1.69 \cdot 10^{-2}$ | $1.27 \cdot 10^{-2}$ | $1.67 \cdot 10^{-2}$ | 12.7 | 1 | $10^{-3}$ | $7.45 \cdot 10^{-7}$ |
| **1 slm =** | 1.69 | 16.9 | 12.7 | 16.7 | $1.27 \cdot 10^{4}$ | 1000 | 1 | $7.45 \cdot 10^{-4}$ |
| **1 Mol $s^{-1}$ =** | $2.27 \cdot 10^{3}$ | $2.27 \cdot 10^{4}$ | $1.7 \cdot 10^{4}$ | $2.24 \cdot 10^{4}$ | $1.7 \cdot 10^{7}$ | $1.34 \cdot 10^{6}$ | $1.34 \cdot 10^{3}$ | 1 |

## Temperature

| | K | °C | °F |
|---|---|---|---|
| **1 K =** | 1 | K-273.15 | 5/9 × K-459.67) |
| **1 °C =** | °C+273.15 | 1 | 5/9 × °C+32) |
| **1 °F =** | 5/9 × (°F+459.67) | 5/9 × (°F-32) | 1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **°C** | -50 | 0 | 50 | 100 | 150 | 200 | 250 |
| **°F** | -58 | 32 | 122 | 212 | 302 | 392 | 482 |

## Torque

| | Nm | ft lbs | kp m | kgf cm |
|---|---|---|---|---|
| **1 Nm =** | 1 | 0.738 | 0.102 | 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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