



PRODUCT CATALOGUE

INDUSTRIAL VALVES



ENGINEERING, EQUIPMENT AND CONSULTING

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ENEQ Overview

With nine years of solid performance and a project portfolio exceeding €20 million, ENEQ Consult Ltd. is a trusted partner in the power industry. We deliver cost-effective, high-quality mechanical equipment for the nuclear, conventional power, oil & gas, and petrochemical sectors, with a specialized focus on solutions for nuclear power plants with PWR reactor technology.

Our expertise spans the entire project lifecycle, from **equipment supply** and turn-key delivery to critical **engineering analyses** (including FEA & CFD) and comprehensive **service** from production to commissioning and after-sales support. Through exclusive partnerships with 15 global manufacturers, we provide a wide range of equipment compliant with international standards such as ASME, EN, N Stamp, DIN, and ISO.

This catalogue details our extensive range of industrial valves, engineered for reliability and performance in the most demanding environments.

ENEQ Valve Portfolio Overview

| Type | Key Feature | Application | Size Range (DN) | Pressure Range (PN) |
|-------------------------|--|--|--------------------------|--|
| Axial Flow Valve | Streamlined in-line design for minimal turbulence and pressure drop; fast operation. | Oil & gas pipelines, compressor discharge, high-integrity process systems. | 50 to 1200 (4" to 48") | Up to 420 bar (ASME Class 2500) |
| Ball Valve | Quarter-turn operation with a perforated ball; available in floating or trunnion-mounted designs with soft or metal seats. | Oil & gas, chemical plants, water systems, HVAC, and marine applications. | 10 to 1400 (1/2" to 56") | Up to ASME Class 2500 / API 15,000 psi |
| Blowdown Valve | Handles high differential pressure for rapid removal of water, sludge, and impurities. Offered in intermittent and continuous designs. | Boiler TDS control, sludge removal, and emergency depressurization. | 10 to 100 | Up to 500 bar |
| Butterfly Valve | Quarter-turn disc operation; lightweight and compact. Concentric, double-offset, and triple-offset designs available. | Water supply, HVAC, chemical processing, fire protection, oil & gas, and power generation. | 50 to 3000 | Up to 40 bar (ASME Class 600) |
| Check Valve | Prevents backflow; available in swing, lift (piston), tilting-disc, dual-plate, and butterfly types. | Backflow prevention in water, steam, oil, gas, and petrochemical services. | 10 to 1600 (up to 64") | Up to 630 bar (ASME Class 4500 / API 15,000 psi) |
| Choke Valve | Designed for severe service; precisely controls flow rate and downstream pressure in high-pressure drop applications. | Oil & gas wellheads, subsea manifolds, gas injection, and flowback control. | 1-13/16" to 7-1/16" | 2,000 to 15,000 psi (up to ASME Class 4500) |

| Type | Key Feature | Application | Size Range (DN) | Pressure Range (PN) |
|----------------------|---|---|-------------------------|---|
| Control Valve | Modulates flow, pressure, or temperature using globe, angle, or 3-way body designs with specialized trims for severe service. | Power plants, refineries, chemical plants, and HVAC automation. | 20 to 400 (3/4" to 16") | Up to PN 400 (ASME Class 2500), with smaller sizes available up to Class 4500 |
| Gate Valve | Linear motion for full open/close isolation with minimal pressure drop. Features various wedge designs and bonnet types. | Oil & gas pipelines, water distribution, and power generation. | 40 to 1800 (up to 72") | Up to 630 bar (ASME Class 4500 / API 15,000 psi) |
| Globe Valve | Linear motion for precise throttling and tight shut-off. Available in straight, Y-pattern, angle, and bellows-sealed designs. | Steam systems, cooling water, fuel oil, chemical processing, and severe service applications. | 6 to 1200 (up to 48") | Up to 630 bar (ASME Class 4500) |

Attachment 1

ENEQ Consult – Axial Flow Valves Catalogue 2025

ENEQ Consult Ltd. delivers cost-effective mechanical equipment for nuclear, conventional, oil & gas, and petrochemical industries.

- **9 years** of solid performance
- **> 20 M€** project portfolio
- **> 50** completed projects, **> 10** in progress
- Exclusive partnerships with **15 manufacturers worldwide**
- Equipment compliant with **ASME, EN, N Stamp, DIN, ASTM, ISO, GOST**

Expertise:

- **Equipment Supply** – high-quality OEMs, cost-effective modernization and new-build NPP solutions, turnkey delivery
- **Engineering** – design critical analyses, FEA & CFD calculations, technical consulting
- **Service** – full project support from production to installation, commissioning, and after-sales

ENEQ Axial Flow Valves

Axial flow valves deliver high-capacity performance with exceptionally low pressure drop, making them ideal for demanding applications in oil and gas, petrochemical, cryogenic, and power generation industries. Their streamlined, in-line design minimizes turbulence and noise while maximizing efficiency. Available in cast or forged bodies with flanged, butt-weld, or custom end connections, these valves can be fitted with specialized trims for severe service, cavitation control, and noise reduction. Manufactured to ASME-ANSI, DIN, API, and BS standards, they are offered in a full range of materials including Carbon Steel, Stainless Steel, Duplex, and high-alloy grades for reliable operation in the most challenging environments.

Table of axial flow valve types and their features:

1. Axial Flow Valve Types & Features

| Type | Key Features | Typical Benefits / Applications |
|----------------------------------|--|---|
| STD Cage | Multi-hole cage for non-critical services; standard regulation; high Cv; simple construction | General control duties where noise and cavitation are not critical |
| LDB Cage | Multi-hole cage with small hole pattern; reduces jet diameter; increases frequency parameter (fp) to lower noise | Low-noise service for gases and liquids; meets environmental noise limits |
| DobDrill | Combination of LDB at low strokes and STD at large strokes; increases rangeability | Processes with wide operating range; maintains low noise at low openings while maximizing capacity at high openings |
| DobCage | Two LDB cages with small expansion area between; multi-stage effect for maximum noise suppression; up to 4 stages possible | Severe service with high pressure drop and critical noise levels |
| Balanced Plug (Stem-Guided) | Reduces actuator torque; can be used without cage for on-off high-capacity service; pressure-balanced inner chamber | High-capacity on-off service; dirty fluids; reduced actuator size |
| Unbalanced Plug | Simpler design; for applications where actuator force is not a limitation | Standard control where torque is not critical |
| Cryogenic Extended Neck Design | Extended body neck for insulation and cold box mounting | LNG, air separation, and other cryogenic services |
| Fully Tungsten Carbide Trim | Extreme hardness (HRC 74); erosion-resistant; sintered construction | Choke service; dirty fluids with solids; high-velocity erosive conditions |
| Special Overlays / Claddings | Stellite, tungsten carbide, chromium carbide, Inconel overlays for seat and trim | Extends service life in corrosive, erosive, or high-temperature duties |
| Rotary-to-Linear Drive Mechanism | Multiplier effect reduces actuator size; backlash-free; low friction; unaffected by dirty fluids | Smooth, precise control; reduced fugitive emissions; smaller actuators for same duty |

2. Standards and Specifications

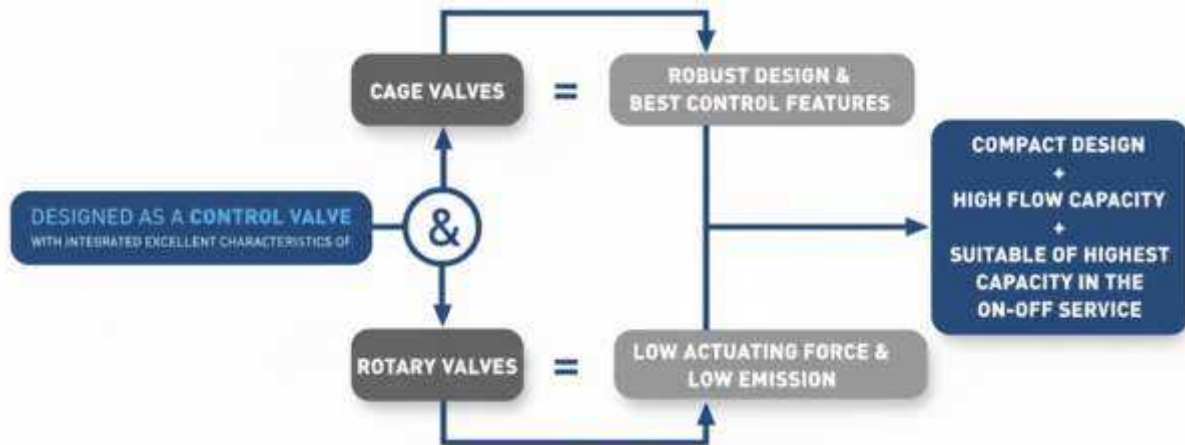
Control valves are designed and manufactured to conform to a variety of international standards, ensuring their suitability for a wide range of applications and industries.

Regarding design and construction, the overall valve design adheres to key international standards, including ASME-ANSI, DIN, API, and BS. The design of pressure-retaining components such as the body, bonnet, and bolting meets all applicable ANSI, ASME, and DIN standards. The sealing of the body-bonnet joint is achieved by using spiral wound gaskets, which are made from stainless steel wound with graphite or other filler materials. These gaskets are fully enclosed between the body and bonnet, functioning under the principle of controlled compression. To ensure this, manufacturing and maintenance procedures provide the correct torques for every bolting size.

For dimensions and connections, face-to-face dimensions are in accordance with ISA S75.12, 15, and 16. Valves are available with several end connections, including SW (Socket Weld), BW (Butt Weld), and FLG (Flanged).

Material selection is a critical aspect of valve design, based on factors like design pressure, temperature, and the type of fluid being handled. Standard materials for the body and bonnet include carbon steel, stainless steel, and alloy steel. For special applications, other alloys such as Duplex, Superduplex, Hastelloy, Inconel, and Monel can be provided. Additionally, materials compliant with NACE standards for sour service are available upon request.

3. Design of the Axial Flow Valve



4. Materials

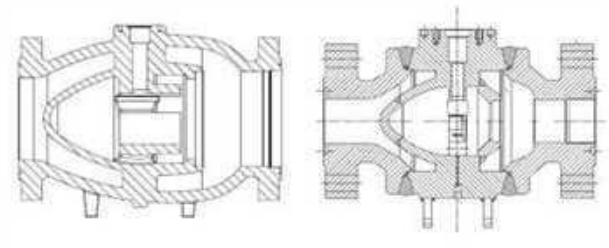
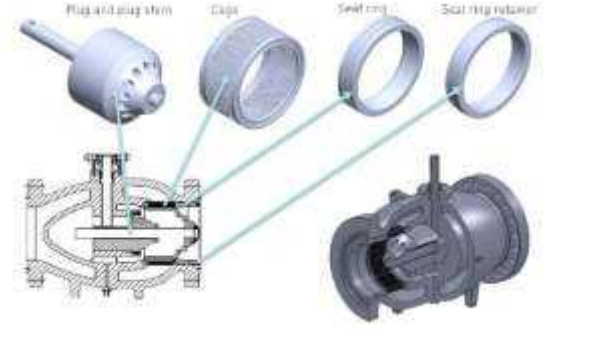
This table details the material options for the valve's main components.

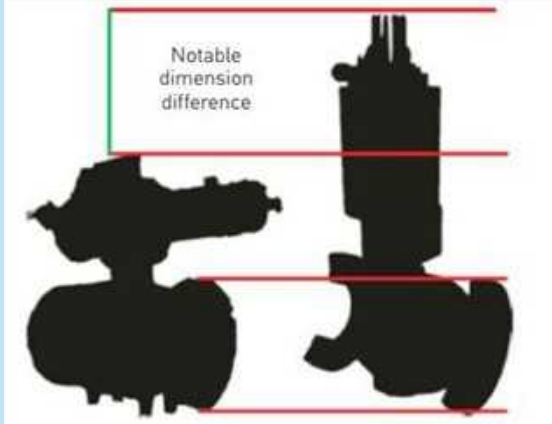
| Component | Material Options | Carbon Steel: | Cr-Mo Alloy Steel: | Cr-Mo-V Alloy Steel: | Stainless Steels: | Nickel-based Alloys & Titanium: |
|-----------|---|---------------|--------------------|----------------------|---|-------------------------------------|
| Body | A wide variety of materials are available, including: | A216-WCB | A217-WC6, A217-WC9 | A217-C12A | A351-CF8M, Alloy 20, Duplex (A890-Gr. 4A), Super Duplex (A890-Gr. 6A) | Hastelloy, Inconel, Monel, Titanium |

| | | | | | |
|-----------------------|--|--|--|--|--|
| Trim | Options include: | Martensitic Steels: A276-410, A276-420 | Austenitic Steel: A276-316 | Duplex & Super Duplex: A182-F51, A182-F55 | • Special Trims: Fully tungsten carbide trims are available for choke applications or fluids with particles. |
| Hardfacing & Overlays | Specialized overlays can be applied for increased hardness and temperature resistance: | Stellite: 45 HRC hardness, for temperatures up to 500°C | Tungsten Carbide: 74 HRC hardness, for temperatures up to 550°C | Chromium Carbide: 68 HRC hardness, for temperatures up to 870°C | |

5. Design and Operational Features

This table describes the key design characteristics of the valve's body, trim, and drive mechanism.

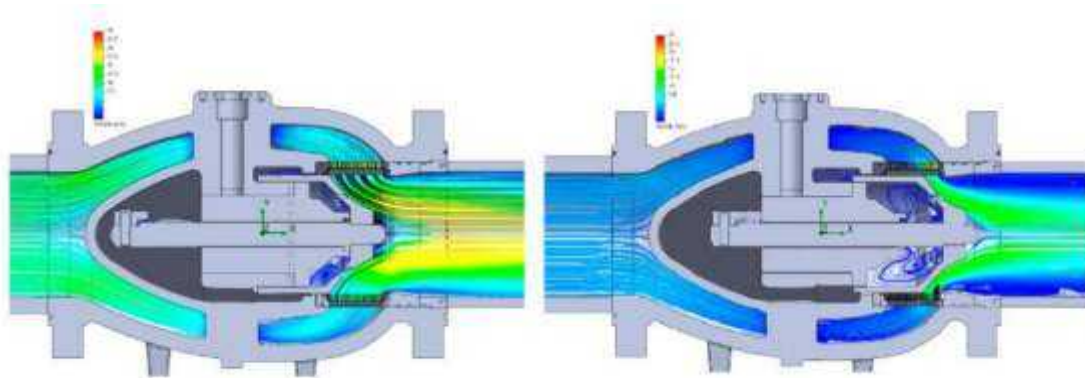
| Feature Category | Description | Image |
|------------------|--|--|
| Body Design | <ul style="list-style-type: none"> The streamlined body has a constant sectional area to provide larger flow coefficients (Cv values) and lower noise levels . Valves are cast in sizes from 4" to 48" and forged for applications below 4" or above 2500# . Low fugitive emissions are ensured by O-ring seals with back-up packing. |  |
| Trim Design | <ul style="list-style-type: none"> The stem-guided plug can be used without a cage for on-off applications to achieve high capacity . Multi-cage designs are available for managing high noise or cavitation through multistage pressure reduction . Balanced plugs can be used to reduce the required actuator torque . The internal transmission mechanism is pressure balanced and its bearings are protected from particles. |  |

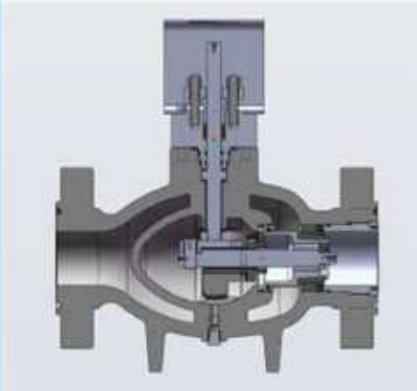
| | | |
|------------------------|---|--|
| <p>Drive Mechanism</p> | <ul style="list-style-type: none"> • A unique rotary-to-linear mechanism converts 90° rotation into linear plug movement . • This system multiplies the actuator's force, delivering maximum thrust when it is most needed at the opening and closing positions, which allows for smaller actuators . • The mechanism is not affected by dirt or impurities and is well-suited for dirty fluids . • It allows for the use of standard 90° rotary actuators from any manufacturer . • The rotary stem design leads to reduced fugitive emissions compared to a linear stem. |  |
|------------------------|---|--|

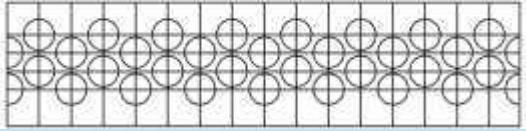
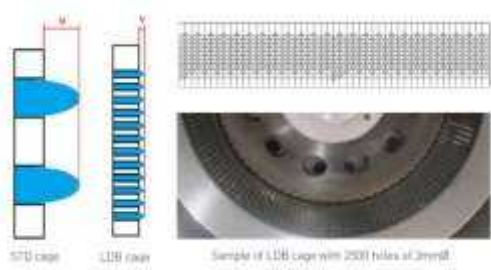
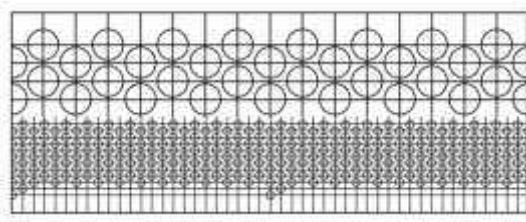
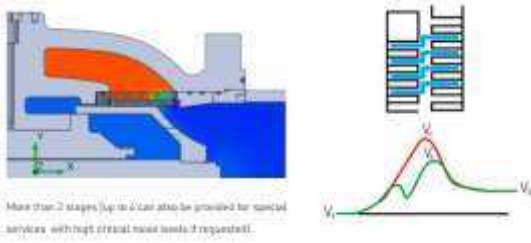
6. Cage Types and Applications

We have a complete range of characterized cages to cope with the problems resulting from high pressure drop applications.

Selection of proper internals type allows cavitation suppression as well as noise reduction. Large valve capacity and increased rangeability cages permit the use of one single valve for all process conditions.



| Application / Cage Type | Description | Image / Diagram |
|-----------------------------------|--|--|
| <p>On-Off Applications</p> | <p>Designed for the largest possible flow capacity. For example, a 16" 600# valve achieves a Cv of 12,445, which is significantly higher than competitors. This allows for either smaller valve sizes or a lower pressure drop for the same service.</p> |  |

| | | |
|------------------------------------|--|--|
| <p>Control Applications</p> | <p>A variety of single or multiple cages are available to handle the most critical and stringent requirements. These are designed to suppress cavitation and reduce noise, with options for linear, equal percentage, standard, or low-noise characteristics. Multi-stage designs can achieve recovery factors (FL) as high as 0.99.</p> | |
| <p>STD Cage</p> | <p>A multi-hole cage designed for standard, non-critical regulation and control services.</p> |  |
| <p>LDB (Low dB) Cage</p> | <p>A multi-hole cage featuring a small hole pattern. This design effectively reduces noise levels by decreasing the jet diameter of the fluid as it passes through the cage.</p> |  |
| <p>DobDrill Cage</p> | <p>A combination design that uses the LDB hole pattern for low strokes and the STD pattern for large strokes. This configuration is used to increase the overall rangeability of the valve.</p> |  |
| <p>DobCage</p> | <p>A multi-stage, anti-noise design that combines two LDB cages with a small expansion area in between. This creates a two-stage pressure drop for maximum noise reduction. Up to four stages can be provided for highly critical services.</p> |  |

7. Axial Valve Codification System

This system breaks down the valve model into a series of codes representing its size, materials, and features.

Body Codes

Valve Size


| Code | Size (inch) | Size (DN) | Code | Size (inch) | Size (DN) |
|------|-------------|-----------|------|-------------|-----------|
| 04 | 4" | 100 | 20 | 20" | 500 |
| 06 | 6" | 150 | 24 | 24" | 600 |
| 08 | 8" | 200 | 28 | 28" | 700 |
| 10 | 10" | 250 | 30 | 30" | 750 |
| 12 | 12" | 300 | 36 | 36" | 900 |
| 14 | 14" | 350 | 40 | 40" | 1000 |
| 16 | 16" | 400 | 42 | 42" | 1050 |
| 18 | 18" | 450 | 48 | 48" | 1200 |

| Rating | | End Connections | |
|---------------|-------------------------|------------------|------------------|
| Code | Description | Code | Description |
| 1 | ANSI 150# / PN 10/16/25 | 1 | ANSI Flanged R/F |
| 2 | ANSI 300# / PN 40 | 2 | DIN Flanged |
| 4 | ANSI 600# | 5 | ANSI Flanged RTJ |
| 5 | ANSI 900# | X | Custom |
| 6 | ANSI 1500# | | |
| 7 | ANSI 2500# | | |
| Body Material | | Packing Material | |
| Code | Description | Code | Description |
| 3 | ASTM A182 F316 | 1 | Graphoil |
| 4 | ASTM A216 WCB | 2 | Teflon |
| 5 | ASTM A536 | 3 | V-Pack |
| X | Custom | | |

Internals Codes

| Cage Type | | Trim Characteristic | |
|----------------|--------------------------------|---------------------|----------------------|
| Code | Description | Code | Description |
| 0 | Quick Opening | 3 | Linear |
| 1 | STD | 4 | Equal Percentage* |
| 3 | LDB | | |
| 4 | DobCage | | |
| 7 | Special | | |
| Trim Materials | | Actuator Codes | |
| Code | Description | Code | Actuator Type |
| 1 | 410 Corrosion Resistance Steel | D | Pneumatic |
| 2 | 420 Corrosion Resistance Steel | E | Electric |
| 3 | 316 Stainless Steel | G | Gear Operated |
| X | Custom | H | Hydraulic |
| | | L | Lever Operated |
| | | P | Pneumatic Piston |

8. Manufacturing Range: Axial Flow Valves

| Standards | Sizes | Features (Design - Materials) | Image |
|-------------|--|---|--|
| ASME B16.34 | <ul style="list-style-type: none"> • 4"-48" 150#-900# • 4"-24" 1500# | <p>Types:</p> <ul style="list-style-type: none"> • One piece body <p>Trim type:</p> <ul style="list-style-type: none"> • STD / LDB / DobDrill / DobCage <p>Materials:</p> <ul style="list-style-type: none"> • Cast <p>Operation:</p> <ul style="list-style-type: none"> • Manual • Pneumatic • Hydraulic • Electric • Electrohydraulic |  |

Attachment 2

ENEQ Consult – Ball Valves Catalogue 2025

ENEQ Consult Ltd. delivers cost-effective mechanical equipment for nuclear, conventional, oil & gas, and petrochemical industries, with a strong focus on nuclear power plants using PWR reactor technology.

- **9 years** of solid performance
- **> 20 M€** project portfolio
- **> 50** completed projects, **> 10** in progress
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- Equipment compliant with **ASME, EN, N Stamp, DIN, ASTM, ISO, GOST**

Expertise:

- **Equipment Supply** – high-quality OEMs, cost-effective modernization and new-build NPP solutions, turnkey delivery
- **Engineering** – design critical analyses, FEA & CFD calculations, technical consulting
- **Service** – full project support from production to installation, commissioning, and after-sales
- **Ball Valve Portfolio Overview**

| Series/Design | Pressure Rating | Size Range | Features/Design |
|--|--|---|---|
| BALL VALVE C05.1 | PN 10–63; PN 10–25 | DN 10–65; DN 80–150 | Modular straight-body full-flow design with stainless steel ball in PTFE seats; PTFE/FPM gaskets; weld, flanged & screw ends; antistatic & deep-cold design; manual, gearbox & electric/pneumatic/hydraulic actuation |
| Floating (Side entry & Top entry) | API 6D – 150, 300, 600, 800, 900, 1500, 2500 | From ½” to 6” (150–600); From ½” to 2” (800–900) | Side-entry & top-entry floating design; soft- & metal-seated options; bi-directional sealing; full-port; grease fittings; manual, gearbox & actuator operation; flanged, butt-weld & threaded ends |
| Trunnion (Side entry & Top entry) | API 6D – 150, 300, 600, 800, | From 2” to 56” (API 6D up to class 600); From 2” | Trunnion-mounted for low-torque operation; side & top entry; pressure-actuated floating seats with automatic cavity pressure relief; double block & bleed option; fire-safe & |

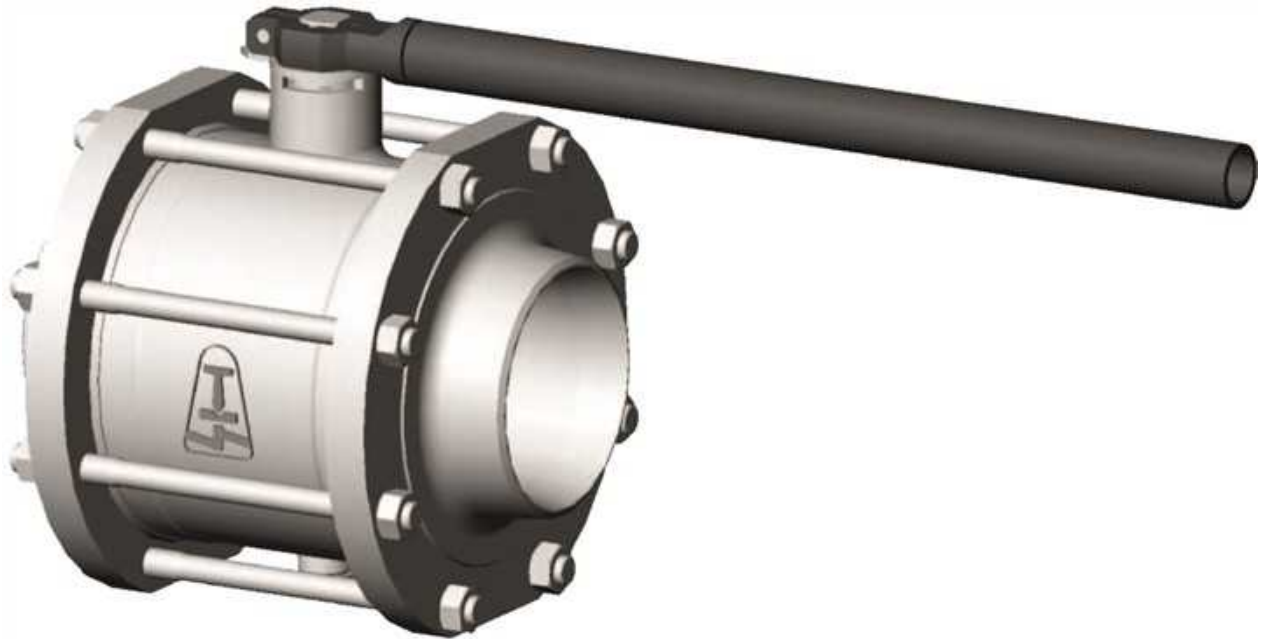
| | | | |
|--|---|--|---|
| | 900, 1500, 2500; API 6A – 2000, 3000, 5000, 10000, 15000 | to 42" (class 800–900); From 2" to 24" (class 1500–2500); From 2 1/16" to 7 1/16" (API 6A) | anti-blow-out stem; full-port; flanged, butt-weld & threaded ends |
|--|---|--|---|

•

BALL VALVE C05.1

PN 10–63; DN 10–65; T_{MAX}: 200 °C

PN 10–25; DN 80–150; T_{MAX}: 200 °C



BALL VALVE C05.1

APPLICATION

- liquid, steam, gas and others

CONNECTION

- weld ends, flanged screw ends, (inside thread)

OPERATION

- hand lever, gearbox, electric actuator, adjustment for pneumatic actuator or hydraulic actuator

DESCRIPTION

- modular design
- full-flow
- closing element - stainless steel ball in PTFE seats
- gasket: PTFE, FPM
- low temperatures design
- complies with the requirements of the directive 2014/68/EU and standard EN 1983
- testing is carried out according to standard EN 12266-1, part 2

BASIC DESIGN OPTIONS

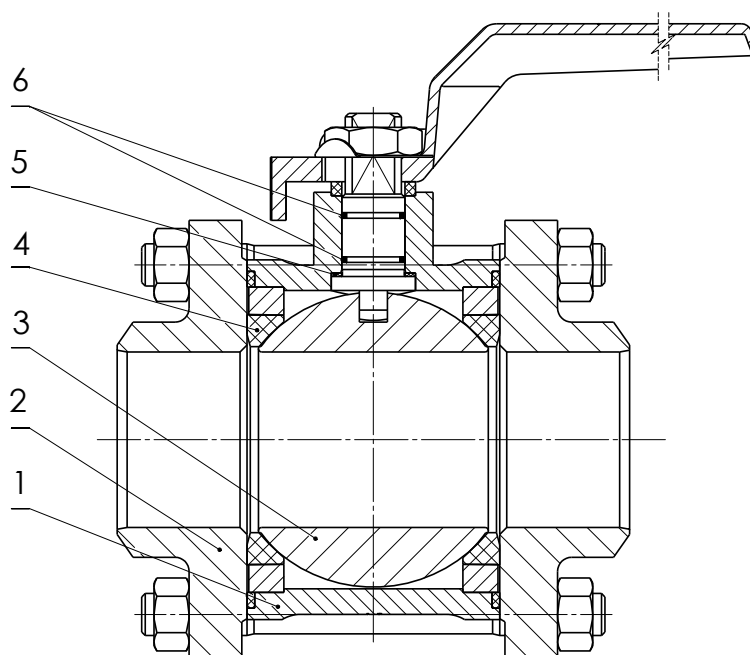
- adjustment for actuator, flange according to ISO 5211
- seal elements change possible
- in the case of manual lever control the ball valve can be retrofitted by locking the open-closed positions with a padlock or positioner, which reports the open-closed position remotely
- in the case of electric or pneumatic drive control, it can be retrofitted with other accessories, for example position limit switches
- antistatic design
- design for deep cold

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | |
|---|----|---|-----|----|-----|-----|
| | | -196 | -10 | 0 | 100 | 200 |
| GP240GH (1.0619, A216WCB) | 10 | - | 10 | 10 | 10 | 10 |
| | 16 | - | 16 | 16 | 16 | 16 |
| | 25 | - | 25 | 25 | 25 | 25 |
| | 40 | - | 40 | 40 | 40 | 40 |
| | 63 | - | 63 | 63 | 63 | 63 |
| GX5CrNiMo19-11-2 (1.4408, A351CF-8M) | 10 | 10 ¹⁾ | 10 | 10 | 10 | 10 |
| | 16 | 16 ¹⁾ | 16 | 16 | 16 | 16 |
| | 25 | 25 ¹⁾ | 25 | 25 | 25 | 25 |
| | 40 | 40 ¹⁾ | 40 | 40 | 40 | 40 |
| | 63 | 63 ¹⁾ | 63 | 63 | 63 | 63 |

1) only with a design for a deep chill

USED MATERIALS



| Pos. | Part | Material | |
|------|--------|--|---|
| 1 | Body | GP240GH/1.0619 (A216 Gr. WCB) | GX5CrNiMo19-11-2/1.4408 (A351 CF-8M) |
| 2 | Flange | GP240GH/1.0619 (A216 Gr. WCB) | GX5CrNiMo19-11-2/1.4408 (A351 CF-8M) (X6CrNiTi 18-10 / 1.4541) |
| 3 | Ball | S.S.316 GX5CrNiMo19-11-2/1.4408 (X5CrNiMo17-12-2/1.4401) | S.S.316 GX5CrNiMo19-11-2/1.4408 (X5CrNiMo17-12-2/1.4401) |
| 4 | Ring | PTFE | |
| 5 | Ring | PTFE | |
| 6 | Ring | FPM/PTFE | |

BALL VALVE C05.1

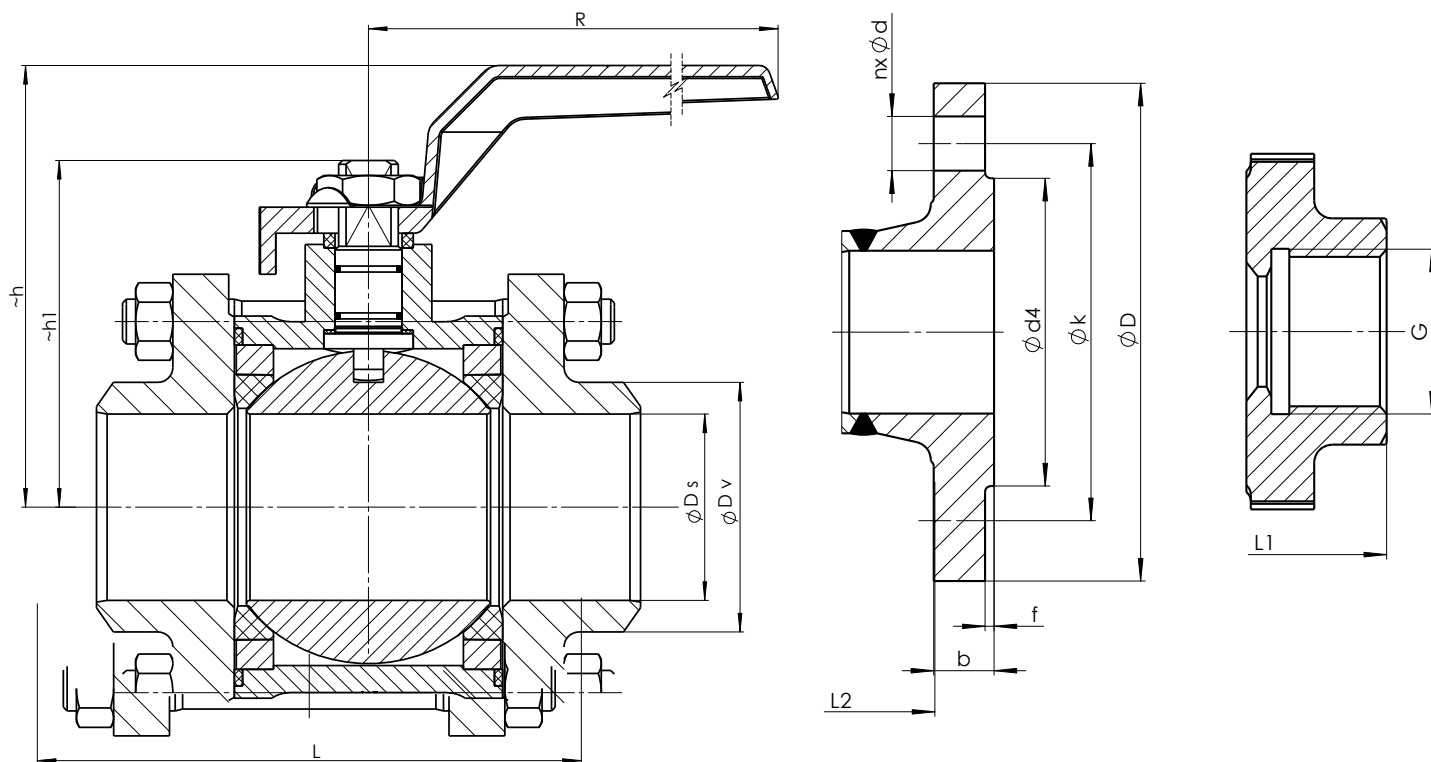
VALVE DIMENSIONS

1. Weld ends, inside thread

Face-to-face dimensions: as per table
Weld ends: DIN 3239 – part 1
Groove form: DIN 2559 – sheet 1 – form 22

2. Flanged

Face-to-face dimensions: as per table
Flanged: EN 1092-1, (DIN 2501/1972)



BALL VALVE C05.1

WELDING DESIGN

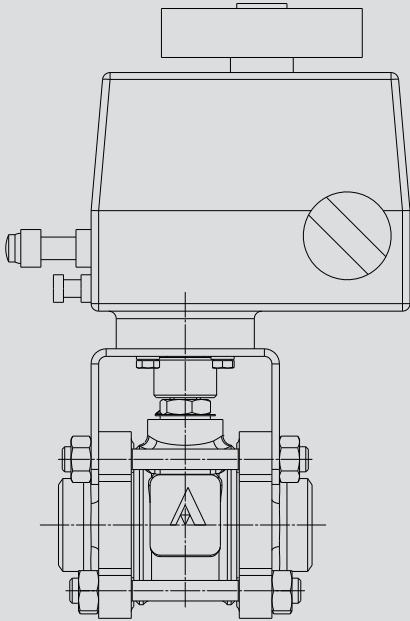
| Nominal pressure | Nominal size | Face-to-face | Face-to-face (screw ends) | Centre-to-top | Centre-to-top | Hand lever | Weld ends | | Pipe dimensions | Inside thread dimension | Approximate weight |
|------------------|--------------|--------------|------------------------------|---------------|---------------|------------|-----------|-------|-----------------|-------------------------|--------------------|
| | | | | | | | Dv | Ds | | | |
| PN | DN | L | L1 | h | h1 | R | Dv | Ds | | G | m [kg] |
| 10, 16, 25 | 10 | 65 | 60 | 70 | 52 | 130 | 20 | 13 | 16x1,5 | 3/8" | 0,75 |
| | 15 | 75 | 75 | 74 | 54 | 130 | 24 | 18 | 22x2 | 1/2" | 1,0 |
| | 20 | 85 | 80 | 77 | 58 | 130 | 31 | 24 | 28x2 | 3/4" | 1,5 |
| | 25 | 100 | 90 | 93 | 67 | 160 | 37 | 28 | 32x2 | 1" | 2,3 |
| | 32 | 100 | 110 | 100 | 74 | 160 | 42,5 | 33 | 38x2,5 | 1 1/4" | 2,6 |
| | 40 | 125 | 120 | 115 | 82 | 200 | 54 | 39,5 | 44,5x2,5 | 1 1/2" | 4,3 |
| | 50 | 145 | 140 | 125 | 90 | 200 | 67 | 51 | 57x3 | 2" | 7,3 |
| | 65 | 160 | - | 125 | 105 | 200 | 83 | 68 | 76x4 | - | 12,7 |
| | 80 | 200 | - | 150 | 145 | 450 | 96 | 83 | 89x3 | - | 24,0 |
| | 100 | 250 | - | 165 | 160 | 500 | 121 | 102 | 108x3 | - | 36,6 |
| | 125 | 310 | - | 195 | 190 | 700 | 147 | 125 | 133x4 | - | 82,0 |
| 150 | 370 | - | 240 | 230 | 700 | 176 | 151 | 159x4 | - | 99,0 | |
| 40 | 10 | 65 | 60 | 70 | 52 | 130 | 20 | 13 | 16x1,5 | 3/8" | 0,75 |
| | 15 | 75 | 75 | 74 | 54 | 130 | 24 | 18 | 22x2 | 1/2" | 1,0 |
| | 20 | 85 | 80 | 77 | 58 | 130 | 31 | 24 | 28x2 | 3/4" | 1,5 |
| | 25 | 100 | 90 | 93 | 67 | 160 | 37 | 28 | 32x2 | 1" | 2,3 |
| | 32 | 100 | 110 | 100 | 74 | 160 | 42,5 | 33 | 38x2,5 | 1 1/4" | 2,6 |
| | 40 | 125 | 120 | 115 | 82 | 200 | 54 | 39,5 | 44,5x2,5 | 1 1/2" | 4,3 |
| | 50 | 145 | 140 | 125 | 90 | 200 | 67 | 51 | 57x3 | 2" | 7,3 |
| | 65 | 160 | - | 125 | 105 | 200 | 83 | 68 | 76x4 | - | 12,7 |
| 63 | 10 | 65 | 60 | 70 | 52 | 130 | 20 | 13 | 17,2x2,0 | 3/8" | 0,75 |
| | 15 | 75 | 75 | 74 | 54 | 130 | 24 | 18 | 21,3x2,0 | 1/2" | 1,0 |
| | 20 | 85 | 80 | 77 | 58 | 130 | 31 | 24 | 26,9x2,3 | 3/4" | 1,5 |
| | 25 | 100 | 90 | 93 | 67 | 160 | 37 | 28 | 33,7x2,6 | 1" | 2,3 |
| | 32 | 100 | 110 | 100 | 74 | 160 | 42,5 | 33 | 42,4x2,6 | 1 1/4" | 2,6 |
| | 40 | 125 | 120 | 115 | 82 | 200 | 54 | 39,5 | 48,3x2,6 | 1 1/2" | 4,3 |
| | 50 | 145 | 140 | 125 | 90 | 200 | 67 | 51 | 60,3x3,2 | 2" | 7,3 |
| | 65 | 160 | - | 125 | 105 | 200 | 83 | 68 | 76,1x5,6 | - | 12,7 |

FLANGE DESIGN

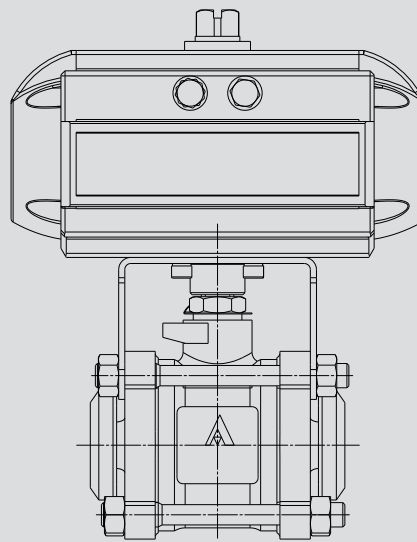
| Nominal pressure | Nominal size | Face-to-face | Centre-to-top | Centre-to-top | Hand lever | Number of holes | Hole | Pitch circle | Flange diameter | Flange thickness | Sealing bar | Approximate weight |
|------------------|--------------|----------------|---------------|----------------|------------|-----------------|------|--------------|-----------------|------------------|------------------|--------------------|
| PN | DN | L ₂ | h | h ₁ | R | n | ød | øk | øD | b | ød _{xf} | m [kg] |
| 10, 16 | 10 | 130 | 70 | 52 | 130 | 4 | 14 | 60 | 90 | 16 | 40x2 | 2,2 |
| | 15 | 130 | 74 | 54 | 130 | 4 | 14 | 65 | 95 | 16 | 45x2 | 2,6 |
| | 20 | 150 | 77 | 58 | 130 | 4 | 14 | 75 | 105 | 18 | 58x2 | 3,7 |
| | 25 | 160 | 93 | 67 | 160 | 4 | 14 | 85 | 115 | 18 | 68x2 | 4,9 |
| | 32 | 180 | 100 | 74 | 160 | 4 | 18 | 100 | 140 | 18 | 78x2 | 6,6 |
| | 40 | 200 | 115 | 82 | 200 | 4 | 18 | 110 | 150 | 18 | 88x3 | 8,7 |
| | 50 | 230 | 125 | 90 | 200 | 4 | 18 | 125 | 165 | 18 | 102x3 | 13 |
| | 65 | 290 | 125 | 105 | 200 | 8 | 18 | 145 | 185 | 18 | 122x3 | 21,2 |
| | 80 | 310 | 150 | 145 | 450 | 8 | 18 | 160 | 200 | 20 | 138x3 | 34,6 |
| | 100 | 350 | 165 | 160 | 500 | 8 | 18 | 180 | 220 | 20 | 162x3 | 49,5 |
| | 125 | 400 | 195 | 190 | 700 | 8 | 18 | 210 | 250 | 22 | 188x3 | 99,0 |
| 150 | 450 | 240 | 230 | 700 | 8 | 22 | 240 | 285 | 22 | 218x3 | 120 | |
| 25 | 10 | 130 | 70 | 52 | 130 | 4 | 14 | 60 | 90 | 16 | 40x2 | 2,2 |
| | 15 | 130 | 74 | 54 | 130 | 4 | 14 | 65 | 95 | 16 | 45x2 | 2,6 |
| | 20 | 150 | 77 | 58 | 130 | 4 | 14 | 75 | 105 | 18 | 58x2 | 3,7 |
| | 25 | 160 | 93 | 67 | 160 | 4 | 14 | 85 | 115 | 18 | 68x2 | 4,9 |
| | 32 | 180 | 100 | 74 | 160 | 4 | 18 | 100 | 140 | 18 | 78x2 | 6,6 |
| | 40 | 200 | 115 | 82 | 200 | 4 | 18 | 110 | 150 | 18 | 88x3 | 8,7 |
| | 50 | 230 | 125 | 90 | 200 | 4 | 18 | 125 | 165 | 20 | 102x3 | 13 |
| | 65 | 290 | 125 | 105 | 200 | 8 | 18 | 145 | 185 | 22 | 122x3 | 21,2 |
| | 80 | 310 | 150 | 145 | 450 | 8 | 18 | 160 | 200 | 24 | 138x3 | 34,6 |
| | 100 | 350 | 165 | 160 | 500 | 8 | 22 | 190 | 235 | 24 | 162x3 | 49,5 |
| | 125 | 400 | 195 | 190 | 700 | 8 | 26 | 220 | 270 | 26 | 188x3 | 99,0 |
| 150 | 450 | 240 | 230 | 700 | 8 | 26 | 250 | 300 | 28 | 218x3 | 120 | |
| 40 | 10 | 130 | 70 | 52 | 130 | 4 | 14 | 60 | 90 | 16 | 40x2 | 2,2 |
| | 15 | 130 | 74 | 54 | 130 | 4 | 14 | 65 | 95 | 16 | 45x2 | 2,6 |
| | 20 | 150 | 77 | 58 | 130 | 4 | 14 | 75 | 105 | 18 | 58x2 | 3,7 |
| | 25 | 160 | 93 | 67 | 160 | 4 | 14 | 85 | 115 | 18 | 68x2 | 4,9 |
| | 32 | 180 | 100 | 74 | 160 | 4 | 18 | 100 | 140 | 18 | 78x2 | 6,6 |
| | 40 | 200 | 115 | 82 | 200 | 4 | 18 | 110 | 150 | 18 | 88x3 | 8,7 |
| | 50 | 230 | 125 | 90 | 200 | 4 | 18 | 125 | 165 | 20 | 102x3 | 13 |
| | 65 | 290 | 125 | 105 | 200 | 8 | 18 | 145 | 185 | 22 | 122x3 | 21,2 |

DESIGN VARIANTS

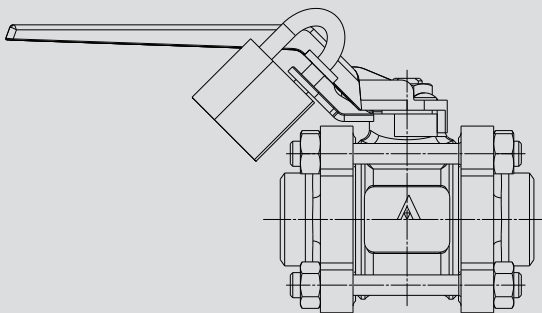
Design with electric actuator



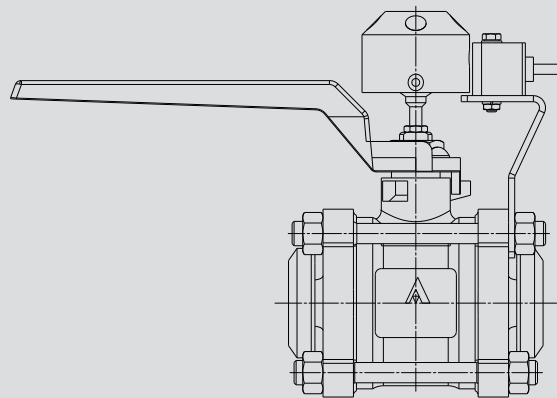
Design with pneumatic actuator



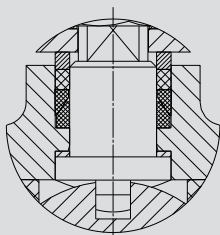
Manual design with locking



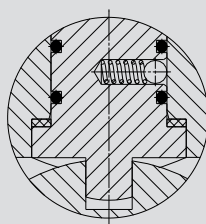
Manual design with positioner



Design for deep cold

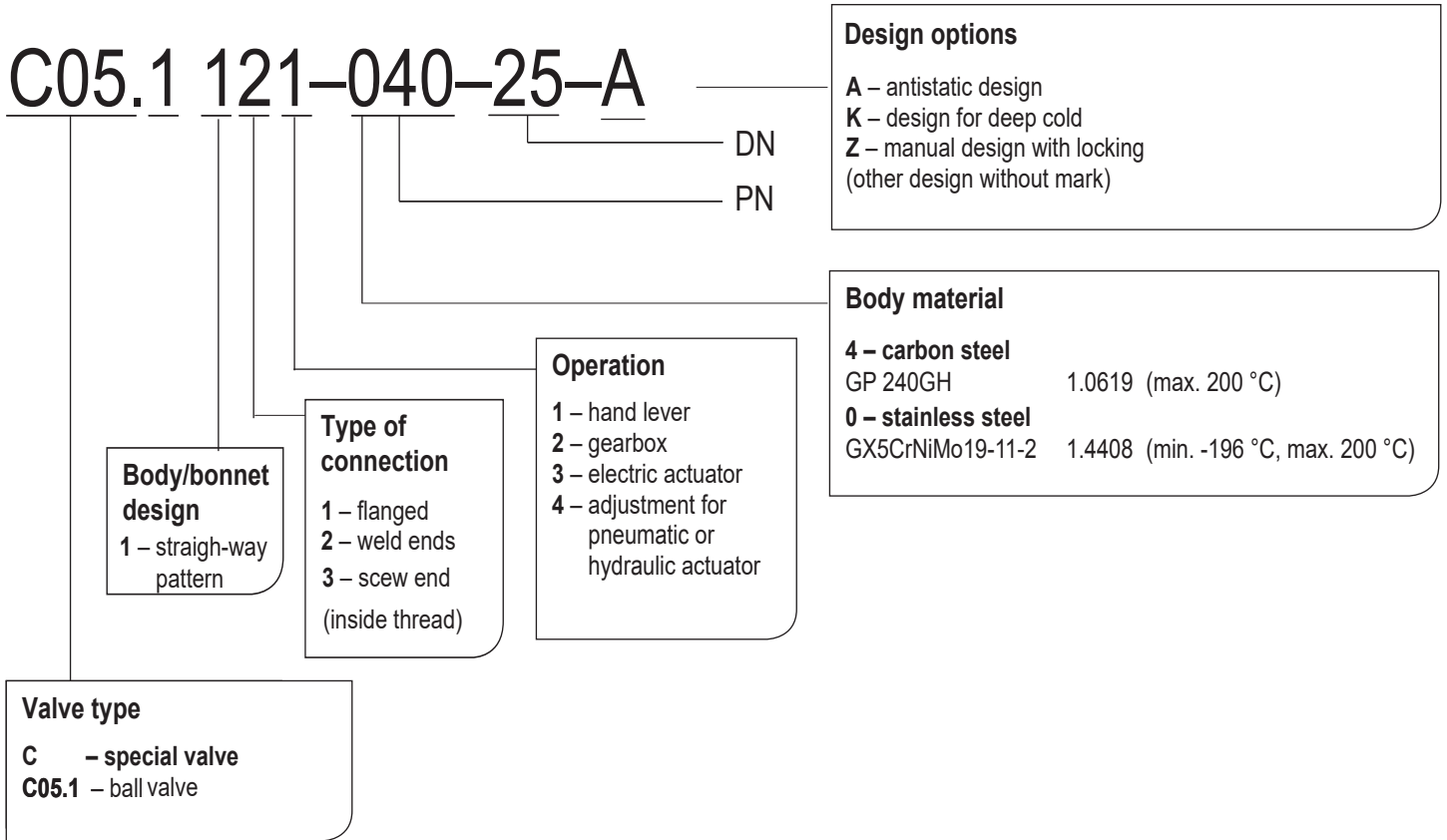


Antistatic design



VALVE DESCRIPTION CODE

C05.1 121-040-25-A



VALVE INSTALLATION

Valve can be built into both vertical and horizontal pipeline. When operating by pneumatic or electric actuator, the actuator regulations must be observed. Medium can flow in one direction and the other. After completion of the assembly it is necessary to check the control function (open-closed).

It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

ENEQ Ball Valves

Ball valves are offered in floating-seat, trunnion-mounted and fully welded configurations for reliable on/off isolation in water, steam, oil, gas and petrochemical services. All designs are available in cast or forged bodies, with bolted-bonnet, pressure-seal or three-piece split-body construction, and a wide range of end connections—including flanged, butt-weld, threaded and ISO 5211-mounted variants. Valves can be supplied with soft seats (PTFE, PEEK) or metal seats hard-faced with Stellite or tungsten carbide, plus API-compatible anti-static devices and fire-safe trims, all backed by full material traceability to meet ANSI, API, BS and EN standards.

Ball valves are designed to meet the requirements of ANSI B16.34, BS EN ISO 17292, ANSI B16.5, ANSI B16.10, API 6D and/or API 6A.

Standards and Specifications

Ball valves are mainly designed to conform API 6D (Specification for pipeline valves) and ANSI B16.34 (Valves Flanged, Threaded and Welding End) or API 6A (Specification for Wellhead and Christmas Tree Equipment) in case of upstream applications. Other related standards such as ANSI B16.5 (Pipe Flanges and Flanged Fittings), ANSI B16.25 (Buttwelding Ends), ANSI B16.10 (Face to Face and End-to-End Dimensions of Valves) are also used for the design of ball valves.

Also our ball valves are designed to meet FIRE SAFE requirements to BS6755, API 6FA and API 607.

Final testing is done to conform API 598 (Valve Inspection and Testing) MSS-SP-61 (Pressure Testing of Steel Valves) API 6D (Specification for Pipeline Valves) or API 6A (Specification for Wellhead and Christmas Tree Equipment) requirements.

Materials are selected mainly to ASTM standards and when sour service is specified to meet NACE MR-01-75 (Sulfide Stress Cracking resistant Metallic Materials for Oilfield Equipment)

Size & Pressure

| BALL VALVE SERIES | | API 6D | | | | | |
|--|-------------------|--------------------|-------------------|------------------|-------------------|-------------------|-------------------|
| SIZE | 150 | 300 | 600 | 800 | 900 | 1500 | 2500 |
| Floating (Top entry & Side entry) | From ½" to 6" | From ½" to 6" | From ½" to 6" | From ½" to 2" | | | |
| Trunnion (Top entry & Side entry) | From 2" to 56" | From 12" to 56" | From 2" to 56" | | From 2" to 42" | From 2" to 36" | From 2" to 24" |

| BALL VALVE SERIES | | API 6A | | | |
|-------------------|-------------------------------|------------------------------|--------------------------------|----------------------------------|-------------------------------|
| SIZE | 2000 | 3000 | 5000 | 10 000 | 15 000 |
| Trunnion | From 2-1/16" to 7-1/16" | From 2-1/6" to 7-1/16" | From 1-13/16" to 7-1/16" | " From 1-13/16" to 7-1/16" | From 1-13/16" to 5-1/8" |


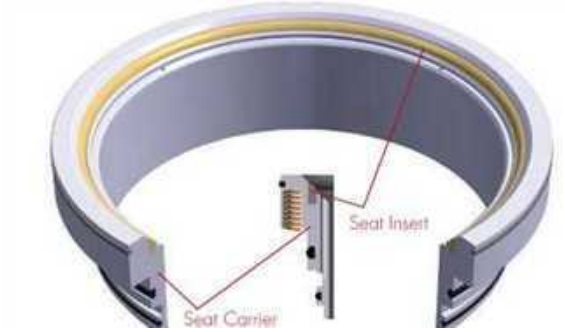
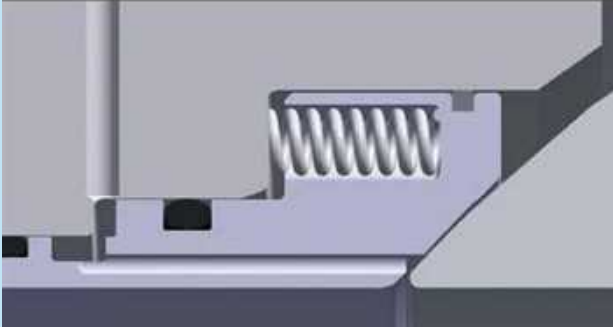
The valves can be supplied with any kind of automatic operator, such as electric actuators, pneumatic actuators, hydraulic actuators, gas-over-oil actuators, etc.

Depending on the application, RV ball valves are provided with a wide variety of trim materials.

Metal & Soft Seated valves are available as well as large range of different seal materials covering different services.

Carbon steel, stainless steel, duplex and special alloys trims, etc, are available

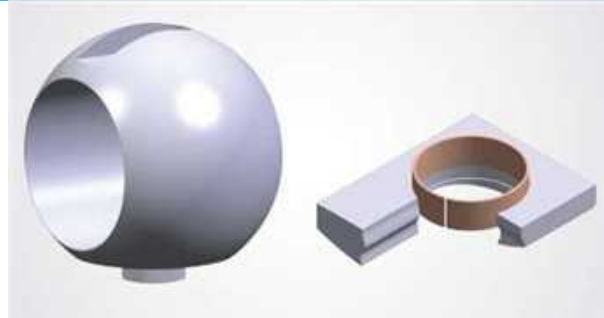
FEATURES AND BENEFITS

| Feature/Benefit | Images |
|---|--|
| <p>Bi-directional Flow</p> <p>Standard RV ball valves are suitable for bi-directional sealing.</p> |  |
| <p>Soft Seated Valves</p> <p>The seat design features a deep pocket with a protective lip for a long-lasting design. The seat assembly consists of an outer metallic seat carrier with a soft seat insert. The soft insert is located in a groove in the metallic seat carrier. The complete seat assembly is floating inside the valve body and is energized by springs to load the seat assembly against the ball, preventing leakage from behind the seat. The assembly is provided with an outer o-ring to avoid leakage and a graphite backup ring for tightness in case of o-ring damage</p> |  |
| <p>Metal Seated Valves</p> <p>Similar seat construction to soft-seated valves, but the seat consists only of a metallic seat ring without an insert. The surface in contact with the ball is hardfaced with Tungsten Carbide, stellite, etc., achieving a minimum hardness of 42 HRC to stellite and 78 HRC to Tungsten Carbide. This design is durable and</p> |  |

reliable, able to achieve classes V & VI leakage class

Trunnion Design for Low Torque Operation

Large diameter trunnions provide smooth, easy operation and extended bearing life. The trunnion bearings are stainless steel with heavy-duty PTFE coating.

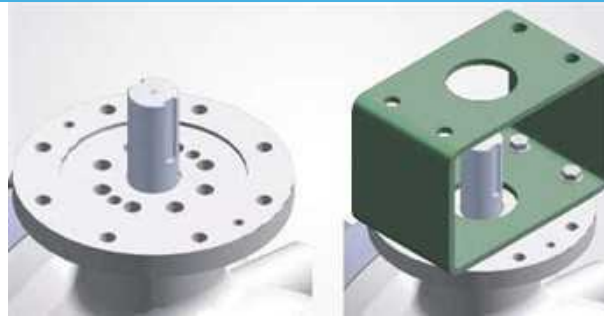


One-Way Operating Lever arm

Operating wrenches are keyed so they can be installed in only one position, in line with the bore of the valve, when the valve is in the open position. They serve as an open-closed indicator in addition to the stop plate indicator on the bonnet cap

Actuator Mounting Provisions

Actuator mounting brackets are available as an option for users who prefer to install their own actuators



Grease Fittings

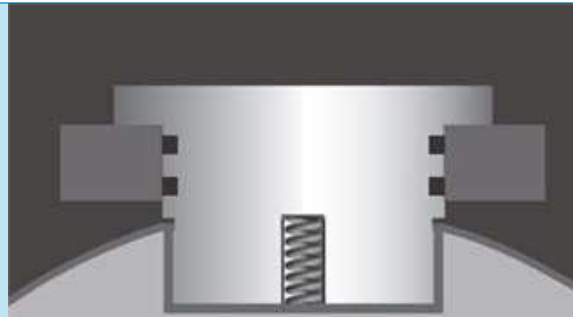
Three grease fittings are supplied, providing the ability to inject lubricant into both seat pockets and stem area.

Manual Operated Valves

For manual valves up to 4", an operating lever can be provided. For valves larger than 4", a worm gear actuator is provided.

Antistatic Device

This is ensured by the adoption of coil springs to ensure electrical continuity between the body, ball, and stem.



Stem Extension for Buried Service

A stem extension is needed when valves are being installed in an underground pipeline. RV valves offer a wide variety of stem extensions for both manual and actuated valves

Bare Shaft Valves

RV Valves can also be provided bare shaft, ready to receive any kind of actuator

Floating Seat Design

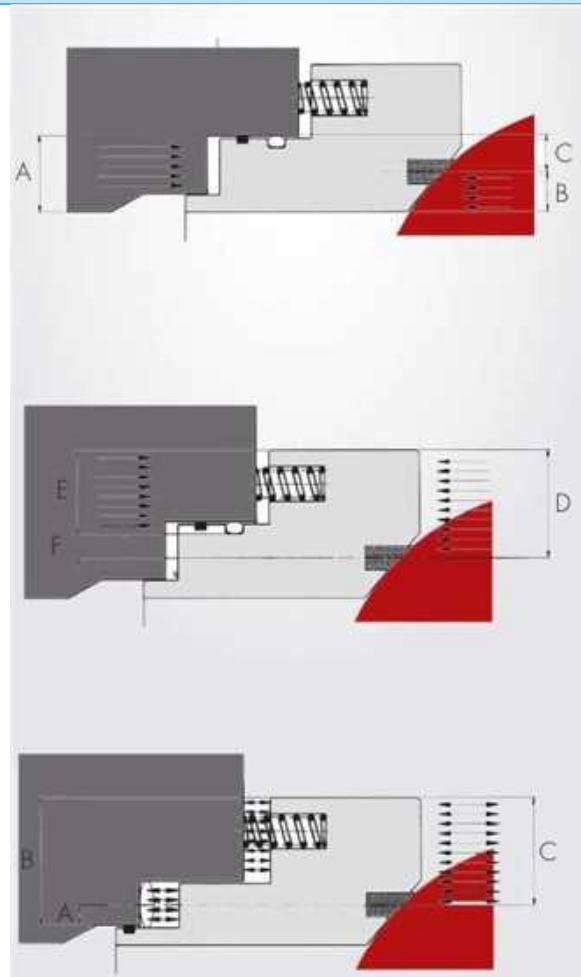
- Bi-directional sealing with a floating seat carrier energized by coil springs.
- • Line-pressure differential enhances sealing force (piston effect).
- • Optional double-piston seat for uni- or bi-directional backup sealing.
- • Automatic cavity pressure relief protects body cavity from overpressure.

Automatic Cavity Pressure Relief

The pressure-actuated seat construction ensures positive relief of excess valve central cavity pressure. If the central cavity pressure exceeds a pre-set pressure, the seat assembly will automatically back off to relieve the excess pressure.

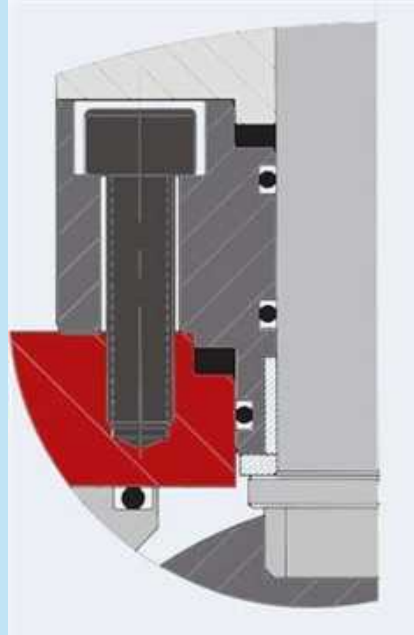
Double Piston Effect (optional)

Modified seats can offer this feature, where the outer diameter of the seat is designed with a double piston profile. In the case of an upstream leak, this enhances the contact pressure between the downstream seat and the ball.



Double Block-Bleed (optional)

Since the floating seats seal both upstream and downstream simultaneously, double block and bleed procedures can be performed.

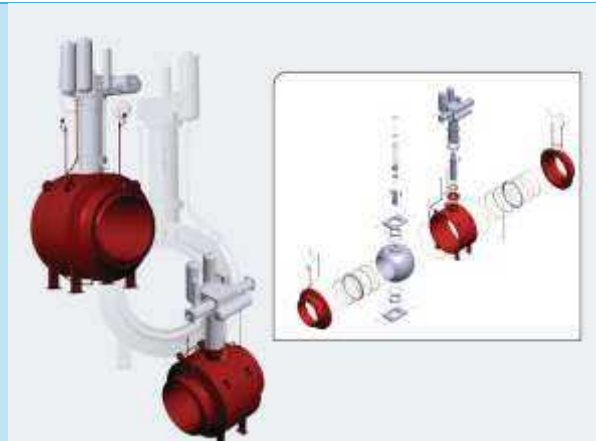


Anti Blow-Out Stem

The valves are always provided with an anti-blow-out stem design, which ensures total safety and integrity.

Fire Safe Design

RV valves are of FIRE SAFE design, which substantially prevents leakage when the valve is subject to high temperatures.



MATERIALS

Valve Material

Ball valves are manufactured using a wide selection of materials:

- Carbon steel.
- Killed carbon steel for low temperature applications.
- High resistance alloy steels for API 6A applications.
- Stainless Steel.
- Duplex & Superduplex steel.

- Nickel alloys.

Materials also meet the requirements of NACE MR-0175/ISO 15156 when sour gas services are specified.

For the majority of industry applications, the following table provides the main guidelines for material selection.

| Tri m | Service | Temperatur e | Class | Body | Internal | Seat | Seal |
|----------|--------------------|------------------|------------------------------|--------------------|-------------------|-----------------|-------|
| A | General Purpose | -29° to 150° | 150-300-600 900-1500-2500 | A105 | A105+ENP | PTFE Devlon | Viton |
| B | General Purpose | -29° to 250° | 150-300-600 900-1500-2500 | A105 | A105+ENP | Peek | Viton |
| C | Moderate Corrosive | -29° to 150° | 150-300-600 900-1500-2500 | A105 | 316SS or 321SS | RPTFE Devlon | Viton |
| D | Low Temperature | -46° to 150° | 150-300-600 900-1500-2500 | LF2 | LF2+ENP | RPTFE Devlon | Viton |
| E | High Corrosive | -29° to 150° | 150-300-600 900-1500-2500 | F316/F321 / F51 | F316/F321 /F51 | RPTFE Devlon | Viton |
| F | Sour service | -29° to 150° | 150-300-600 900-1500-2500 | A105 | A105+ENP | RPTFE Devlon | Viton |
| G | Offshore | -29° to 150° | 150-300-600 900-1500-2500 | F51 | F51 | RPTFE Devlon | Viton |
| H | Seawater | -29° to 150° | 150-300-600 900-1500-2500 | F44 | F44 | RPTFE Devlon | PTFE |
| I | Cryogenic | -196° to 150° | 150-300-600 | F316/F321 | F316/F321 | KEL-F | PTFE |

| | | | | | | | |
|--|--|--|---------------|--|--|--|--|
| | | | 900-1500-2500 | | | | |
|--|--|--|---------------|--|--|--|--|

Remarks: The table is for informational purposes only. For **Metal to Metal valves**, the seat and ball are hardfaced with materials like stellite, Tungsten Carbide, or Chromium Carbide, with base materials chosen based on the application, design pressure, and temperatures.

Sealing Material

O-rings or Lip Seals are commonly used as sealing elements.

| Sealing Type | Material | Description |
|------------------|--------------------------|---|
| O-RINGS | BUNA-N (Nitrilic rubber) | Most commonly used. |
| | VITON | Includes alternatives for high temperature (up to 210°C) and for explosive decompression. |
| | Other materials | Used depending on the specific application. |
| LIP SEALS | PTFE, KEL-F, etc. | Used for more severe applications like cryogenic services, high temperatures, or nuclear ball valve applications where the seal must be radiation resistant. They are self-energized by an internal spring of stainless or Inconel alloy. |


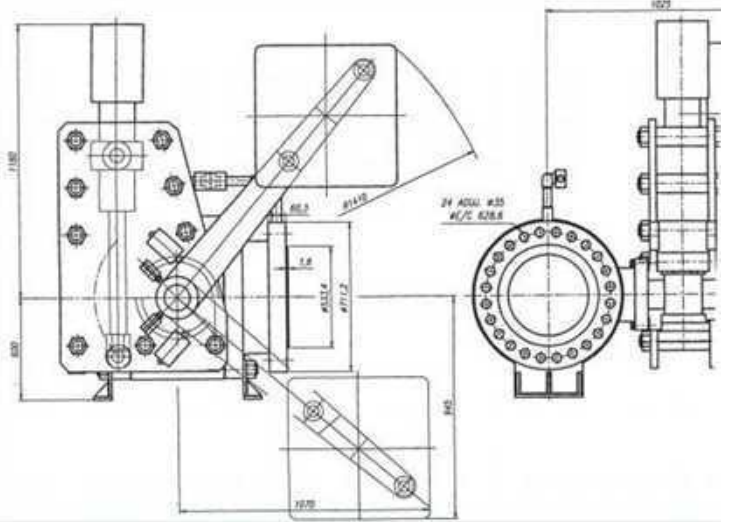
SEAT MATERIALS

| Seat Type | Material | Description |
|---------------------------------|-----------------------------|---|
| Soft Seated Ball Valves | PTFE or Teflon | Suitable up to ANSI Class 600. |
| | PTFE reinforced by graphite | A variant of PTFE. |
| | Nylon | Suitable for high pressure and temperatures up to 120°C. |
| | Devlon | Suitable for high pressure and a wider range of temperatures. |
| | PCTFE or KEL-F | Suitable for low temperatures, up to -196°C. |
| | PEEK | Suitable for high temperatures, up to 260°C. |
| Metal Seated Ball Valves | Stellite | Hardness up to 45 HRC. |

| | | |
|--|------------------|------------------------|
| | Tungsten Carbide | Hardness up to 85 HRC. |
| | Chromium Carbide | Hardness up to 70 HRC. |

04. Other Ball Valves

OTHER BALL VALVES

| Feature/Valve Type and Description | Photos |
|--|--|
| <p>Gas-Over-Oil Actuated Ball Valves</p> <p>This valve is used in gas pipelines, and the actuator is powered directly from the line gas pressure. The valve actuator may be provided with a line break detection system which closes the valve in case the gradient of pressure drop in the line is greater than a preset value.</p> |  |
| <p>Emergency Assisted Ball Valves</p> <p>This valve is intended for the protection of a turbine or pump in hydroelectric power stations. It is assembled in a horizontal position and has a hydraulic piston to open the valve. If reverse flow is detected, a pressure transducer sends a signal to the valve, releasing the pressure in the hydraulic piston and allowing a counterweight to close the valve in a few seconds, preventing counterflow from reaching the turbine/pump.</p> |  |

Fully Welded Ball Valves

These are available for cases where leakage to the atmosphere must be absolutely avoided, such as in gas transmission pipelines. The valve is built in a three-piece, fully welded construction.



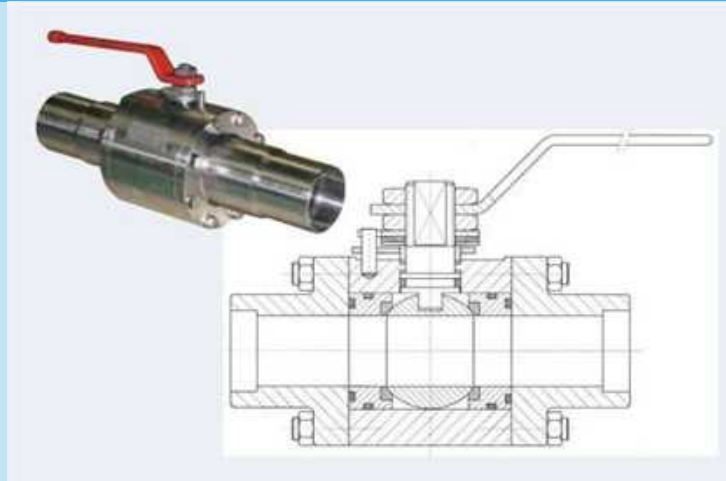
Top-Entry Ball Valves

The Top-entry design has a major application when frequent maintenance is required and the valve cannot be easily removed from the pipe. In this model, all internals can be easily dismantled by loosening the bonnet and removing the ball, seat-holders, and shaft.



In-Line Serviceable Ball Valves

For sizes up to 6", this type of valve can be used, offering the same maintenance possibilities as a top-entry ball valve but with a more economical construction.

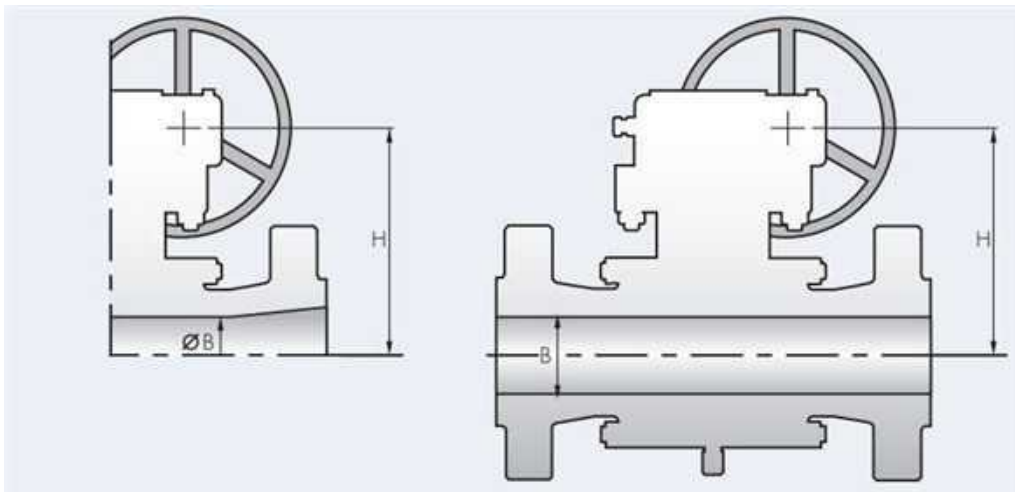


API 6A Ball Valves

For upstream applications, a three-piece side-entry ball valve is used in accordance with the requirements of API 6A. Valve classes from 2000 to 20000 in sizes from 2-1/16" to 7-1/16" are available. Material selection is done in full compliance with API 6A requirements. Valve designs are available to meet Pressure Product Requirement Levels PSL-1, PSL-2, PSL-3/PSL-3G, and PSL-4.



05. Side-Entry API 6D Dimensions



SIDE ENTRY API 6D DIMENSIONS

Class 150

| NOMINAL NPS | RF mm | RTJ mm | BW mm | B mm | H mm |
|----------------|-----------------|-----------------|-----------------|---------------|-----------------|
| inch | FACE TO FACE | FACE TO FACE | FACE TO FACE | VALVE BORE | VALVE HEIGHT |
| 2 | 178 | 190.5 | 216 | 51 | 140 |
| 3 x 2 | 203 | 216 | 283 | 51 | 140 |
| 3 | 203 | 216 | 283 | 76 | 165 |

| | | | | | |
|----------------|-------|--------|-------|-------|------|
| 4 x 3 | 229 | 241 | 305 | 76 | 165 |
| 4 | 229 | 241 | 305 | 102 | 235 |
| 6 x 4 | 394 | 406.5 | 457 | 102 | 235 |
| 6 | 394 | 406.5 | 457 | 152.5 | 241 |
| 8 x 6 | 457 | 470 | 521 | 152.5 | 241 |
| 8 | 457 | 470 | 521 | 204 | 280 |
| 10 x 8 | 533.5 | 546 | 559 | 204 | 280 |
| 10 | 533.5 | 546 | 559 | 254 | 305 |
| 12 x 10 | 609.5 | 622 | 635 | 254 | 305 |
| 12 | 609.5 | 622 | 635 | 305 | 356 |
| 14 x 12 | 686 | 698.5 | 762 | 305 | 356 |
| 14 | 686 | 698.5 | 762 | 336.5 | 406 |
| 16 x 12 | 762 | 775 | 838 | 305 | 356 |
| 16 | 762 | 775 | 838 | 387.5 | 457 |
| 18 | 864 | 876 | 914.5 | 438 | 508 |
| 20 x 16 | 914.5 | 927 | 991 | 387.5 | 457 |
| 20 | 914.5 | 927 | 991 | 489 | 584 |
| 24 x 20 | 1067 | 1079.5 | 1143 | 489 | 584 |
| 24 | 1067 | 1079.5 | 1143 | 590 | 711 |
| 26 | 1143 | | 1245 | 635 | 762 |
| 28 | 1245 | | 1346 | 686 | 813 |
| 30 x 24 | 1295 | | 1397 | 590 | 711 |
| 30 | 1295 | | 1397 | 737 | 864 |
| 36 x 30 | 1524 | | 1727 | 737 | 864 |
| 36 | 1524 | | 1727 | 876 | 965 |
| 40 x 36 | 1780 | | 1780 | 876 | 965 |
| 40 | 1780 | | 1780 | 978 | 1100 |
| 42 x 36 | 1854 | | 1854 | 876 | 965 |
| 42 | 1854 | | 1854 | 1020 | 1250 |
| 48 | 2135 | | 2135 | 1170 | 1380 |

Dimensions of larger sizes & rating upon request

Class 300

| NOMINAL NPS | RF mm | RTJ mm | BW mm | B mm | H mm |
|------------------------|-------------------------|-------------------------|-------------------------|-----------------------|-------------------------|
| inch | FACE TO FACE | FACE TO FACE | FACE TO FACE | VALVE BORE | VALVE HEIGHT |
| 2 | 216 | 232 | 216 | 51 | 152 |
| 3 x 2 | 283 | 299 | 283 | 51 | 152 |
| 3 | 283 | 299 | 283 | 76 | 178 |
| 4 x 3 | 305 | 321 | 305 | 76 | 178 |
| 4 | 305 | 321 | 305 | 102 | 203 |
| 6 x 4 | 404 | 419 | 457 | 102 | 203 |
| 6 | 404 | 419 | 457 | 152.5 | 254 |
| 8 x 6 | 502 | 518 | 521 | 152.5 | 254 |
| 8 | 502 | 518 | 521 | 204 | 280 |
| 10 x 8 | 569 | 584 | 559 | 204 | 280 |
| 10 | 569 | 584 | 559 | 254 | 305 |
| 12 x 10 | 648 | 664 | 635 | 254 | 305 |
| 12 | 648 | 664 | 635 | 305 | 355 |
| 14 x 12 | 762 | 778 | 762 | 305 | 355 |
| 14 | 762 | 778 | 762 | 336.5 | 406 |
| 16 x 12 | 838 | 854 | 838 | 305 | 355 |
| 16 | 838 | 854 | 838 | 387.5 | 457 |
| 18 | 915 | 930 | 915 | 438 | 495 |
| 20 x 16 | 991 | 1010 | 991 | 387.5 | 457 |
| 20 | 991 | 1010 | 991 | 489 | 635 |
| 24 x 20 | 1143 | 1165 | 1143 | 489 | 635 |
| 24 | 1143 | 1165 | 1143 | 590 | 762 |
| 26 | 1245 | 1270 | 1245 | 635 | 813 |
| 28 | 1346 | 1372 | 1346 | 686 | 864 |

| | | | | | |
|----------------|------|------|------|------|------|
| 30 x 24 | 1397 | 1423 | 1397 | 590 | 762 |
| 30 | 1397 | 1423 | 1397 | 737 | 914 |
| 36 x 30 | 1727 | 1756 | 1727 | 737 | 914 |
| 36 | 1727 | 1756 | 1727 | 876 | 965 |
| 40 x 36 | 1980 | | 1780 | 876 | 965 |
| 40 | 1980 | | 1780 | 978 | 1100 |
| 42 x 36 | 2032 | | 1854 | 876 | 965 |
| 42 | 2032 | | 1854 | 1020 | 1250 |
| 48 | 2388 | | 2135 | 1170 | 1350 |

Class 600

| NOMINAL NPS | RF mm | RTJ mm | BW mm | B mm | H mm |
|------------------------|-------------------------|-------------------------|-------------------------|-----------------------|-------------------------|
| inch | FACE TO FACE | FACE TO FACE | FACE TO FACE | VALVE BORE | VALVE HEIGHT |
| 2 | 292 | 295 | 292 | 51 | 140 |
| 3 x 2 | 356 | 359 | 356 | 51 | 140 |
| 3 | 356 | 359 | 356 | 76 | 197 |
| 4 x 3 | 432 | 435 | 432 | 76 | 197 |
| 4 | 432 | 435 | 432 | 102 | 197 |
| 6 x 4 | 559 | 562 | 559 | 102 | 254 |
| 6 | 559 | 562 | 559 | 152.5 | 254 |
| 8 x 6 | 661 | 664 | 661 | 152.5 | 290 |
| 8 | 661 | 664 | 661 | 204 | 290 |
| 10 x 8 | 788 | 791 | 788 | 204 | 310 |
| 10 | 788 | 791 | 788 | 254 | 310 |
| 12 x 10 | 838 | 841 | 838 | 254 | 350 |
| 12 | 838 | 841 | 838 | 305 | 350 |
| 14 x 12 | 889 | 892 | 889 | 305 | 400 |
| 14 | 889 | 892 | 889 | 336.5 | 400 |
| 16 x 12 | 991 | 994 | 991 | 305 | 430 |

| | | | | | |
|----------------|------|------|------|-------|------|
| 16 | 991 | 994 | 991 | 387.5 | 400 |
| 18 | 1093 | 1096 | 1093 | 438 | 520 |
| 20 x 16 | 1194 | 1200 | 1194 | 387.5 | 560 |
| 20 | 1194 | 1200 | 1194 | 489 | 660 |
| 24 x 20 | 1397 | 1407 | 1397 | 489 | 660 |
| 24 | 1397 | 1407 | 1397 | 590 | 750 |
| 26 | 1448 | 1461 | 1448 | 635 | 800 |
| 28 | 1550 | 1562 | 1550 | 686 | 860 |
| 30 x 24 | 1651 | 1664 | 1651 | 590 | 750 |
| 30 | 1651 | 1664 | 1651 | 737 | 940 |
| 36 x 30 | 2083 | 2099 | 2083 | 737 | 940 |
| 36 | 2083 | 2099 | 2083 | 876 | 1100 |
| 40 x 36 | 2337 | | 2337 | 876 | 1100 |
| 40 | 2337 | | 2337 | 978 | 1150 |
| 42 x 36 | 2240 | | 2240 | 876 | 1100 |
| 42 | 2240 | | 2240 | 1020 | 1300 |
| 48 | 2845 | | 2845 | 1168 | 1480 |

Class 900

| NOMINAL NPS | RF mm | RTJ mm | BW mm | B mm | H mm |
|------------------------|-------------------------|-------------------------|-------------------------|-----------------------|-------------------------|
| inch | FACE TO FACE | FACE TO FACE | FACE TO FACE | VALVE BORE | VALVE HEIGHT |
| 2 | 369 | 372 | 369 | 51 | 140 |
| 3 x 2 | 381 | 385 | 381 | 51 | 140 |
| 3 | 381 | 385 | 381 | 76 | 170 |
| 4 x 3 | 458 | 461 | 458 | 76 | 170 |
| 4 | 458 | 461 | 458 | 102 | 185 |
| 6 x 4 | 610 | 613 | 610 | 102 | 185 |
| 6 | 610 | 613 | 610 | 152.5 | 240 |
| 8 x 6 | 737 | 740 | 737 | 152.5 | 240 |

| | | | | | |
|----------------|------|------|------|-----|-----|
| 8 | 737 | 740 | 737 | 204 | 310 |
| 10 x 8 | 838 | 841 | 838 | 204 | 310 |
| 10 | 838 | 841 | 838 | 254 | 350 |
| 12 x 10 | 965 | 968 | 965 | 254 | 350 |
| 12 | 965 | 968 | 965 | 305 | 400 |
| 14 x 12 | 1029 | 1038 | 1029 | 305 | 400 |
| 14 | 1029 | 1038 | 1029 | 324 | 455 |
| 16 x 12 | 1130 | 1140 | 1130 | 305 | 400 |
| 16 | 1130 | 1140 | 1130 | 375 | 545 |
| 18 | 1219 | 1232 | 1219 | 425 | 597 |
| 20 x 16 | 1321 | 1334 | 1321 | 375 | 545 |
| 20 | 1321 | 1334 | 1321 | 473 | 711 |
| 24 x 20 | 1549 | 1568 | 1549 | 473 | 711 |
| 24 | 1549 | 1568 | 1549 | 572 | 813 |
| 26 | 1650 | | 1650 | 620 | |
| 28 | 1778 | | 1778 | 667 | |
| 30 x 24 | 1880 | | 1880 | 572 | |
| 30 | 1880 | | 1880 | 715 | |
| 36 x 30 | 2286 | | 2286 | 715 | |
| 36 | 2286 | | 2286 | 857 | |

Class 1500

| NOMINAL NPS | RF mm | RTJ mm | BW mm | B mm | H mm |
|------------------------|-------------------------|-------------------------|-------------------------|-----------------------|-------------------------|
| inch | FACE TO FACE | FACE TO FACE | FACE TO FACE | VALVE BORE | VALVE HEIGHT |
| 2 | 369 | 372 | 369 | 51 | 140 |
| 3 x 2 | 470 | 473 | 470 | 51 | 140 |
| 3 | 470 | 473 | 470 | 76 | 170 |
| 4 x 3 | 546 | 550 | 546 | 76 | 170 |
| 4 | 546 | 550 | 546 | 102 | 250 |

| | | | | | |
|----------------|------|------|------|-----|------|
| 6 x 4 | 705 | 711 | 705 | 102 | 250 |
| 6 | 705 | 711 | 705 | 146 | 280 |
| 8 x 6 | 832 | 841 | 832 | 146 | 280 |
| 8 | 832 | 841 | 832 | 194 | 420 |
| 10 x 8 | 991 | 1000 | 991 | 194 | 420 |
| 10 | 991 | 1000 | 991 | 241 | 470 |
| 12 x 10 | 1130 | 1146 | 1130 | 241 | 470 |
| 12 | 1130 | 1146 | 1130 | 289 | 520 |
| 14 x 12 | 1257 | 1276 | 1257 | 289 | 520 |
| 14 | 1257 | 1276 | 1257 | 318 | 600 |
| 16 x 12 | 1384 | 1407 | 1384 | 289 | 520 |
| 16 | 1384 | 1407 | 1384 | 362 | 700 |
| 18 | 1537 | 1559 | 1537 | 410 | 890 |
| 20 x 16 | 1664 | 1686 | 1664 | 362 | 700 |
| 20 | 1664 | 1686 | 1664 | 456 | 940 |
| 24 x 20 | 1943 | 1972 | 1943 | 456 | 940 |
| 24 | 1943 | 1972 | 1943 | 548 | 1143 |

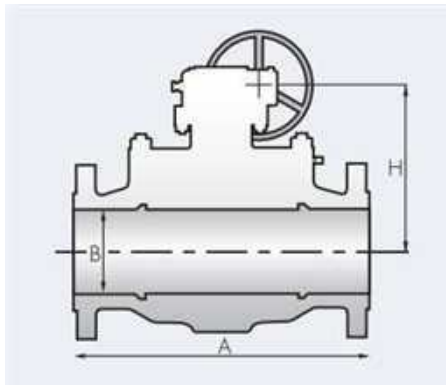
Class 2500

| NOMINAL NPS inch | FACE TO FACE RF mm | FACE TO FACE RTJ mm | FACE TO FACE BW mm | VALVE BORE B mm | VALVE HEIGHT H mm |
|-----------------------------|-----------------------------------|------------------------------------|-----------------------------------|--------------------------------|----------------------------------|
| 2 | 451 | 454 | 451 | 44 | 235 |
| 3 x 2 | 578 | 584 | 578 | 44 | 235 |
| 3 | 578 | 584 | 578 | 64 | 300 |
| 4 x 3 | 673 | 683 | 673 | 64 | 300 |
| 4 | 673 | 683 | 673 | 90 | 343 |
| 6 x 4 | 914 | 927 | 914 | 90 | 343 |
| 6 | 914 | 927 | 914 | 135 | 445 |
| 8 x 6 | 1022 | 1038 | 1022 | 135 | 445 |
| 8 | 1022 | 1038 | 1022 | 180 | 508 |

| | | | | | |
|----------------|------|------|------|-----|-----|
| 10 x 8 | 1270 | 1292 | 1270 | 180 | 508 |
| 10 | 1270 | 1292 | 1270 | 225 | 584 |
| 12 x 10 | 1422 | 1445 | 1422 | 225 | 584 |
| 12 | 1422 | 1445 | 1422 | 267 | 686 |

Dimensions of larger sizes & rating upon request

Top-Entry API 6D Dimensions



Top entry, cast steel, full bore ASME Class 150 valves¹:

| NOMINAL NPS | FACE TO FACE RF (mm) | RTJ (mm) | BW (mm) | VALVEBORE B (mm) | VALVEHEIGHT H (mm) |
|---------------------|----------------------|----------|---------|------------------|--------------------|
| 2 inch | 292 | 295 | 292 | 51 | 161 |
| 3 x 2 inch | 356 | 359 | 356 | 51 | 161 |
| 3 inch | 356 | 359 | 356 | 76 | 227 |
| 4 x 3 inch | 432 | 435 | 432 | 76 | 227 |
| 4 inch | 432 | 435 | 432 | 102 | 292 |
| 6 x 4 inch | 559 | 562 | 559 | 102 | 292 |
| 6 inch | 559 | 562 | 559 | 152.5 | 334 |
| 8 x 6 inch | 661 | 664 | 661 | 152.5 | 334 |
| 8 inch | 661 | 664 | 661 | 204 | 357 |
| 10 x 8 inch | 788 | 791 | 788 | 204 | 357 |
| 10 inch | 788 | 791 | 788 | 254 | 403 |
| 12 x 10 inch | 838 | 841 | 838 | 254 | 403 |
| 12 inch | 838 | 841 | 838 | 305 | 460 |

| | | | | | |
|---------------------|------|------|------|-------|------|
| 14 x 12 inch | 889 | 893 | 889 | 305 | 460 |
| 14 inch | 889 | 893 | 889 | 336.5 | 495 |
| 16 x 12 inch | 991 | 994 | 991 | 305 | 460 |
| 16 inch | 991 | 994 | 991 | 387.5 | 598 |
| 18 inch | 1093 | 1096 | 1093 | 438 | 644 |
| 20 x 16 inch | 1194 | 1200 | 1194 | 387.5 | 598 |
| 20 inch | 1194 | 1200 | 1194 | 489 | 759 |
| 24 x 20 inch | 1397 | 1407 | 1397 | 489 | 759 |
| 24 inch | 1397 | 1407 | 1397 | 590 | 863 |
| 26 inch | 1448 | 1461 | 1448 | 635 | 920 |
| 28 inch | 1550 | 1562 | 1550 | 686 | 989 |
| 30 x 24 inch | 1651 | 1664 | 1651 | 590 | 863 |
| 30 inch | 1651 | 1664 | 1651 | 737 | 1081 |
| 36 x 30 inch | 2083 | 2099 | 2083 | 737 | 1081 |
| 36 inch | 2083 | 2099 | 2083 | 876 | 1265 |
| 40 x 36 inch | 2337 | - | 2337 | 876 | 1265 |
| 40 inch | 2337 | - | 2337 | 978 | 1323 |
| 42 x 36 inch | 2240 | - | 2240 | 876 | 1265 |
| 42 inch | 2240 | - | 2240 | 1020 | 1495 |
| 48 inch | 2845 | - | 2845 | 1168 | 1702 |

B Top Entry, Cast Steel, Full Bore, ASME Class 300 valves:

| NOMINAL NPS | FACE TO FACE RF (mm) | RTJ (mm) | BW (mm) | VALVE BORE B (mm) | VALVE HEIGHT H (mm) |
|--------------------|-----------------------------|-----------------|----------------|--------------------------|----------------------------|
| 2 inch | 292 | 295 | 292 | 51 | 161 |
| 3 x 2 inch | 356 | 359 | 356 | 51 | 161 |
| 3 inch | 356 | 359 | 356 | 76 | 227 |
| 4 x 3 inch | 432 | 435 | 432 | 76 | 227 |
| 4 inch | 432 | 435 | 432 | 102 | 292 |
| 6 x 4 inch | 559 | 562 | 559 | 102 | 292 |

| | | | | | |
|---------------------|------|------|------|-------|------|
| 6 inch | 559 | 562 | 559 | 152.5 | 334 |
| 8 x 6 inch | 661 | 664 | 661 | 152.5 | 334 |
| 8 inch | 661 | 664 | 661 | 204 | 357 |
| 10 x 8 inch | 788 | 791 | 788 | 204 | 357 |
| 10 inch | 788 | 791 | 788 | 254 | 403 |
| 12 x 10 inch | 838 | 841 | 838 | 254 | 403 |
| 12 inch | 838 | 841 | 838 | 305 | 460 |
| 14 x 12 inch | 889 | 893 | 889 | 305 | 460 |
| 14 inch | 889 | 893 | 889 | 336.5 | 495 |
| 16 x 12 inch | 991 | 994 | 991 | 305 | 460 |
| 16 inch | 991 | 994 | 991 | 387.5 | 598 |
| 18 inch | 1093 | 1096 | 1093 | 438 | 644 |
| 20 x 16 inch | 1194 | 1200 | 1194 | 387.5 | 598 |
| 20 inch | 1194 | 1200 | 1194 | 489 | 759 |
| 24 x 20 inch | 1397 | 1407 | 1397 | 489 | 759 |
| 24 inch | 1397 | 1407 | 1397 | 590 | 863 |
| 26 inch | 1448 | 1461 | 1448 | 635 | 920 |
| 28 inch | 1550 | 1562 | 1550 | 686 | 989 |
| 30 x 24 inch | 1651 | 1664 | 1651 | 590 | 863 |
| 30 inch | 1651 | 1664 | 1651 | 737 | 1081 |
| 36 x 30 inch | 2083 | 2099 | 2083 | 737 | 1081 |
| 36 inch | 2083 | 2099 | 2083 | 876 | 1265 |
| 40 x 36 inch | 2337 | - | 2337 | 876 | 1265 |
| 40 inch | 2337 | - | 2337 | 978 | 1323 |
| 42 x 36 inch | 2240 | - | 2240 | 876 | 1265 |
| 42 inch | 2240 | - | 2240 | 1020 | 1495 |
| 48 inch | 2845 | - | 2845 | 1168 | 1702 |

Top entry, cast steel, full bore ASME Class 600

| NOMINAL NPS (inch) | FACE TO FACE RF (mm) | RTJ (mm) | BW (mm) | VALVE BORE B (mm) | VALVE HEIGHT H (mm) |
|-------------------------------|---------------------------------|---------------------|--------------------|------------------------------|--------------------------------|
| 2 | 292 | 296 | 292 | 51 | 161 |
| 3 x 2 | 356 | 359 | 356 | 51 | 161 |
| 3 | 356 | 359 | 356 | 76 | 227 |
| 4 x 3 | 432 | 435 | 432 | 76 | 227 |
| 4 | 432 | 435 | 432 | 102 | 292 |
| 6 x 4 | 559 | 562 | 559 | 102 | 292 |
| 6 | 559 | 562 | 559 | 152.5 | 334 |
| 8 x 6 | 661 | 664 | 661 | 152.5 | 334 |
| 8 | 661 | 664 | 661 | 204 | 357 |
| 10 x 8 | 788 | 791 | 788 | 204 | 357 |
| 10 | 788 | 791 | 788 | 254 | 403 |
| 12 x 10 | 838 | 841 | 838 | 254 | 403 |
| 12 | 838 | 841 | 838 | 305 | 460 |
| 14 x 12 | 889 | 893 | 889 | 305 | 460 |
| 14 | 889 | 893 | 889 | 336.5 | 495 |
| 16 x 12 | 991 | 994 | 991 | 305 | 460 |
| 16 | 991 | 994 | 991 | 387.5 | 598 |
| 18 | 1093 | 1096 | 1093 | 438 | 644 |
| 20 x 16 | 1194 | 1200 | 1194 | 387.5 | 598 |
| 20 | 1194 | 1200 | 1194 | 489 | 759 |
| 24 x 20 | 1397 | 1407 | 1397 | 489 | 759 |
| 24 | 1397 | 1407 | 1397 | 590 | 863 |
| 26 | 1448 | 1461 | 1448 | 635 | 920 |
| 28 | 1550 | 1562 | 1550 | 686 | 989 |
| 30 x 24 | 1651 | 1664 | 1651 | 590 | 863 |
| 30 | 1651 | 1664 | 1651 | 737 | 1081 |
| 36 x 30 | 2083 | 2099 | 2083 | 737 | 1081 |
| 36 | 2083 | 2099 | 2083 | 876 | 1265 |

| | | | | | |
|----------------|------|---|------|------|------|
| 40 x 36 | 2337 | - | 2337 | 876 | 1265 |
| 40 | 2337 | - | 2337 | 978 | 1323 |
| 42 x 36 | 2240 | - | 2240 | 876 | 1265 |
| 42 | 2240 | - | 2240 | 1020 | 1495 |
| 48 | 2845 | - | 2845 | 1168 | 1702 |

Top entry, cast steel, full bore ASME Class 900

| NOMINAL NPS (inch) | FACE TO FACE RF (mm) | RTJ (mm) | BW (mm) | VALVE BORE B (mm) | VALVE HEIGHT H (mm) |
|-------------------------------|---------------------------------|---------------------|--------------------|------------------------------|--------------------------------|
| 2 | 369 | 372 | 369 | 51 | 161 |
| 3 x 2 | 381 | 385 | 381 | 51 | 161 |
| 3 | 381 | 385 | 381 | 76 | 195 |
| 4 x 3 | 458 | 461 | 458 | 76 | 195 |
| 4 | 458 | 461 | 458 | 102 | 213 |
| 6 x 4 | 610 | 613 | 610 | 102 | 213 |
| 6 | 610 | 613 | 610 | 152.5 | 275 |
| 8 x 6 | 737 | 740 | 737 | 152.5 | 275 |
| 8 | 737 | 740 | 737 | 204 | 357 |
| 10 x 8 | 838 | 841 | 838 | 204 | 357 |
| 10 | 838 | 841 | 838 | 254 | 456 |
| 12 x 10 | 965 | 968 | 965 | 254 | 456 |
| 12 | 965 | 968 | 965 | 305 | 460 |
| 14 x 12 | 1029 | 1038 | 1029 | 305 | 460 |
| 14 | 1029 | 1038 | 1029 | 324 | 523 |
| 16 x 12 | 1130 | 1140 | 1130 | 305 | 460 |
| 16 | 1130 | 1140 | 1130 | 375 | 627 |
| 18 | 1219 | 1232 | 1219 | 425 | 687 |
| 20 x 16 | 1321 | 1334 | 1321 | 375 | 627 |
| 20 | 1321 | 1334 | 1321 | 473 | 820 |
| 24 x 20 | 1549 | 1568 | 1549 | 473 | 820 |

| | | | | | |
|----------------|------|------|------|-----|-----|
| 24 | 1549 | 1568 | 1549 | 572 | 935 |
| 26 | 1650 | - | 1650 | 620 | - |
| 28 | 1778 | - | 1778 | 667 | - |
| 30 x 24 | 1880 | - | 1880 | 572 | - |
| 30 | 1880 | - | 1880 | 715 | - |
| 36 x 30 | 2286 | - | 2286 | 715 | - |
| 36 | 2286 | - | 2286 | 857 | - |

Top entry, cast steel, full bore ASME Class 1500

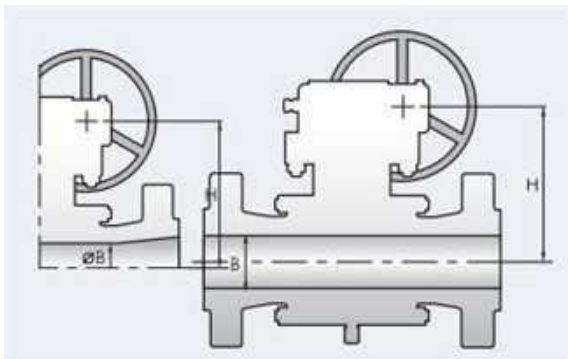
| NOMINAL NPS (inch) | FACE TO FACE RF (mm) | RTJ (mm) | BW (mm) | VALVE BORE B (mm) | VALVE HEIGHT H (mm) |
|-------------------------------|---------------------------------|---------------------|--------------------|------------------------------|--------------------------------|
| 2 | 369 | 372 | 369 | 51 | 161 |
| 3 x 2 | 470 | 473 | 470 | 51 | 161 |
| 3 | 470 | 473 | 470 | 76 | 196 |
| 4 x 3 | 546 | 550 | 546 | 76 | 196 |
| 4 | 546 | 550 | 546 | 102 | 288 |
| 6 x 4 | 705 | 711 | 705 | 102 | 288 |
| 6 | 705 | 711 | 705 | 146 | 322 |
| 8 x 6 | 832 | 841 | 832 | 146 | 322 |
| 8 | 832 | 841 | 832 | 194 | 483 |
| 10 x 8 | 991 | 1000 | 991 | 194 | 483 |
| 10 | 991 | 1000 | 991 | 241 | 540 |
| 12 x 10 | 1130 | 1146 | 1130 | 241 | 540 |
| 12 | 1130 | 1146 | 1130 | 289 | 598 |
| 14 x 12 | 1257 | 1276 | 1257 | 289 | 598 |
| 14 | 1257 | 1276 | 1257 | 318 | 690 |
| 16 x 12 | 1384 | 1407 | 1384 | 289 | 598 |
| 16 | 1384 | 1407 | 1384 | 362 | 805 |
| 18 | 1537 | 1559 | 1537 | 410 | 1024 |
| 20 x 16 | 1664 | 1686 | 1664 | 362 | 805 |

| | | | | | |
|----------------|------|------|------|-----|------|
| 20 | 1664 | 1686 | 1664 | 456 | 1082 |
| 24 x 20 | 1943 | 1972 | 1943 | 456 | 1082 |
| 24 | 1943 | 1972 | 1943 | 548 | 1315 |

Top entry, cast steel, full bore ASME Class 2500

| NOMINAL NPS (inch) | FACE TO FACE RF (mm) | RTJ (mm) | BW (mm) | VALVE BORE B (mm) | VALVE HEIGHT H (mm) |
|-------------------------------|---------------------------------|---------------------|--------------------|------------------------------|--------------------------------|
| 2 | 451 | 454 | 451 | 44 | 270 |
| 3 x 2 | 578 | 584 | 578 | 44 | 270 |
| 3 | 578 | 584 | 578 | 64 | 345 |
| 4 x 3 | 673 | 683 | 673 | 64 | 345 |
| 4 | 673 | 683 | 673 | 90 | 395 |
| 6 x 4 | 914 | 927 | 914 | 90 | 395 |
| 6 | 914 | 927 | 914 | 135 | 512 |
| 8 x 6 | 1022 | 1038 | 1022 | 135 | 512 |
| 8 | 1022 | 1038 | 1022 | 180 | 584 |
| 10 x 8 | 1270 | 1292 | 1270 | 180 | 584 |
| 10 | 1270 | 1292 | 1270 | 225 | 672 |
| 12 x 10 | 1422 | 1445 | 1422 | 225 | 672 |
| 12 | 1422 | 1445 | 1422 | 267 | 790 |

07. API 6A DIMENSIONS:



Class 2000

API 6A Class 2000 dimensional data, mm

| NOMINAL SIZE (inch) | A-RTJ (mm) | VALVE BORE B (mm) | VALVE HEIGHT H (mm) |
|---------------------|------------|-------------------|---------------------|
| 2 1/16" x 1 13/16" | 295 | 46 | 160 |
| 2 1/16" | 295 | 52.4 | 180 |
| 3 1/8" x 2 1/16" | 359 | 52.4 | 180 |
| 3 1/8" | 359 | 79.4 | 200 |
| 4 1/16" x 3 1/8" | 435 | 79.4 | 200 |
| 4 1/16" | 435 | 103.2 | 255 |
| 5 1/8" x 4 1/16" | 562 | 103.2 | 255 |
| 5 1/8" | 562 | 130.2 | 320 |
| 7 1/16" x 6" | 562 | 152.4 | 320 |
| 7 1/16" | 664 | 179.4 | 410 |

API 6A Class 3000 dimensional data, mm

| NOMINAL SIZE (inch) | A-RTJ (mm) | VALVE BORE B (mm) | VALVE HEIGHT H (mm) |
|---------------------|------------|-------------------|---------------------|
| 2 1/16" x 1 13/16" | 371 | 46 | 160 |
| 2 1/16" | 371 | 52.4 | 180 |
| 3 1/8" x 2 1/16" | 384 | 52.4 | 180 |
| 3 1/8" | 384 | 79.4 | 200 |
| 4 1/16" x 3 1/8" | 460 | 79.4 | 200 |
| 4 1/16" | 460 | 103.2 | 255 |
| 5 1/8" x 4 1/16" | 613 | 103.2 | 255 |
| 5 1/8" | 613 | 130.2 | 320 |
| 7 1/16" x 6" | 613 | 152.4 | 320 |
| 7 1/16" | 714 | 179.4 | 410 |

API 6A Class 5000 dimensional data, mm

| NOMINAL SIZE (inch) | A-RTJ (mm) | VALVE BORE B (mm) | VALVE HEIGHT H (mm) |
|---------------------|------------|-------------------|---------------------|
| 2 1/16" x 1 13/16" | 371 | 46 | 195 |
| 2 1/16" | 371 | 52.4 | 195 |
| 3 1/8" x 2 1/16" | 473 | 52.4 | 195 |

| | | | |
|-------------------------|-----|-------|-----|
| 3 1/8" | 473 | 79.4 | 210 |
| 4 1/16" x 3 1/8" | 549 | 79.4 | 210 |
| 4 1/16" | 549 | 103.2 | 255 |
| 5 1/8" x 4 1/16" | 727 | 103.2 | 255 |
| 5 1/8" | 727 | 130.2 | 320 |
| 7 1/16" x 6" | 737 | 152.4 | 320 |
| 7 1/16" | 813 | 179.4 | 410 |

API 6A Class 10000 dimensional data, mm

| NOMINAL SIZE (inch) | A-RTJ (mm) | VALVE BORE B (mm) | VALVE HEIGHT H (mm) |
|----------------------------|-------------------|--------------------------|----------------------------|
| 2 1/16" x 1 13/16" | 521 | 46 | 198 |
| 2 1/16" | 521 | 52.4 | 245 |
| 3 1/16" x 2 1/16" | 619 | 52.4 | 245 |
| 3 1/16" | 619 | 77.8 | 280 |
| 4 1/16" x 3 1/8" | 670 | 79.4 | 280 |
| 4 1/16" | 670 | 103.2 | 365 |
| 5 1/8" x 4 1/16" | 737 | 103.2 | 365 |

API 6A Class 15000 dimensional data, mm

| NOMINAL SIZE (inch) | A-RTJ (mm) | VALVE BORE B (mm) | VALVE HEIGHT H (mm) |
|----------------------------|-------------------|--------------------------|----------------------------|
| 2 1/16" x 1 13/16" | 597 | 46 | 208 |
| 2 1/16" | 597 | 52.4 | 257 |
| 3 1/16" x 2 1/16" | 745 | 52.4 | 257 |
| 3 1/16" | 745 | 77.8 | 294 |
| 4 1/16" x 3 1/8" | 920 | 79.4 | 294 |
| 4 1/16" | 920 | 103.2 | 383 |
| 5 1/8" x 4 1/16" | 1110 | 103.2 | 383 |

Ball Valve CV Values

Based on the data you provided, here are the two separate tables for the Ball CV tables from page 21.

BALL FB 150, 300&600, 900, 1500, 2500

| BALL FB (inch) | FB 150, 300&600 | 900 | 1500 | 2500 |
|-----------------------|----------------------------|------------|-------------|-------------|
| 1/2 | 26 | 26 | 26 | 26 |
| 3/4 | 61 | 61 | 61 | 61 |
| 1 | 114 | 114 | 114 | 114 |
| 1-1/2 | 268 | 268 | 268 | 186 |
| 2 | 501 | 501 | 501 | 384 |
| 3 | 1158 | 1158 | 1158 | 804 |
| 4 | 2118 | 2118 | 2118 | 1622 |
| 6 | 5074 | 5074 | 4660 | 3885 |
| 8 | 9337 | 9337 | 8483 | 7407 |
| 10 | 14590 | 14590 | 13167 | 11492 |
| 12 | 21009 | 21009 | 18875 | 16085 |
| 14 | 26581 | 24613 | 23657 | 20903 |
| 16 | 35211 | 32940 | 30745 | 28625 |
| 18 | 46892 | 44213 | 41613 | 39091 |
| 20 | 58396 | 54665 | 51770 | 48261 |
| 22 | 71160 | 67036 | 63825 | 59922 |
| 24 | 85186 | 79778 | 76272 | 69496 |
| 26 | 102871 | 97792 | 93821 | - |
| 28 | 119989 | 113416 | 108079 | - |
| 30 | 138424 | 130196 | 127892 | - |
| 32 | 155634 | 148135 | 144454 | - |
| 34 | 176537 | 167230 | 160736 | - |
| 36 | 195908 | 187483 | 179243 | - |
| 38 | 219280 | 210361 | - | - |
| 40 | 243970 | 231460 | - | - |
| 42 | 266653 | 253567 | - | - |
| 48 | 365280 | - | - | - |
| 54 | 462308 | - | - | - |

| | | | | |
|----|--------|---|---|---|
| 60 | 570750 | - | - | - |
|----|--------|---|---|---|

BALL FB (continued)

| BALL FB | FB 150, 300&600 | 900 | 1500 | 2500 |
|-----------------|----------------------------|------------|-------------|-------------|
| 3x2x3 | 212 | 212 | 212 | 180 |
| 4x3x4 | 629 | 629 | 629 | 393 |
| 6x4x6 | 895 | 895 | 980 | 685 |
| 8x6x8 | 2755 | 2755 | 2560 | 2031 |
| 10x8x10 | 5821 | 5821 | 5325 | 4652 |
| 12x10x12 | 9925 | 9925 | 9000 | 8058 |
| 14x12x14 | 17065 | 18510 | 15490 | 12700 |
| 16x14x16 | 19768 | 18105 | 17955 | 15005 |
| 18x16x18 | 27171 | 25208 | 23319 | 21506 |
| 20x18x20 | 37241 | 35383 | 33084 | 31333 |
| 22x20x22 | 47458 | 44130 | 41557 | 38450 |
| 24x22x24 | 58932 | 55863 | 52955 | 51316 |
| 26x24x26 | 73188 | 67469 | 64266 | 58773 |
| 28x26x28 | 87567 | 83746 | 80920 | - |
| 30x28x30 | 103331 | 98180 | 90610 | - |
| 32x30x32 | 122483 | 113770 | 112619 | - |
| 34x32x34 | 136436 | 130516 | 129223 | - |
| 36x34x36 | 158370 | 148420 | 143460 | - |
| 38x36x38 | 174167 | 166250 | - | - |
| 40x38x40 | 196181 | 190411 | - | - |
| 42x40x42 | 222384 | 210470 | - | - |
| 48x42x48 | 201308 | 185711 | - | - |
| 54x48x54 | 285163 | - | - | - |
| 60x54x60 | 370560 | - | - | - |
| 16x12x16 | - | 13119 | 14090 | 12156 |
| 20x16x20 | - | 21496 | 20095 | 18466 |

| | | | | |
|-----------------|---|--------|-------|-------|
| 24x20x24 | - | 39180 | 36661 | 34369 |
| 30x24x30 | - | 53351 | 49735 | - |
| 36x30x36 | - | 95927 | 88572 | - |
| 40x36x40 | - | 155589 | - | - |
| 42x36x42 | - | 141539 | - | - |

Manufacturing Range

| Standards | Sizes | Features |
|---------------|---|---|
| API 6D | <ul style="list-style-type: none"> • 56" ANSI 150 to 900 • 36" ANSI 1500 / 2500 | <ul style="list-style-type: none"> • Floating type • Trunnion mounted • Top Entry and Side Entry design • 3-Way • Metal to Metal or Soft Seated • Bolted or fully welded design • 2 PCS and 3 PCS design |
| API 6A | <ul style="list-style-type: none"> • 2-1/16" to 7-1/16" class 2000 • 2-1/16" to 7-1/16" class 3000 • 2-1/16" to 9" class 5000 • 1-13/16" to 7-1/16" class 10000 • 1-13/16" to 5-1/8" class 15000 | |

Attachment 3

ENEQ Consult – Blow Down Valves Catalogue 2025

ENEQ Consult Ltd. delivers cost-effective mechanical equipment for nuclear, conventional, oil & gas, and petrochemical industries.

- **9 years** of solid performance
- **> 20 M€** project portfolio
- **> 50** completed projects, **> 10** in progress
- Exclusive partnerships with **15 manufacturers worldwide**
- Equipment compliant with **ASME, EN, N Stamp, DIN, ASTM, ISO, GOST**

Expertise:

- **Equipment Supply** – high-quality OEMs, cost-effective modernization and new-build NPP solutions, turnkey delivery
- **Engineering** – design critical analyses, FEA & CFD calculations, technical consulting
- **Service** – full project support from production to installation, commissioning, and after-sales

Blow-down Valves:

| Type | Key Feature | Application | Manufacturing Range |
|---|---|---|--|
| B10.3 – Intermittent Blow-Down Valve | Straight-way design with rotating rising stem; dual handwheels (main operation + seat cleaning); precision-machined sealing surfaces hard-faced in 13Cr or Stellite 6; available in carbon, alloy, or stainless steel | Rapid discharge of boiler sludge and sediments; maintains boiler efficiency; prevents scale build-up in high-pressure, high-temperature steam systems | DN: 10 – 50 PN: 63 – 500 Max Temp: up to 580 °C (depending on material) |
| B25.2 – Continuous Blow-Down Valve | Straight-way design with non-rotating rising stem; fine adjustment for steady, controlled discharge; precision-machined sealing surfaces hard-faced in 13Cr; forged carbon steel body | Continuous removal of dissolved solids from boiler water; maintains optimal water chemistry; reduces risk of carryover in power plants, marine | DN: 15, 25 PN: 63 – 400 Max Temp: up to 450 °C |

| | | | |
|--|--|---------------------------------------|--|
| | | boilers, and industrial steam systems | |
|--|--|---------------------------------------|--|

BLOW-DOWN VALVE B10.3

PN 63–500; DN 10–50; T_{MAX}: 580 °C



BLOW-DOWN VALVE B10.3

APPLICATION

- turbid boiler water (boiler mud and sludge)

CONNECTION

- weld ends, flanged

OPERATION

- handwheel

DESCRIPTION

- body without cover
- rotating rising stem
- two handwheels, large wheel for opening and closing, small for removal of dirt from the seat
- sealing surface is welded by hard facing (13Cr) or Stellite 6
- straight-way pattern
- complies with the requirements of the directive 2014/68/EU and standard EN 13 709
- testing is carried out according to standard EN 12266-1, part 2

BASIC DESIGN OPTIONS

- graphite gasket

BLOW-DOWN VALVE B10.3

PRESSURE-TEMPERATURE-RATINGS

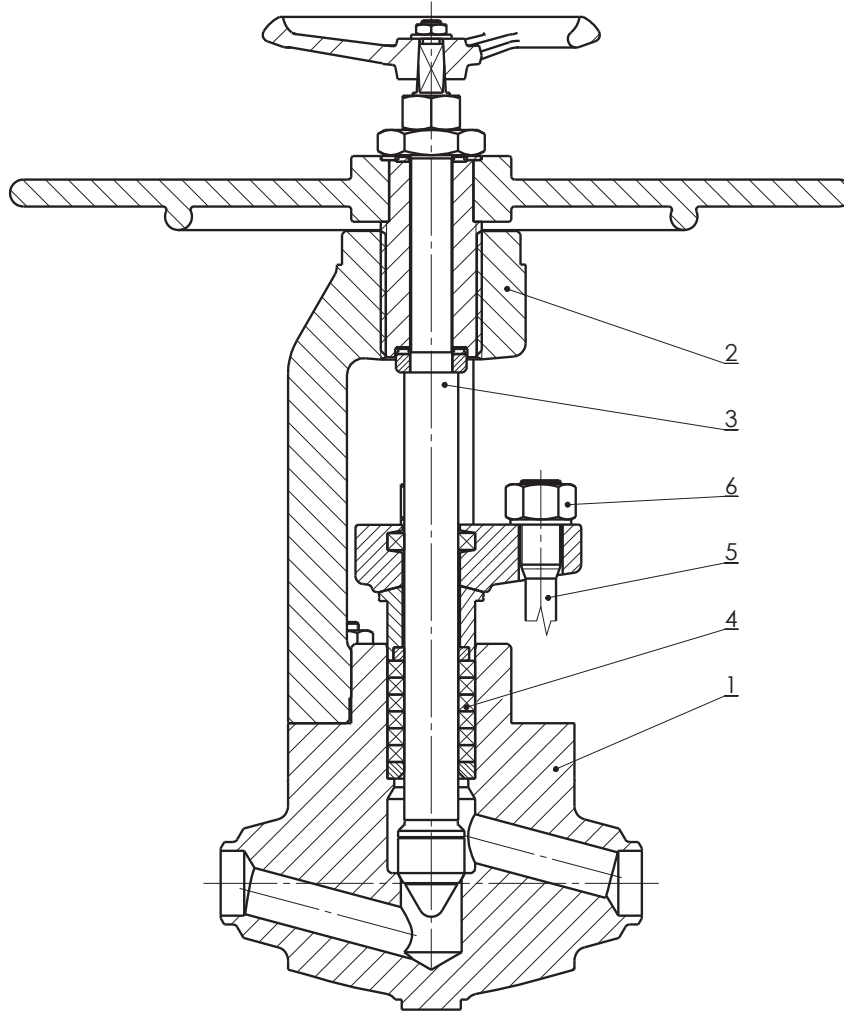
| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | |
|-------------------------------|-----|---|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 | 580 |
| P250GH (C22.8) (1.0460) | 63 | 63 | 63 | 63 | 63 | 63 | 44.8 | 40.6 | 37.8 | 36.4 | 21 | - | - | - | - | - | - | - | - | - |
| | 100 | 100 | 100 | 100 | 100 | 100 | 71.1 | 64.4 | 60 | 57.8 | 33 | - | - | - | - | - | - | - | - | - |
| | 160 | 160 | 160 | 160 | 160 | 160 | 110 | 94.1 | 88.3 | 78.5 | 45 | - | - | - | - | - | - | - | - | - |
| | 250 | 250 | 250 | 250 | 250 | 250 | 172 | 147 | 137 | 123 | 70 | - | - | - | - | - | - | - | - | - |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 273 | 233 | 182 | 103 | - | - | - | - | - | - | - | - | - |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 342 | 290 | 227 | 129 | - | - | - | - | - | - | - | - | - |
| | 500 | 500 | 500 | 500 | 500 | 500 | 490 | 427 | 364 | 284 | 162 | - | - | - | - | - | - | - | - | - |
| 11CrMo9-10 (1.7383) | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 61.8 | 59.8 | 56.9 | 54.9 | 46.1 | 38.7 | 31.4 | 27.4 | 23.5 | 20 | 17.3 | 14.8 | 12.8 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 98.1 | 93.2 | 89.2 | 85.3 | 72.6 | 60.3 | 48.1 | 42 | 35.9 | 30.7 | 26.4 | 22.7 | 19.6 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 152 | 150 | 143 | 136 | 116 | 96.5 | 77.5 | 68.6 | 59.8 | 51 | 44 | 37.8 | 32.5 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 237 | 233 | 223 | 213 | 180 | 151 | 122 | 107 | 93.2 | 79.4 | 68.4 | 58.9 | 50.7 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 314 | 298 | 286 | 273 | 232 | 193 | 155 | 137 | 119 | 102 | 87.9 | 75.6 | 65.1 |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 392 | 373 | 357 | 341 | 289 | 241 | 194 | 171 | 148 | 127 | 109 | 94.2 | 81 |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 426 | 375 | 325 | 285 | 246 | 215 | 188 | 161 | 143 |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | |
|-----------------------|-----|---|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|-----|-----|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 |
| 13CrMo4-5 (1.7335) | 63 | 63 | 63 | 63 | 63 | 63 | 61.6 | 57.4 | 53.2 | 50.4 | 47.6 | 38.4 | 32.5 | 26.3 | 21.8 | 17.6 | 13.7 | - | - |
| | 100 | 100 | 100 | 100 | 100 | 100 | 97.8 | 91.1 | 84.4 | 80 | 75.6 | 60.9 | 51.6 | 41.8 | 34.7 | 28 | 21.8 | - | - |
| | 160 | 160 | 160 | 160 | 160 | 160 | 157 | 152 | 150 | 143 | 136 | 116 | 98.1 | 77.5 | 60.8 | 45.1 | 34.3 | - | - |
| | 250 | 250 | 250 | 250 | 250 | 250 | 245 | 237 | 233 | 223 | 213 | 180 | 151 | 122 | 95.1 | 71.6 | 53 | - | - |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 314 | 298 | 286 | 273 | 232 | 196 | 155 | 122 | 91.2 | 67.7 | - | - |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 392 | 373 | 357 | 341 | 289 | 245 | 194 | 152 | 114 | 85.3 | - | - |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 489 | 433 | 363 | 287 | 234 | 189 | 148 | - |

| Material | PN | Admissible operating pressure Ps [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | |
|-----------------------------------|-----|---|-----|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 |
| X6CrNiMoTi 17-12-2 (1.4571) | 63 | 63 | 63 | 61.6 | 57.4 | 53.8 | 51.2 | 49 | 47.3 | 45.9 | - | - | - | - | - | - | - | - | - |
| | 100 | 100 | 100 | 97.8 | 91.1 | 85.3 | 81.3 | 77.8 | 75.1 | 72.9 | - | - | - | - | - | - | - | - | - |
| | 160 | 160 | 160 | 146 | 140 | 131 | 125 | 119 | 115 | 112 | - | - | - | - | - | - | - | - | - |
| | 250 | 250 | 250 | 229 | 218 | 204 | 195 | 186 | 180 | 174 | - | - | - | - | - | - | - | - | - |
| | 320 | 320 | 320 | 293 | 279 | 261 | 249 | 238 | 230 | 223 | - | - | - | - | - | - | - | - | - |
| | 400 | 400 | 400 | 366 | 349 | 327 | 311 | 298 | 288 | 279 | - | - | - | - | - | - | - | - | - |

BLOW-DOWN VALVE B10.3

USED MATERIALS



| Pos. | Part | Material | | | |
|------|--------------------------------|--------------------------------|--------------------------|--------------------------|-------------------------------|
| 1 | Body | P250GH (C 22.8) (1.0460) | 11CrMo9-10 (1.7383) | 13CrMo4-5 (1.7335) | X6CrNiMoTi17-12-2 (1.4571) |
| | Hard facing of sealing surface | 13Cr | Stellite 6 | | |
| 2 | Bonnet | 11CrMo9-10 (1.7383) | 11CrMo9-10 (1.7383) | 13CrMo4-5 (1.7335) | X6CrNiMoTi17-12-2 (1.4571) |
| 3 | Stem with disk | X20Cr13 (1.4021) | X20CrMoV11-1 (1.4922) | | X6CrNiMoTi17-12-2 (1.4571) |
| | Hard facing of sealing surface | Hardening | Stellite 6 | | |
| 4 | Gasket | Graphite | | | |
| 5 | Stud | 21CrMoV5-7 (1.7709) | | X22CrMoV12-1 (1.4923) | |
| 6 | Nut | 25CrMo4 (1.7218) | | X22CrMoV12-1 (1.4923) | |

BLOW-DOWN VALVE B10.3

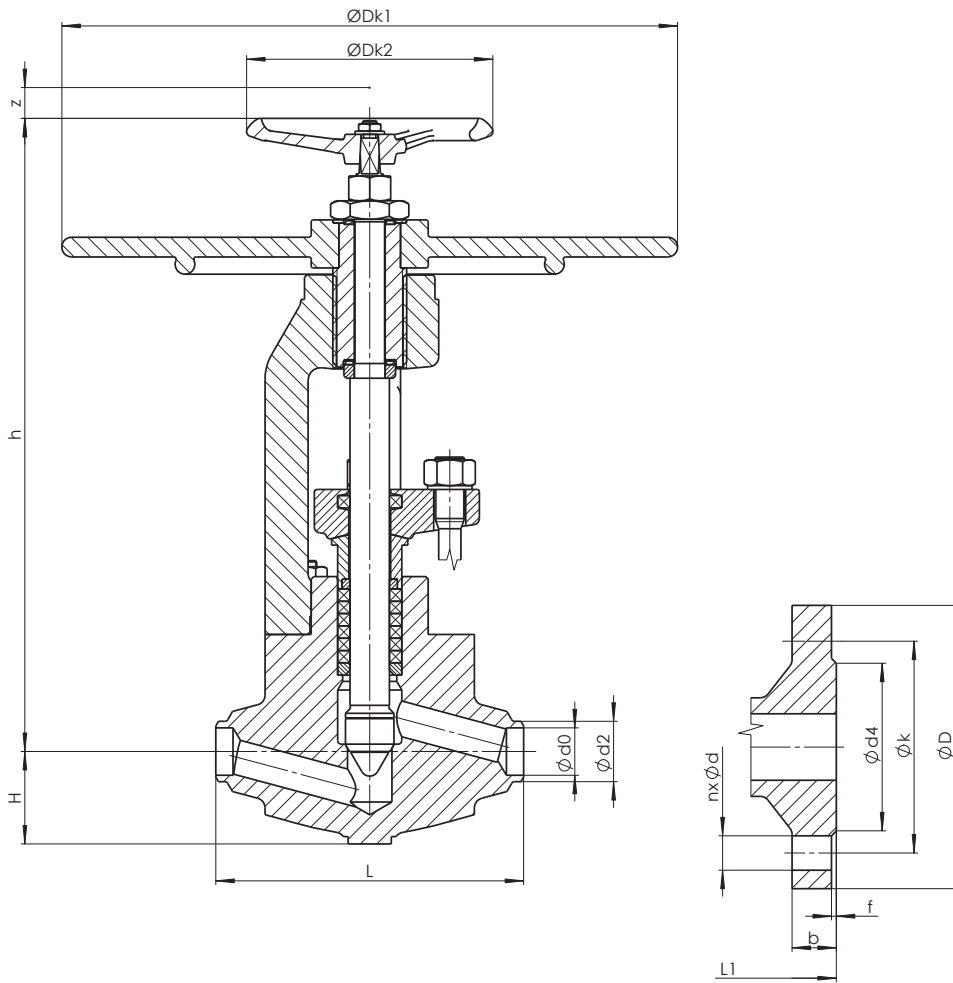
VALVE DIMENSIONS

1. Weld ends

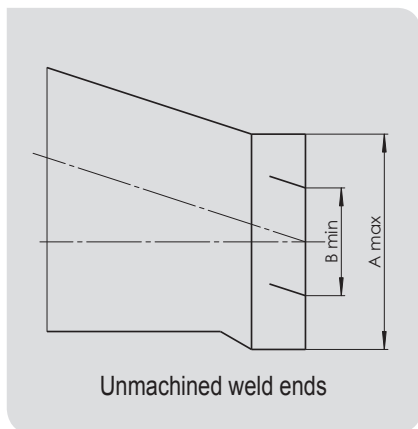
Face-to-face dimensions: according to the manufacturer's standard
Weld ends: DIN 3239 – part 1
Groove form: DIN 2559 – sheet 1 – form 22

2. Flanged

Face-to-face dimensions: according to the manufacturer's standard
Flanges: EN 1092-1 (DIN 2501/1972)



WELDING ENDS



BLOW-DOWN VALVE B10.3

WELDING DESIGN

| Nominal pressure | Nominal size | Face-to-face | Centre-to-top | Centre-to-top | Stroke | Handwheel | Handwheel | Weld ends | | Pipe dimensions | Dimension of unmachined weld ends | | Approximate weight |
|------------------|--------------|--------------|---------------|---------------|--------|-----------|-----------|-----------|------|-----------------|-----------------------------------|------|--------------------|
| PN | DN | L | h | H | z | ØDk1 | ØDk2 | d2 | d0 | | Amax | Bmin | m [kg] |
| 63 | 10 | 150 | 300 | 30 | - | 160 | 250 | 18 | 13,0 | 17,2x2,0 | 9 | 32 | - |
| | 15 | 150 | 300 | 30 | - | 160 | 250 | 22 | 17,0 | 21,3x2,0 | 14 | 32 | - |
| | 20 | 160 | 350 | 45 | - | 160 | 250 | 28 | 22,0 | 26,9x2,3 | 19 | 50 | - |
| | 25 | 160 | 350 | 45 | - | 160 | 250 | 34 | 28,5 | 33,7x2,6 | 22 | 50 | - |
| | 40 | 250 | 515 | 75 | 30 | 300 | 500 | 49 | 43,0 | 48,3x2,6 | 32 | 88 | 65 |
| | 50 | 250 | 515 | 75 | 30 | 300 | 500 | 61 | 54,0 | 60,3x3,2 | 40 | 88 | 65 |
| 100 | 10 | 150 | 300 | 30 | - | 160 | 250 | 18 | 13,0 | 17,2x2,0 | 9 | 32 | - |
| | 15 | 150 | 300 | 30 | - | 160 | 250 | 22 | 17,0 | 21,3x2,0 | 14 | 32 | - |
| | 20 | 160 | 350 | 45 | - | 160 | 250 | 28 | 22,0 | 26,9x2,3 | 19 | 50 | - |
| | 25 | 160 | 350 | 45 | - | 160 | 250 | 34 | 28,5 | 33,7x2,6 | 22 | 50 | - |
| | 40 | 250 | 515 | 75 | 30 | 300 | 500 | 49 | 43,0 | 48,3x2,6 | 32 | 88 | 65 |
| | 50 | 250 | 515 | 75 | 30 | 300 | 500 | 61 | 54,0 | 60,3x3,2 | 40 | 88 | 65 |
| 160 | 10 | 150 | 300 | 30 | - | 160 | 250 | 18 | 13,0 | 17,2x2,0 | 9 | 32 | - |
| | 15 | 150 | 300 | 30 | - | 160 | 250 | 22 | 17,0 | 21,3x2,0 | 14 | 32 | - |
| | 20 | 160 | 350 | 45 | - | 160 | 250 | 28 | 22,0 | 26,9x2,3 | 19 | 50 | - |
| | 25 | 160 | 350 | 45 | - | 160 | 250 | 34 | 27,5 | 33,7x3,2 | 22 | 50 | - |
| | 40 | 250 | 515 | 75 | 30 | 300 | 500 | 49 | 41,0 | 48,3x3,6 | 32 | 88 | 65 |
| | 50 | 250 | 515 | 75 | 30 | 300 | 500 | 61 | 52,5 | 60,3x4,0 | 40 | 88 | 65 |
| 250 | 10 | 150 | 300 | 30 | - | 160 | 250 | 18 | 12,0 | 17,2x2,6 | 9 | 32 | - |
| | 15 | 150 | 300 | 30 | - | 160 | 250 | 22 | 16,0 | 21,3x2,6 | 14 | 32 | - |
| | 20 | 160 | 350 | 45 | - | 160 | 250 | 28 | 20,0 | 26,9x3,6 | 19 | 50 | - |
| | 25 | 160 | 350 | 45 | - | 160 | 250 | 35 | 26,5 | 33,7x3,6 | 22 | 50 | - |
| | 40 | 250 | 515 | 75 | 30 | 300 | 500 | 49 | 38,5 | 48,3x5,0 | 32 | 88 | 65 |
| | 50 | 250 | 515 | 75 | 30 | 300 | 500 | 61 | 45,0 | 60,3x8,0 | 40 | 88 | 65 |
| 320 | 10 | 150 | - | - | - | - | - | 18 | 12,0 | 17,2x2,6 | 9 | 32 | - |
| | 15 | 150 | - | - | - | - | - | 22 | 15,0 | 21,3x3,2 | 14 | 32 | - |
| | 20 | 160 | - | - | - | - | - | 28 | 19,0 | 26,9x4,0 | 19 | 50 | - |
| | 25 | 160 | - | - | - | - | - | 35 | 24,0 | 33,7x5,0 | 22 | 50 | - |
| | 40 | 250 | 515 | 75 | 30 | 300 | 500 | 49 | 36,0 | 48,3x6,3 | 32 | 88 | 65 |
| | 50 | 250 | 515 | 75 | 30 | 300 | 500 | 77 | 59,5 | 76,1x8,8 | 40 | 88 | 65 |
| 400 | 10 | 150 | - | - | - | - | - | 18 | 10 | 17,2x3,6 | 9 | 32 | - |
| | 15 | 150 | - | - | - | - | - | 28 | 17 | 26,9x5,0 | 14 | 32 | - |
| | 20 | 160 | - | - | - | - | - | 34 | 19,5 | 32,0x6,3 | 19 | 50 | - |
| | 25 | 160 | - | - | - | - | - | 44 | 28 | 42,4x8,0 | 22 | 50 | - |
| | 40 | 250 | 515 | 75 | 30 | 300 | 500 | 61 | 39 | 60,3x11,0 | 32 | 88 | 65 |
| | 50 | 250 | 515 | 75 | 30 | 300 | 500 | 76 | 49 | 76,1x14,2 | 40 | 88 | 65 |
| 500 | 10 | 150 | - | - | - | - | - | 22 | 11,5 | 21,3x5,0 | 9 | 32 | - |
| | 15 | 150 | - | - | - | - | - | 33 | 16,5 | 32,0x8,0 | 14 | 32 | - |
| | 20 | 160 | - | - | - | - | - | 38 | 20,5 | 38,0x8,8 | 19 | 50 | - |
| | 25 | 160 | - | - | - | - | - | 48 | 23,5 | 48,3x12,5 | 22 | 50 | - |
| | 40 | 250 | 515 | 75 | 30 | 300 | 500 | 76 | 42 | 76,1x17,5 | 32 | 88 | 65 |
| | 50 | 250 | 515 | 75 | 30 | 300 | 500 | *) | *) | *) | 40 | 88 | 65 |

Missing parameters on request *)

BLOW-DOWN VALVE B10.3

FLANGE DESIGN

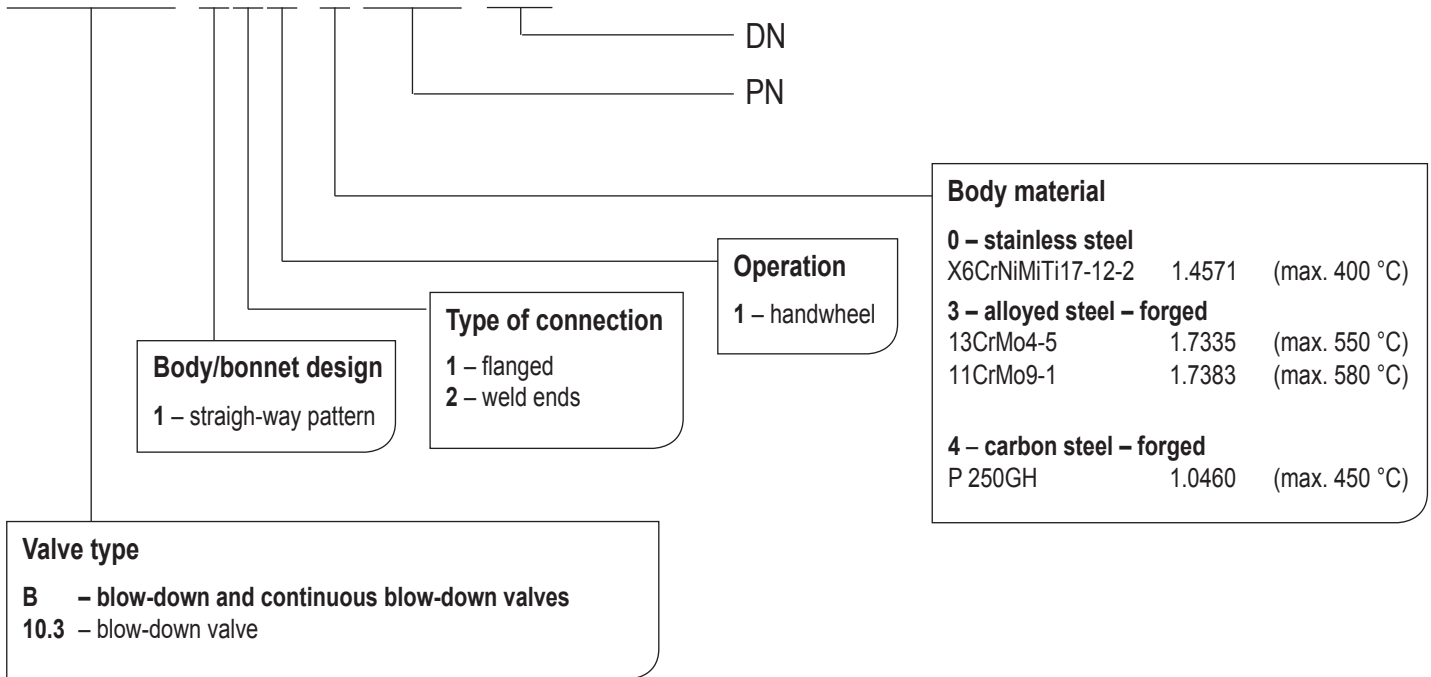
| Nominal pressure | Nominal size | Face-to-face | Number of holes | Hole | Pitch circle | Flange diameter | Flange thickness | Sealing bar |
|------------------|--------------|----------------|-----------------|------|--------------|-----------------|------------------|-------------------|
| PN | DN | L _f | n | ød | øk | øD | b | ød _{4xf} |
| 63 | 10 | 260 | 4 | 14 | 70 | 100 | 20 | 40x2 |
| | 15 | 260 | 4 | 14 | 75 | 105 | 20 | 45x2 |
| | 20 | - | - | - | - | - | - | - |
| | 25 | 300 | 4 | 18 | 100 | 140 | 24 | 68x2 |
| | 32 | - | - | - | - | - | - | - |
| | 40 | 400 | 4 | 22 | 125 | 170 | 26 | 88x3 |
| | 50 | 400 | 4 | 22 | 135 | 180 | 26 | 102x3 |
| 100 | 10 | 260 | 4 | 14 | 70 | 100 | 20 | 40x2 |
| | 15 | 260 | 4 | 14 | 75 | 105 | 20 | 45x2 |
| | 20 | - | - | - | - | - | - | - |
| | 25 | 300 | 4 | 18 | 100 | 140 | 24 | 68x2 |
| | 32 | - | - | - | - | - | - | - |
| | 40 | 400 | 4 | 22 | 125 | 170 | 26 | 88x3 |
| | 50 | 400 | 4 | 26 | 135 | 180 | 28 | 102x3 |
| 160 | 10 | 260 | 4 | 14 | 70 | 100 | 20 | 40x2 |
| | 15 | 260 | 4 | 14 | 75 | 105 | 20 | 45x2 |
| | 20 | - | - | - | - | - | - | - |
| | 25 | 300 | 4 | 18 | 100 | 140 | 24 | 68x2 |
| | 32 | - | - | - | - | - | - | - |
| | 40 | 400 | 4 | 22 | 125 | 170 | 28 | 88x3 |
| | 50 | 400 | 4 | 26 | 145 | 195 | 30 | 102x3 |
| 250 | 10 | 260 | 4 | 18 | 85 | 125 | 24 | 40x2 |
| | 15 | 260 | 4 | 18 | 90 | 130 | 26 | 45x2 |
| | 20 | - | - | - | - | - | - | - |
| | 25 | 300 | 4 | 22 | 105 | 150 | 28 | 68x2 |
| | 32 | - | - | - | - | - | - | - |
| | 40 | 400 | 4 | 26 | 135 | 185 | 34 | 88x3 |
| | 50 | 400 | 8 | 26 | 150 | 200 | 38 | 102x3 |
| 320 | 10 | 260 | 4 | 18 | 85 | 125 | 24 | 40x2 |
| | 15 | 260 | 4 | 18 | 90 | 130 | 26 | 45x2 |
| | 20 | - | - | - | - | - | - | - |
| | 25 | 300 | 4 | 22 | 115 | 160 | 34 | 68x2 |
| | 32 | - | - | - | - | - | - | - |
| | 40 | 400 | 4 | 26 | 145 | 195 | 38 | 88x3 |
| | 50 | 400 | 8 | 26 | 160 | 210 | 42 | 102x3 |
| 400 | 10 | 260 | 4 | 18 | 85 | 125 | 28 | 40x2 |
| | 15 | 260 | 4 | 22 | 100 | 145 | 30 | 45x2 |
| | 20 | - | - | - | - | - | - | - |
| | 25 | 300 | 4 | 26 | 130 | 180 | 38 | 68x2 |
| | 32 | - | - | - | - | - | - | - |
| | 40 | 400 | 4 | 30 | 165 | 220 | 48 | 88x3 |
| | 50 | 400 | 8 | 30 | 180 | 235 | 52 | 102x3 |

DN20 and DN32 - on customer request

BLOW-DOWN VALVE B10.3

VALVE DESCRIPTION CODE

B10.3 111-3320-25



VALVE INSTALLATION

The valve is mounted in straight pipe sections with an uninterrupted flow of working fluid. Recommended valve position - stem and controls perpendicular upwards, mounting with hanging spindle is not permitted. Medium must flow in accordance with the direction indicated by an arrow on the valve body. Blow-down valves are not intended as shut-off valves, for a safe shut-off the shut-off valve of the same DN is inserted before or after these valves.

It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- the medium used must be comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

CONTINUOUS BLOWDOWN VALVE B25.2

PN 63–400; DN 15, 25; T_{MAX}: 450 °C



CONTINUOUS BLOWDOWN VALVE B25.2

APPLICATION

- water

CONNECTION

- weld ends, flanged

OPERATION

- handwheel

DESCRIPTION

- non-rotating rising stem
- straight-way pattern
- complies with the requirements of the directive 2014/68/EU and standard EN 13 709
- testing is carried out according to standard EN 12266-1, part 2

BASIC DESIGN OPTIONS

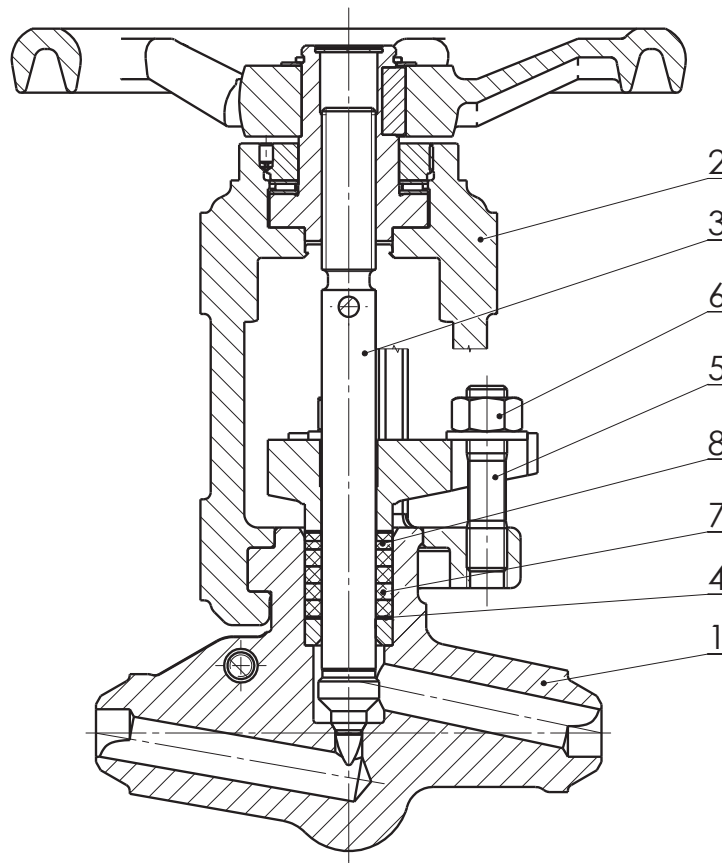
- graphite gasket

CONTINUOUS BLOWDOWN VALVE B25.2

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | |
|-------------------------------|-----|---|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 280 | 300 | 350 | 380 | 390 | 400 | 410 | 420 | 430 | 440 | 450 |
| P250GH (C22.8) (1.0460) | 63 | 63 | 63 | 63 | 63 | 63 | 56,7 | 53,2 | 50,4 | 44,9 | 41,0 | 40,2 | 39,4 | 38,4 | 37,5 | 36,5 | 35,6 | 34,7 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 90,0 | 84,5 | 80,0 | 71,3 | 65,0 | 63,8 | 62,5 | 61,0 | 59,5 | 58,0 | 56,5 | 55,0 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 144 | 135 | 128 | 114 | 104 | 102 | 100 | 97,6 | 95,2 | 92,8 | 90,4 | 88,0 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 225 | 212 | 200 | 178 | 163 | 159 | 156 | 153 | 149 | 145 | 141 | 138 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 288 | 271 | 256 | 228 | 208 | 204 | 200 | 195 | 190 | 186 | 181 | 176 |
| | 400 | 400 | 400 | 400 | 400 | 400 | 360 | 340 | 320 | 285 | 260 | 255 | 250 | 244 | 238 | 232 | 226 | 220 |

USED MATERIALS



| Pos. | Part | Material |
|------|--------------------------------|------------------------|
| 1 | Body | P250GH (C 22.8) 1.0460 |
| | Hard facing of sealing surface | 13Cr |
| 2 | Yoke | G17CrMo9-10 (1.7379) |
| 3 | Stem with disc | X20Cr13, 1.4021 |
| | Hard facing of sealing surface | Hardening |
| 4 | Gasket | CrN – steel graphite |
| 5 | Stud | 21CrMoV5-7 (1.7705) |
| 6 | Nut | 25CrMo4 (1.7218) |
| 8 | Gasket | Grafit knitted |
| 7 | Gasket | Grafit pressed |

CONTINUOUS BLOWDOWN VALVE B25.2

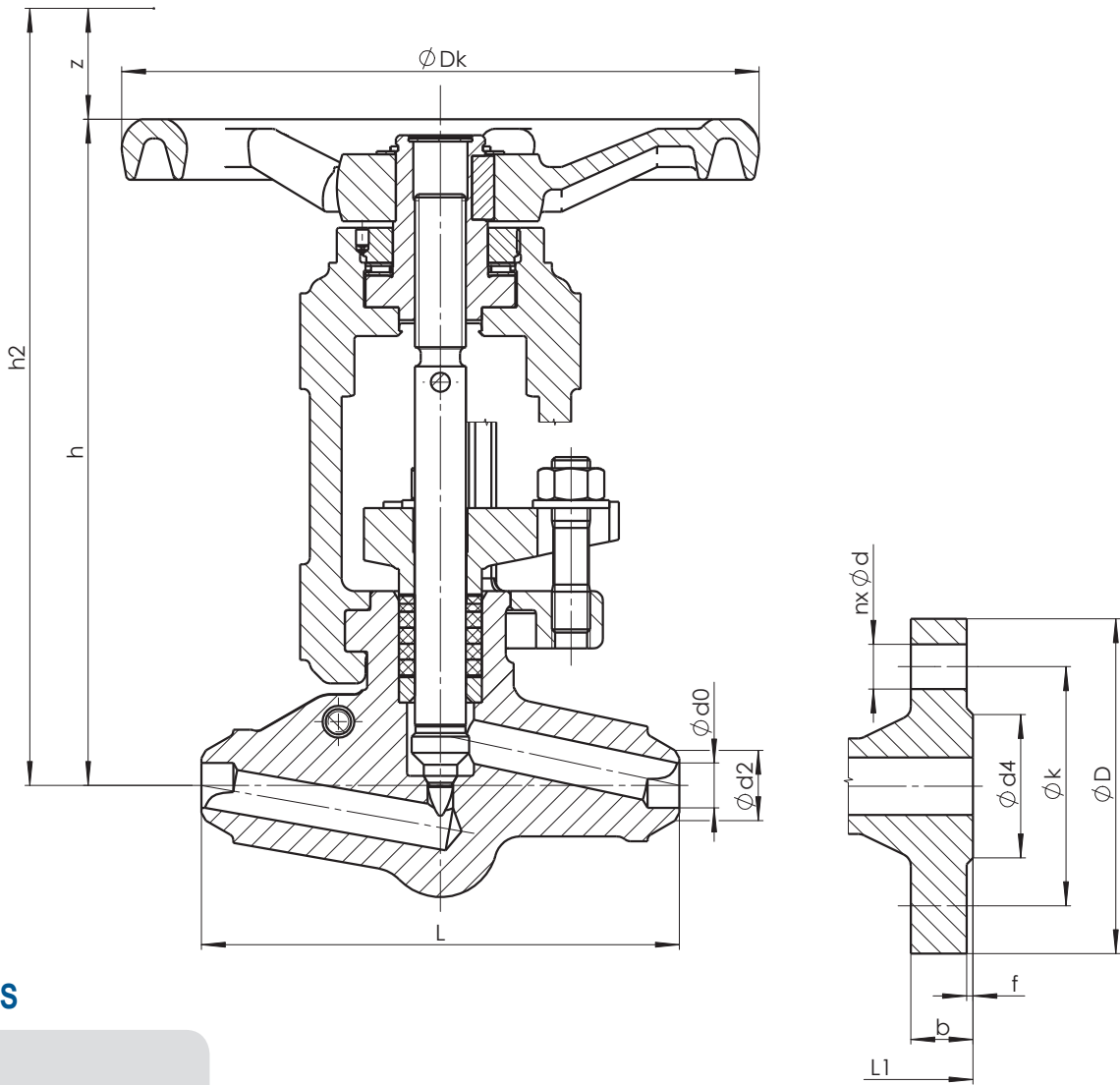
VALVE DIMENSIONS

1. Weld ends

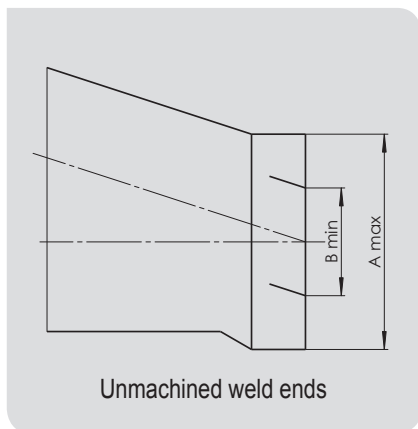
Face-to-face dimensions: EN 12982 – line 65
Weld ends: DIN 3239 – part 1
Groove form: DIN 2559 – sheet 1 – form 22

2. Flanged

Face-to-face dimensions: EN 558-1 – line 2
Flanged: EN 1092-1, (DIN 2501/1972)



WELDING ENDS



CONTINUOUS BLOWDOWN VALVE B25.2

WELDING DESIGN

| Nominal pressure | Nominal size | Face-to-face | Centre-to-top | Disassembly height | Handwheel | Stroke | Weld ends | | Pipes dimension | Dimension of unmachined weld ends | | Approximate weight |
|------------------|--------------|--------------|---------------|--------------------|-------------------|--------|-----------|-------|-----------------|-----------------------------------|-----------|--------------------|
| | | | | | | | d_2 | d_0 | | A_{max} | B_{min} | |
| PN | DN | L | h | h_2 | $\varnothing D_k$ | z | d_2 | d_0 | | A_{max} | B_{min} | m [kg] |
| 63 | 15 | 150 | 225 | 330 | 200 | 11 | 22 | 17 | 21,3x2,0 | 35 | 9 | 6,4 |
| | 25 | 160 | 240 | 360 | 250 | 18 | 35 | 28,5 | 33,7x2,6 | 50 | 24 | 8,5 |
| 100 | 15 | 150 | 225 | 330 | 200 | 11 | 22 | 17 | 21,3x2,0 | 35 | 9 | 6,4 |
| | 25 | 160 | 240 | 360 | 250 | 18 | 35 | 28,5 | 33,7x2,6 | 50 | 24 | 8,5 |
| 160 | 15 | 150 | 225 | 330 | 200 | 11 | 22 | 17 | 21,3x2,0 | 35 | 9 | 6,4 |
| | 25 | 160 | 240 | 360 | 250 | 18 | 35 | 27,5 | 33,7x3,2 | 50 | 24 | 8,5 |
| 250 | 15 | 150 | 225 | 330 | 200 | 11 | 22 | 16 | 21,3x2,6 | 35 | 9 | 6,4 |
| | 25 | 160 | 240 | 360 | 250 | 18 | 35 | 26,5 | 33,7x3,6 | 50 | 24 | 8,5 |
| 320 | 15 | 150 | 225 | 330 | 200 | 11 | 22 | 15 | 21,3x3,2 | 35 | 14 | 6,4 |
| | 25 | 160 | 240 | 360 | 250 | 18 | 35 | 24 | 33,7x5,0 | 50 | 24 | 8,5 |
| 400 | 15 | 150 | 225 | 330 | 250 | 11 | 22 | 17 | 26,9x5,0 | 35 | 14 | 7,1 |
| | 25 | 160 | 240 | 360 | 250 | 18 | 44 | 28 | 42,4x8,0 | 48 | 22 | 9,0 |

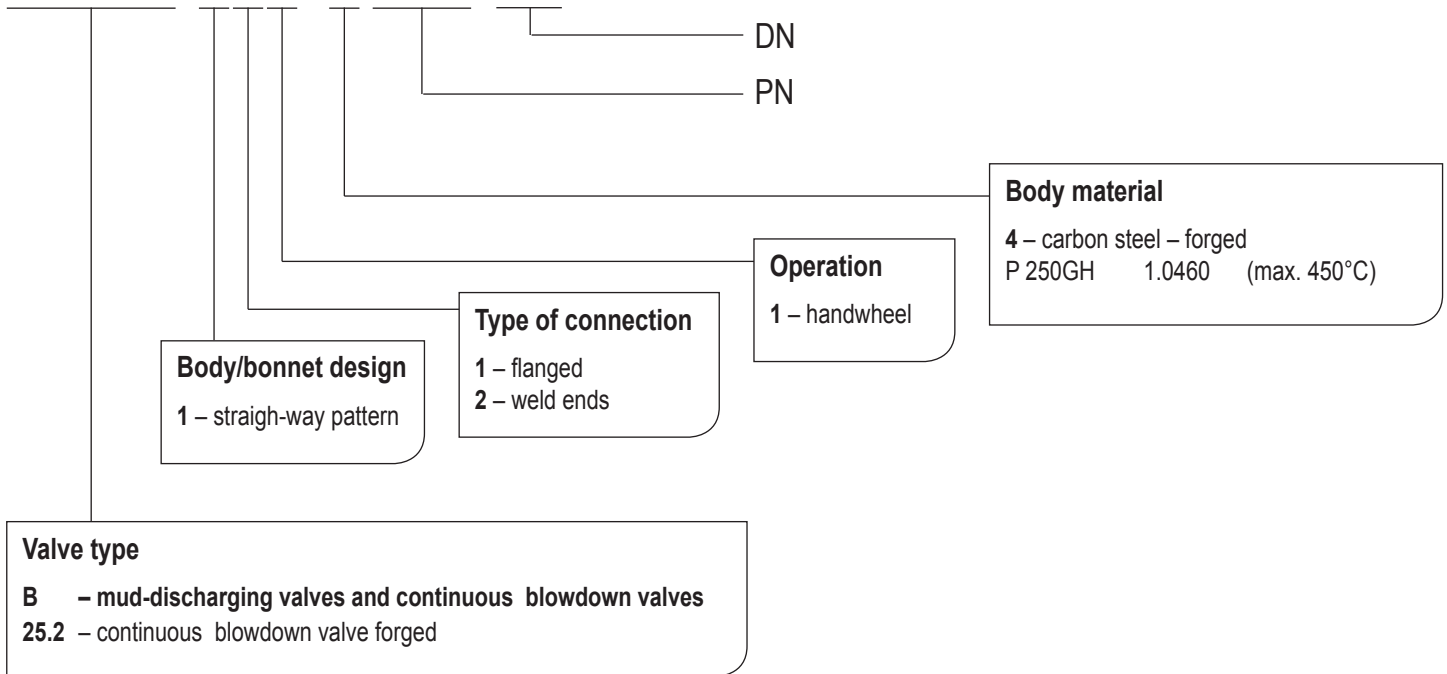
FLANGE DESIGN

| Nominal pressure | Nominal size | Face-to-face | Centre-to-top | Disassembly height | Handwheel | Number of holes | Hole | Pitch circle | Flange diameter | Flange thickness | Sealing bar | Approximate weight |
|------------------|--------------|--------------|---------------|--------------------|-----------|-----------------|------|--------------|-----------------|------------------|-------------|--------------------|
| | | | | | | | | | | | | |
| 63 | 15 | 230 | 225 | 330 | 200 | 4 | 14 | 75 | 105 | 20 | 45x2 | 11,0 |
| | 25 | 260 | 240 | 360 | 200 | 4 | 18 | 100 | 140 | 24 | 68x2 | 14,5 |
| 100 | 15 | 230 | 225 | 330 | 200 | 4 | 14 | 75 | 105 | 20 | 45x2 | 11,0 |
| | 25 | 260 | 240 | 360 | 200 | 4 | 18 | 100 | 140 | 24 | 68x2 | 14,5 |
| 160 | 15 | 230 | 225 | 330 | 200 | 4 | 14 | 75 | 105 | 20 | 45x2 | 11,0 |
| | 25 | 260 | 240 | 360 | 200 | 4 | 18 | 100 | 140 | 24 | 68x2 | 14,5 |
| 250 | 15 | 230 | 225 | 330 | 160 | 4 | 18 | 90 | 130 | 26 | 45x2 | 11,0 |
| | 25 | 260 | 240 | 360 | 200 | 4 | 22 | 105 | 150 | 28 | 68x2 | 14,5 |
| 320 | 15 | 230 | 225 | 330 | 200 | 4 | 18 | 90 | 130 | 26 | 45x2 | 11,0 |
| | 25 | 260 | 240 | 360 | 250 | 4 | 22 | 115 | 160 | 34 | 68x2 | 17,5 |
| 400 | 15 | 230 | 225 | 330 | 200 | 4 | 22 | 100 | 145 | 30 | 45x2 | 11,0 |
| | 25 | 260 | 240 | 360 | 250 | 4 | 26 | 130 | 180 | 38 | 68x2 | 14,5 |

CONTINUOUS BLOWDOWN VALVE B25.2

VALVE DESCRIPTION CODE

B25.2 111-4250-25



VALVE INSTALLATION

Valve is mounted in straight pipe sections with an uninterrupted flow of working fluid in any position. Recommended valve position – stem and controls perpendicular upwards. Medium must flow in accordance with the direction indicated by an arrow on the valve body. It is recommended to install a shut-off globe valve before the continuous blowdown valve. There is a throttle cone, fine thread of the stem and opening indicator at the globe valve for setting of the correct continue blow-down valve.

It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- the medium used must be comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

Attachment 4

ENEQ Consult – Butterfly Valves Catalogue 2025

ENEQ Consult Ltd. delivers cost-effective mechanical equipment for nuclear, conventional, oil & gas, and petrochemical industries.

- **9 years** of solid performance
- **> 20 M€** project portfolio
- **> 50** completed projects, **> 10** in progress
- Exclusive partnerships with **15 manufacturers worldwide**
- Equipment compliant with **ASME, EN, N Stamp, DIN, ASTM, ISO, GOST**

Expertise:

- **Equipment Supply** – high-quality OEMs, cost-effective modernization and new-build NPP solutions, turnkey delivery
- **Engineering** – design critical analyses, FEA & CFD calculations, technical consulting
- **Service** – full project support from production to installation, commissioning, and after-sales

ENEQ Butterfly Valves

Butterfly valves provide reliable, high-capacity flow control in a compact, lightweight design, making them ideal for demanding applications in oil and gas, petrochemical, power generation, water treatment, and marine industries. Their streamlined, quarter-turn operation ensures quick opening and closing with minimal pressure drop, while advanced sealing systems deliver tight shut-off and long service life. Available in concentric, double-offset, and triple-offset configurations, these valves can be supplied in cast or fabricated bodies with flanged, lug, wafer, or butt-weld end connections to suit a wide range of installation requirements.

Specialized seat and disc materials are offered for severe service, high-temperature, cryogenic, and corrosive environments, including metal-to-metal sealing for fire-safe performance and soft-seated designs for zero-leakage applications. Manufactured in compliance with ASME-ANSI, DIN, API, and BS standards, butterfly valves are available in a full range of materials such as Carbon Steel, Stainless Steel, Duplex, Super Duplex, and high-alloy grades, ensuring dependable operation in the most challenging service conditions.



1. Butterfly Valves – Manufacturing Range & Features

Table of Butterfly valve types and their features:

| Type | Key Features | Typical Benefits / Applications | Construction Options | Operation Modes | Materials | Standards / Size Range |
|------------------|--|---|----------------------------|--|--|--|
| Concentric | Disc centered in bore; soft or metal seat; compact design | General service duties; water treatment; HVAC; low-pressure industrial processes | Wafer, Lug, Double-Flanged | Manual, MOV, AOV, HOV, Electro-hydraulic | Carbon Steel, LTCS, Alloy Steel, Stainless Steel, Super Austenitic SS, Duplex, Super Duplex, Nickel Alloys, Titanium, Aluminium Bronze | AWWA C-504 (40"–120", Class 25A–250A); BS-3952 (3"–40", ANSI 600#) |
| Double Eccentric | Shaft offset from disc centerline; reduced seat contact during operation | Lower torque; extended seat life; suitable for steam, gas, and moderate-temperature service | Wafer, Lug, Double-Flanged | Manual, MOV, AOV, HOV, Electro-hydraulic | Same as above | Same as above |

| | | | | | | |
|------------------|---|--|----------------------------|--|---------------|---------------|
| Triple Eccentric | Triple-offset geometry; metal-to-metal sealing; zero rubbing during operation | High-temperature/pressure isolation; fire-safe; severe service in oil, gas, and power generation | Wafer, Lug, Double-Flanged | Manual, MOV, AOV, HOV, Electro-hydraulic | Same as above | Same as above |
| Soft-Seated | Resilient sealing materials; bubble-tight shut-off | Zero-leakage isolation for clean fluids, water, and low-temperature service | Wafer, Lug, Double-Flanged | Manual, MOV, AOV, HOV, Electro-hydraulic | Same as above | Same as above |
| Metal-Seated | Hardened sealing surfaces; high wear and temperature resistance | Abrasive media, high-temperature steam, and fire-safe applications | Wafer, Lug, Double-Flanged | Manual, MOV, AOV, HOV, Electro-hydraulic | Same as above | Same as above |

Attachment 5

ENEQ Consult – Check Valves Catalogue 2025

ENEQ Consult Ltd. delivers cost-effective mechanical equipment for nuclear, conventional, oil & gas, and petrochemical industries, with a strong focus on nuclear power plants using PWR reactor technology.

- **9 years** of solid performance
- **> 20 M€** project portfolio
- **> 50** completed projects, **> 10** in progress
- Exclusive partnerships with **15 manufacturers worldwide**
- Equipment compliant with **ASME, EN, N Stamp, DIN, ASTM, ISO, GOST**

Expertise:

- **Equipment Supply** – high-quality OEMs, cost-effective modernization and new-build NPP solutions, turnkey delivery
- **Engineering** – design critical analyses, FEA & CFD calculations, technical consulting
- **Service** – full project support from production to installation, commissioning, and after-sales

Check Valve Portfolio Overview

| Series/Design | Pressure Rating | Size Range | Features/Design |
|------------------------------|-----------------|------------|---|
| SWING CHECK VALVE L30 | PN 16–100 | DN 50–400 | Straight-body swing disc with lever & weight or weightless operation; horizontal mounting (cover up); 13Cr/Stellite 6 hard-faced sealing; flanged & weld ends |
| SWING CHECK VALVE L43 | PN 160–320 | DN 50–350 | Straight-body swing disc with self-sealing bonnet; horizontal mounting (cover up); Stellite 6 hard-faced sealing; flanged & weld ends |
| LIFT CHECK VALVE C09 | PN 10–40 | DN 15–200 | Straight-body lift disc with spring; horizontal & vertical mounting; 13Cr hard-faced sealing (except stainless steel); flanged & weld ends |

| | | | |
|---|------------------------|--|---|
| HIGH-PRESSURE LIFT CHECK VALVE Z15.4 | PN 63–160 | DN 50–150 | Straight-body lift disc; self-acting control; horizontal & vertical mounting; 13Cr or Stellite 6 hard-faced sealing; flanged, weld & combination ends |
| HIGH-PRESSURE LIFT CHECK VALVE Z15.2 | PN 63–500 | DN 10–65 | Straight-body lift disc with closing spring (except DN 10/15); conical seat; 13Cr or Stellite 6 hard-faced sealing; flanged, weld, socket-weld & combination ends |
| HIGH-PRESSURE LIFT CHECK VALVE Z15.3 | PN 63–250 / PN 320–630 | DN 10–65 | Straight-body lift disc (spring optional); horizontal & vertical mounting (spring required vertical); 13Cr or Stellite 6 hard-faced sealing; flanged, weld, socket & combination ends |
| LIFT CHECK VALVE Z15 | PN 160–400 | DN 65–150 | Straight-body lift disc; horizontal mounting; 13Cr or Stellite 6 hard-faced sealing; flanged, weld & combination ends |
| LIFT CHECK VALVE Z35 | PN 16–250 | DN 65–150 | Straight-body vertical lift disc; vertical mounting only; 13Cr hard-faced sealing; flanged ends |
| LIFT CHECK VALVE WITH AUTOMATIC RELIEF Z40 | PN 16–100 | DN 65–150 | Straight-body vertical lift disc with automatic relief; vertical mounting only; 13Cr hard-faced sealing; flanged ends |
| Swing Check Valve | ANSI 150 to 4500 | up to 64" | Full opening, anti-rotation pin, piggable, API 6D / API 6A compliant |
| Piston Check Valve | ANSI 150 to 4500 | Normally up to 2" (larger sizes available) | T-pattern and Y-pattern available |
| Dual Plate Check Valve | ANSI 150 to 4500 | See below | Double disc with spring, metal or soft seats, reduced weight and face-to-face length |
| Tilting Disc Check Valve | ANSI 150 to 4500 | See below | Operates with very small pressure drop, balanced disc |
| Emergency Assisted Check Valve | ANSI 150 to 4500 | See below | Pneumatic piston with solenoid valve for fast closing in turbine steam extractions |
| Testable Check Valve | ANSI 150 to 4500 | See below | Position indicator, limit switches, operating lever |

| | | | |
|------------------------------|--|--|---|
| Butterfly Check Valve | ANSI 150 to 4500 | Large sizes (e.g., pump outlets, turbines) | Functions as both butterfly and check valve |
| API 6A Check Valve | Class 2000 / 3000 / 5000 / 10000 / 15000 | 1-13/16" to 11" | Designed for high-pressure applications |

SWING CHECK VALVE L30

PN 16–100; DN 50–400; T_{MAX} : 540 °C



SWING CHECK VALVE L30

APPLICATION

- water, steam, gas, oil, petroleum products, non-aggressive and aggressive substances

CONNECTION

- flanged, weld ends

OPERATION

- self-acting control

DESCRIPTION

- with lever and weight
- without lever and weight
- complies with the requirements of the directive 2014/68/EU
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

- drain plug
- with by-pass, without by-pass
- delivery on request according to TRD 201

SWING CHECK VALVE L30

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | |
|------------------------|-----|---|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 500 | 510 | 520 | 530 | 540 |
| GP240GH (1.0619) | 16 | 16 | 16 | 14,9 | 13,9 | 12,4 | 11,4 | 10,3 | 9,6 | 9,2 | - | - | - | - | - | - | - |
| | 25 | 25 | 25 | 23,3 | 21,7 | 19,4 | 17,8 | 16,1 | 15 | 14,4 | - | - | - | - | - | - | - |
| | 40 | 40 | 40 | 37,3 | 35 | 30,2 | 28,4 | 25,8 | 24 | 23,1 | - | - | - | - | - | - | - |
| | 63 | 63 | 63 | 58,8 | 54,6 | 47,6 | 44,8 | 40,6 | 37,8 | 36,4 | - | - | - | - | - | - | - |
| | 100 | 100 | 100 | 93,3 | 86,7 | 75,6 | 71,1 | 64,4 | 60 | 57,8 | - | - | - | - | - | - | - |
| G17CrMo5-5 (1.7357) | 16 | 16 | 16 | 16 | 16 | 16 | 15,6 | 14,6 | 13,5 | 12,8 | 12,1 | 11,9 | 9,7 | 8,2 | 6,7 | 5,5 | 4,5 |
| | 25 | 25 | 25 | 25 | 25 | 25 | 24,4 | 22,8 | 21,1 | 20,0 | 18,9 | 18,7 | 15,2 | 12,9 | 10,4 | 8,7 | 7,1 |
| | 40 | 40 | 40 | 40 | 40 | 40 | 39,1 | 36,4 | 33,8 | 32 | 30,2 | 29,9 | 24,4 | 20,6 | 16,7 | 13,9 | 11,4 |
| | 63 | 63 | 63 | 63 | 63 | 63 | 61,6 | 57,4 | 53,2 | 50,4 | 47,6 | 47 | 38,4 | 32,5 | 26,3 | 21,8 | 18,0 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 97,8 | 91,1 | 84,4 | 80 | 75,6 | 74,7 | 60,9 | 51,6 | 41,8 | 34,7 | 28,6 |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | |
|----------------------------------|-----|---|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -105 | -50 | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 460 | 470 | 480 | 490 | 500 |
| GX5CrNiMo 19-11-2 (1.4408) | 16 | - | 16 | 16 | 16 | 14,8 | 14 | 12,8 | 11,8 | 10,8 | - | - | - | - | - | - | - | |
| | 25 | - | 25 | 25 | 25 | 23 | 21 | 19,2 | 18,2 | 17,2 | - | - | - | - | - | - | - | |
| | 40 | - | 40 | 40 | 40 | 37 | 35 | 32 | 29,5 | 27 | - | - | - | - | - | - | - | |
| | 63 | - | 63 | 63 | 63 | 42 | 40 | 38 | 36 | 35 | - | - | - | - | - | - | - | |
| | 100 | - | 100 | 100 | 100 | 66 | 63 | 60 | 58 | 56 | - | - | - | - | - | - | - | |
| GX5CrNiNb 19-11 (1.4552) | 16 | 16 | 16 | 16 | 16 | 13,8 | 12,7 | 11,6 | 11,0 | 10,4 | 10,0 | 9,6 | 9,3 | 9,1 | 9,0 | 9,0 | 8,9 | 8,8 |
| | 25 | 25 | 25 | 25 | 25 | 21,5 | 19,8 | 18,1 | 17,2 | 16,3 | 15,6 | 15,0 | 14,5 | 14,3 | 14,1 | 14,0 | 13,9 | 13,8 |
| | 40 | 40 | 40 | 40 | 40 | 34,5 | 31,7 | 29,0 | 27,5 | 26,0 | 25,0 | 24,0 | 23,2 | 22,8 | 22,6 | 22,4 | 22,2 | 22,0 |
| | 63 | 63 | 63 | 63 | 63 | 54,3 | 50,0 | 45,7 | 43,3 | 41,0 | 39,4 | 37,8 | 36,5 | 35,9 | 35,6 | 35,3 | 35,0 | 34,7 |
| | 100 | 100 | 100 | 100 | 100 | 86,2 | 79,3 | 72,5 | 68,7 | 65,0 | 62,5 | 60,0 | 59,0 | 58,0 | 58,0 | 57,5 | 57,0 | 56,5 |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | |
|--------------------|-----|---|-----|-----|-----|------|-----|------|------|------|-----|-----|-----|-----|-----|-----|-----|
| | | -50 | -30 | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 500 | 510 | 520 |
| G21Mn5 (1.1138) | 16 | - | 16 | 16 | 16 | 14,8 | 14 | 12,8 | 11,8 | 10,8 | - | - | - | - | - | - | - |
| | 25 | - | 25 | 25 | 25 | 23 | 21 | 19,2 | 18,2 | 17,2 | - | - | - | - | - | - | - |
| | 40 | - | 40 | 40 | 40 | 37 | 35 | 32 | 29,5 | 27 | - | - | - | - | - | - | - |
| | 63 | - | 63 | 63 | 63 | 42 | 40 | 38 | 36 | 35 | - | - | - | - | - | - | - |
| | 100 | - | 100 | 100 | 100 | 66 | 63 | 60 | 58 | 56 | - | - | - | - | - | - | - |

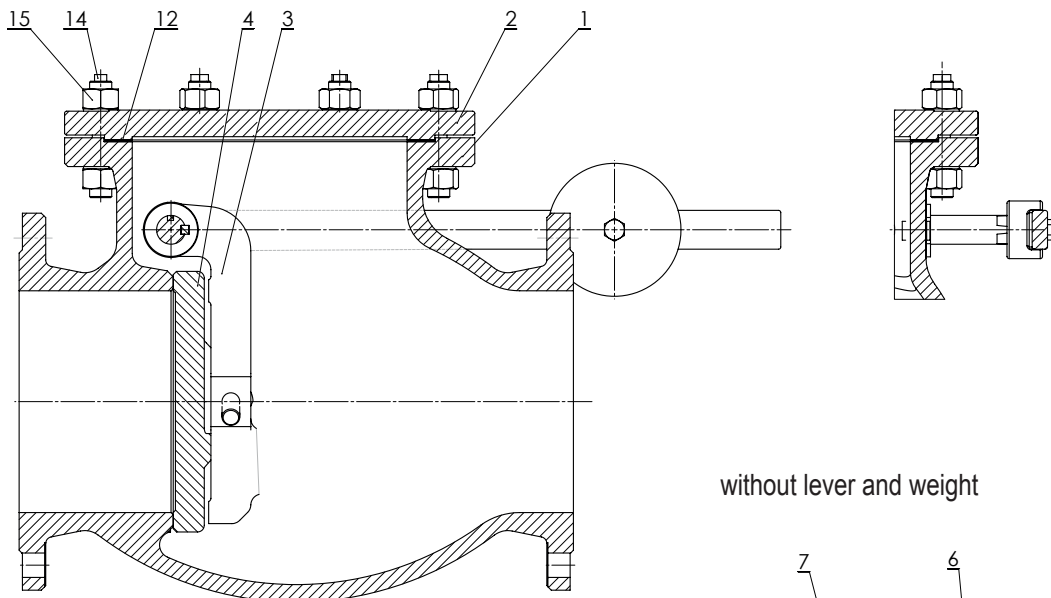
| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | |
|-------------------------|-----|---|-----|-----|-----|-----|------|------|------|------|------|------|------|-----|-----|-----|-----|
| | | -60 | -30 | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 500 | 510 | 520 |
| 42 2707.6, 42 2707.9 | 16 | 16 | 16 | 16 | 16 | 16 | 10,1 | 9,6 | 9,3 | 9,1 | 7,7 | 7,5 | 7,2 | - | - | - | - |
| | 25 | 25 | 25 | 25 | 25 | 25 | 15,8 | 15 | 14,5 | 14,2 | 12,1 | 11,7 | 11,3 | - | - | - | - |
| | 40 | 40 | 40 | 40 | 40 | 40 | 25,3 | 24 | 23,2 | 22,7 | 19,4 | 18,7 | 18,0 | - | - | - | - |
| | 63 | 63 | 63 | 63 | 63 | 63 | 39,9 | 37,8 | 36,5 | 35,7 | 30,5 | 29,4 | 28,4 | - | - | - | - |
| | 100 | 100 | 100 | 100 | 100 | 100 | 63,3 | 60 | 58 | 56,7 | 48,4 | 46,7 | 45,1 | - | - | - | - |

SWING CHECK VALVE L30

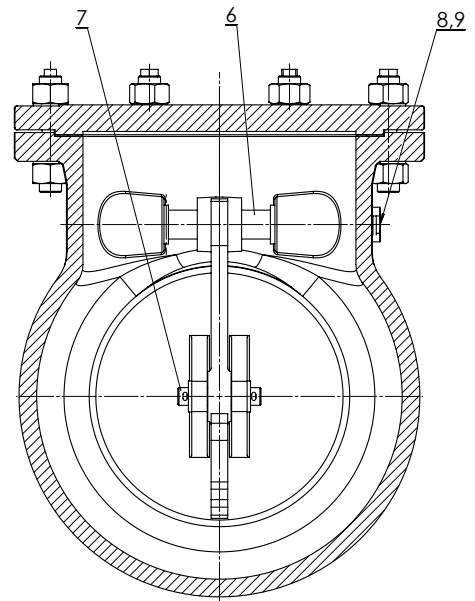
| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | |
|--------------------|-----|---|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 20 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 460 | 470 | 480 | 490 | 500 |
| G20Mo5 (1.5419) | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14,8 | 13,7 | 12,9 | 11,9 | 11,0 | 10,2 | 9,4 | 8,6 | 7,8 | 7,0 |
| | 25 | 25 | 25 | 25 | 25 | 25 | 24,0 | 22,0 | 20,0 | 19,2 | 18,6 | 17,2 | 16,0 | 14,7 | 13,5 | 12,3 | 11,0 |
| | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 37,0 | 34,2 | 32,3 | 29,9 | 27,6 | 25,6 | 23,6 | 21,6 | 19,7 | 17,7 |
| | 63 | 63 | 63 | 63 | 63 | 61 | 59,0 | 55,0 | 51,0 | 48,0 | 46,0 | 43,5 | 40,3 | 37,2 | 34,1 | 31,0 | 27,9 |
| | 100 | 100 | 100 | 100 | 95,0 | 89,0 | 83,0 | 79,0 | 75,0 | 71,0 | 68,0 | 63,0 | 61,0 | 59,1 | 54,2 | 49,2 | 44,2 |

USED MATERIALS

with lever and weight



without lever and weight



SWING CHECK VALVE L30

| Pos. | Part | Material | | | |
|------|-------------------------------------|------------------------|-------------------------|---------------------------|-----------------------------|
| 1 | Body | GP240GH (1.0619) | G17CrMo5-5 (1.7357) | G20Mo5 (1.5419) | GX5CrNiNb19-11 (1.4552) |
| | Hard facing of body sealing surface | 13Cr | Stellite 6 | 13Cr | - |
| 2 | Flange cover | GP240GH (1.0619) | G17CrMo5-5 (1.7357) | G20Mo5 (1.5419) | GX5CrNiNb19-11 (1.4552) |
| 3 | Hinge | GP240GH (1.0619) | G17CrMo5-5 (1.7357) | G20Mo5 (1.5419) | GX5CrNiNb19-11 (1.4552) |
| 4 | Disc | GP240GH (1.0619) | G17CrMo5-5 (1.7357) | G20Mo5 (1.5419) | GX5CrNiNb19-11 (1.4552) |
| | Hard facing of sealing surface | 13Cr | Stellite 6 | 13Cr | X10CrNiMn18-8-6 (1.4370) |
| 6, 7 | Pin | X20Cr13 (1.4021) | X39CrMo17-1 (1.4122) | X6CrNiTi18-10 (1.4541) | X6CrNiTi18-10 (1.4541) |
| 8 | Plug (DN50-300) | 21CrMoV5-7 (1.7709) | 21CrMoV5-7 (1.7709) | A2 (A4) | A2 (A4) |
| 9 | Gasket (DN50-300) | ST/ISOPLAN | | | |
| 12 | Gasket | Graphite | | | |
| 14 | Stud | 25CrMo4 (1.7218) | 21CrMoV5-7 (1.7709) | 21CrMoV5-7 (1.7709) | A2-70 |
| 15 | Nut | C35E+QT (1.1181+QT) | 25CrMo4 (1.7218) | 25CrMo4 (1.7218) | A2-70 |

| Pos. | Part | Material | | |
|------|-------------------------------------|------------------------|-------------------------------|-------------------------------|
| 1 | Body | G21Mn5 (1.1138) | 42 2707.6, 42 2707.9 | GX5CrNiMo19-11-2 (1.4408) |
| | Hard facing of body sealing surface | 13Cr | 13Cr | - |
| 2 | Flange cover | G21Mn5 (1.1138) | 42 2707.6, 42 2707.9 | GX5CrNiMo19-11-2 (1.4408) |
| 3 | Hinge | G21Mn5 (1.1138) | 42 2707.6, 42 2707.9 | GX5CrNiMo19-11-2 (1.4408) |
| 4 | Disc | G21Mn5 (1.1138) | 42 2707.6, 42 2707.9 | GX5CrNiMo19-11-2 (1.4408) |
| | Hard facing of sealing surface | 13Cr | 13Cr | X10CrNiMn18-8-6 (1.4370) |
| 6, 7 | Pin | X20Cr13 (1.4021) | X6CrNiMoTi17-12-2 (1.4571) | X6CrNiMoTi17-12-2 (1.4571) |
| 8 | Plug (DN50-300) | 21CrMoV5-7 (1.7709) | A2 (A4) | A2 (A4) |
| 9 | Gasket (DN50-300) | ST/ISOPLAN | | |
| 12 | Gasket | Graphite | | |
| 14 | Stud | A2-70 | A2-70 | A2-70 |
| 15 | Nut | A2-70 | A2-70 | A2-70 |

SWING CHECK VALVE L30

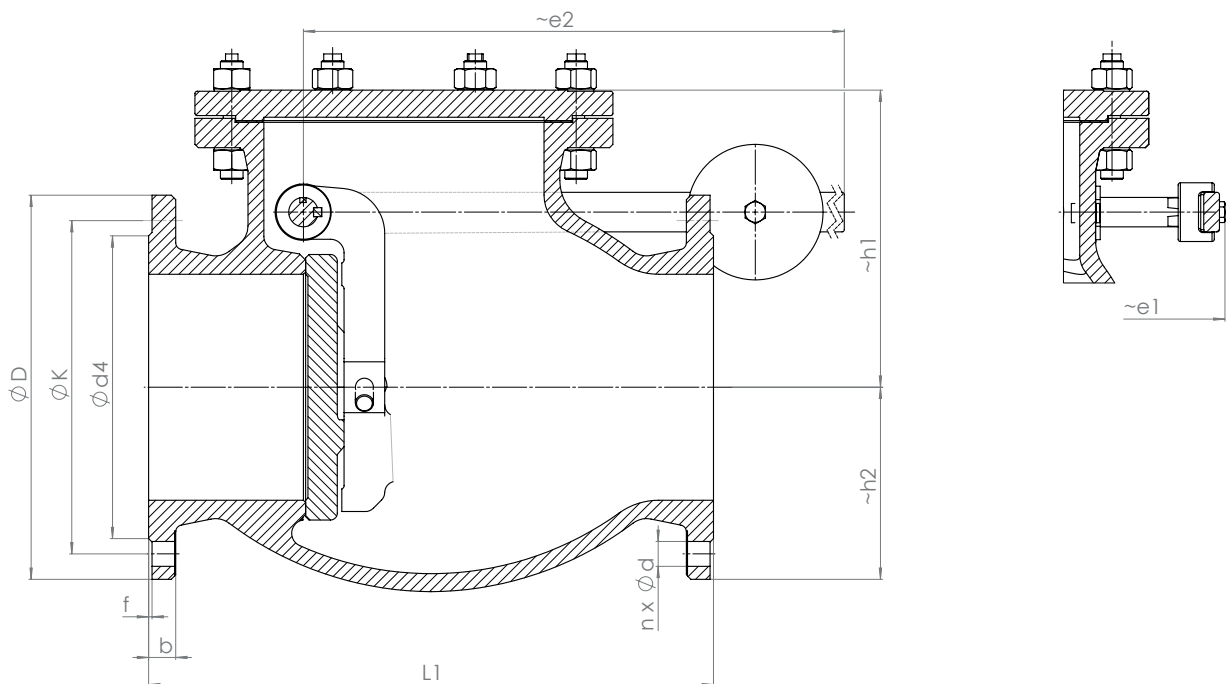
VALVE DIMENSIONS

1. Flanged

Face-to-face dimensions: EN 558
Flanges: EN 1092-1

2. Weld ends

Face-to-face dimensions: as per table
Dimensions of welding ends: DIN 3239 – part 1
Groove form: DIN 2559 – sheet 1 – form 22



SWING CHECK VALVE L30

| Nominal pressure | Nominal size | Face-to-face | Centre-to-top | | | Flange | Pitch diameter | Number of holes | Hole | Sealing bar | Flange thickness | Approximate weight | |
|------------------|--------------|--------------|---------------|-----|-----|--------|----------------|-----------------|-------|-------------|------------------|--------------------|-------|
| | | | | e1 | e2 | | | | | | | m1 | m2 |
| PN | DN | L | h1 | e1 | e2 | øD | øk | n | ød | ød4xf | b | m1 | m2 |
| 16 | 50 | 200 | 123,5 | 150 | 210 | 165 | 125 | 4 | 18 | 102x3 | 18 | 16,0 | 18,0 |
| | 65 | 240 | 139 | 165 | 280 | 185 | 145 | 8 | 18 | 122x3 | 18 | 26,0 | 29,0 |
| | 80 | 260 | 164,5 | 170 | 280 | 200 | 160 | 8 | 18 | 138x3 | 20 | 31,0 | 34,0 |
| | 100 | 300 | 176 | 185 | 350 | 220 | 180 | 8 | 18 | 158x3 | 20 | 41,0 | 44,0 |
| | 125 | 350 | 197 | 200 | 400 | 250 | 210 | 8 | 18 | 188x3 | 22 | 59,0 | 64,0 |
| | 150 | 400 | 235 | 240 | 430 | 285 | 240 | 8 | 22 | 212x3 | 22 | 89,0 | 94,0 |
| | 200 | 500 | 263 | 265 | 550 | 340 | 295 | 12 | 22 | 268x3 | 24 | 138,0 | 145,0 |
| | 250 | 600 | 300,5 | 315 | 730 | 405 | 355 | 12 | 26 | 320x3 | 26 | 200,0 | 210,0 |
| | 300 | 700 | 375,5 | 350 | 750 | 460 | 410 | 12 | 26 | 378x4 | 28 | 298,0 | 310,0 |
| | 350 | 800 | 407,5 | 455 | 830 | 520 | 470 | 16 | 26 | 438x4 | 30 | 483,0 | 502,0 |
| 25 | 400 | 900 | 444,5 | 505 | 930 | 580 | 525 | 16 | 30 | 490x4 | 32 | 610,0 | 635,0 |
| | 50 | 230 | 148,5 | 180 | 210 | 165 | 125 | 4 | 18 | 102x3 | 20 | 24,0 | 27,0 |
| | 80 | 310 | 175 | 215 | 280 | 200 | 160 | 8 | 18 | 138x3 | 24 | 44,0 | 48,0 |
| | 100 | 350 | 195 | 255 | 350 | 235 | 190 | 8 | 22 | 162x3 | 24 | 66,0 | 71,0 |
| | 150 | 480 | 258 | 290 | 430 | 300 | 250 | 8 | 26 | 218x3 | 28 | 115,0 | 122,0 |
| | 200 | 600 | 293 | 325 | 550 | 360 | 310 | 12 | 26 | 278x3 | 30 | 181,0 | 191,0 |
| | 250 | 730 | 330 | 355 | 730 | 425 | 370 | 12 | 30 | 355x3 | 32 | 326,0 | 338,0 |
| | 300 | 850 | 388,5 | 405 | 750 | 485 | 430 | 16 | 30 | 395x4 | 34 | 504,0 | 517,0 |
| | 350 | 980 | 490 | 510 | 830 | 555 | 490 | 16 | 33 | 450x4 | 38 | 693,0 | 712,0 |
| 40 | 400 | 1100 | 515,5 | 545 | 930 | 620 | 550 | 16 | 36 | 505x4 | 40 | 847,0 | 872,0 |
| | 50 | 230 | 148,5 | 180 | 210 | 165 | 125 | 4 | 18 | 102x3 | 20 | 24,0 | 27,0 |
| | 80 | 310 | 175 | 215 | 280 | 200 | 160 | 8 | 18 | 138x3 | 24 | 44,0 | 48,0 |
| | 100 | 350 | 195 | 255 | 350 | 235 | 190 | 8 | 22 | 162x3 | 24 | 66,0 | 71,0 |
| | 150 | 480 | 258 | 290 | 430 | 300 | 250 | 8 | 26 | 218x3 | 28 | 115,0 | 122,0 |
| | 200 | 600 | 304 | 325 | 550 | 375 | 320 | 12 | 30 | 285x3 | 34 | 181,0 | 191,0 |
| | 250 | 730 | 348 | 355 | 730 | 450 | 385 | 12 | 33 | 345x3 | 38 | 326,0 | 338,0 |
| | 300 | 850 | 406,5 | 405 | 750 | 515 | 450 | 16 | 33 | 410x4 | 42 | 504,0 | 517,0 |
| | 350 | 980 | 490 | 510 | 830 | 580 | 510 | 16 | 36 | 465x4 | 46 | 795,0 | 814,0 |
| 400 | 1100 | 585 | 545 | 930 | 660 | 585 | 16 | 39 | 535x4 | 50 | 930,0 | 955,0 | |

m1 – mass of swing check valve without lever and weight

m2 – mass of swing check valve with lever and weight

SWING CHECK VALVE L30

| Nominal pressure | Nominal size | Face-to-face | Centre-to-top | | | | Flange | Pitch diameter | Number of holes | Hole | Smooth bar | Flange thickness | Approximate weight | |
|------------------|--------------|--------------|---------------|-------|-----|-----|--------|----------------|-----------------|------|------------|------------------|--------------------|-------|
| | | | h1 | h2 | e1 | e2 | | | | | | | ∅D | ∅k |
| 63 | 50 | 300 | 157,5 | 90 | *) | | 180 | 135 | 4 | 22 | 102x3 | 26 | 29 | 32 |
| | 65 | 340 | 197 | 102,5 | | | 205 | 160 | 8 | 22 | 122x3 | 26 | 46 | 50 |
| | 100 | 430 | 220 | 125 | 255 | 350 | 250 | 200 | 8 | 26 | 162x3 | 30 | 79,0 | 82,0 |
| | 150 | 550 | 284 | 172,5 | 295 | 430 | 345 | 280 | 8 | 33 | 218x3 | 36 | 191,0 | 196,0 |
| | 200 | 650 | 329 | 207,5 | 340 | 550 | 415 | 345 | 12 | 36 | 285x3 | 42 | 296,0 | 303,0 |
| | 250 | 775 | 364 | 235 | 355 | 730 | 470 | 400 | 12 | 36 | 345x3 | 46 | 406,0 | 416,0 |
| | 300 | 900 | 473,5 | 230 | 410 | 750 | 530 | 460 | 16 | 36 | 410x4 | 52 | 705,0 | 717,0 |
| | 350 | 1025 | 500 | 262,5 | 470 | 830 | 600 | 525 | 16 | 39 | 465x4 | 56 | 856,0 | 875,0 |
| 100 | 50 | 300 | 174,5 | 97,5 | 180 | 180 | 195 | 145 | 4 | 26 | 102x3 | 28 | 32,0 | 35,0 |
| | 65 | 340 | 201 | 110 | 200 | 211 | 220 | 170 | 8 | 26 | 122x3 | 30 | 45,0 | 48,0 |
| | 80 | 380 | 203,5 | 115 | 235 | 280 | 230 | 180 | 8 | 26 | 138x3 | 32 | 60,0 | 63,0 |
| | 100 | 430 | 236 | 132,5 | 255 | 350 | 265 | 210 | 8 | 30 | 162x3 | 36 | 104,0 | 107,0 |
| | 125 | 500 | 305 | 157,5 | 260 | 430 | 315 | 250 | 8 | 33 | 188x3 | 40 | 150,0 | 154,0 |
| | 150 | 550 | 309 | 177,5 | 295 | 430 | 355 | 290 | 12 | 33 | 218x3 | 44 | 233,0 | 238,0 |
| | 200 | 650 | 367 | 215 | 340 | 550 | 430 | 360 | 12 | 36 | 285x3 | 52 | 422,0 | 429,0 |
| | 250 | 775 | 424 | 252,5 | 395 | 750 | 505 | 430 | 12 | 39 | 345x3 | 60 | 627,0 | 637,0 |

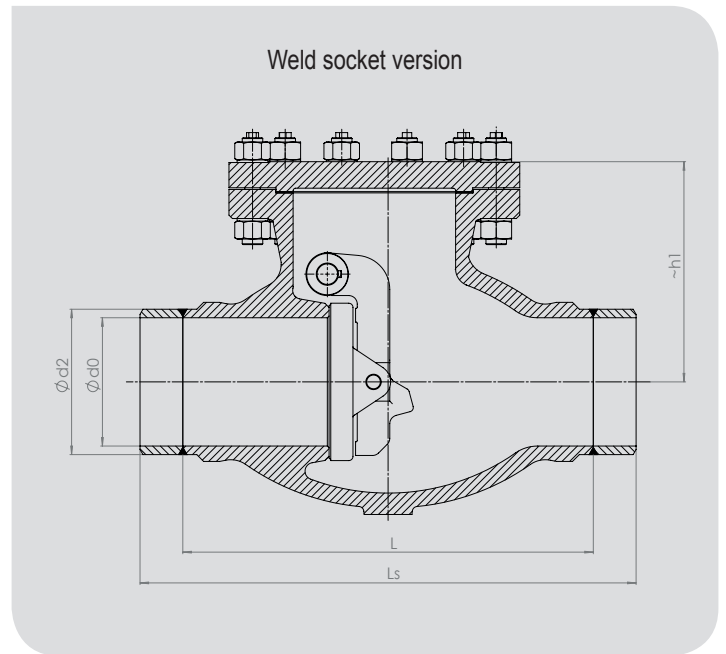
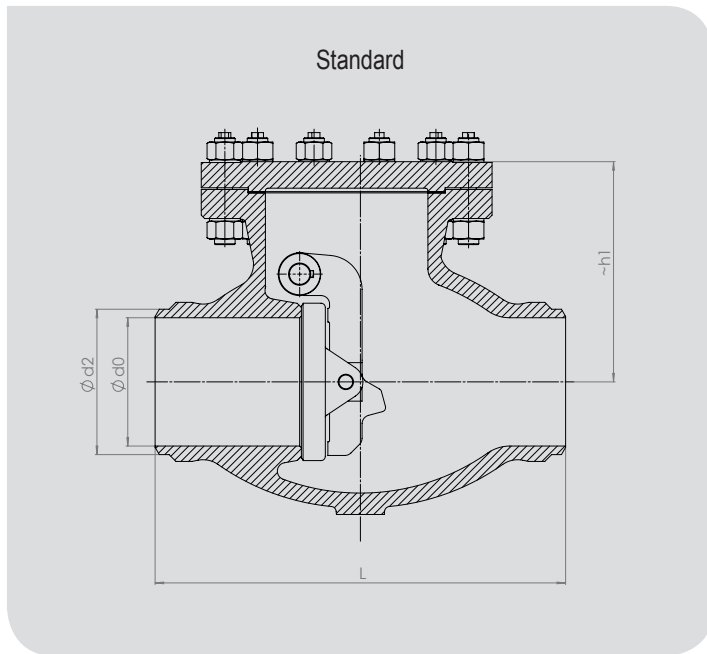
m1 – mass of swing check valve without lever and weight

m2 – mass of swing check valve with lever and weight

*) missing data on request

SWING CHECK VALVE L30

WELD ENDS



| Nominal pressure | Nominal size | Face-to-face | Centre-to-top | Approximate weight | Nominal pressure | Nominal size | Face-to-face | Centre-to-top | Approximate weight |
|------------------|--------------|--------------|---------------|--------------------|------------------|--------------|--------------|---------------|--------------------|
| PN | DN | L | h1 | m | PN | DN | L | h1 | m |
| 16 | 50 | 200 | 123,5 | 13,0 | 25 | 50 | 230 | 148,5 | 21,0 |
| | 65 | 240 | 139 | 23,0 | | 65 | - | - | - |
| | 80 | 260 | 164,5 | 26,0 | | 80 | 310 | 175 | 39,0 |
| | 100 | 300 | 176 | 36,5 | | 100 | 350 | 195 | 59,0 |
| | 125 | 350 | 197 | 52,5 | | 125 | - | - | - |
| | 150 | 400 | 235 | 81,0 | | 150 | 480 | 258 | 103,0 |
| | 200 | 500 | 263 | 127,0 | | 200 | 600 | 293 | 164,0 |
| | 250 | 600 | 300,5 | 183,0 | | 250 | 730 | 330 | 302,0 |
| | 300 | 700 | 375,5 | 276,0 | | 300 | 850 | 388,5 | 472,0 |
| | 350 | 800 | 407,5 | 451,0 | | 350 | 980 | 490 | 645,0 |
| 400 | 900 | 444,5 | 570,0 | 400 | 1100 | 515,5 | 784,0 | | |

SWING CHECK VALVE L30

| Nominal pressure | Nominal size | Face-to-face | Centre-to-top | Approximate weight | Nominal pressure | Nominal size | Face-to-face | Centre-to-top | Approximate weight | Nominal pressure | Nominal size | Face-to-face | Centre-to-top | Approximate weight |
|------------------|--------------|--------------|---------------|--------------------|------------------|--------------|--------------|---------------|--------------------|------------------|--------------|--------------|---------------|--------------------|
| PN | DN | L | h_1 | m | PN | DN | L | h_1 | m | PN | DN | L | h_1 | m |
| 40 | 50 | 230 | 148,5 | 21,0 | 63 | 50 | 300 | 157,5 | 26,0 | 100 | 50 | 300 | 174,5 | 26,0 |
| | 65 | - | - | - | | 65 | 340 | 197 | 38,0 | | 65 | 340 | 201 | 38,0 |
| | 80 | 310 | 175 | 39,0 | | 80 | - | - | - | | 80 | 380 | 203,5 | 51,0 |
| | 100 | 350 | 195 | 59,0 | | 100 | 430 | 220 | 70,0 | | 100 | 430 | 236 | 91,0 |
| | 125 | - | - | - | | 125 | - | - | - | | 125 | 500 | 305 | 129,0 |
| | 150 | 480 | 258 | 103,0 | | 150 | 550 | 284 | 170,0 | | 150 | 550 | 309 | 205,0 |
| | 200 | 600 | 304 | 159,0 | | 200 | 650 | 329 | 262,0 | | 200 | 650 | 367 | 372,0 |
| | 250 | 730 | 348 | 290,0 | | 250 | 775 | 364 | 358,0 | | 250 | 775 | 424 | 546,0 |
| | 300 | 850 | 406,5 | 457,0 | | 300 | 900 | 473,5 | 638,0 | | 300 | - | - | - |
| | 350 | 980 | 490 | 726,0 | | 350 | 1025 | 500 | 780,0 | | 350 | - | - | - |
| 400 | 1100 | 585 | 832,0 | 400 | - | - | - | 400 | - | - | - | | | |

| Nominal size | Weld ends according to DIN 3239-1 Groove form according to DIN 2559-sheet 1, form 22 | | | | Associated pipe dimension | | |
|--------------|---|------------------------|----------|-----------|---------------------------|------------|------------|
| | | PN16, PN25, PN40 | PN 63 | PN 100 | PN16, PN25, PN40 | PN 63 | PN 100 |
| DN | $\varnothing d_2$ | $\varnothing d_0^{1)}$ | | | | | |
| 50 | 61 | 54,5 | 54 | 51,5 | 60,3x2,9 | 60,3x3,2 | 60,3x4,5 |
| 65 | 77 | 69,5 | 69 | 66,5 | 76,1x3,2 | 76,1x3,6 | 76,1x5,0 |
| 80 | 90 | 81,5 | 81 | 78 | 88,9x3,6 | 88,9x4,0 | 88,9x5,6 |
| 100 | 115 | 106 | 104 | 100 | 114,3x4,0 | 114,3x5,0 | 114,3x7,0 |
| 125 | 141 | 130,5 | 128,5 | 124 | 139,7x4,5 | 139,7x5,6 | 139,7x8,0 |
| 150 | 170 | 158 | 154 | 149 | 168,3x5,0 | 168,3x7,0 | 168,3x10,0 |
| 200 | 222 | 206 | 203 | 195 | 219,1x6,3 | 219,1x8,0 | 219,1x12,5 |
| 250 | 276 | 258 | 253 | 242,5 | 273x7,0 | 273x10,0 | 273x16,0 |
| 300 | 325 | 306,5 | 298,5 | 290 | 323,9x8,0 | 323,9x12,5 | 323,9x18,0 |
| 350 | 359 | 336,5 | 330 | 321 | 355,6x9,0 | 355,6x12,5 | 355,6x20,0 |
| 400 | 411 | 383 | 377 | 367 | 406,4x11,0 | 406,4x14,0 | 406,4x20,0 |

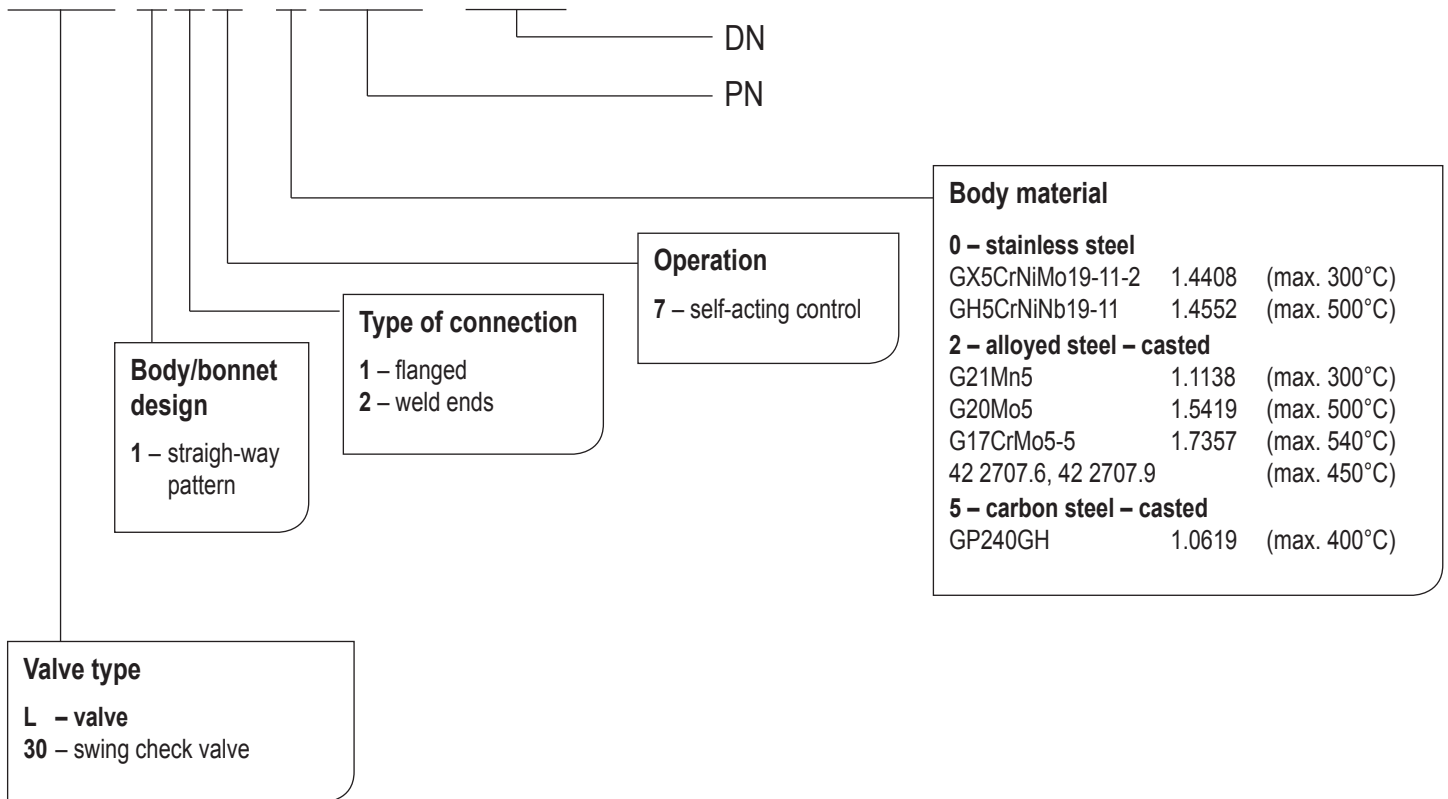
1) $d_0 = d_p$ according to DIN 3239

Bold framed - ČSN 13 1075 (DIN3239-1 not stated)

SWING CHECK VALVE L30

VALVE DESCRIPTION CODE

L30 117-5100-150



VALVE INSTALLATION

The swing check valve should be installed horizontally (cover vertically up). Valves are mounted on straight sections of the pipeline with unobstructed flow of medium. Installation of the pipeline should exclude forces, moments and vibrations acting on valves.

It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- the medium used must be comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

SWING CHECK VALVE L43

PN 160–320; DN 50/50–350/275; T_{MAX}: 600 °C



SWING CHECK VALVE L43

APPLICATION

- water, steam, gas and other substances used in power engineering, chemical industry and other industries

CONNECTION

- flanged, weld ends

OPERATION

- self-acting control

DESCRIPTION

- self-sealing bonnet
- sealing surface is welded by hard facing Stellite 6
- complies with the requirements of directive 2014/68/EU
- testing is carried out according to standard EN 12266-1, part 2

BASIC DESIGN OPTIONS

- with by-pass

SWING CHECK VALVE L43

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | | |
|--------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -10 | 20 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 480 | 500 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 |
| 1.0460 (P250GH) | 160 | 160 | 160 | 160 | 148 | 135 | 120 | 105 | 88 | 70 | 51 | - | - | - | - | - | - | - | - | - | - |
| | 250 | 250 | 250 | 250 | 230 | 211 | 188 | 164 | 137 | 109 | 80 | - | - | - | - | - | - | - | - | - | - |
| | 320 | 320 | 320 | 320 | 295 | 270 | 240 | 210 | 175 | 140 | 102 | - | - | - | - | - | - | - | - | - | - |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | | | |
|------------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -10 | 20 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 480 | 500 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 | 600 |
| 1.7383 (11CrMo9-10) | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 145 | 123 | 109 | 100 | 80 | 70 | 60 | 50 | 45 | 40 | 35 | 30 | 25 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 227 | 191 | 170 | 156 | 125 | 109 | 94 | 78 | 70 | 63 | 55 | 47 | 39 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 290 | 245 | 218 | 200 | 160 | 140 | 120 | 100 | 90 | 80 | 70 | 60 | 50 |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | | | |
|----------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -10 | 20 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 480 | 500 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 | 600 |
| 1.7715 (14MoV6-3) | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 154 | 150 | 147 | 117 | 101 | 86 | 76 | 66 | 56 | - | - | - |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 240 | 234 | 230 | 182 | 158 | 134 | 119 | 103 | 87 | - | - | - |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 307 | 299 | 294 | 233 | 202 | 172 | 152 | 132 | 111 | - | - | - |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | | | |
|-------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -10 | 20 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 480 | 500 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 | 600 |
| 1.5415 (16Mo3) | 160 | 160 | 160 | 160 | 160 | 145 | 130 | 115 | 111 | 107 | 89 | 78 | 71 | 48 | 36 | - | - | - | - | - | - | - |
| | 250 | 250 | 250 | 250 | 250 | 227 | 203 | 179 | 173 | 166 | 139 | 122 | 111 | 74 | 56 | - | - | - | - | - | - | - |
| | 320 | 320 | 320 | 320 | 320 | 290 | 260 | 229 | 221 | 213 | 178 | 156 | 142 | 95 | 72 | - | - | - | - | - | - | - |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | | | |
|-----------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -10 | 20 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 480 | 500 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 | 600 |
| 1.7335 (13CrMo4-5) | 160 | 160 | 160 | 160 | 160 | 160 | 151 | 141 | 133 | 126 | 115 | 109 | 105 | 76 | 61 | 47 | 40 | 33 | 25 | - | - | - |
| | 250 | 250 | 250 | 250 | 250 | 250 | 235 | 220 | 208 | 196 | 180 | 170 | 163 | 118 | 95 | 73 | 62 | 51 | 39 | - | - | - |
| | 320 | 320 | 320 | 320 | 320 | 320 | 301 | 282 | 266 | 251 | 230 | 217 | 209 | 151 | 122 | 93 | 79 | 65 | 50 | - | - | - |

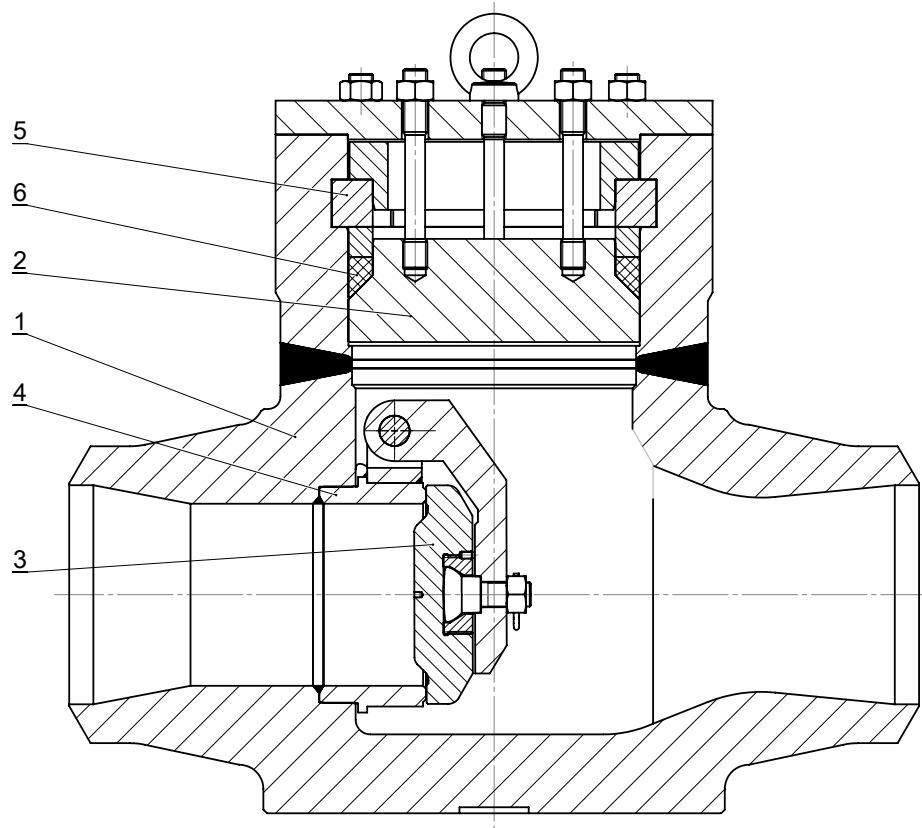
| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | |
|----------------------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 530 | 550 | 570 | 590 | 600 |
| 1.6368 (155NiCuMoNb 5-6-4) | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 154 | 151 | 148 | 145 | - | - | - | - | - | |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 241 | 236 | 231 | 227 | - | - | - | - | - | |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 308 | 302 | 296 | 290 | - | - | - | - | - | |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | |
|-------------------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 530 | 550 | 570 | 590 | 600 |
| 1.4903 (X10CrMoVNb 9-1) | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 144 | 118 | 100 | 82 | 65 | 56 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 225 | 184 | 156 | 129 | 101 | 88 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 288 | 235 | 200 | 165 | 130 | 112 |

Others materials on request

SWING CHECK VALVE L43

USED MATERIALS



| Pos. | Part | Material | | | | |
|------|----------------------|--|--|--------------------------------------|-----------------------------------|---------------------------------------|
| | | T _{max.} 450°C | T _{max.} 600°C | T _{max.} 570°C | T _{max.} 530°C | T _{max.} 570°C |
| 1 | Body | 1.0460 (P250GH) | 1.7383 (11CrMo9-10) | 1.7715 (14MoV6-3) | 1.5415 (16Mo3) | 1.7335 (13CrMo4-5) |
| 2 | Pressure seal bonnet | 1.0460 (P250GH) | 1.7383 (11CrMo9-10) | 1.7715 (14MoV6-3) | 1.5415 (16Mo3) | 1.7335 (13CrMo4-5) |
| 3 | Disc + weld-on | 1.0460, 1.0425 (P250GH) + Stellite 6 | 1.7383 (11CrMo9-10) + Stellite 6 | 1.7715 (14MoV6-3) + Stellite 6 | 1.5415 (16Mo3) + Stellite 6 | 1.7335 (13CrMo4-5) + Stellite 6 |
| 4 | Seat + weld-on | 1.0460 + Stellite 6 | 1.7383 (11CrMo9-10) + Stellite 6 | 1.7715 (14MoV6-3) + Stellite 6 | 1.5415 (16Mo3) + Stellite 6 | 1.7335 (13CrMo4-5) + Stellite 6 |
| 5 | Divided ring | 1.7715 | 1.7383 (11CrMo9-10) | 1.7715 (14MoV6-3) | 1.5415 (16Mo3) | 1.7335 (13CrMo4-5) |
| 6 | Bonnet sealing | Pressed graphite | Pressed graphite | Pressed graphite | Pressed graphite | Pressed graphite |

Material upon request 1.6368, 1.4903

SWING CHECK VALVE L43

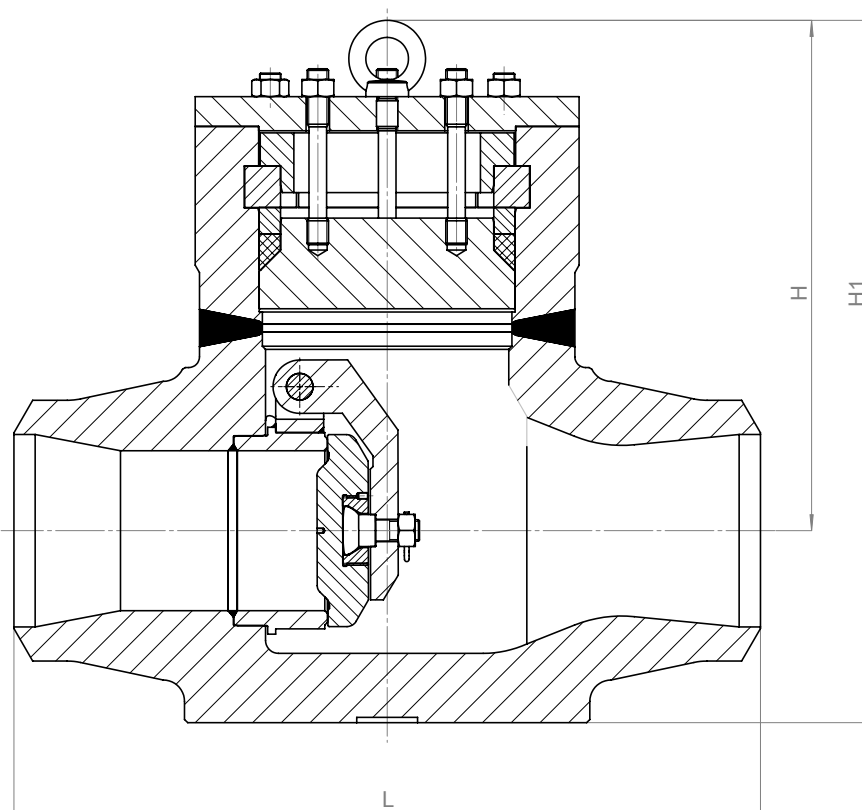
VALVE DIMENSIONS

Weld ends

Face-to-face dimensions: as per table (possible adjustments according to the customer's requirements)

Weld ends: as per table (d2, d0 comply with the pressure-temperature system L43)

Groove form: DIN 2559 – sheet 1 – form 22



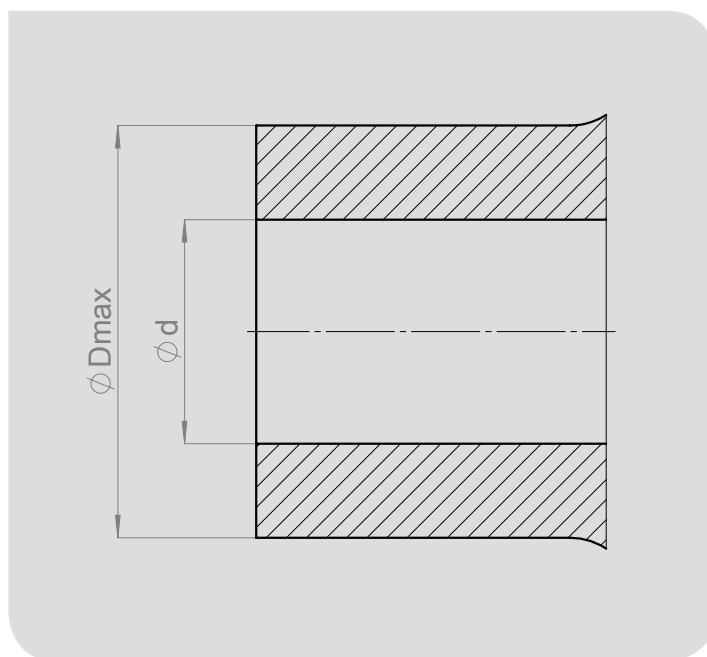
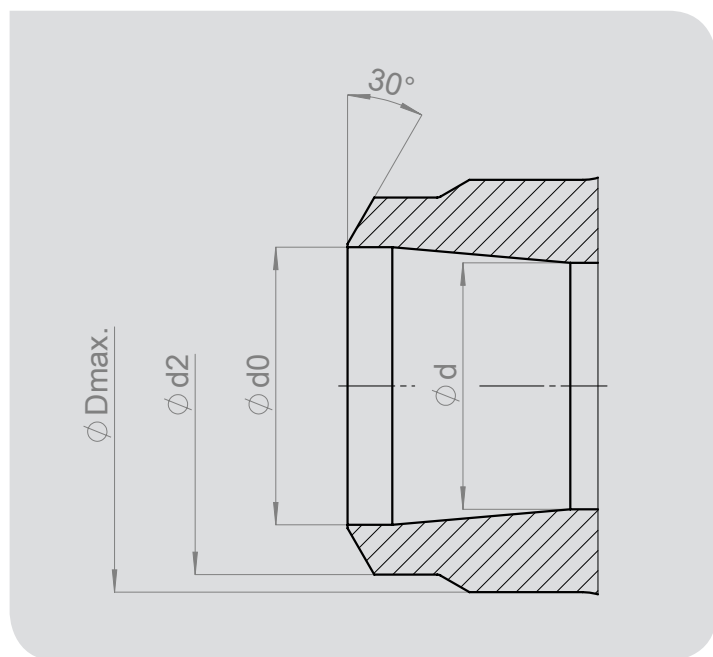
| DN/d | L [mm] | H [mm] | H1 [mm] | ζ | Weight [kg] |
|---------|--------|--------|---------|---------|-------------|
| 50/50 | 300 | 220 | 280 | 0,41 | 38 |
| 65/50 | 340 | 220 | 280 | 0,94 | 40 |
| 80/65 | 390 | | | | |
| 100/80 | 450 | 297 | 393 | 1,27 | 94 |
| 125/110 | 550 | 360 | 490 | 0,65 | 186 |
| 150/125 | 550 | 400 | 555 | 0,62 | 255 |
| 200/150 | 700 | 480 | 660 | 0,87 | 450 |
| 250/200 | 850 | 530 | 745 | 0,67 | 725 |
| 300/250 | 1000 | | | | |
| 350/275 | 1200 | | | | |

Total loss coefficient ζ of the gate valves is calculated for the DN/d dimensions

L can be adjusted according to the customer's requirements

SWING CHECK VALVE L43

WELD ENDS



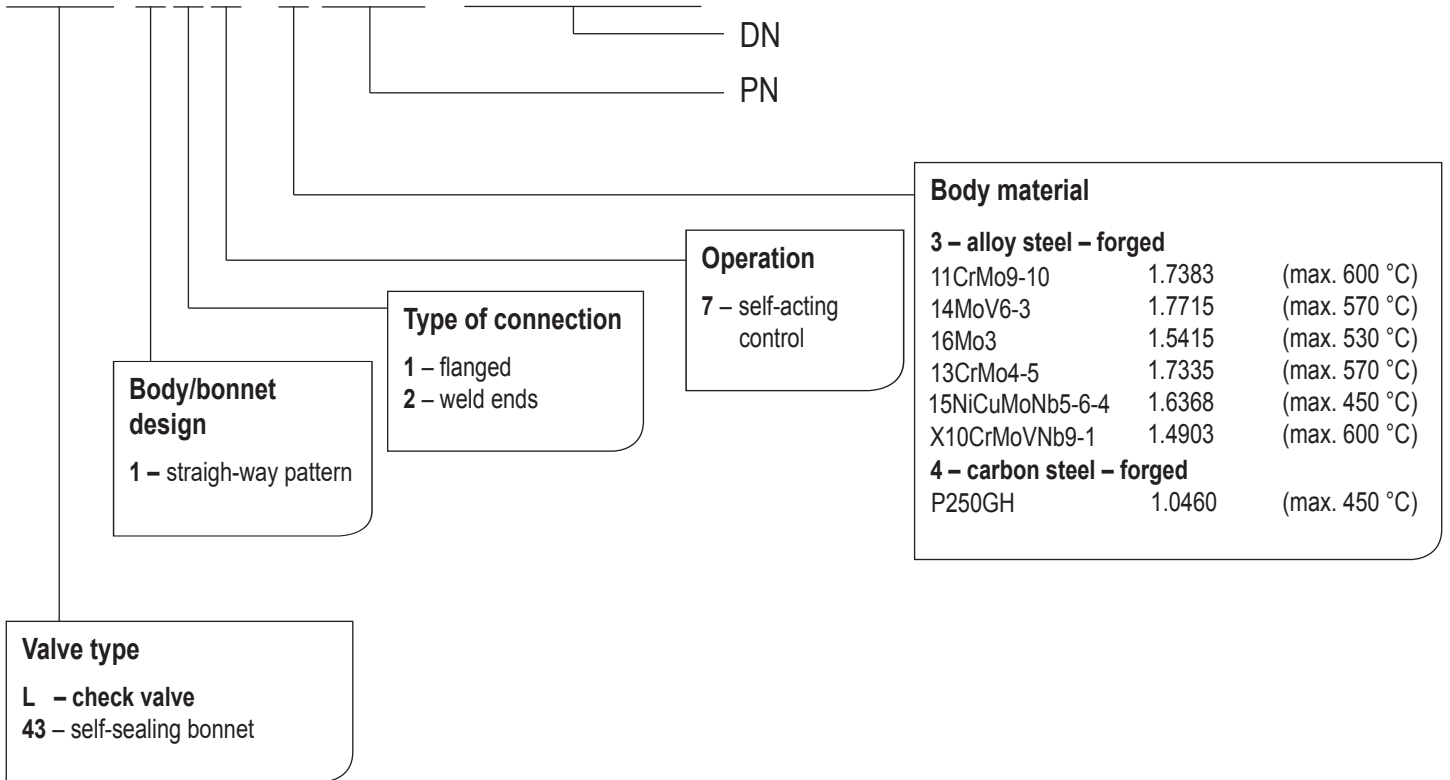
| DN/d | PN | D_{max}/d | d_2 | d_0 |
|---------|-----|-------------|-------|-------|
| 50/50 | 160 | 92/50 | 60,3 | 50,3 |
| | 250 | | 63,5 | 47,5 |
| | 320 | | 70 | 50 |
| 65/50 | 160 | 92/50 | 76,1 | 63,5 |
| | 250 | | 76,1 | 58,5 |
| | 320 | | 88,9 | 63,9 |
| 80/65 | 160 | 110/65 | 88,9 | 74,7 |
| | 250 | | 101,6 | 76,6 |
| | 320 | | 101,6 | 73,2 |
| 100/80 | 160 | 136/80 | 114,3 | 96,7 |
| | 250 | | 127 | 98,6 |
| | 320 | | 133 | 98 |
| 125/110 | 160 | 184/110 | 139,7 | 117,7 |
| | 250 | | 152,4 | 117,4 |
| | 320 | | 168,3 | 123,9 |

| DN/d | PN | D_{max}/d | d_2 | d_0 |
|---------|-----|-------------|-------|-------|
| 150/125 | 160 | 210/125 | 168,3 | 143,3 |
| | 250 | | 177,8 | 137,8 |
| | 320 | | 193,7 | 143,7 |
| 200/150 | 160 | 245/150 | 219,1 | 183,1 |
| | 250 | | 244,5 | 188,5 |
| | 320 | | 244,5 | 180,5 |
| 250/200 | 160 | 325/200 | 273 | 229 |
| | 250 | | 298,5 | 234,5 |
| | 320 | | 323,9 | 233,9 |
| 300/250 | 160 | 372/250 | 323,9 | 273,9 |
| | 250 | | 355,6 | 283,6 |
| | 320 | | 355,6 | 265,6 |
| 350/275 | 160 | 420/275 | 355,6 | 299,6 |
| | 250 | | 406,4 | 316,4 |
| | 320 | | 406,4 | 296,4 |

SWING CHECK VALVE L43

VALVE DESCRIPTION CODE

L43 127-3320-150/125



VALVE INSTALLATION

Swing check valve must be installed horizontally – by cover perpendicular up. Vertical pipe mounting is only possible if the medium is flowing from the bottom up. The swing check valves are mounted in straight pipe sections with undisturbed working fluid flow. Pipe mounting and mounting must eliminate forces, torques and vibration on the valves.

It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- the medium used must be comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

LIFT CHECK VALVE C09

PN 10–40; DN 15–200; T_{max}: 400 °C



LIFT CHECK VALVE C09

APPLICATION

- water, steam, aggressive and non-aggressive substances

CONNECTION

- weld ends, flanged

OPERATION

- self-acting control

DESCRIPTION

- design of the body is straight sealing
- check valve disc with spring
- with spring, the valve can be mounted in position both horizontal and vertical
- sealing surface is welded by hard facing (13Cr) - except stainless steel design
- complies with the requirements of the directive 2014/68/EU and standard EN 16767
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

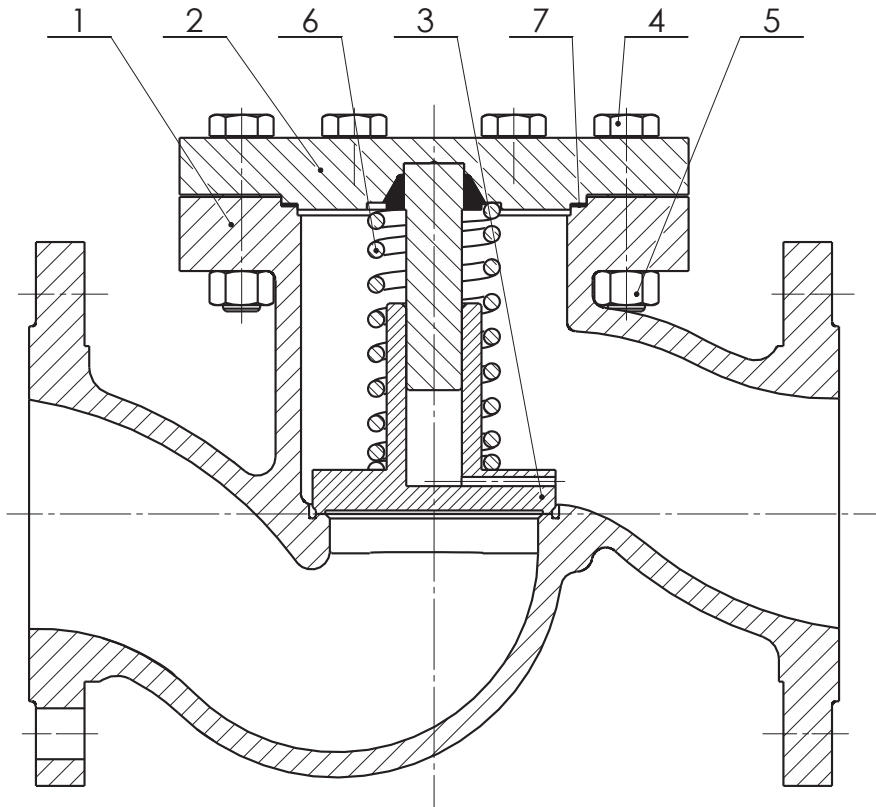
- without oil and grease
- delivery according to TRD 201, TP TC-010/2011, TP TC-032/2013 on request

LIFT CHECK VALVE C09

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | |
|-------------------------------|----|---|-----|-----|------|------|------|------|------|------|-----|------|
| | | -50 | -30 | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 |
| GX5CrNiMo 19-11-2 (1.4408) | 10 | 10 | 10 | 10 | 10 | 9,3 | 8,4 | 7,8 | 7,3 | - | - | - |
| | 16 | 16 | 16 | 16 | 16 | 14,9 | 13,5 | 12,4 | 11,7 | - | - | - |
| | 25 | 25 | 25 | 25 | 25 | 23,3 | 21,1 | 19,4 | 18,3 | - | - | - |
| | 40 | 40 | 40 | 40 | 40 | 37,3 | 33,8 | 31,1 | 29,3 | - | - | - |
| GX5CrNi19-10 (1.4308) | 10 | 10 | 10 | 10 | 9,3 | 8,4 | 7,6 | 6,9 | 6,4 | - | - | - |
| | 16 | 16 | 16 | 16 | 14,9 | 13,5 | 12,1 | 11 | 10,3 | - | - | - |
| | 25 | 25 | 25 | 25 | 23,3 | 21,1 | 18,9 | 17,2 | 16,1 | - | - | - |
| | 40 | 40 | 40 | 40 | 37,3 | 33,8 | 30,2 | 27,6 | 25,8 | - | - | - |
| G21Mn5 (1.1138) | 10 | - | 10 | 10 | 10 | 9,2 | 8,7 | 7,9 | 7,2 | 6,5 | - | - |
| | 16 | - | 16 | 16 | 16 | 14,8 | 14 | 12,8 | 11,8 | 10,8 | - | - |
| | 25 | - | 25 | 25 | 25 | 23 | 21 | 19,2 | 18,2 | 17,2 | - | - |
| | 40 | - | 40 | 40 | 40 | 37 | 35 | 32 | 29,5 | 27 | - | - |
| GP240GH (1.0619) | 10 | - | - | 10 | 10 | 9,3 | 8,7 | 7,8 | 7,1 | 6,4 | 6 | 5,8 |
| | 16 | - | - | 16 | 16 | 14,9 | 13,9 | 12,4 | 11,4 | 10,3 | 9,6 | 9,2 |
| | 25 | - | - | 25 | 25 | 23,3 | 21,7 | 19,4 | 17,8 | 16,1 | 15 | 14,4 |
| | 40 | - | - | 40 | 40 | 37,3 | 34,7 | 30,2 | 28,4 | 25,8 | 24 | 23,1 |

USED MATERIALS



LIFT CHECK VALVE C09

| Pos. | Part | Material | | | |
|------|--------------------------------|--|--|------------------------------------|------------------------------------|
| 1 | Body | GX5CrNiMo19-11-2 (1.4408) | GX5CrNi19-10 (1.4308) | G21Mn5 (1.1138) | GP240GH (1.0619) |
| | Hard facing of sealing surface | - | - | 13Cr | 13Cr |
| 2 | Cover | X 6CrNiTi 18-10, X6CrNiMoTi 17-12-2 (1.4541, 1.4571) | X 6CrNiTi 18-10, X6CrNiMoTi 17-12-2 (1.4541, 1.4571) | P250GH, P265GH (1.0460, 1.0425) | P250GH, P265GH (1.0460, 1.0425) |
| 3 | Disc | X 6CrNiTi 18-10 (1.4541) | X 6CrNiTi 18-10 (1.4541) | X 6CrNiTi 18-10 (1.4541) | X 6CrNiTi 18-10 (1.4541) |
| 4 | Bolt | A2-70 | | | |
| 5 | Hex. nut | A2-70 | | | |
| 6 | Spring ¹⁾ | X10CrNi 18-8 (1.4310) | | | |
| 7 | Gasket | PTFE | | Graphite | |

1) For DN 150 and DN 200 on request

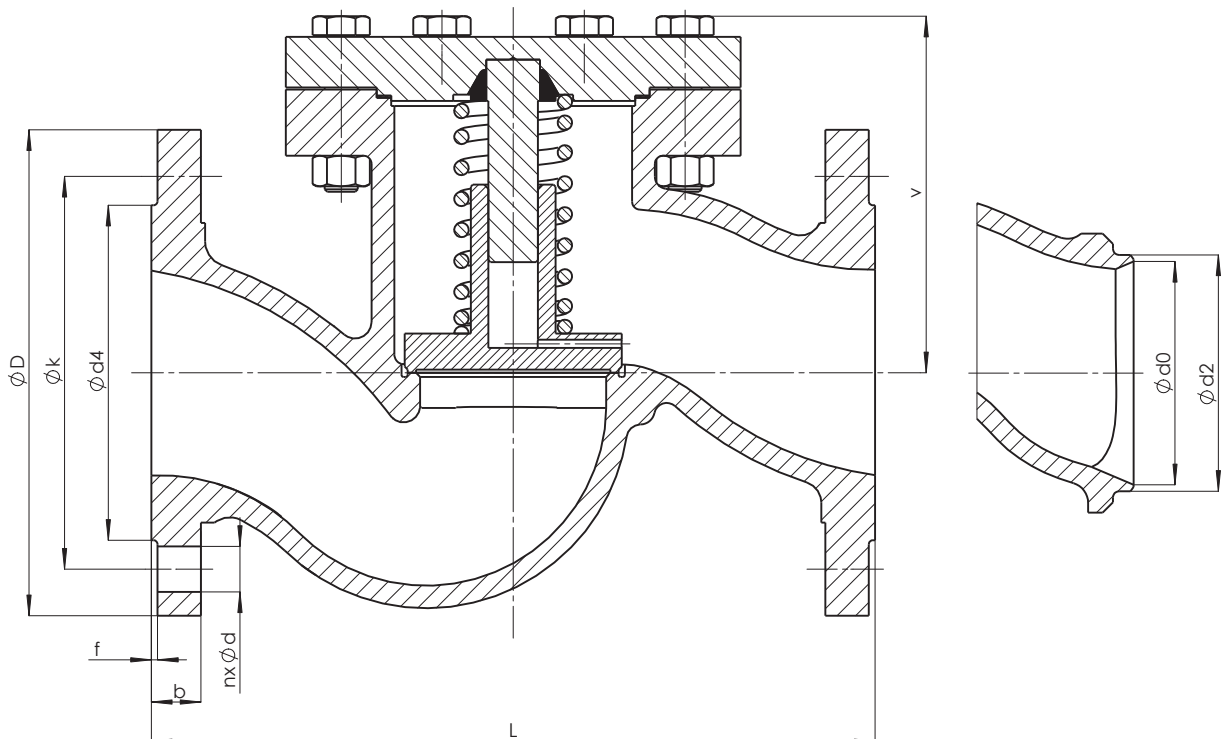
VALVE DIMENSIONS

1. Flanged

Face-to-face dimension: EN 558 – line 1
Flanges: EN 1092-1

2. Weld ends

Face-to-face dimension: EN 12982 – line 1
Weld ends: DIN 3239 – part 1
Groove form: DIN 2559 – sheet 1 – form 22



LIFT CHECK VALVE C09

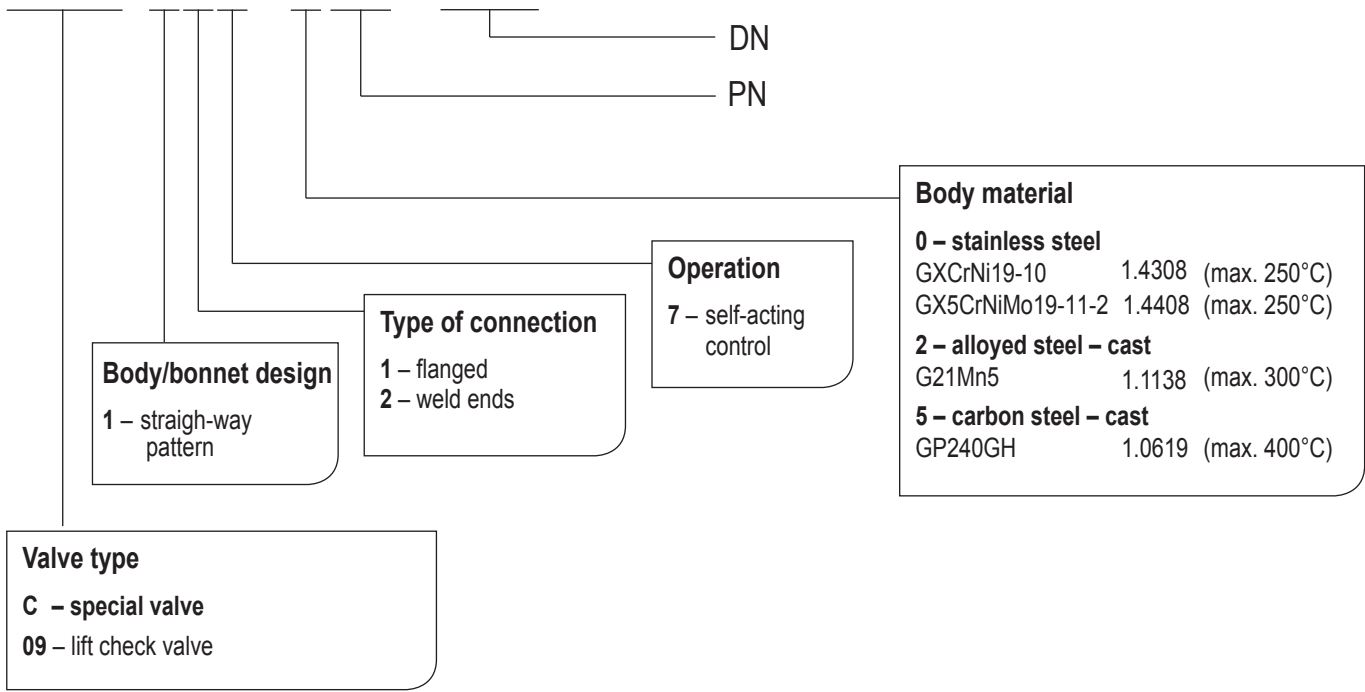
| Nominal pressure | Nominal size | Face-to-face | Centre-to-top-height | Flanged | | | | | | | Weld ends | | | |
|------------------|--------------|--------------|----------------------|---------|-----|--------|--------|-------|--------|--------|-----------|--------|-----------|-----------|
| | | | | PN | DN | L [mm] | V [mm] | n | d [mm] | k [mm] | D [mm] | b [mm] | d4×f [mm] | m [kg] |
| 10, 16 | 15 | 130 | 70 | 4 | 14 | 65 | 95 | 16 | 45×2 | 2,7 | 22 | 17 | - | 21,3×2,0 |
| | 20 | 150 | 80 | 4 | 14 | 75 | 105 | 18 | 58×2 | 4,3 | 28 | 22 | - | 26,9×2,3 |
| | 25 | 160 | 85 | 4 | 14 | 85 | 115 | 18 | 68×2 | 5,0 | 34 | 28,5 | - | 33,7×2,6 |
| | 32 | 180 | 95 | 4 | 18 | 100 | 140 | 18 | 78×2 | 7,0 | 43 | 37 | - | 42,4×2,6 |
| | 40 | 200 | 105 | 4 | 18 | 110 | 150 | 18 | 88×3 | 9,0 | 49 | 43 | - | 48,3×2,6 |
| | 50 | 230 | 125 | 4 | 18 | 125 | 165 | 18 | 102×3 | 13,0 | 61 | 54 | - | 60,3×3,2 |
| | 65 | 290 | 140 | 8 | 18 | 145 | 185 | 18 | 122×3 | 17,0 | 77 | 69 | 12,0 | 76,1×3,6 |
| | 80 | 310 | 145 | 8 | 18 | 160 | 200 | 20 | 138×3 | 23,0 | 90 | 81 | 17,0 | 88,9×4,0 |
| | 100 | 350 | 175 | 8 | 18 | 180 | 220 | 20 | 158×3 | 31,0 | 115 | 104 | 24,0 | 114,3×5,0 |
| | 125 | 400 | 250 | 8 | 18 | 210 | 250 | 22 | 188×3 | 47,0 | 141 | 130,5 | 37,0 | 139,7×4,5 |
| | 150 | 480 | 280 | 8 | 22 | 240 | 285 | 22 | 212×3 | 69,0 | 170 | 156,5 | 56,0 | 168,3×5,6 |
| 200 | 600 | 340 | 12 | 22 | 295 | 340 | 24 | 268×3 | 156,0 | 222 | 204,5 | - | 219,1×7,1 | |
| 25, 40 | 15 | 130 | 70 | 4 | 14 | 65 | 95 | 16 | 45×2 | 2,7 | 22 | 17 | 1,5 | 21,3×2,0 |
| | 20 | 150 | 80 | 4 | 14 | 75 | 105 | 18 | 58×2 | 4,3 | 28 | 22 | 3,0 | 26,9×2,3 |
| | 25 | 160 | 85 | 4 | 14 | 85 | 115 | 18 | 68×2 | 5,0 | 34 | 28,5 | 3,0 | 33,7×2,6 |
| | 32 | 180 | 95 | 4 | 18 | 100 | 140 | 18 | 78×2 | 7,0 | 43 | 37 | 4,0 | 42,4×2,6 |
| | 40 | 200 | 105 | 4 | 18 | 110 | 150 | 18 | 88×3 | 9,0 | 49 | 43 | 5,0 | 48,3×2,6 |
| | 50 | 230 | 125 | 4 | 18 | 125 | 165 | 20 | 102×3 | 13,0 | 61 | 54 | 9,0 | 60,3×3,2 |
| | 65 | 290 | 150 | 8 | 18 | 145 | 185 | 22 | 122×3 | 27,0 | 77 | 69 | 20,0 | 76,1×3,6 |
| | 80 | 310 | 155 | 8 | 18 | 160 | 200 | 24 | 138×3 | 31,0 | 90 | 81 | 22,0 | 88,9×4,0 |
| | 100 | 350 | 175 | 8 | 22 | 190 | 235 | 24 | 162×3 | 42,0 | 115 | 104 | 32,0 | 114,3×5,0 |
| | 125 | 400 | 215 | 8 | 26 | 220 | 270 | 26 | 188×3 | 62,0 | 141 | 130,5 | 49,0 | 139,7×4,5 |
| 150 | 480 | 245 | 8 | 26 | 250 | 300 | 28 | 218×3 | 84,0 | 170 | 156,5 | 67,0 | 168,3×5,6 | |
| 25 | 200 | 600 | 340 | 12 | 26 | 310 | 360 | 30 | 278×3 | 170,0 | 222 | 204,5 | 146,0 | 219,1×7,1 |
| 40 | 200 | 600 | 340 | 12 | 30 | 320 | 375 | 34 | 285×3 | 175,0 | 222 | 204,5 | 146,0 | 219,1×7,1 |

Missing parameters on your request

LIFT CHECK VALVE C09

VALVE DESCRIPTION CODE

C09 117-540-150



VALVE INSTALLATION

Recommended mounting of the check valve – horizontal position. If the check valve is mounted in a non-horizontal position, the valve components must be spring. The flow of media under the cone, the direction of flow of the working substance must match the direction of the arrow on the valve body.

It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

HIGH-PRESSURE LIFT CHECK VALVE Z15.4

PN 63–160; DN 50–150, T_{MAX}: 550°C



HIGH-PRESSURE LIFT CHECK VALVE Z15.4

APPLICATION

- water, steam, gas, oil, petroleum products, non-aggressive substances

CONNECTION

- weld ends, flanged, combination

OPERATION

- self-acting control

DESCRIPTION

- design of the body is straight sealing
- check valve disc
- to horizontal and vertical position
- sealing surface is welded by hard facing (13Cr) or Stellite 6
- complies with the requirements of the directive 2014/68/EU and standard EN 16767
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

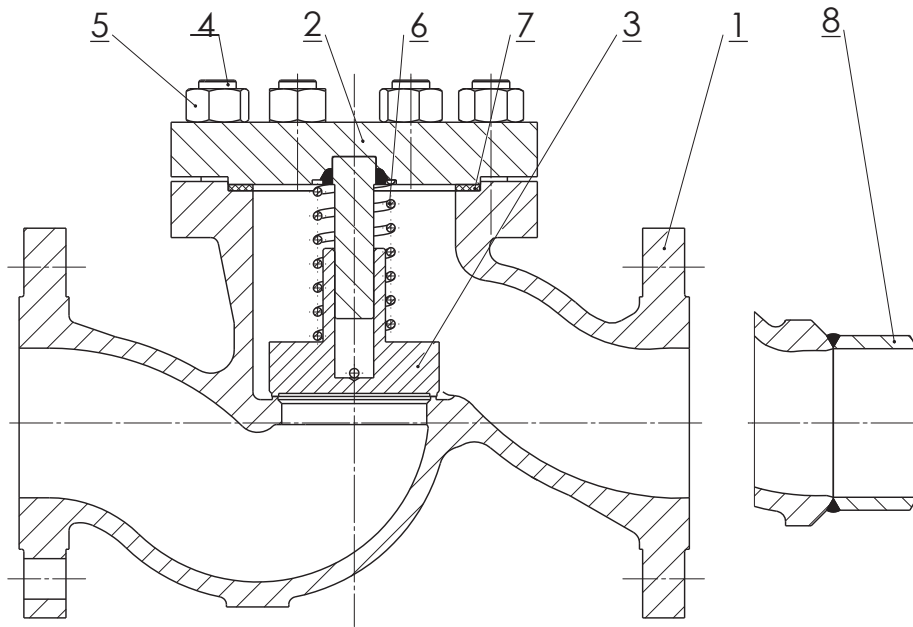
- branch from forged materials
- according to TRD 201

HIGH-PRESSURE LIFT CHECK VALVE Z15.4

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | |
|----------------------------------|-----|---|-----|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|------|------|------|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 500 | 510 | 520 | 530 | 540 | 550 |
| GX5CrNiMo 19-11-2 (1.4408) | 63 | 63 | 63 | 47,3 | 42,1 | 37,4 | 32,3 | 25,4 | 20,3 | 16,7 | - | - | - | - | - | - | - | - |
| | 100 | 100 | 100 | 75 | 66,9 | 59,4 | 51,3 | 40,3 | 32,3 | 26,5 | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GP240GH (1.0619) | 63 | 63 | 63 | 59 | 55 | 48 | 45 | 41 | 38 | 36 | 35 | - | - | - | - | - | - | - |
| | 100 | 100 | 100 | 93 | 87 | 76 | 71 | 64 | 60 | 58 | 55 | - | - | - | - | - | - | - |
| | 160 | 160 | 160 | 149 | 136 | 124 | 113 | 103 | 96 | 92 | 89 | - | - | - | - | - | - | - |
| G17CrMo5-5 (1.7357) | 63 | 63 | 63 | 63 | 63 | 63 | 62 | 57 | 53 | 51 | 48 | 47 | 38 | 33 | 26 | 24,4 | 18,1 | 13,7 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 98 | 91 | 84 | 80 | 76 | 75 | 61 | 52 | 42 | 38,7 | 28,7 | 21,8 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 152 | 146 | 139 | 127 | 118 | 97 | 79 | 62 | 46 | 35 |

USED MATERIALS



| Pos. | Part | Material | |
|------|--------------------------------|-----------------------|---------------------|
| 1 | Body | GP240GH (1.0619) | G17CrMo5-5 (1.7357) |
| | Hard facing of sealing surface | 13Cr | Stellite 6 |
| 2 | Cover | 13CrMo4-5 (1.7335) | |
| 3 | Disc | P250GH (1.0460) | 13CrMo4-5 (1.7335) |
| | Hard facing of sealing surface | 13Cr | Stellite 6 |
| 4 | Bolt | 21CrMoV5-7 (1.7709) | 21CrMoV5-7 (1.7709) |
| 5 | Nut | 25CrMo4 (1.7218) | 21CrMoV5-7 (1.7709) |
| 6 | Spring | X10CzNi 18-8 (1.4310) | |
| 7 | Gasket | Graphite – camprofile | |
| 8 | Branch | P250GH (1.0460) | 13CrMo4-5 (1.7335) |

HIGH-PRESSURE LIFT CHECK VALVE Z15.4

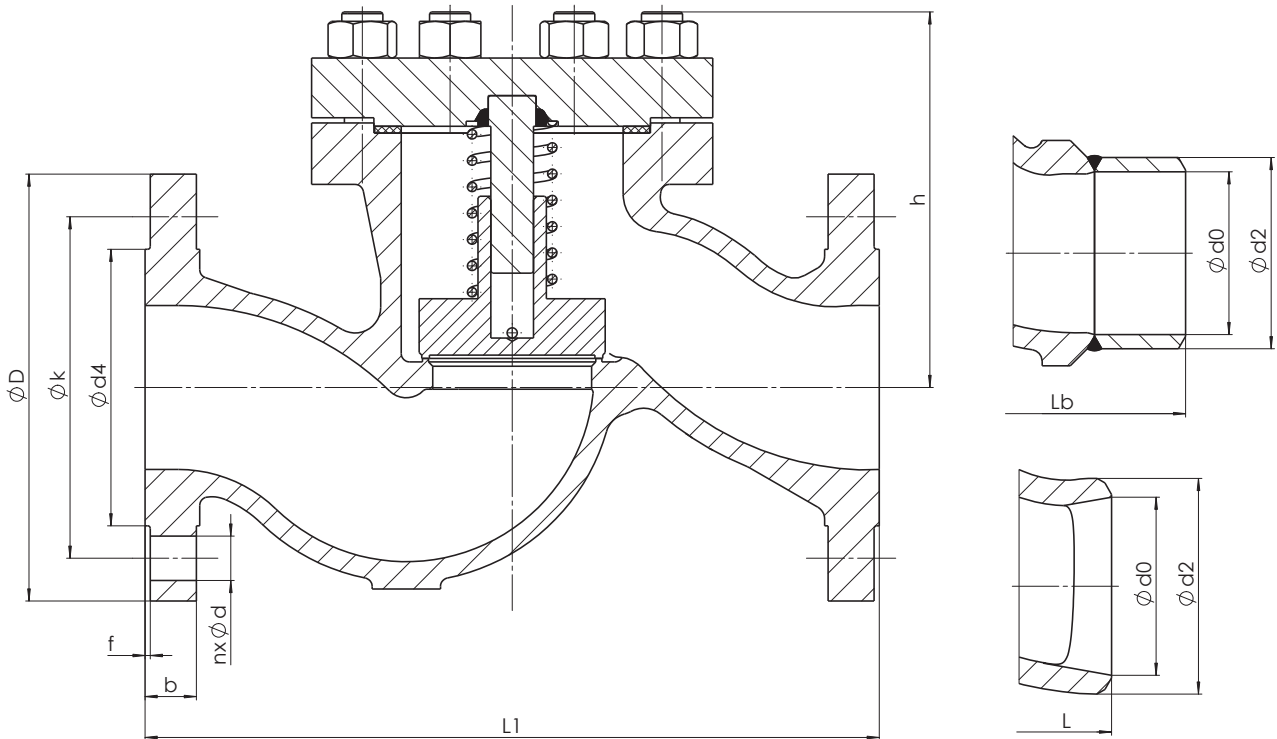
VALVE DIMENSIONS

1. Flanged

Face-to-face dimensions: EN 558 – line 2
Flanges: EN 1092-1

2. Weld ends

Face-to-face dimensions: as per table (Lb) on your request
Dimensions of welding ends: DIN 3239 – part 1
Groove form: DIN 2559 – sheet 1 – form 22



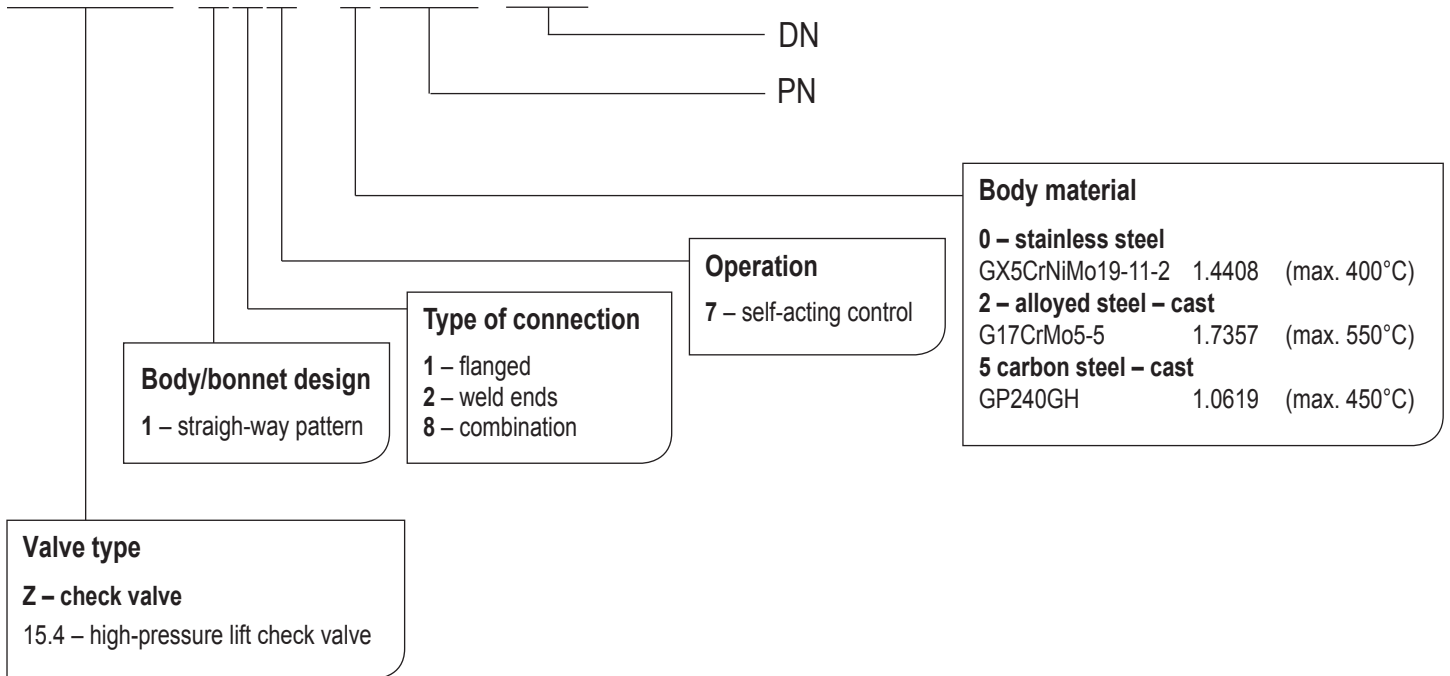
HIGH-PRESSURE LIFT CHECK VALVE Z15.4

| Nominal pressure | Nominal size | Centre-to-top | Flanged | | | | | | | | Weld ends | | | | | |
|------------------|--------------|---------------|---------|----|--------|---------|-----|--------|--------|--------|-----------|-----------|--------|--------|---------|------------|
| | | | PN | DN | h [mm] | L1 [mm] | n | d [mm] | k [mm] | D [mm] | b [mm] | d4xf [mm] | m [kg] | L [mm] | Lb [mm] | d2 [mm] |
| 63 | 50 | 148 | 300 | 4 | 22 | 135 | 180 | 26 | 102×3 | 24 | 260 | 400 | 61 | 54 | 32 | 60,3×3,2 |
| | 65 | 172 | 340 | 8 | 22 | 160 | 205 | 26 | 122×3 | 35 | 340 | 480 | 77 | 69 | 44 | 76,1×3,6 |
| | 80 | 200 | 380 | 8 | 22 | 170 | 215 | 28 | 138×3 | 42 | 380 | 520 | 90 | 81 | 50 | 88,9×4,0 |
| | 100 | 220 | 430 | 8 | 26 | 200 | 250 | 30 | 162×3 | 63 | 430 | 570 | 115 | 104 | 75 | 114,3×5,0 |
| | 125 | 245 | 500 | 8 | 30 | 240 | 295 | 34 | 188×3 | 87 | 500 | 650 | 141 | 130,5 | 113 | 139,7×4,5 |
| | 150 | 275 | 550 | 8 | 33 | 280 | 345 | 36 | 218×3 | 140 | 550 | 710 | 170 | 156,5 | 192 | 168,3×5,6 |
| 100 | 50 | 148 | 300 | 4 | 26 | 145 | 195 | 28 | 102×3 | 26 | 260 | 400 | 61 | 54 | 35 | 60,3×3,2 |
| | 65 | 172 | 340 | 8 | 26 | 170 | 220 | 30 | 122×3 | 39 | 340 | 480 | 77 | 69 | 52 | 76,1×3,6 |
| | 80 | 200 | 380 | 8 | 26 | 180 | 230 | 32 | 138×3 | 49 | 380 | 520 | 90 | 81 | 63 | 88,9×4,0 |
| | 100 | 220 | 430 | 8 | 30 | 210 | 265 | 36 | 162×3 | 74 | 430 | 570 | 115 | 104 | 97 | 114,3×5,0 |
| | 125 | 245 | 500 | 8 | 33 | 250 | 315 | 40 | 188×3 | 101 | 500 | 650 | 141 | 127 | 134 | 139,7×6,3 |
| | 150 | 275 | 550 | 12 | 33 | 290 | 355 | 44 | 218×3 | 144 | 550 | 710 | 170 | 154 | 196 | 168,3×7,1 |
| 160 | 50 | 148 | 300 | 4 | 26 | 145 | 195 | 30 | 102×3 | 27 | 260 | 400 | 61 | 52,5 | 36 | 60,3×4 |
| | 65 | 172 | 340 | 8 | 26 | 170 | 220 | 34 | 122×3 | 40 | 340 | 480 | 77 | 65 | 53 | 76,1×5,6 |
| | 80 | 200 | 380 | 8 | 26 | 180 | 230 | 36 | 138×3 | 50 | 380 | 520 | 90 | 76,5 | 64 | 88,9×6,3 |
| | 100 | 220 | 430 | 8 | 30 | 210 | 265 | 40 | 162×3 | 75 | 430 | 570 | 115 | 98,5 | 98 | 114,3×8 |
| | 125 | 245 | 500 | 8 | 33 | 250 | 315 | 44 | 188×3 | 102 | 500 | 650 | 141 | 120,5 | 135 | 139,7×10 |
| | 150 | 275 | - | 12 | 33 | 290 | 355 | 50 | 218×3 | 146 | 550 | 710 | 170 | 144,5 | 198 | 168,3×12,5 |

HIGH-PRESSURE LIFT CHECK VALVE Z15.4

VALVE DESCRIPTION CODE

Z15.4 117-2100-50



VALVE INSTALLATION

The armature can be installed in any position. Medium must flow under the cone in accordance with the direction indicated on the body. Installation and use of the valve following points have to be respected:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary to keep the working environment and pipeline clean, for example by using filters
- medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

HIGH-PRESSURE LIFT CHECK VALVE Z15.2

PN 63–500; DN 10–65; T_{MAX}: 600 °C



HIGH-PRESSURE LIFT CHECK VALVE Z15.2

APPLICATION

- steam, water, gas, oil, petroleum products, aggressive and non-aggressive substances

CONNECTION

- flanged, weld ends, socket-weld, combinator

OPERATION

- self-acting control

DESCRIPTION

- design of the body is straight sealing
- closing spring (except DN 10, 15)
- conical seat
- sealing surface is welded by hard facing (13Cr) or Stellite 6
- complies with the requirements of the directive 2014/68/EU
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

- delivery according to TRD 201 on request

HIGH-PRESSURE LIFT CHECK VALVE Z15.2

PRESSURE-TEMPERATURE-RATINGS FOR DN 10 - 50

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | |
|-------------------------------|-----|---|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 280 | 300 | 350 | 380 | 390 | 400 | 410 | 420 | 430 | 440 | 450 | |
| P250GH (C22.8) (1.0460) | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 56,7 | 53,2 | 50,4 | 44,9 | 41,0 | 40,2 | 39,4 | 38,4 | 37,5 | 36,5 | 35,6 | 34,7 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 90,0 | 84,5 | 80,0 | 71,3 | 65,0 | 63,8 | 62,5 | 61,0 | 59,5 | 58,0 | 56,5 | 55,0 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 144 | 135 | 128 | 114 | 104 | 102 | 100 | 97,6 | 95,2 | 92,8 | 90,4 | 88,0 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 225 | 212 | 200 | 178 | 163 | 159 | 156 | 153 | 149 | 145 | 141 | 138 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 288 | 271 | 256 | 228 | 208 | 204 | 200 | 195 | 190 | 186 | 181 | 176 |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 360 | 340 | 320 | 285 | 260 | 255 | 250 | 244 | 238 | 232 | 226 | 220 |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | |
|-------------------|-----|---|-----|-----|-----|-----|------|-------|------|------|------|------|------|------|-----|-----|-----|-----|-----|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 575 | 580 | 600 |
| 16Mo3 (1.5415) | 63 | 63 | 63 | 63 | 63 | 59 | 56,7 | 52,9 | 50,4 | 44,1 | 36,5 | 25,7 | 20,4 | 16,3 | - | - | - | - | - |
| | 100 | 100 | 100 | 100 | 100 | 94 | 90 | 84 | 80 | 70 | 58 | 40,8 | 32,4 | 25,8 | - | - | - | - | - |
| | 160 | 160 | 160 | 160 | 160 | 151 | 144 | 134 | 128 | 112 | 92,8 | 65,3 | 51,8 | 41,3 | - | - | - | - | - |
| | 250 | 250 | 250 | 250 | 250 | 238 | 225 | 210 | 200 | 175 | 145 | 102 | 81 | 64,5 | - | - | - | - | - |
| | 320 | 320 | 320 | 320 | 320 | 302 | 288 | 268,8 | 256 | 224 | 186 | 131 | 104 | 82,6 | - | - | - | - | - |
| | 400 | 400 | 400 | 400 | 400 | 379 | 360 | 336 | 320 | 280 | 232 | 163 | 130 | 103 | - | - | - | - | - |
| | 500 | 500 | 500 | 500 | 500 | 473 | 450 | 420 | 400 | 350 | 290 | 204 | 162 | 129 | - | - | - | - | - |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | |
|-----------------------|-----|---|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|-----|-----|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 570 | 580 | 600 |
| 13CrMo4-5 (1.7335) | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 56,7 | 55,3 | 52,3 | 50,4 | 40,3 | 32,8 | 27,1 | 21,2 | 17,0 | 10,5 | - | - |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 90 | 87,8 | 83 | 80 | 64 | 52,0 | 43,0 | 33,6 | 27,0 | 16,6 | - | - |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 144 | 140 | 133 | 128 | 102 | 83,2 | 68,8 | 53,8 | 43,2 | 26,6 | - | - |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 225 | 220 | 208 | 200 | 160 | 130 | 108 | 84 | 67,5 | 41,5 | - | - |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 288 | 281 | 266 | 256 | 205 | 166 | 138 | 108 | 86,4 | 53,1 | - | - |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 360 | 351 | 332 | 320 | 256 | 208 | 172 | 134 | 108 | 66,4 | - | - |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 450 | 439 | 415 | 400 | 320 | 260 | 215 | 168 | 135 | 83,0 | - | - |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | |
|------------------------|-----|---|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 575 | 580 | 600 |
| 11CrMo9-10 (1.7383) | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 56,7 | 54,2 | 51,7 | 50,4 | 40,3 | 35,3 | 30,2 | 26,5 | 22,7 | 16,4 | 15,1 | 11,6 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 90,0 | 86,0 | 82,0 | 80,0 | 64,0 | 56,0 | 48,0 | 42,0 | 36,0 | 26,0 | 24,0 | 18,4 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 144 | 138 | 131 | 128 | 102 | 89,6 | 76,8 | 67,2 | 57,6 | 41,6 | 38,4 | 29,4 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 225 | 215 | 205 | 200 | 160 | 140 | 120 | 105 | 90,0 | 65,0 | 60,0 | 46,0 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 288 | 275 | 262 | 256 | 205 | 179 | 154 | 134 | 115 | 83,2 | 76,8 | 58,9 |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 360 | 344 | 328 | 320 | 256 | 224 | 192 | 168 | 144 | 104 | 96,0 | 73,6 |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 450 | 430 | 410 | 400 | 320 | 280 | 240 | 210 | 180 | 130 | 120 | 92 |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | |
|---|-----|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 575 | 580 | 600 |
| X6CrNiMoTi 17-12-2 (1.4571) ¹⁾ | 63 | 63 | 61,7 | 57,9 | 54,9 | 53,3 | 51,4 | 50,1 | 50,1 | 49,9 | 49,9 | 49,9 | 49,6 | 49,6 | 49,4 | 49,1 | 48,6 | 40,3 | 35,3 |
| | 100 | 100 | 98,0 | 92,5 | 87,2 | 84,2 | 81,6 | 79,6 | 79,6 | 79,2 | 79,2 | 79,2 | 78,8 | 78,8 | 78,4 | 78,0 | 77,2 | 64,0 | 56,0 |
| | 160 | 160 | 157 | 148 | 140 | 135 | 131 | 127 | 127 | 127 | 127 | 127 | 126 | 126 | 125 | 125 | 124 | 102 | 89,6 |
| | 250 | 250 | 245 | 231 | 218 | 211 | 204 | 199 | 199 | 198 | 198 | 198 | 197 | 197 | 196 | 195 | 193 | 160 | 140 |
| | 320 | 320 | 314 | 293 | 279 | 270 | 261 | 255 | 255 | 253 | 253 | 253 | 252 | 248 | 236 | 228 | 193 | 160 | 140 |
| | 400 | 400 | 392 | 370 | 349 | 337 | 326 | 318 | 318 | 317 | 317 | 317 | 315 | 310 | 295 | 285 | 193 | 160 | 140 |

HIGH-PRESSURE LIFT CHECK VALVE Z15.2

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | |
|--|-----|--|------|------|------|------|------|------|
| | | -196 | 20 | 100 | 200 | 300 | 350 | 400 |
| X6CrNiMo- Ti17-12-2 (1.4571) ²⁾ | 63 | 63,0 | 63,0 | 60,5 | 51,7 | 42,8 | 40,3 | 37,8 |
| | 100 | 100 | 100 | 96,0 | 82,0 | 68,0 | 64,0 | 60,0 |
| | 160 | 160 | 160 | 154 | 131 | 109 | 102 | 96,0 |
| | 250 | 250 | 250 | 240 | 205 | 170 | 160 | 150 |

1) Use of valve above 400 °C only for media without risk of intercrystalline corrosion

2) Application for temperatures from -196 °C to +400 °C, material variant 2 – see below

PRESSURE-TEMPERATURE-RATINGS FOR DN 65

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | |
|-------------------------------|-----|---|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 280 | 300 | 350 | 380 | 390 | 400 | 410 | 420 | 430 | 440 | 450 |
| P250GH (C22.8) (1.0460) | 63 | 63 | 63 | 63 | 63 | 63 | 57,7 | 55,4 | 50,4 | 42,8 | 39,0 | 37,8 | 36,5 | 35,2 | 32,7 | 27,7 | 25,2 | 20,1 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 92,0 | 88,0 | 80,0 | 68 | 62,0 | 60,0 | 58,0 | 56,0 | 52,0 | 44,0 | 40,0 | 32,0 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 147 | 141 | 128 | 109 | 99,2 | 96 | 92,8 | 89,6 | 83,2 | 70,4 | 64,0 | 51,2 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 230 | 220 | 200 | 170 | 155 | 150 | 145 | 140 | 130 | 110 | 100 | 80,0 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 294 | 282 | 256 | 218 | 198 | 192 | 186 | 179 | 166 | 141 | 128 | 102 |
| | 400 | 400 | 400 | 400 | 400 | 400 | 368 | 352 | 320 | 272 | 248 | 240 | 232 | 224 | 208 | 176 | 160 | 128 |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | |
|-------------------|-----|---|-----|-----|------|-----|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 575 | 580 | 600 |
| 16Mo3 (1.5415) | 63 | 63 | 63 | 63 | 60,5 | 58 | 54,2 | 52,9 | 50,4 | 37,8 | 29,0 | 22,7 | 17,6 | 12,6 | - | - | - | - | - |
| | 100 | 100 | 100 | 100 | 96 | 92 | 86 | 84 | 80 | 60 | 46 | 36,0 | 28,0 | 20,0 | - | - | - | - | - |
| | 160 | 160 | 160 | 160 | 154 | 147 | 138 | 134 | 128 | 96 | 73,6 | 57,6 | 44,8 | 32,0 | - | - | - | - | - |
| | 250 | 250 | 250 | 250 | 240 | 230 | 215 | 210 | 200 | 150 | 115 | 90 | 70 | 50,0 | - | - | - | - | - |
| | 320 | 320 | 320 | 320 | 307 | 294 | 275 | 269 | 256 | 192 | 147 | 115 | 90 | 64,0 | - | - | - | - | - |
| | 400 | 400 | 400 | 400 | 384 | 368 | 344 | 336 | 320 | 240 | 184 | 144 | 112 | 80 | - | - | - | - | - |
| | 500 | 500 | 500 | 500 | 480 | 460 | 430 | 420 | 400 | 300 | 230 | 180 | 140 | 100 | - | - | - | - | - |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | |
|-----------------------|-----|---|-----|-----|-----|-----|-----|------|------|------|-------|------|------|------|------|------|------|-----|-----|--|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 570 | 580 | 600 | |
| 13CrMo4-5 (1.7335) | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 60,5 | 55,4 | 52,9 | 45,40 | 37,8 | 30,2 | 22,7 | 17,6 | 12,6 | 6,3 | - | - | |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 96 | 88,0 | 84 | 72 | 60 | 48,0 | 36,0 | 28,0 | 20,0 | 10,0 | - | - | |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 154 | 141 | 134 | 115 | 96 | 76,8 | 57,6 | 44,8 | 32,0 | 16,0 | - | - | |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 240 | 220 | 210 | 180 | 150 | 120 | 90 | 70 | 50,0 | 25,0 | - | - | |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 307 | 282 | 269 | 230 | 192 | 154 | 115 | 90 | 64,0 | 32,0 | - | - | |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 384 | 352 | 336 | 288 | 240 | 192 | 144 | 112 | 80,0 | 40,0 | - | - | |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 480 | 440 | 420 | 360 | 300 | 240 | 180 | 140 | 100 | 50,0 | - | - | |

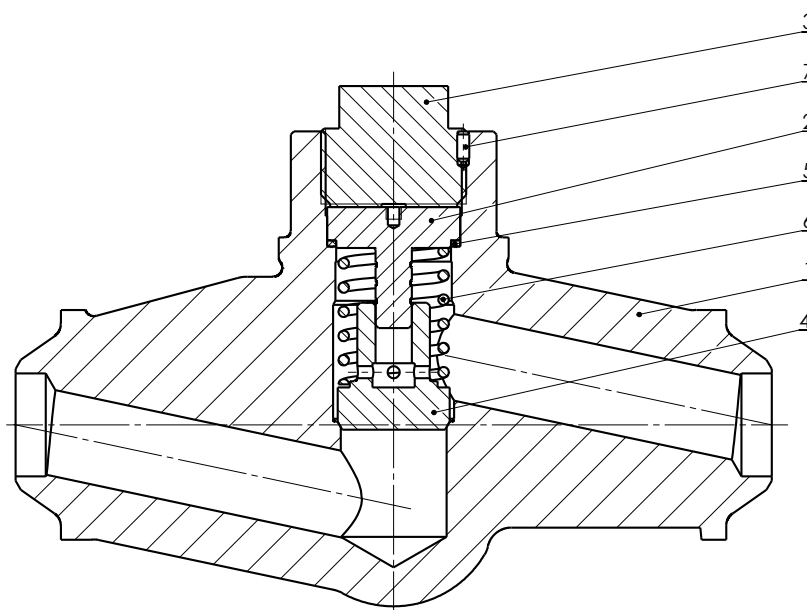
| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | |
|------------------------|-----|---|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 575 | 580 | 600 | |
| 11CrMo9-10 (1.7383) | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 60,5 | 58,0 | 50,4 | 45,4 | 37,8 | 32,8 | 27,7 | 22,7 | 20,2 | 12,6 | 11,3 | 7,6 | |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 96,0 | 92,0 | 80,0 | 72,0 | 60,0 | 52,0 | 44,0 | 36,0 | 32,0 | 20,0 | 18,0 | 12,0 | |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 154 | 147 | 128 | 115 | 96 | 83,2 | 70,4 | 57,6 | 51,2 | 32,0 | 28,8 | 19,2 | |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 240 | 230 | 200 | 180 | 150 | 130 | 110 | 90,0 | 80,0 | 50,0 | 45,0 | 30,0 | |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 307 | 294 | 256 | 230 | 192 | 166 | 141 | 115 | 102 | 64,0 | 58,0 | 38,0 | |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 384 | 368 | 320 | 288 | 240 | 208 | 176 | 144 | 128 | 80,0 | 72,0 | 48,0 | |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 480 | 460 | 400 | 360 | 300 | 260 | 220 | 180 | 160 | 100 | 90,0 | 60,0 | |

HIGH-PRESSURE LIFT CHECK VALVE Z15.2

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | |
|---|-----|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 575 | 580 | 600 |
| X6CrNiMoTi 17-12-2 (1.4571) ¹⁾ | 63 | 63 | 55,4 | 52,9 | 47,9 | 46,6 | 45,4 | 44,1 | 43,5 | 43,1 | 42,8 | 42,3 | 41,8 | 41,3 | 40,8 | 40,3 | 39,1 | 38,8 | 37,8 |
| | 100 | 100 | 88,0 | 84,0 | 76,0 | 74,0 | 72,0 | 70,0 | 69,0 | 68,4 | 68,0 | 67,2 | 66,4 | 65,6 | 64,8 | 64,0 | 62,0 | 61,6 | 60,0 |
| | 160 | 160 | 141 | 134 | 122 | 118 | 115 | 112 | 110 | 109 | 109 | 108 | 106 | 105 | 104 | 102 | 99,0 | 99,0 | 96,0 |
| | 250 | 250 | 220 | 210 | 190 | 185 | 180 | 175 | 173 | 171 | 170 | 168 | 166 | 164 | 162 | 160 | 155 | 154 | 150 |
| | 320 | 320 | 282 | 269 | 243 | 237 | 230 | 224 | 221 | 219 | 218 | 215 | 212 | 210 | 207 | 205 | 198 | 197 | 192 |
| | 400 | 400 | 352 | 336 | 304 | 269 | 288 | 280 | 276 | 274 | 272 | 269 | 266 | 262 | 259 | 256 | 248 | 246 | 240 |

1) Use of valve above 400 °C only for media without risk of intercrystalline corrosion

USED MATERIALS



| Pos. | Part | Material | | | | | | |
|------|--|-------------------------------|--------------------------|-----------------------|------------------------|--|---|--|
| 1 | Body | P250GH (C22.8) (1.0460) | 16Mo3 (1.5415) | 13CrMo4-5 (1.7335) | 11CrMo9-10 (1.7383) | X6CrNiMo-Ti Ti17-12-2 (1.4571) ¹⁾ | X6CrNiMoTi17-12-2 (1.4571) ²⁾ | |
| | Hard facing of body sealing surface | 13Cr | Stellite 6 | | | | | |
| 2 | Cover | P250GH (C22.8) (1.0460) | X22CrMoV12-1 (1.4923) | | | | X6CrNiMoTi17-12-2 (1.4571) | |
| 3 | Nut | P250GH (C22.8) (1.0460) | X22CrMoV12-1 (1.4923) | | | | X6CrNiMoTi17-12-2 (1.4571) | |
| 4 | Disc | X20Cr13 (1.4021) | X22CrMoV12-1 (1.4923) | | | | X6CrNiMoTi17-12-2 (1.4571) | |
| | Hard facing of body sealing surface | Hardened | Stellite 6 | | | | | |
| 5 | Gasket | Graphite | | | | | | |
| 6 | Spring ³⁾ | X10CrNi18-8 (1.4310) | | | | | | |
| 7 | Pin | X5CrNi18-10 (A2) (1.4301) | | | | | | |

1) Use of valve above 400 °C only for media without risk of intercrystalline corrosion

2) Application for temperatures from -196° C to +400 °C, material variant 2

3) DN10 and DN15 – valve design without spring

HIGH-PRESSURE LIFT CHECK VALVE Z15.2

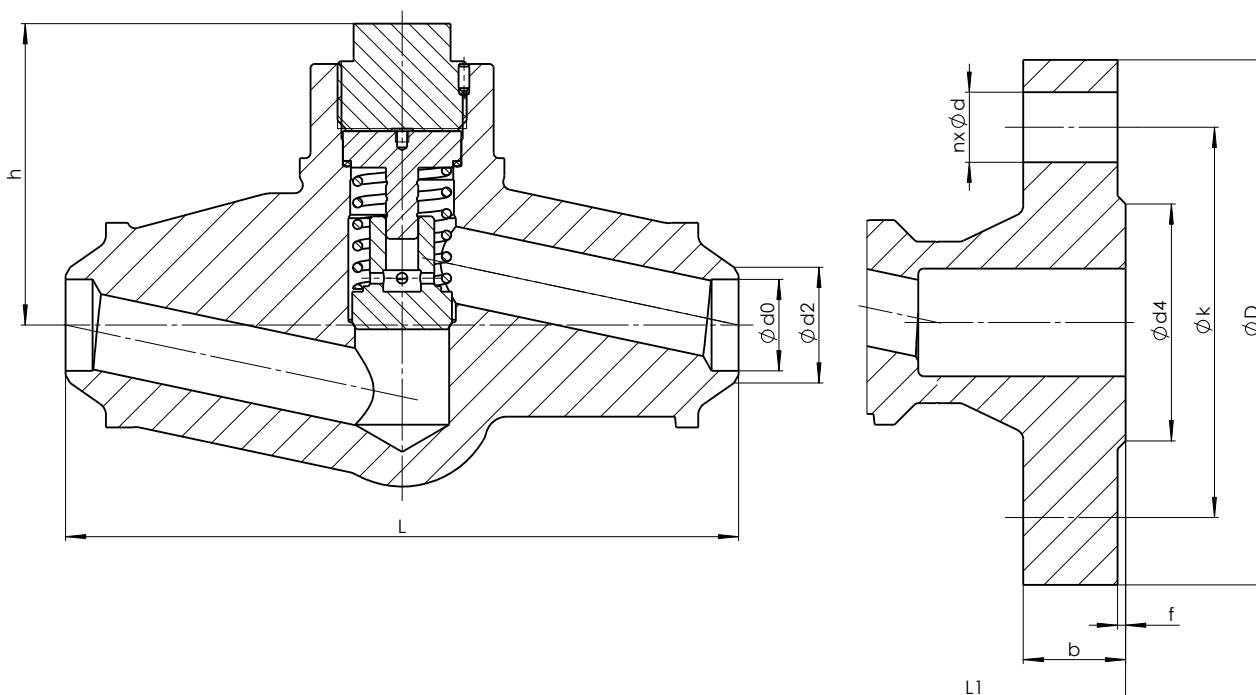
VALVE DIMENSIONS

1. Flanged

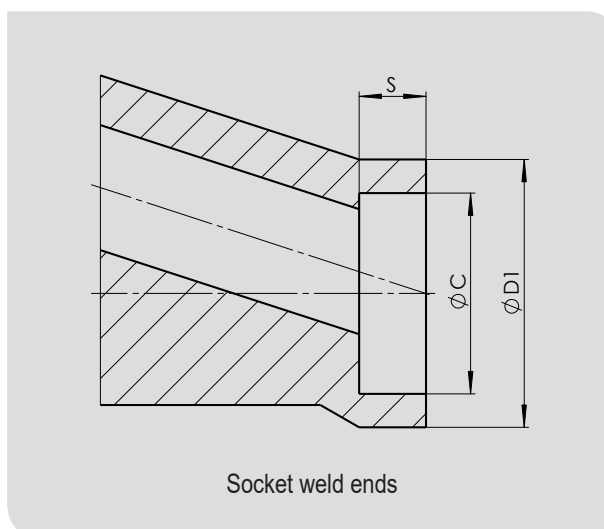
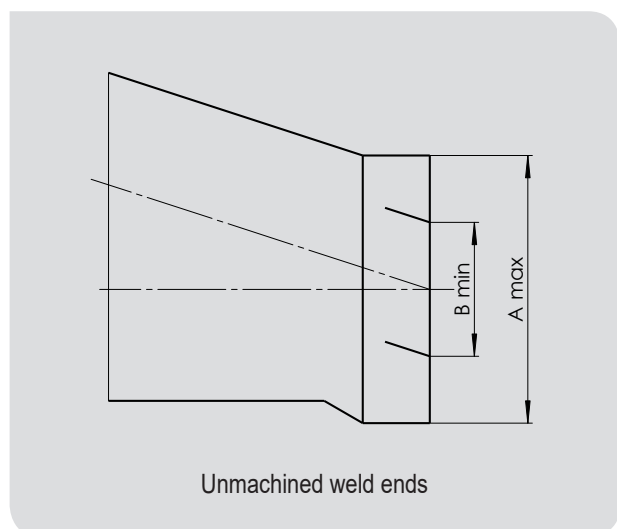
Face-to-face dimensions: as per table
Flanges: EN 1092-1, (DIN 2501/1972), sealing bar - Form B1
Others variants at the customer's request.

2. Weld ends, socket weld

Face-to-face dimensions: as per table
Dimensions of welding ends: EN 12627 (on request according to invalid standard DIN 3239 – 1)
Groove form: ISO 9692-1 (on request according to invalid standard DIN 2559 – 1)
Socket weld: ASME B16.11, DIN 3239 – 2



WELDING ENDS



HIGH-PRESSURE LIFT CHECK VALVE Z15.2

WELDING DESIGN

| Nominal pressure | Nominal size | Face-to-face | Centre-to-top | Weld ends | | Socket weld dle ASME B16.11, resp. DIN 3239-2 | | | Dimension of unmachined weld ends | | Approximate weight | Pipe dimensions |
|------------------|--------------|--------------|---------------|-----------|-------|---|------------------------|-----------|---|-----------|-----------------------|--------------------|
| | | | | | | $\varnothing D_{1-0,5}$ | $\varnothing C^{+0,2}$ | b_{min} | A_{max} | B_{min} | | |
| PN | DN | L | h | d_2 | d_0 | | | | | | | |
| 63, 100 | 10 | 150 | 71 | 18 | 13,0 | 33 | 18 | 9,5 | 35 | 9 | 1,7 | 17,2x2,0 |
| | 15 | 150 | 71 | 22 | 17,0 | 33 | 22 | 9,5 | 35 | 14 | 1,8 | 21,3x2,0 |
| | 20 | 160 | 83 | 28 | 22,0 | 48 | 27,5 | 12,7 | 50 | 19 | 2,6 | 26,9x2,3 |
| | 25 | 160 | 83 | 34 | 28,5 | 48 | 34,5 | 12,7 | 50 | 24 | 2,6 | 33,7x2,6 |
| | 32 | 250 | 111 | 43 | 37,0 | 76 | 43 | 12,7 | 75 | 29 | 7,8 | 42,4x2,6 |
| | 40 | 250 | 111 | 49 | 43,0 | 76 | 49 | 12,7 | 75 | 35 | 7,8 | 48,3x2,6 |
| | 50 | 250 | 111 | 61 | 54,0 | 76 | 61 | 15,9 | 75 | 35 | 7,8 | 60,3x3,2 |
| | 65 | 340 | - | 77 | 69 | 90 | 74 | 16 | 100 | 48 | - | 76,1x3,6 |
| 160 | 10 | 150 | 71 | 18 | 13,0 | 33 | 18 | 9,5 | 35 | 9 | 1,7 | 17,2x2,0 |
| | 15 | 150 | 71 | 22 | 17,0 | 33 | 22 | 9,5 | 35 | 14 | 1,8 | 21,3x2,0 |
| | 20 | 160 | 83 | 28 | 22,0 | 48 | 27,5 | 12,7 | 50 | 19 | 2,6 | 26,9x2,3 |
| | 25 | 160 | 83 | 34 | 27,5 | 48 | 34,5 | 12,7 | 50 | 24 | 2,6 | 33,7x3,2 |
| | 32 | 250 | 111 | 43 | 36,0 | 76 | 43 | 12,7 | 75 | 29 | 7,8 | 42,4x3,6 |
| | 40 | 250 | 111 | 49 | 41,0 | 76 | 49 | 12,7 | 75 | 35 | 7,8 | 48,3x3,6 |
| | 50 | 250 | 111 | 61 | 52,5 | 76 | 61 | 15,9 | 75 | 35 | 7,8 | 60,3x4,0 |
| | 65 | 340 | - | 77 | 65 | 90 | 74 | 16 | 100 | 48 | - | 76,1x5,6 |
| 250 | 10 | 150 | 71 | 18 | 12 | 33 | 18 | 9,5 | 35 | 9 | 1,7 | 17,2x2,6 |
| | 15 | 150 | 71 | 22 | 16 | 33 | 22 | 9,5 | 35 | 14 | 1,8 | 21,3x2,6 |
| | 20 | 160 | 83 | 28 | 20 | 48 | 27,5 | 12,7 | 50 | 19 | 2,6 | 26,9x3,6 |
| | 25 | 160 | 83 | 35 | 26,5 | 48 | 34,5 | 12,7 | 50 | 24 | 2,6 | 33,7x3,6 |
| | 32 | 250 | 111 | 43 | 34 | 76 | 43 | 12,7 | 75 | 29 | 7,8 | 42,4x4,5 |
| | 40 | 250 | 111 | 49 | 38,5 | 76 | 49 | 12,7 | 75 | 35 | 7,8 | 48,3x5,0 |
| | 50 | 250 | 111 | 61 | 45 | 76 | 61 | 15,9 | 75 | 35 | 7,8 | 60,3x8,0 |
| | 65 | 340 | - | 77 | 59,5 | 90 | 74 | 16 | 100 | 48 | - | 76,1x8,8 |
| 320 | 10 | 150 | 71 | 18 | 12,0 | 33 | 18 | 9,5 | 35 | 9 | 1,7 | 17,2x2,6 |
| | 15 | 150 | 71 | 22 | 15,0 | 33 | 22 | 9,5 | 35 | 14 | 1,8 | 21,3x3,2 |
| | 20 | 160 | 83 | 28 | 19,0 | 48 | 27,5 | 12,7 | 50 | 19 | 2,6 | 26,9x4,0 |
| | 25 | 160 | 83 | 35 | 24,0 | 48 | 34,5 | 12,7 | 50 | 24 | 2,6 | 33,7x5,0 |
| | 32 | 250 | 111 | 43 | 31 | 76 | 43 | 12,7 | 75 | 29 | 7,8 | 42,4x6,3 |
| | 40 | 250 | 111 | 49 | 36,0 | 76 | 49 | 12,7 | 75 | 35 | 7,8 | 48,3x6,3 |
| | 50 | 250 | 111 | 77 | 59,5 | 76 | 61 | 15,9 | 75 | 35 | 7,8 | 76,1x8,8 |
| | 65 | 340 | - | 90 | 68 | 90 | 74 | 16 | 100 | 48 | - | 88,9x11 |
| 400 | 10 | 150 | 71 | 18 | 10 | - | - | - | 35 | 9 | 1,7 | 17,2x3,6 |
| | 15 | 150 | 71 | 28 | 17 | - | - | - | 35 | 14 | 1,8 | 26,9x5,0 |
| | 20 | 160 | 83 | 34 | 19,5 | - | - | - | 48 | 18 | 2,6 | 32x6,3 |
| | 25 | 160 | 83 | 44 | 28 | - | - | - | 48 | 22 | 2,6 | 42,4x8,0 |
| | 32 | 250 | 111 | 49 | 29,5 | - | - | - | 78 | 30 | 7,8 | 48,3x10,0 |
| | 40 | 250 | 111 | 61 | 39 | - | - | - | 78 | 32 | 7,8 | 60,3x11,0 |
| | 50 | 250 | 111 | 76 | 49 | - | - | - | 78 | 38 | 7,8 | 76,1x14,2 |
| | 65 | 340 | - | - | - | - | - | - | 100 | 48 | - | - |
| 500 | 10 | 150 | 71 | 22 | 11,5 | - | - | - | 35 | 9 | 1,7 | 21,3x5,0 |
| | 15 | 150 | 71 | 33 | 16,5 | - | - | - | 35 | 14 | 1,8 | 32x8,0 |
| | 20 | 160 | 83 | 38 | 20,5 | - | - | - | 48 | 18 | 2,6 | 38x8,8 |
| | 25 | 160 | 83 | 48 | 23,5 | - | - | - | 48 | 22 | 2,6 | 48,3x12,5 |
| | 32 | 250 | 111 | 61 | 33,5 | - | - | - | 78 | 30 | 7,8 | 60,3x14,2 |
| | 40 | 250 | 111 | 76 | 43,5 | - | - | - | 78 | 32 | 7,8 | 76,1x17,5 |
| | 50 | 250 | 111 | 76 | 43,5 | - | - | - | 78 | 38 | 7,8 | 76,1x17,5 |
| | 65 | 340 | - | - | - | - | - | - | 100 | 48 | - | - |

HIGH-PRESSURE LIFT CHECK VALVE Z15.2

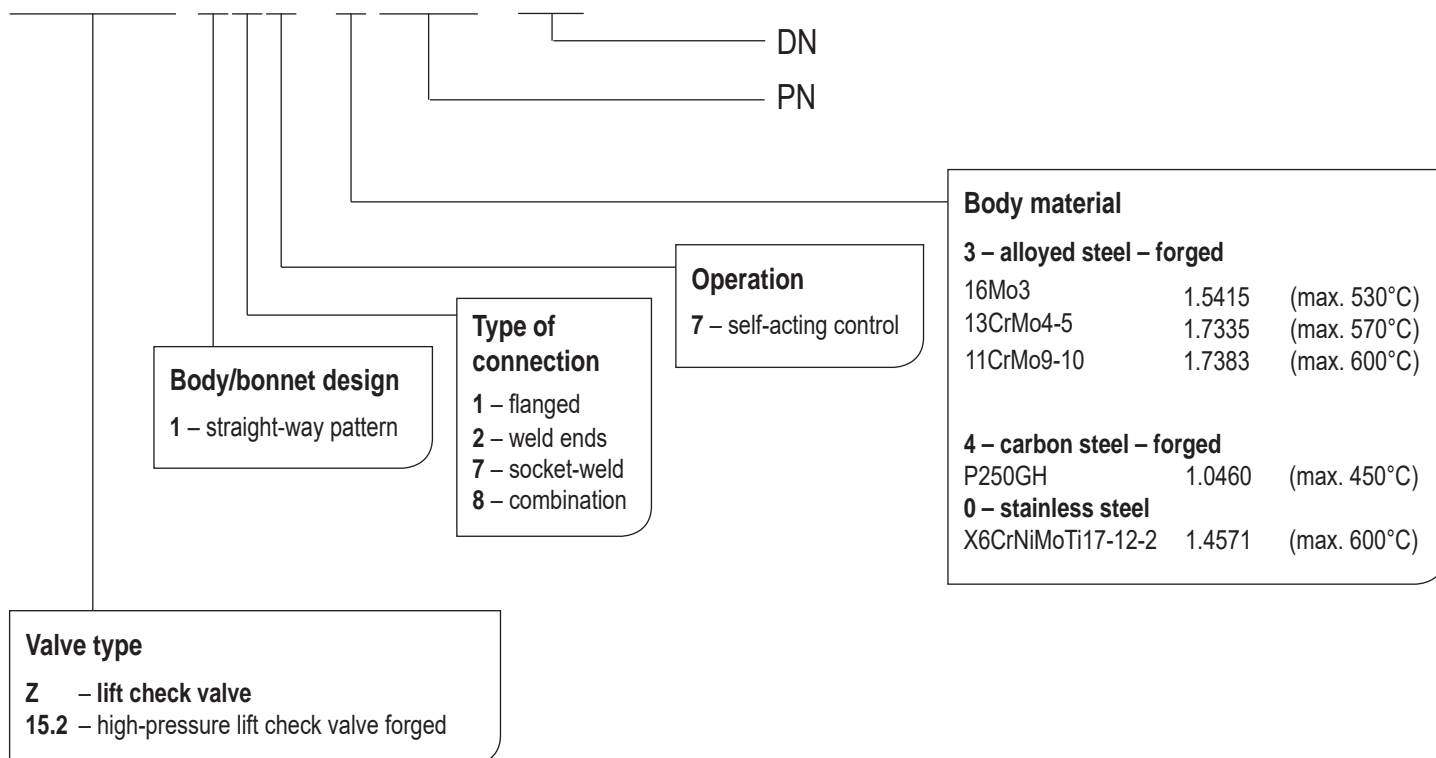
FLANGE DESIGN

| Nominal pressure | Nominal size | Face-to-face | Number of holes | Hole | Pitch circle | Flange diameter | Flange thickness | Smooth bar | Approximate weight |
|------------------|--------------|--------------|-----------------|------|--------------|-----------------|------------------|-------------------|--------------------|
| PN | DN | L1 | n | ød | øk | øD | b | ød _{4xf} | m [kg] |
| 63, 100 | 10 | 230 | 4 | 14 | 70 | 100 | 20 | 40x2 | 2,7 |
| | 15 | 230 | 4 | 14 | 75 | 105 | 20 | 45x2 | 3,0 |
| | 20 | 260 | 4 | 18 | 90 | 130 | 22 | 58x2 | 4,6 |
| | 25 | 260 | 4 | 18 | 100 | 140 | 24 | 68x2 | 5,2 |
| | 32 | 390 | 4 | 22 | 110 | 155 | 24 | 78x2 | 11,0 |
| | 40 | 390 | 4 | 22 | 125 | 170 | 26 | 88x3 | 12,0 |
| 63 | 50 | 390 | 4 | 22 | 135 | 180 | 26 | 102x3 | 12,3 |
| 63 | 65 | 540 | 8 | 22 | 160 | 205 | 26 | 122x3 | - |
| 100 | 50 | 390 | 4 | 26 | 145 | 195 | 28 | 102x3 | 13,6 |
| 100 | 65 | 540 | 8 | 26 | 170 | 220 | 30 | 122x3 | - |
| 160 | 10 | 230 | 4 | 14 | 70 | 100 | 20 | 40x2 | 2,8 |
| | 15 | 230 | 4 | 14 | 75 | 105 | 20 | 45x2 | 3,0 |
| | 25 | 260 | 4 | 18 | 100 | 140 | 24 | 68x2 | 5,2 |
| | 40 | 390 | 4 | 22 | 125 | 170 | 28 | 88x3 | 12,2 |
| | 50 | 390 | 4 | 26 | 145 | 195 | 30 | 102x3 | 14,2 |
| | 65 | 540 | 8 | 26 | 170 | 220 | 34 | 122x3 | - |
| 250 | 10 | 230 | 4 | 18 | 85 | 125 | 24 | 40x2 | 3,8 |
| | 15 | 230 | 4 | 18 | 90 | 130 | 26 | 45x2 | 4,3 |
| | 25 | 260 | 4 | 22 | 105 | 150 | 28 | 68x2 | 6,2 |
| | 40 | 390 | 4 | 26 | 135 | 185 | 34 | 88x3 | 14,5 |
| | 50 | 390 | 8 | 26 | 150 | 200 | 38 | 102x3 | 16,0 |
| | 65 | 540 | 8 | 26 | 180 | 230 | 42 | 122x3 | - |
| 320 | 10 | 230 | 4 | 18 | 85 | 125 | 24 | 40x2 | 3,9 |
| | 15 | 230 | 4 | 18 | 90 | 130 | 26 | 45x2 | 4,3 |
| | 25 | 260 | 4 | 22 | 115 | 160 | 34 | 68x2 | 7,8 |
| | 40 | 390 | 4 | 26 | 145 | 195 | 38 | 88x3 | 16,5 |
| | 50 | 390 | 8 | 26 | 160 | 210 | 42 | 102x3 | 18,5 |
| | 65 | 540 | 8 | 30 | 200 | 255 | 51 | 122x3 | - |
| 400 | 10 | 230 | 4 | 18 | 85 | 125 | 28 | 40x2 | 4,3 |
| | 15 | 230 | 4 | 22 | 100 | 145 | 30 | 45x2 | 5,4 |
| | 25 | 260 | 4 | 26 | 130 | 180 | 38 | 68x2 | 10,1 |
| | 40 | 390 | 4 | 30 | 165 | 220 | 48 | 88x3 | 21,9 |
| | 50 | 390 | 8 | 30 | 180 | 235 | 52 | 102x3 | 24,5 |
| | 65 | 540 | 8 | 33 | 225 | 290 | 64 | 122x3 | - |

HIGH-PRESSURE LIFT CHECK VALVE Z15.2

VALVE DESCRIPTION CODE

Z15.2 117-3250-25



VALVE INSTALLATION

Valve can be installed in any position. Medium must flow under the cone in accordance with the direction indicated on the valve body. It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary to keep working environment a pipeline clean, for example with using filters
- the medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of a valve can be significantly extended by regular maintenance and repairs carried out by qualified personnel.

HIGH-PRESSURE LIFT CHECK VALVE Z15.3

PN 63-250, DN 65, PN 320-630, DN 10-50, T_{MAX}: 600 °C



HIGH-PRESSURE LIFT CHECK VALVE Z15.3

APPLICATION

- water, steam, non-aggressive substances

CONNECTION

- weld ends, flanged, combination, socket-weld

OPERATION

- self-acting control

DESCRIPTION

- design of the body is straight sealing
- sealing surface is welded by hard facing (13Cr) or Stellite 6
- complies with the requirements of the directive 2014/68/EU
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

- without oil and grease
- with spring
- delivery on request according to TRD 201

HIGH-PRESSURE LIFT CHECK VALVE Z15.3

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | | |
|------------------------|-----|---|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | |
| P250GH (1.0460) | 63 | 63 | 63 | 63 | 63 | 63 | 44.8 | 40.6 | 37.8 | 36.4 | 21 | - | - | - | - | - | - | - | - | - | |
| | 100 | 100 | 100 | 100 | 100 | 100 | 71.1 | 64.4 | 60 | 57.8 | 33 | - | - | - | - | - | - | - | - | - | |
| | 160 | 160 | 160 | 160 | 160 | 160 | 110 | 94.1 | 88.3 | 78.5 | 45 | - | - | - | - | - | - | - | - | - | |
| | 250 | 250 | 250 | 250 | 250 | 250 | 172 | 147 | 137 | 123 | 70 | - | - | - | - | - | - | - | - | - | |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 273 | 233 | 182 | 103 | - | - | - | - | - | - | - | - | - |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 342 | 290 | 227 | 129 | - | - | - | - | - | - | - | - | - |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 490 | 427 | 364 | 284 | 162 | - | - | - | - | - | - | - | - | - |
| 16Mo3 (1.5415) | 63 | 63 | 63 | 63 | 63 | 60,2 | 56 | 47,6 | 44,8 | 42 | 40,6 | 28,3 | 21,5 | 17 | 13,6 | - | - | - | - | - | |
| | 100 | 100 | 100 | 100 | 100 | 95,6 | 88,9 | 75,6 | 71,1 | 66,7 | 64,4 | 44,9 | 34,1 | 26,9 | 21,6 | - | - | - | - | - | |
| | 160 | 160 | 160 | 160 | 160 | 157 | 147 | 136 | 123 | 116 | 110 | 79,9 | 60,7 | 47,9 | 38,4 | - | - | - | - | - | |
| | 250 | 250 | 250 | 250 | 250 | 245 | 229 | 213 | 191 | 181 | 171 | 124 | 94,2 | 74,4 | 59,5 | - | - | - | - | - | |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 318 | 298 | 288 | 179 | 136 | 107 | 86 | - | - | - | - | - | |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 398 | 373 | 360 | 224 | 170 | 134 | 108 | - | - | - | - | - | |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 484 | 422 | 398 | 361 | 321 | 184 | 145 | 116 | - | - | - | - | - |
| 13CrMo4-5 (1.7335) | 63 | 63 | 63 | 63 | 63 | 63 | 61.6 | 57.4 | 53.2 | 50.4 | 47.6 | 38.4 | 32.5 | 26.3 | 21.8 | 17.6 | 13.7 | - | - | - | |
| | 100 | 100 | 100 | 100 | 100 | 100 | 97.8 | 91.1 | 84.4 | 80 | 75.6 | 60.9 | 51.6 | 41.8 | 34.7 | 28 | 21.8 | - | - | - | |
| | 160 | 160 | 160 | 160 | 160 | 160 | 157 | 152 | 150 | 143 | 136 | 116 | 98.1 | 77.5 | 60.8 | 45.1 | 34.3 | - | - | - | |
| | 250 | 250 | 250 | 250 | 250 | 250 | 245 | 237 | 233 | 223 | 213 | 180 | 151 | 122 | 95.1 | 71.6 | 53 | - | - | - | |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 314 | 298 | 286 | 273 | 232 | 196 | 155 | 122 | 91.2 | 67.7 | - | - | - | |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 392 | 373 | 357 | 341 | 289 | 245 | 194 | 152 | 114 | 85.3 | - | - | - | |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 489 | 433 | 363 | 287 | 234 | 189 | 148 | - | - | - |
| 11CrMo9-10 (1.7383) | 63 | 63 | 63 | 63 | 63 | 63 | 61.8 | 59.8 | 56.9 | 54.9 | 46.1 | 38,7 | 31,4 | 27,4 | 23,5 | 20 | 17,3 | 14,8 | 12,8 | | |
| | 100 | 100 | 100 | 100 | 100 | 100 | 98.1 | 93.2 | 89.2 | 85.3 | 72.6 | 60,3 | 48,1 | 42 | 35,9 | 30,7 | 26,4 | 22,7 | 19,6 | | |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 152 | 150 | 143 | 136 | 116 | 96,7 | 77,5 | 68,6 | 59,8 | 51 | 44 | 37,8 | 32,5 | |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 237 | 233 | 223 | 213 | 180 | 151 | 122 | 107 | 93,2 | 79,4 | 68,4 | 58,9 | 50,7 | |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 314 | 298 | 286 | 273 | 232 | 193 | 155 | 137 | 119 | 102 | 87,9 | 75,6 | 65,1 | |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 392 | 373 | 357 | 341 | 289 | 241 | 194 | 171 | 148 | 127 | 109 | 94,2 | 81 | |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 426 | 375 | 325 | 285 | 246 | 215 | 188 | 161 | 143 | |
| 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 490 | 426 | 369 | 320 | 276 | 235 | 202 | 174 | 149 | |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | |
|-----------------------------------|-----|---|-----|-----|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -196 ¹⁾ | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 |
| X6CrNiMoTi 17-12-2 (1.4571) | 63 | 63 | 63 | 63 | 61.6 | 57.4 | 53.8 | 51.2 | 49 | 47.3 | 45.9 | - | - | - | - | - | - | - | - | - |
| | 100 | 100 | 100 | 100 | 97.8 | 91.1 | 85.3 | 81.3 | 77.8 | 75.1 | 72.9 | - | - | - | - | - | - | - | - | - |
| | 160 | 160 | 160 | 160 | 146 | 140 | 131 | 125 | 119 | 115 | 112 | - | - | - | - | - | - | - | - | - |
| | 250 | 250 | 250 | 250 | 229 | 218 | 204 | 195 | 186 | 180 | 174 | - | - | - | - | - | - | - | - | - |
| | 320 | 320 | 320 | 320 | 293 | 279 | 261 | 249 | 238 | 230 | 223 | - | - | - | - | - | - | - | - | - |
| | 400 | 400 | 400 | 400 | 366 | 349 | 327 | 311 | 298 | 288 | 279 | - | - | - | - | - | - | - | - | - |

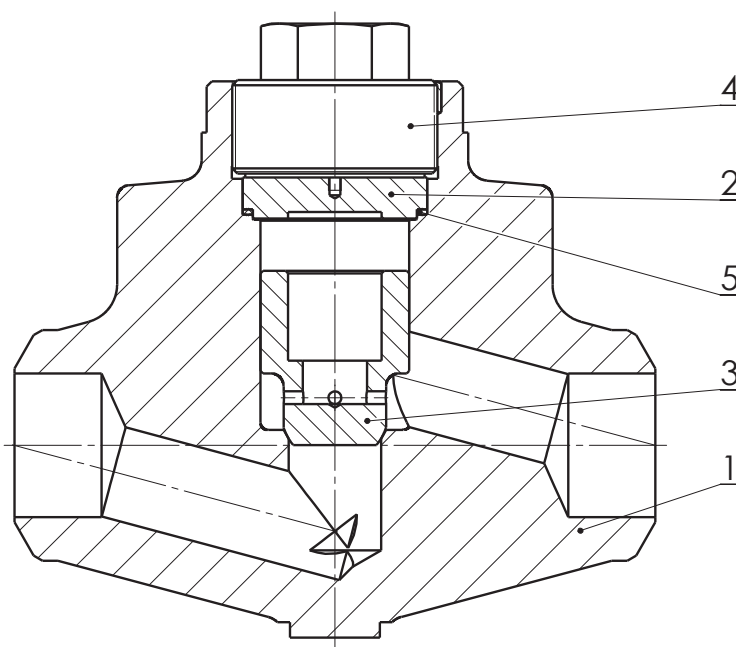
1) Application for temperature from - 196 °C to + 400 °C on request

HIGH-PRESSURE LIFT CHECK VALVE Z15.3

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | | |
|--|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 480 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 | 600 |
| X10CrMoVNB9-1 (P91) (1.4903) ²⁾ | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 57,5 | 52,4 | 47,6 | 42,8 | 37,6 | 32,8 | 30,0 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 91,3 | 83,2 | 75,6 | 67,9 | 59,7 | 52,1 | 47,6 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 146 | 133 | 121 | 109 | 95,5 | 83,3 | 76,2 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 228 | 208 | 189 | 170 | 149 | 130 | 119 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 292 | 266 | 242 | 217 | 191 | 167 | 152 |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 365 | 333 | 302 | 272 | 239 | 208 | 190 |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 456 | 416 | 378 | 340 | 298 | 260 | 238 |
| | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 575 | 524 | 476 | 428 | 376 | 328 | 300 |

2) Application for temperature to + 650 °C on request

USED MATERIALS



| Pos. | Part | Material | | | | | |
|------|---|------------------------|--------------------------|--------------------------|--------------------------|---------------------------------|-----------------------------------|
| 1 | Body | P250GH (1.0460) | 16Mo3 (1.5415) | 13CrMo4-5 (1.7335) | 11CrMo9-10 (1.7383) | X6CrNiMo- Ti17-12-2 (1.4571) | X10CrMoVNB9-1, (P91), (1.4903) |
| | Hard facing of body sealing surface | 13Cr | Stellite 6 | | | | |
| 2 | Cover | 10CrMo9-10 (1.7380) | 16Mo3 (1.5415) | 13CrMo4-5 (1.7335) | 11CrMo9-10 (1.7383) | X6CrNiMo- Ti17-12-2 (1.4571) | 11CrMo9-10 (1.7383) |
| 3 | Disc | X20Cr13 (1.4021) | 13CrMo4-5 (1.7335) | X20CrMoV12-1 (1.4922) | X20CrMoV11-1 (1.4922) | X6CrNiMo- Ti17-12-2 (1.4571) | X20CrMoV11-1 (1.4922) |
| | Hard facing of body sealing surface | Hardened | Stellite 6 | | | | |
| 4 | Pin | 24CrMo5 (1.7258) | X22CrMoV12-1 (1.4923) | | | | |
| 5 | Gasket | Graphite | | | | | |

HIGH-PRESSURE LIFT CHECK VALVE Z15.3

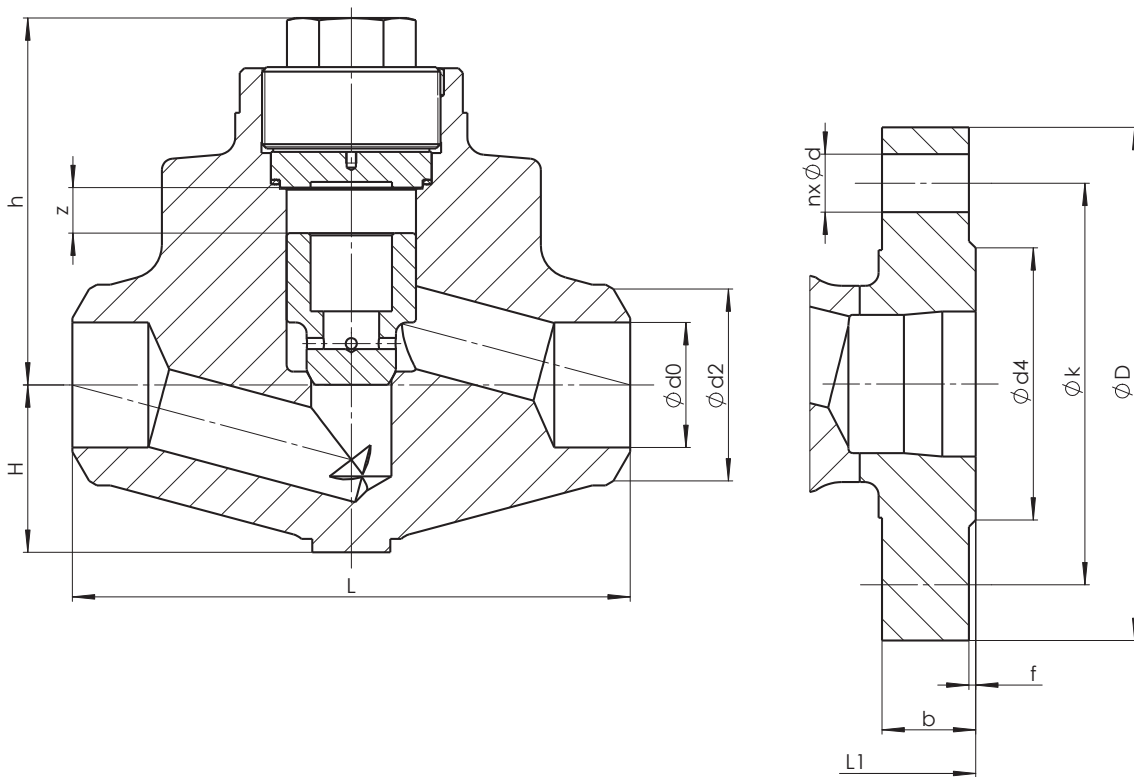
VALVE DIMENSIONS

1. Flanged

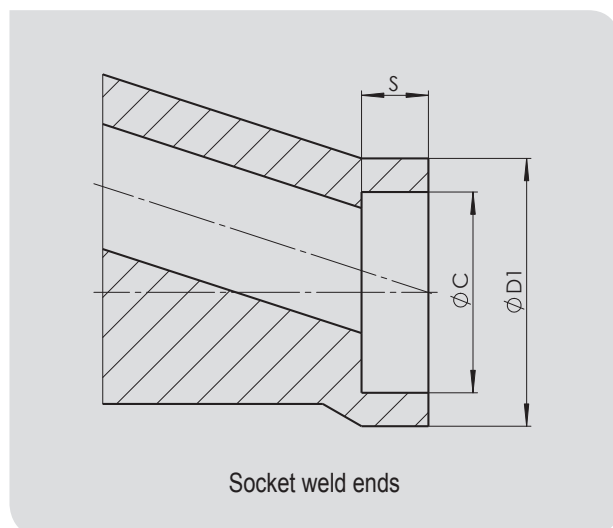
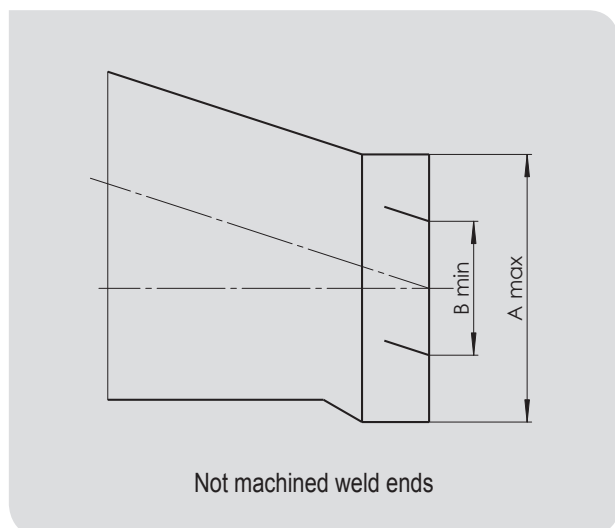
Face-to-face dimensions: EN 558, line 2
Flanges: EN 1092-1 (on request DIN 2501/1972)

2. Weld ends

Face-to-face dimensions: as per table (EN 12982, line 65)
Weld ends: as per table (DIN 3239 – line 1)
Groove form: DIN 2559 – sheet 1 – form 22



WELDING ENDS



HIGH-PRESSURE LIFT CHECK VALVE Z15.3

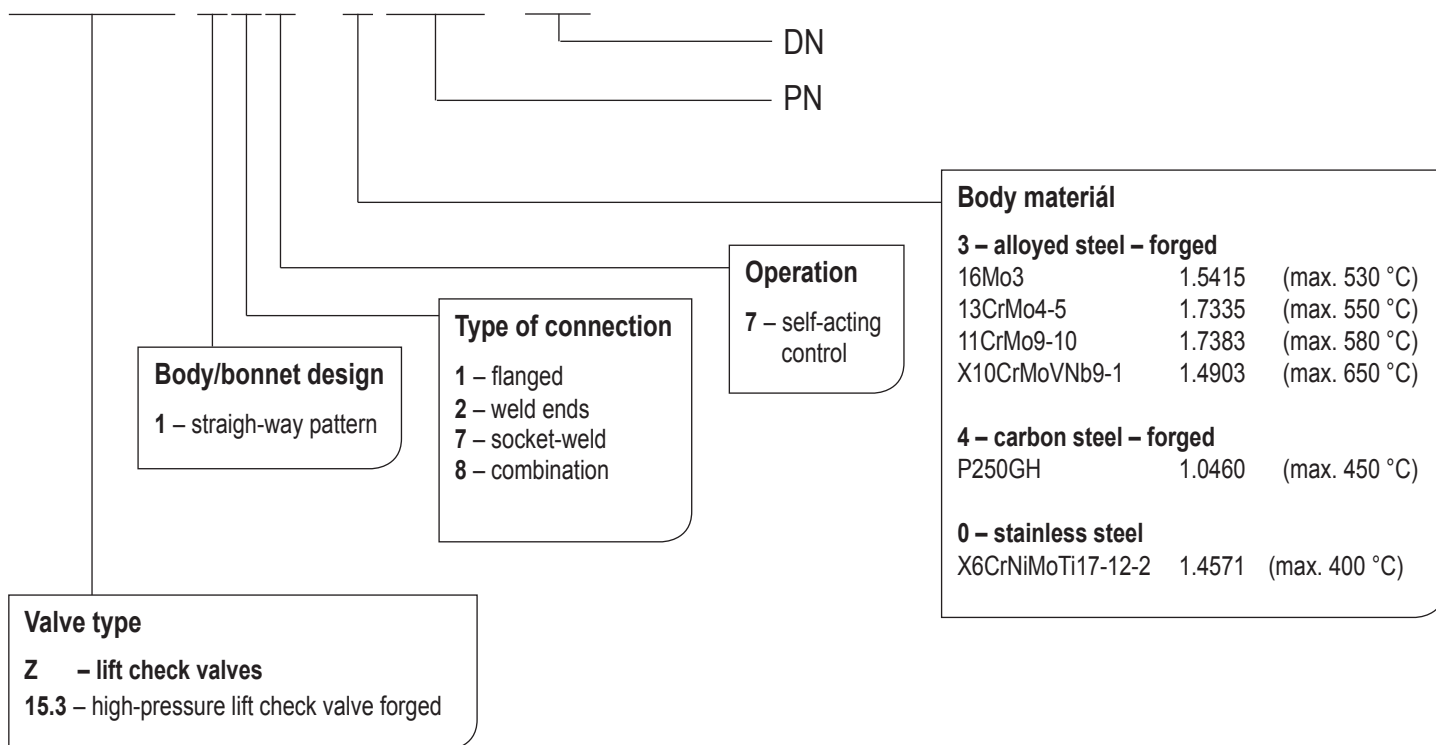
| Nominal pressure | Nominal size | Centre-to-top | Disassembly height | Stroke | Weldind design | | | | | | | | | | | | | | | | | |
|------------------|--------------|---------------|--------------------|-----------|--|------------|---|-----------|-----------|-----------|-----------|--------------|-----------|------------|------------|----------------------------|---------------------------|--------------------------|--------------------------|--------------------------|-----------|----------------|
| | | | | | Flange design Socket weld acc. to ASME B16.11 or DIN 3239-2 PN320 1) | | | | | | | | | | | | Not machined weld ends | | | | | |
| PN | DN | h [mm] | h4 [mm] | H [mm] | z [mm] | L1 [mm] | n | d [mm] | k [mm] | D [mm] | b [mm] | d4xf [mm] | L [mm] | d2 [mm] | d0 [mm] | D1 ^{-0.5} [mm] | C ^{+0.2} [mm] | s _{min} [mm] | A _{max} [mm] | B _{min} [mm] | m [kg] | Pipe dimension |
| 320 | 10 | 80 | 130 | 31 | 7 | 260 | 4 | 18 | 85 | 125 | 24 | 40x2 | 150 | 18 | 12 | 27 | 17,6 | 9,5 | 32 | 9 | 6,4 | 17,2x2,6 |
| | 15 | 80 | 130 | 31 | 7 | 260 | 4 | 18 | 90 | 130 | 26 | 45x2 | 150 | 22 | 15 | 32,5 | 21,7 | 9,5 | 32 | 14 | 6,4 | 21,3x3,2 |
| | 20 | 100 | 150 | 45 | 10 | - | - | - | - | - | - | - | 160 | 28 | 20 | 39,5 | 27,1 | 12,7 | 50 | 19 | 6,2 | 26,9x4,0 |
| | 25 | 100 | 150 | 45 | 10 | 300 | 4 | 22 | 115 | 160 | 34 | 68x2 | 160 | 35 | 24 | 48 | 33,8 | 12,7 | 50 | 22 | 6,2 | 33,7x5,0 |
| | 40 | 185 | 260 | 75 | 20 | 400 | 4 | 26 | 145 | 195 | 38 | 88x3 | 250 | 49 | 35 | 64,5 | 48,7 | 12,7 | 88 | 32 | 20,5 | 48,3x7,1 |
| | 50 | 185 | 260 | 75 | 20 | 400 | 8 | 26 | 160 | 210 | 42 | 102x3 | 250 | 67 | 47 | 73,5 | 61,1 | 15,9 | 88 | 40 | 20,2 | 63,5x8,8 |
| 400 | 10 | 80 | 130 | 31 | 7 | 260 | 4 | 18 | 85 | 125 | 28 | 40x2 | 150 | 18 | 10 | - | - | - | 32 | 9 | 6,4 | 17,2x3,6 |
| | 15 | 80 | 130 | 31 | 7 | 260 | 4 | 22 | 100 | 145 | 30 | 45x2 | 150 | 28 | 17 | - | - | - | 32 | 14 | 6,4 | 26,9x5,0 |
| | 20 | 100 | 150 | 45 | 10 | - | - | - | - | - | - | - | 160 | 34 | 20 | - | - | - | 50 | 19 | 6,2 | 32x6,3 |
| | 25 | 100 | 150 | 45 | 10 | 300 | 4 | 26 | 130 | 180 | 38 | 68x2 | 160 | 44 | 28 | - | - | - | 50 | 22 | 6,2 | 42,4x8 |
| | 40 | 185 | 260 | 75 | 20 | 400 | 4 | 30 | 165 | 220 | 48 | 88x3 | 250 | 61 | 40 | - | - | - | 88 | 32 | 20,5 | 60,3x11 |
| | 50 | 185 | 260 | 75 | 20 | 400 | 8 | 30 | 180 | 235 | 52 | 102x3 | 250 | 77 | 49 | - | - | - | 88 | 40 | 20,2 | 76,1x14,2 |
| 500 | 10 | 80 | 130 | 31 | 7 | - | - | - | - | - | - | - | 150 | 22 | 11,5 | - | - | - | 32 | 9 | 6,4 | 21,3x5,0 |
| | 15 | 80 | 130 | 31 | 7 | - | - | - | - | - | - | - | 150 | 32 | 16,5 | - | - | - | 32 | 14 | 6,4 | 32x8,0 |
| | 20 | 100 | 150 | 45 | 10 | - | - | - | - | - | - | - | 160 | 38 | 20 | - | - | - | 50 | 19 | 6,2 | 38x10,0 |
| | 25 | 100 | 150 | 45 | 10 | - | - | - | - | - | - | - | 160 | 49 | 23,5 | - | - | - | 50 | 22 | 6,2 | 48,3x12,5 |
| | 40 | 185 | 260 | 75 | 20 | - | - | - | - | - | - | - | 250 | 77 | 42 | - | - | - | 88 | 32 | 20,5 | 76,1x17,5 |
| | 50 | 185 | 260 | 75 | 20 | - | - | - | - | - | - | - | 250 | 86 | 45 | - | - | - | 88 | 40 | 20,2 | 82,5x20,0 |
| 630 | 10 | 80 | 130 | 31 | 7 | - | - | - | - | - | - | - | 150 | 22 | 11,5 | - | - | - | 32 | 9 | 6,4 | 21,3x5,0 |
| | 15 | 80 | 130 | 31 | 7 | - | - | - | - | - | - | - | 150 | 32 | 16,5 | - | - | - | 32 | 14 | 6,4 | 32x8,0 |
| | 20 | 100 | 150 | 45 | 10 | - | - | - | - | - | - | - | 160 | 38 | 20 | - | - | - | 50 | 19 | 6,2 | 38x10,0 |
| | 25 | 100 | 150 | 45 | 10 | - | - | - | - | - | - | - | 160 | 49 | 23,5 | - | - | - | 50 | 22 | 6,2 | 48,3x12,5 |
| | 40 | 185 | 260 | 75 | 20 | - | - | - | - | - | - | - | 250 | 77 | 42 | - | - | - | 88 | 32 | 20,5 | 76,1x17,5 |
| | 50 | 185 | 260 | 75 | 20 | - | - | - | - | - | - | - | 250 | 86 | 45 | - | - | - | 88 | 40 | 20,2 | 82,5x20,0 |
| 63 | 65 | 185 | 260 | 75 | 20 | 340 | 8 | 22 | 160 | 205 | 26 | 122x3 | 250 | 78 | 69 | 80,5 | 61,1 | 15,9 | 90 | 57 | 20,0 | 76,1x3,6 |
| 100 | | 185 | 260 | 75 | 20 | 340 | 8 | 26 | 170 | 220 | 30 | 122x3 | 250 | 78 | 69 | 80,5 | 61,1 | 15,9 | 90 | 57 | 20,0 | 76,1x3,6 |
| 160 | | 185 | 260 | 75 | 20 | 340 | 8 | 26 | 170 | 220 | 34 | 122x3 | 250 | 78 | 65 | 80,5 | 61,1 | 15,9 | 90 | 57 | 20,0 | 76,1x5,6 |
| 250 | | 185 | 260 | 75 | 20 | 340 | 8 | 26 | 180 | 230 | 42 | 122x3 | 250 | 78 | 59,5 | 80,5 | 61,1 | 15,9 | 90 | 57 | 20,0 | 76,1x8,8 |

Flanges DN 20 and DN 32 on customer request

HIGH-PRESSURE LIFT CHECK VALVE Z15.3

VALVE DESCRIPTION CODE

Z15.3 127-3320-25



VALVE INSTALLATION

Recommended valve assembly - horizontal position. In the case of mounting in a position other than horizontal, a spring must be included in the valve. Medium must flow under the cone in accordance with the direction indicated on the valve body.

It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- the medium used must be comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

LIFT CHECK VALVE Z15

PN 160 – 400; DN 65 – 150, T_{MAX}: 550°C



LIFT CHECK VALVE Z15

APPLICATION

- water, steam, non-aggressive substances, petroleum products, oil

CONNECTION

- weld ends, flanged, combination

OPERATION

- self-acting control

DESCRIPTION

- high-pressure lift check valve
- design of the body is straight sealing
- check valve disc
- sealing surface is welded by hard facing (13Cr) or Stellite 6
- complies with the requirements of the directive 2014/68/EU and standard EN 16767
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

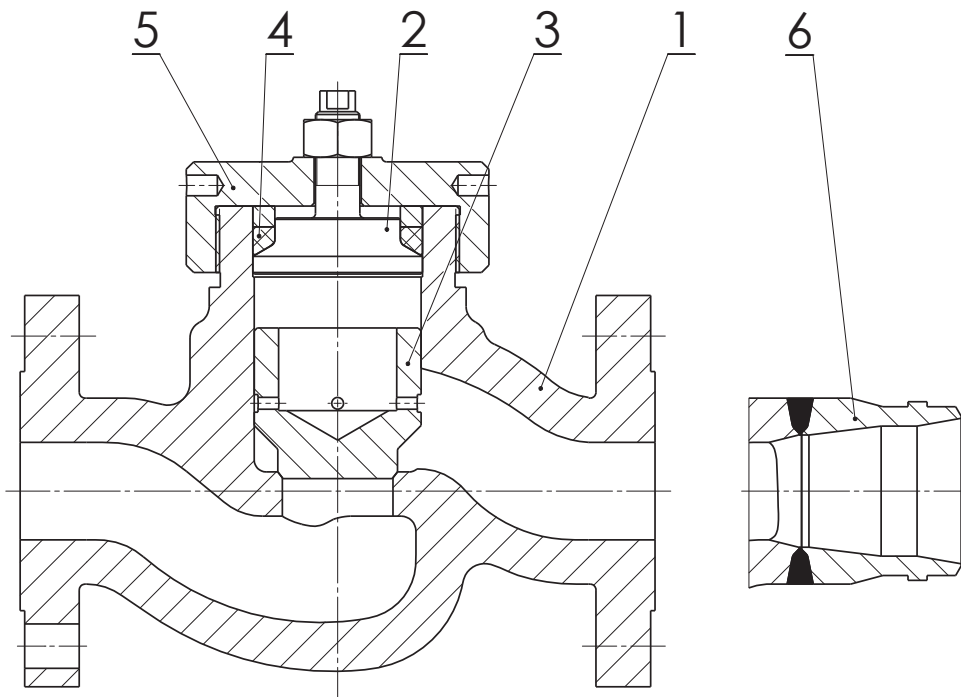
- branch from forged materials
- according to TRD 201 – on request

LIFT CHECK VALVE Z15

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | |
|------------------------|-----|---|-----|-----|-----|-----|-----|------|------|------|-----|-----|-----|------|------|------|------|------|------|------|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 425 | 450 | 475 | 500 | 510 | 520 | 530 | 540 | 545 | 550 |
| G17CrMo5-5 (1.7357) | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 153 | 143 | 133 | 129 | 126 | 111 | 77,6 | 66,4 | 56,8 | 48,8 | 42 | 39,2 | 36,4 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 239 | 223 | 208 | 202 | 197 | 173 | 121 | 103 | 88,7 | 76,2 | 65,6 | 61,2 | 56,8 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 306 | 286 | 266 | 259 | 252 | 222 | 155 | 132 | 113 | 97,6 | 84 | 78,4 | 72,8 |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 383 | 358 | 333 | 324 | 316 | 278 | 194 | 166 | 142 | 122 | 105 | 98 | 91 |
| GP240GH (1.0619) | 160 | 160 | 160 | 160 | 157 | 128 | 110 | 94.1 | 88.3 | 78.5 | - | - | - | - | - | - | - | - | - | - |
| | 250 | 250 | 250 | 250 | 245 | 196 | 172 | 147 | 137 | 123 | - | - | - | - | - | - | - | - | - | - |
| | 320 | 320 | 320 | 320 | 314 | 245 | 221 | 188 | 177 | 157 | - | - | - | - | - | - | - | - | - | - |
| | 400 | 400 | 400 | 400 | 392 | 314 | 275 | 235 | 221 | 196 | - | - | - | - | - | - | - | - | - | - |

USED MATERIALS



| Pos. | Part | Material | |
|------|--------------------------------|-------------------|---------------------|
| 1 | Body | GP240GH/1.0619 | G17CrMo5-5 / 1.7357 |
| | Hard facing of sealing surface | 13Cr | Stellite 6 |
| 2 | Cover | G17CrMo5-5/1.7357 | G17CrMo5-5/1.7357 |
| 3 | Disc | X20Cr13/1.4021 | X22CrMoV12-1/1.4923 |
| | Hard facing of sealing surface | hardening | Stellite 6 |
| 4 | Gasket | Graphite | |
| 5 | Nut | C35/1.0501 | 24CrMoV5-5/1.7733 |
| 6 | Branch | P250GH/1.0460 | 13CrMo4-5/1.7335 |

LIFT CHECK VALVE Z15

VALVE DIMENSIONS

1. Flanged

Face-to-face dimensions: DIN 3202 – part 1 – line F2 (PN160), line F3 (PN250)

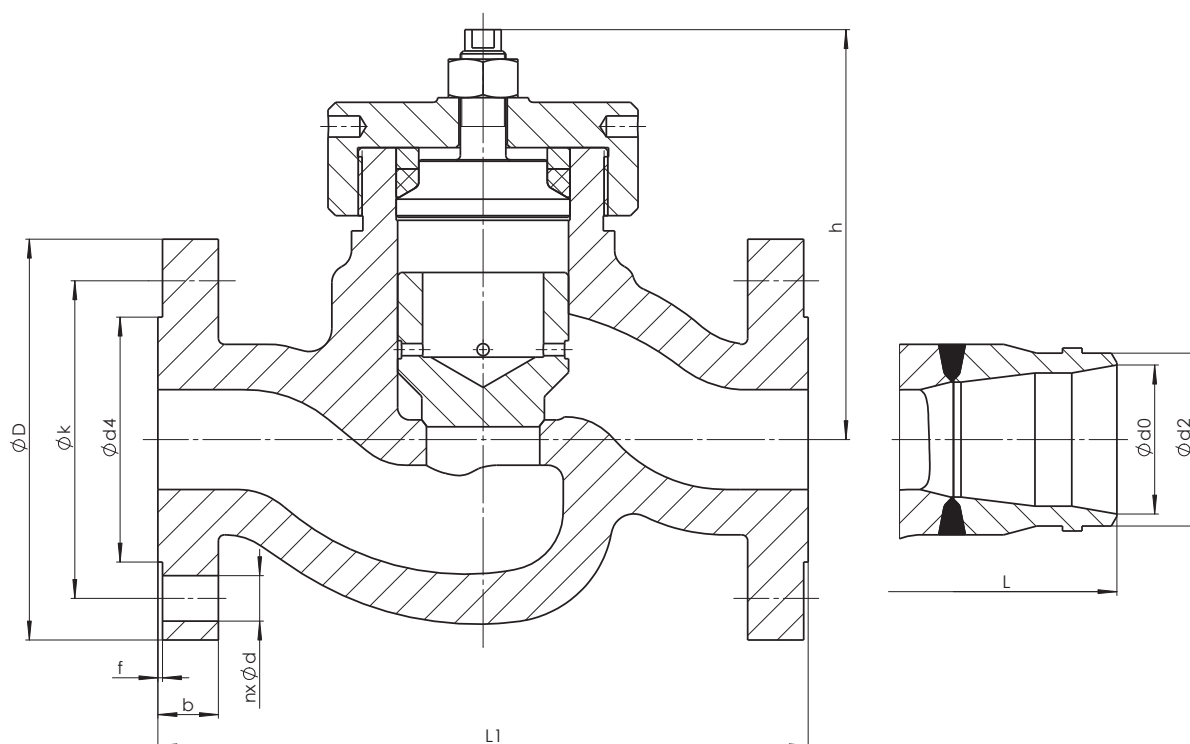
Flanges: EN 1092-1, (DIN 2501 – sheet 1/1972)

2. Weld ends

Face-to-face dimensions: as per table (EN 12982, line 65, DIN 3202 – part 2, line S3)

Dimensions of welding ends: DIN 3239 – part 1 (EN 12627)

Groove form: DIN 2559 – sheet 1 – form 22



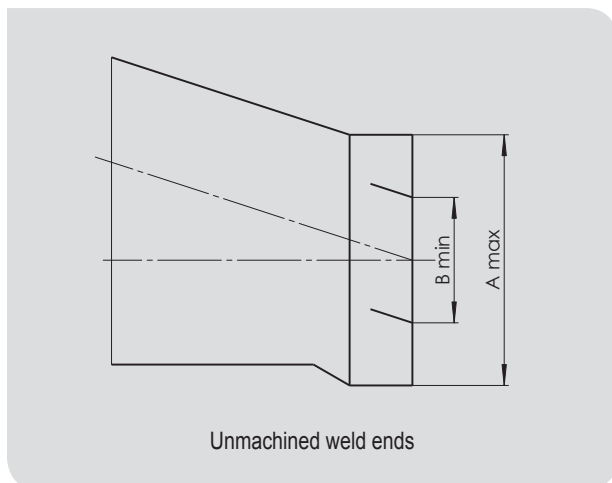
LIFT CHECK VALVE Z15

| Nominal pressure | Nominal size | Centre-to-top | Flanged | | | | | | | | Weld ends | | | | | | |
|------------------|--------------|---------------|---------|----|--------|---------|-----|--------|--------|--------|-----------|-----------|--------|--------|---------|---------|------------|
| | | | PN | DN | h [mm] | L1 [mm] | n | d [mm] | k [mm] | D [mm] | b [mm] | d4xf [mm] | m [kg] | L [mm] | d2 [mm] | d0 [mm] | Amax [mm] |
| 160 | 65 | 180 | 340 | 8 | 26 | 170 | 220 | 34 | 122×3 | 54 | 500 | 77 | 65 | 93 | 48 | 43 | 76,1×5,6 |
| | 80 | 240 | 380 | 8 | 26 | 180 | 230 | 36 | 138×3 | 90 | 600 | 90 | 76,5 | 116 | 62 | 76 | 88,9×6,3 |
| | 100 | 240 | 430 | 8 | 30 | 210 | 265 | 40 | 162×3 | 139 | 600 | 115 | 98,5 | 138 | 84 | 126 | 114,3×8 |
| | 125 | 365 | 500 | 8 | 33 | 250 | 315 | 44 | 188×3 | 213 | 900 | 141 | 120,5 | 179 | 106 | 182 | 139,7×10 |
| | 150 | 365 | 550 | 12 | 33 | 290 | 355 | 50 | 218×3 | 296 | 900 | 170 | 144,5 | 198 | 133 | 255 | 168,3×12,5 |
| 250 | 65 | 180 | 400 | 8 | 26 | 180 | 230 | 42 | 122×3 | 64 | 500 | 77 | 59,5 | 93 | 48 | 43 | 76,1×8,8 |
| | 80 | 240 | 450 | 8 | 30 | 200 | 255 | 46 | 138×3 | 100 | 600 | 115 | 93 | 116 | 62 | 76 | 2) |
| | 100 | 240 | 520 | 8 | 33 | 235 | 300 | 54 | 162×3 | 149 | 600 | - | - | 138 | 84 | 126 | 2) |
| | 125 | 365 | 600 | 12 | 33 | 275 | 340 | 60 | 188×3 | 225 | 900 | - | - | 179 | 106 | 182 | 2) |
| | 150 | 365 | 700 | 12 | 36 | 320 | 390 | 68 | 218×3 | 295 | 900 | - | - | 198 | 133 | 255 | 2) |
| 320 | 65 | 180 | - | - | - | - | - | - | - | - | 500 | 90 | 68 | 93 | 48 | 1) | 88,9×11 |
| | 80 | 240 | - | - | - | - | - | - | - | - | 600 | 115 | 87,5 | 116 | 62 | 1) | 2) |
| | 100 | 240 | - | - | - | - | - | - | - | - | 600 | - | - | 138 | 84 | 1) | 2) |
| | 125 | 365 | - | - | - | - | - | - | - | - | 900 | - | - | 179 | 106 | 1) | 2) |
| | 150 | 365 | - | - | - | - | - | - | - | - | 900 | - | - | 198 | 133 | 1) | 2) |
| 400 | 65 | 180 | - | - | - | - | - | - | - | - | 500 | 115 | 81 | 93 | 48 | 1) | 2) |
| | 80 | 240 | - | - | - | - | - | - | - | - | 600 | 115 | 81 | 116 | 62 | 1) | 2) |
| | 100 | 240 | - | - | - | - | - | - | - | - | 600 | - | - | 138 | 84 | 1) | 2) |
| | 125 | 365 | - | - | - | - | - | - | - | - | 900 | - | - | 179 | 106 | 1) | 2) |
| | 150 | 365 | - | - | - | - | - | - | - | - | 900 | - | - | 198 | 133 | 1) | 2) |

1) Values on request

2) Dimensions on request according to dimensions Amax and Bmin

WELDING ENDS

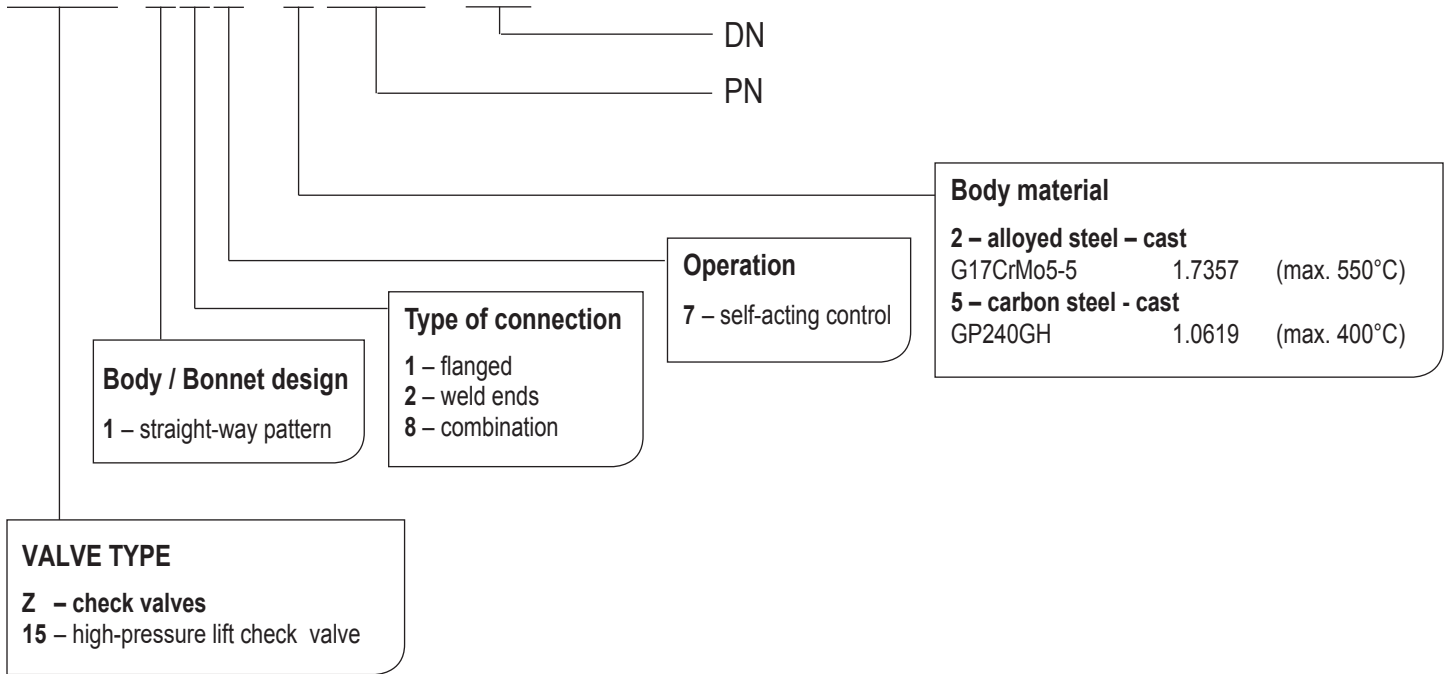


Unmachined weld ends

LIFT CHECK VALVE Z15

VALVE DESCRIPTION CODE

Z15 117-2160-65



VALVE INSTALLATION

Lift check valve must always be installed in horizontal position. Medium must flow under the cone in accordance with the direction indicated on the body. Installation and use of the valve following points have to be respected:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary to keep the working environment and pipeline clean, for example by using filters
- medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

LIFT CHECK VALVE Z35

PN 16-250; DN 65-150 (DN 80 AND DN 125 ONLY UP TO PN 100), T_{MAX}: 300°C



LIFT CHECK VALVE Z35

APPLICATION

- water, non-aggressive substances

CONNECTION

- flanged

OPERATION

- self-acting control

DESCRIPTION

- check valve to vertical pipe
- design of the body is straight sealing
- check valve disc
- sealing surface is welded by hard facing (13Cr)
- complies with the requirements of the directive 2014/68/EU and standard EN 16767
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

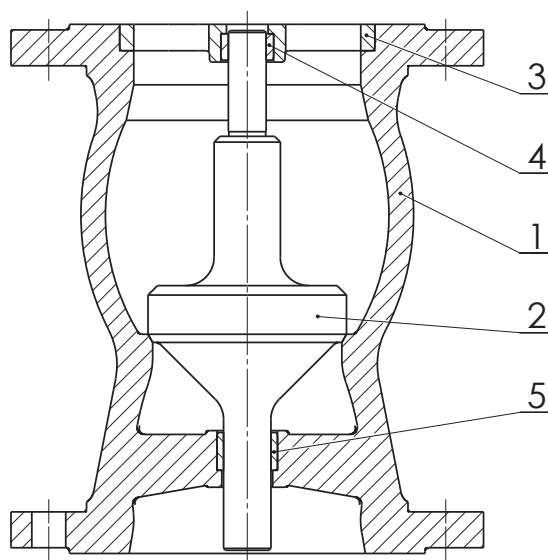
- according to TRD 201

LIFT CHECK VALVE Z35

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | |
|---------------------|-----|---|-----|------|------|------|------|------|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 |
| GP240GH (1.0619) | 16 | 16 | 16 | 14,9 | 13,9 | 12,4 | 11,4 | 10,3 |
| | 40 | 40 | 40 | 37,3 | 34,7 | 30,2 | 28,4 | 25,8 |
| | 63 | 63 | 63 | 58,8 | 54,6 | 47,6 | 44,8 | 40,6 |
| | 100 | 100 | 100 | 93,3 | 86,7 | 75,6 | 71,1 | 64,4 |
| | 160 | 160 | 160 | 160 | 157 | 128 | 110 | 94,1 |
| | 250 | 250 | 250 | 250 | 245 | 196 | 172 | 147 |

USED MATERIALS



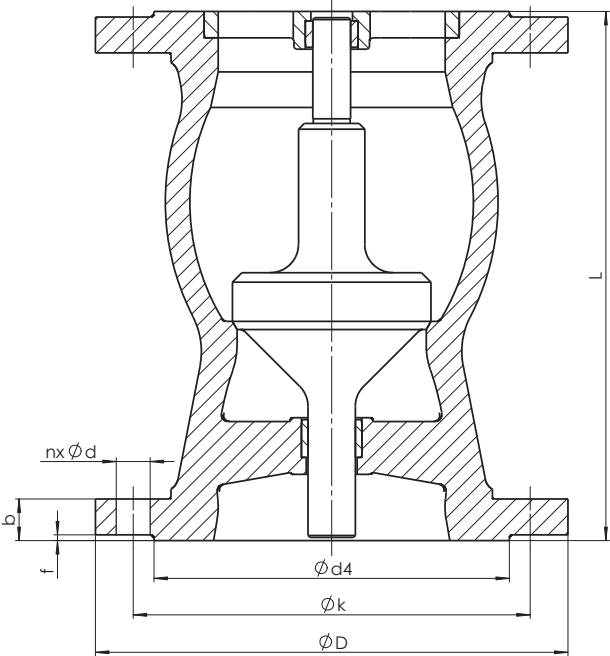
| Pos. | Part | Material |
|------|--------------------------------|--------------------------|
| 1 | Body | GP240GH (1.0619) |
| | Hard facing of sealing surface | 13 Cr |
| 2 | Disc | X20Cr13 (1.4021) |
| 3 | Disc guide | 11 523, 1.0425 (P265GH) |
| 4, 5 | Bushing | 42 3018.21 (ČSN 02 3499) |

LIFT CHECK VALVE Z35

VALVE DIMENSIONS

1. Flanged

Face-to-face dimensions: as per table
Flanges: EN 1092-1, (DIN 2501/1972)



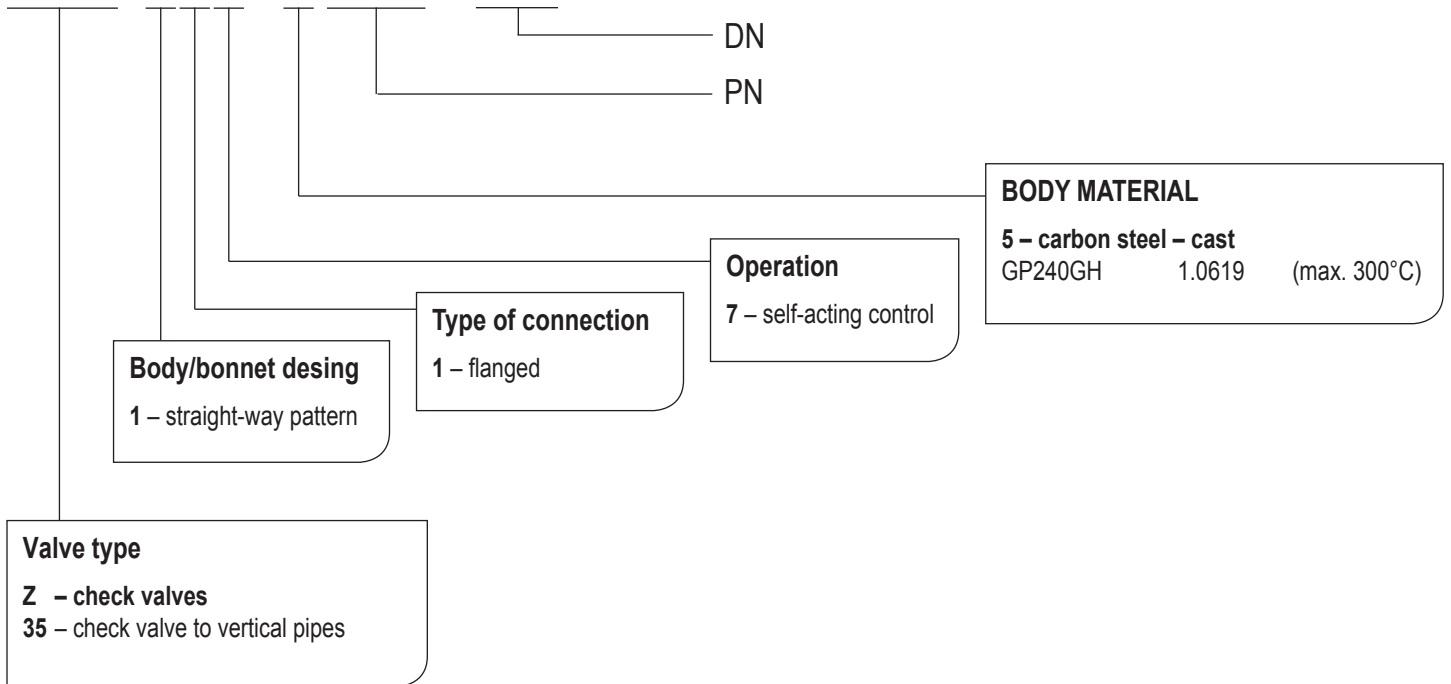
LIFT CHECK VALVE Z35

| Nominal pressure | Nominal size | Face-to-face dimension | Flanged | | | | | | |
|------------------|--------------|------------------------|---------|----|--------|-----|--------|--------|--------|
| | | | PN | DN | L [mm] | n | d [mm] | k [mm] | D [mm] |
| 16 | 65 | 180 | 8 | 18 | 145 | 185 | 18 | 122×3 | 12,0 |
| | 80 | 200 | 8 | 18 | 160 | 200 | 20 | 138×3 | 15,4 |
| | 100 | 230 | 8 | 18 | 180 | 220 | 20 | 158×3 | 18,5 |
| | 125 | 280 | 8 | 18 | 210 | 250 | 22 | 188×3 | 28,0 |
| | 150 | 330 | 8 | 22 | 240 | 285 | 22 | 212×3 | 43,0 |
| 40 | 65 | 180 | 8 | 18 | 145 | 185 | 22 | 122×3 | 12,8 |
| | 80 | 200 | 8 | 18 | 160 | 200 | 24 | 138×3 | 16,9 |
| | 100 | 230 | 8 | 22 | 190 | 235 | 24 | 162×3 | 21,0 |
| | 125 | 280 | 8 | 26 | 220 | 270 | 26 | 188×3 | 31,0 |
| | 150 | 330 | 8 | 26 | 250 | 300 | 28 | 218×3 | 47,0 |
| 63 | 65 | 180 | 8 | 22 | 160 | 205 | 26 | 122×3 | 16,3 |
| | 80 | 200 | 8 | 22 | 170 | 215 | 28 | 138×3 | 20,0 |
| | 100 | 230 | 8 | 26 | 200 | 250 | 30 | 162×3 | 27,1 |
| | 125 | 280 | 8 | 30 | 240 | 295 | 34 | 188×3 | 44,0 |
| | 150 | 330 | 8 | 33 | 280 | 345 | 36 | 218×3 | 66,0 |
| 100 | 65 | 180 | 8 | 26 | 170 | 220 | 30 | 122×3 | 19,6 |
| | 80 | 200 | 8 | 26 | 180 | 230 | 32 | 138×3 | 23,0 |
| | 100 | 230 | 8 | 30 | 210 | 265 | 36 | 162×3 | 32,0 |
| | 125 | 280 | 8 | 33 | 250 | 315 | 40 | 188×3 | 52,0 |
| | 150 | 330 | 12 | 33 | 290 | 355 | 44 | 218×3 | 76,0 |
| 160 | 65 | 200 | 8 | 26 | 170 | 220 | 34 | 122×3 | 25,0 |
| | 100 | 230 | 8 | 30 | 210 | 265 | 40 | 162×3 | 46,0 |
| | 150 | 300 | 12 | 33 | 290 | 355 | 50 | 218×3 | 104,0 |
| 250 | 65 | 200 | 8 | 26 | 180 | 230 | 42 | 122×3 | 30,0 |
| | 100 | 230 | 8 | 33 | 235 | 300 | 54 | 162×3 | 62,0 |
| | 150 | 300 | 12 | 36 | 320 | 390 | 68 | 218×3 | 133,0 |

LIFT CHECK VALVE Z35

VALVE DESCRIPTION CODE

Z35 117-5100-150



VALVE INSTALLATION

Lift check valve must be installed in the vertical position. Medium must flow under the cone in accordance with the direction indicated on the body. Installation and use the valve following points have to be respected:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

LIFT CHECK VALVE WITH AUTOMATIC RELIEF Z40

PN 16-100; DN 65-150, T_{MAX}: 300°C



LIFT CHECK VALVE WITH AUTOMATIC RELIEF Z40

APPLICATION

- water, non-aggressive liquids

CONNECTION

- flanged

OPERATION

- self-acting control

DESCRIPTION

- vertical lift check valve with automatic relief
- design of the body is straight sealing
- check valve disc
- sealing surfaces are welded by hard facing (13Cr)
- complies with the requirements of the directive 2014/68/EU and standard EN 16767
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

- according to TRD 201

SPECIFICATIONS TO BE KNOW FOR ORDER

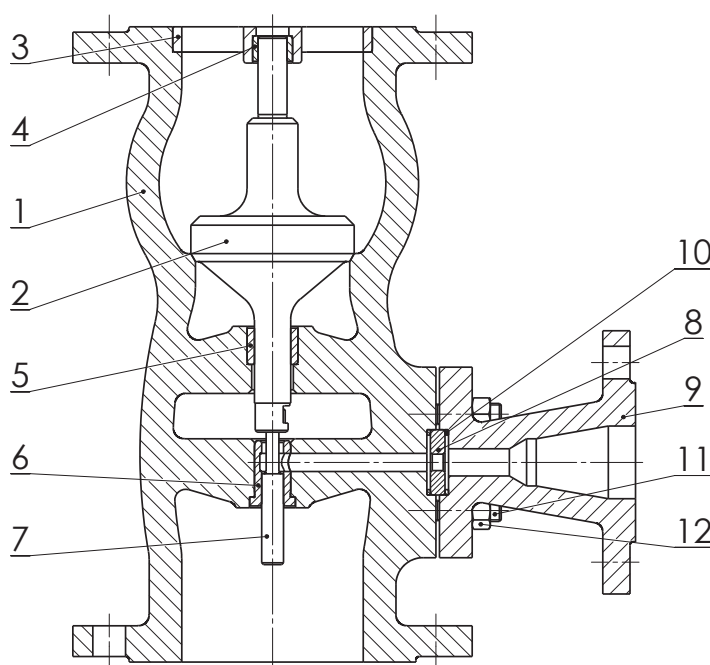
- PN, DN
- pressure in front of the expander
- required pressure behind the expander
- required flow volume through the expander
- medium
- medium temperature

LIFT CHECK VALVE WITH AUTOMATIC RELIEF Z40

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | |
|---------------------|-----|---|-----|------|------|------|------|------|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 |
| GP240GH (1.0619) | 16 | 16 | 16 | 14,9 | 13,9 | 12,4 | 11,4 | 10,3 |
| | 40 | 40 | 40 | 37,3 | 34,7 | 30,2 | 28,4 | 25,8 |
| | 63 | 63 | 63 | 58,8 | 54,6 | 47,6 | 44,8 | 40,6 |
| | 100 | 100 | 100 | 93,3 | 86,7 | 75,6 | 71,1 | 64,4 |

USED MATERIALS



| Pos. | Part | Material |
|------|--------------------------------|---------------------------------|
| 1 | Body | GP240GH (1.0619) |
| | Hard facing of sealing surface | 13 Cr |
| 2 | Disc | X20Cr13 (1.4021) |
| 3 | Disk guide | 11 523, P265GH (1.0425) |
| 4, 5 | Bushing | 42 3018.21 (ČSN 02 3499) |
| 6 | Bushing | 17 023 (1.4028) |
| 7 | Relief piston | 17 029 (1.4034) |
| 8 | Orifice plate | REAL 096 |
| 9 | Expander | P250GH, P265GH (1.0460, 1.0425) |
| 10 | Sealing ring | 12 014 |
| 11 | Bolt | 25CrMo4 (1.7218) |
| 12 | Nut | C35E+QT (1.1181) |

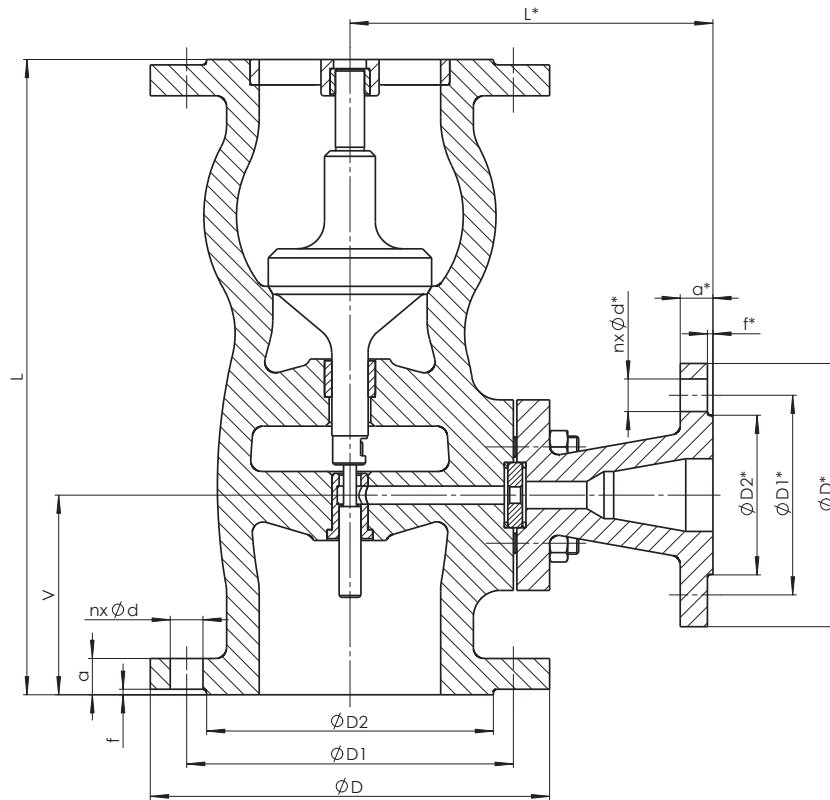
LIFT CHECK VALVE WITH AUTOMATIC RELIEF Z40

VALVE DIMENSIONS

1. Flanged

Face-to-face dimensions: EN 558 – part 1 (PN16-40), EN 558 – part 2 (PN63-100)

Flanges: EN 1092-1, (DIN 2501/1972)



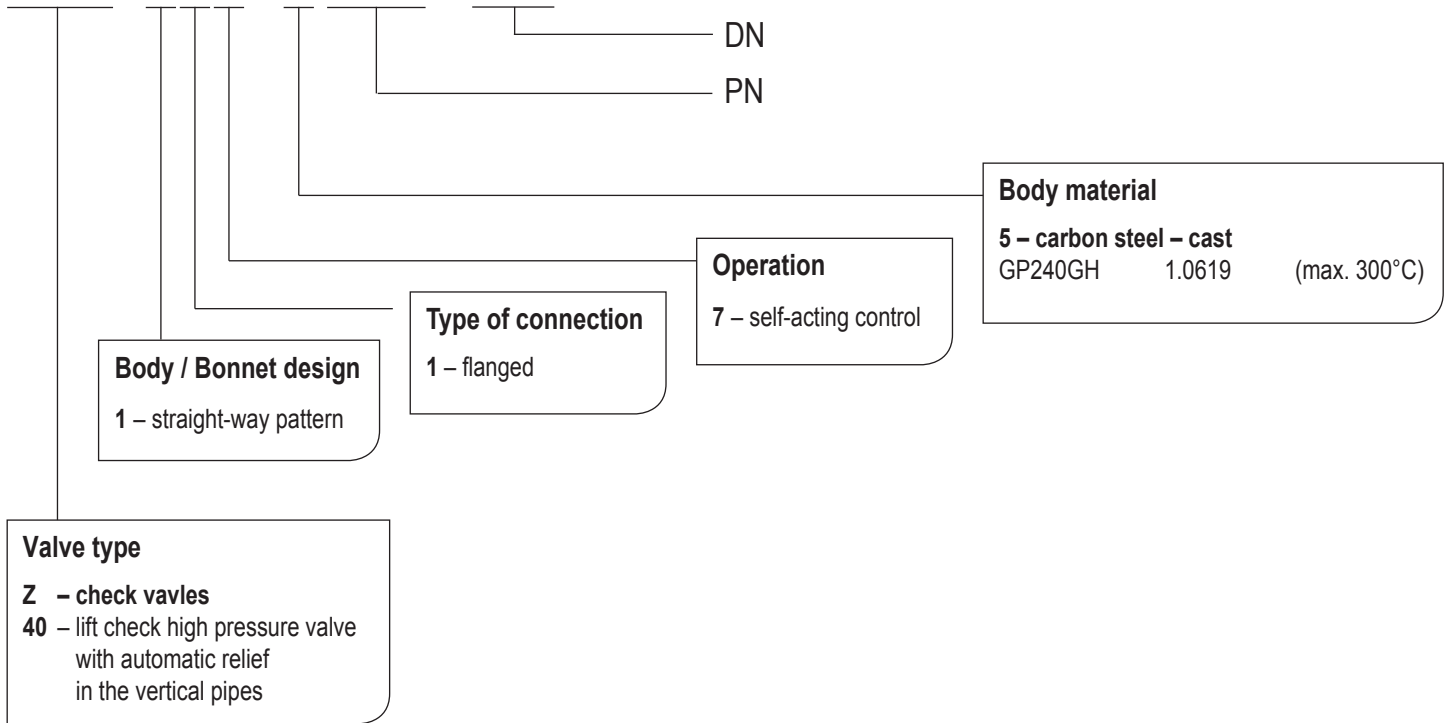
LIFT CHECK VALVE WITH AUTOMATIC RELIEF Z40

| Nominal pressure | Nominal size | Face-to-face dimension | Face-to-face dimension | Disassembly height | Flanged | | | | | | | | | | | | |
|------------------|--------------|------------------------|------------------------|--------------------|---------|----|--------|---------|--------|-------|--------|---------|--------|--------|-----------|-------|---------|
| | | | | | PN | DN | L [mm] | L* [mm] | V [mm] | n | d [mm] | D1 [mm] | D [mm] | a [mm] | D2×f [mm] | n | d* [mm] |
| 16 | 65 | 290 | 150 | 90 | 8 | 18 | 145 | 185 | 18 | 122×3 | 4 | 14 | 85 | 115 | 18 | 68×2 | 24,0 |
| | 80 | 310 | 160 | 100 | 8 | 18 | 160 | 200 | 20 | 138×3 | 4 | 14 | 85 | 115 | 18 | 68×2 | 26,0 |
| | 100 | 350 | 200 | 110 | 8 | 18 | 180 | 220 | 20 | 158×3 | 4 | 18 | 110 | 145 | 18 | 88×3 | 41,0 |
| | 125 | 400 | 210 | 125 | 8 | 18 | 210 | 250 | 22 | 188×3 | 4 | 18 | 110 | 145 | 18 | 88×3 | 55,0 |
| | 150 | 480 | 260 | 160 | 8 | 22 | 240 | 285 | 22 | 212×3 | 8 | 18 | 145 | 185 | 22 | 122×3 | 80,0 |
| 40 | 65 | 290 | 150 | 90 | 8 | 18 | 145 | 185 | 22 | 122×3 | 4 | 14 | 85 | 115 | 18 | 68×2 | 24,0 |
| | 80 | 310 | 160 | 100 | 8 | 18 | 160 | 200 | 24 | 138×3 | 4 | 14 | 85 | 115 | 18 | 68×2 | 26,0 |
| | 100 | 350 | 200 | 110 | 8 | 22 | 190 | 235 | 24 | 162×3 | 4 | 18 | 110 | 145 | 18 | 88×3 | 41,0 |
| | 125 | 400 | 210 | 125 | 8 | 26 | 220 | 270 | 26 | 188×3 | 4 | 18 | 110 | 145 | 18 | 88×3 | 55,0 |
| | 150 | 480 | 260 | 160 | 8 | 26 | 250 | 300 | 28 | 218×3 | 8 | 18 | 145 | 185 | 22 | 122×3 | 80,0 |
| 63 | 65 | 340 | 192 | 110 | 8 | 22 | 160 | 205 | 26 | 122×3 | 4 | 18 | 100 | 140 | 24 | 68×2 | 40,0 |
| | 80 | 380 | 200 | 120 | 8 | 22 | 170 | 215 | 28 | 138×3 | 4 | 18 | 100 | 140 | 24 | 68×2 | 46,0 |
| | 100 | 430 | 215 | 125 | 8 | 26 | 200 | 250 | 30 | 162×3 | 4 | 22 | 125 | 170 | 26 | 88×3 | 64,0 |
| | 125 | 500 | 230 | 140 | 8 | 30 | 240 | 295 | 34 | 188×3 | 4 | 22 | 125 | 170 | 26 | 88×3 | 68,0 |
| | 150 | 550 | 230 | 190 | 8 | 33 | 280 | 345 | 36 | 218×3 | 8 | 26 | 170 | 220 | 30 | 122×3 | 120,0 |
| 100 | 65 | 340 | 192 | 110 | 8 | 26 | 170 | 220 | 30 | 122×3 | 4 | 18 | 100 | 140 | 24 | 68×2 | 45,0 |
| | 80 | 380 | 200 | 120 | 8 | 26 | 180 | 230 | 32 | 138×3 | 4 | 18 | 100 | 140 | 24 | 68×2 | 50,0 |
| | 100 | 430 | 215 | 125 | 8 | 30 | 210 | 265 | 36 | 162×3 | 4 | 22 | 125 | 170 | 26 | 88×3 | 64,0 |
| | 125 | 500 | 230 | 140 | 8 | 33 | 250 | 315 | 40 | 188×3 | 4 | 22 | 125 | 170 | 26 | 88×3 | 72,0 |
| | 150 | 550 | 230 | 190 | 12 | 33 | 290 | 355 | 44 | 218×3 | 8 | 26 | 170 | 220 | 30 | 122×3 | 136,0 |

LIFT CHECK VALVE WITH AUTOMATIC RELIEF Z40

VALVE DESCRIPTION CODE

Z40 117-5100-150



VALVE INSTALLATION

Lift check valve must be installed in the vertical position. Medium must flow under the plug in accordance with the direction indicated on the body. Installation and use of the valve following points have to be respected:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary to keep the working environment and pipeline clean, for example by using filters
- medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

Check Valves

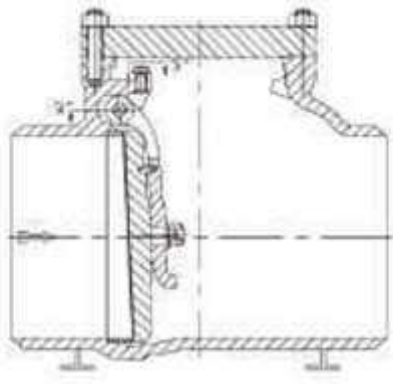
ENEQ check valves are offered in swing, lift (piston), tilting-disc and twin-disc configurations for reliable backflow prevention in water, steam, oil, gas and petrochemical services. All designs are available in cast or forged bodies, with bolted-bonnet, pressure-seal or wafer construction, and a wide range of end connections. Valves can be supplied with metal-to-metal or soft seats, API-compatible hard facings and full material traceability to meet ANSI-, API-, BS- and EN-based standards.

Check valves are designed to meet requirements of ANSI B16.34, BS-1868, ANSI B16.5, ANSI B16.10, API 602, API 6D and/or API 6A.

Check Valve Standards, Sizes & Features

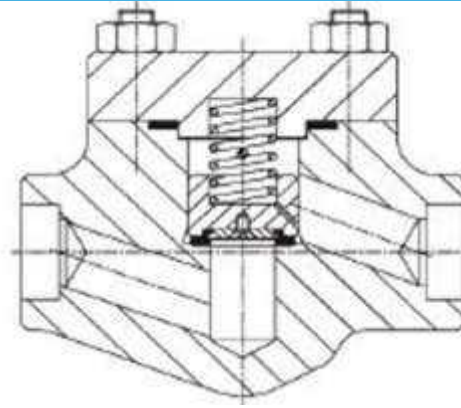
| Standard | Sizes | Features / Design - Materials |
|--------------------|--|--|
| API 6D | - 64" ANSI 150 / 300 | Bolted bonnet |
| BS-1868 | - 48" ANSI 600 / 900 | Pressure seal |
| ANSI B16.34 | - 36" ANSI 1500 / 2500 - 24" ANSI 4500 | Cast and forged Piston check |
| API 6A | 2-1/16" to 11" Class 2000 2-1/16" to 11" Class 3000 2-1/16" to 9" Class 5000 1-13/16" to 7-1/16" Class 10000 1-13/16" to 4-1/16" Class 15000 | Tilting disc Swing check Emergency assisted Duo Check |

Configurations

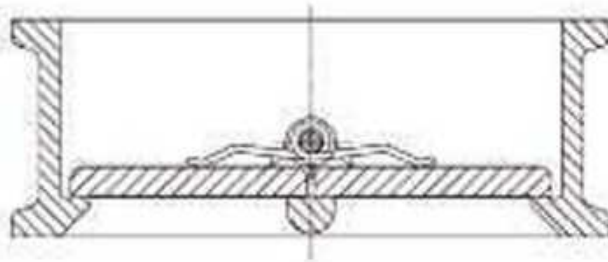
| Gate Valve Configuration | Image |
|---|--|
| <p>Swing Check Valve Valve disc is provided with antirotations pin. Full opening swing check valves to API 6D or API 6A suitable for pig passage are also available.</p> |  |

Piston Check Valve

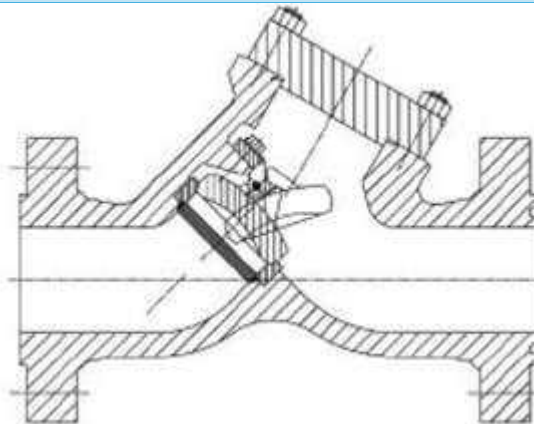
Normally upto sizes 2", (larger sizes are also available) both T-Pattern and Y-Pattern are available.

**Dual Plate Check Valve**

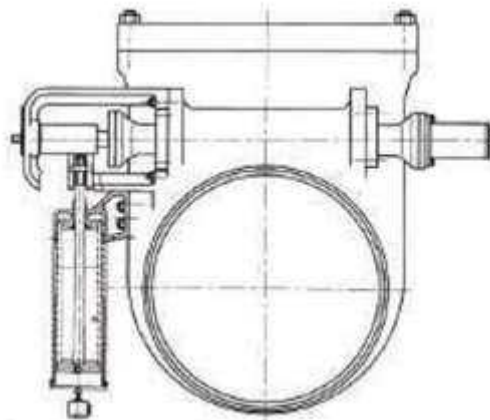
Valves provided with double disc and spring. They are available with metal to metal seats and soft seats. This design reduces substantially the weight of the valve as well as the face to face dimension.

**Tilting Disc Check Valve**

When the check valve must be operated by a very small pressure drop this design is used. Valve disc is balanced in such a way that very small variations of pressure open/close the valve. This reduces substantially the pressure drop across the valve.

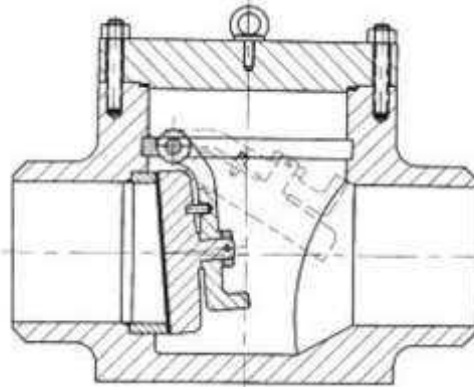
**Emergency Assisted Check Valve**

Used in the turbine steam extractions of power plants. Valve is provided with a pneumatic piston and solenoid valve in such a way that when a closing signal is received in the solenoid valve the air in the pneumatic piston is released starting the closing stroke of valve disc and ensuring fast valve closing by fluid media.



Testable Check Valve

In those cases when indication of check valve position is required the valve is provided with a position indicator and limit switches. Also a operating lever is available in case proper rotation of hinge shaft must be checked.

**Butterfly Check Valve**

Normally used in the outlet of large size pumps or inlet of hydro power plant turbines. Valve can operate like a butterfly valve but also like a check valve by fluid-media.

Materials**Body/Bonnet Materials**

| Material Family | Designations |
|---|--|
| Carbon Steel (General Use) | WCB; WCC; WCA; A 105N |
| Carbon Steel (Low Temperature) | LCB; LCC; LCA; LC3; LF2; LF3; LF6 |
| Alloy Steel (High Temperature) | WC1; WC6; WC9; C5; C12; C12A; F1; F11; F22; F5; F9; F91 |
| Martensitic Steel | CA15; CA6NM; F6 |
| Stainless Steel (Corrosion Resistant) | CF8; CF8M; CF3; CF3M; CF8C; F304; F316; F304L; F316L; F321; F347 |
| Duplex & Superduplex Stainless Steel | CD4MCu; CD4MCuN; CK3MCuN; F51; F44; F52; F53 |
| Nickel Base Alloys | Inconel 625; Hastelloy (CW-12MW); Incoloy 825; Monel |

*) Table based on ASTM materials. Equivalent DIN materials are also available upon request.

Trim Materials

Different combinations of trim material consistent with body / bonnet material according API 600 are available.

Different hard facings for sealing areas can be used being the most common ones: stellite-6 & 12, 13% Cr, Bohler skwan,

Cobalt free alloys, and Tungsten Carbide for API 6A applications.

Different hardened martensitic steels upto 48 HRC are also available for globe valves wearing resistant trims.

| Trim # | Nominal Trim | Cast Spec | Forged Spec | Welded Spec | Material Type |
|--------|-------------------|------------------|------------------------|---|---------------|
| 1 | F6 | ASTM A217 (CA15) | ASTM A105 (F6A) | AWS A5.9 ER410 | 13 Cr |
| 2 | 304 | ASTM A351 (CF8) | ASTM A182 (F304) | AWS A5.9 ER308 | 18 Cr-8 Ni |
| 3 | F310 | – | ASTM A182 (F310) | AWS A5.9 ER410 | 25 Cr-20 Ni |
| 4 | Hard F6 | – | Note h | – | 13 Cr |
| 5 | Hardfaced | – | – | AWS A5.13 ER/R CoCr-a | 13 Cr |
| 5 A | Hardfaced | – | – | Note h | 13 Cr |
| 6 | F6 & Cu-Ni | ASTM A217 (CA15) | ASTM A182 (F6A) Note h | AWS A5.9 ER410 | 13 Cr |
| 7 | F6 & Hardfaced | ASTM A217 (CA15) | Note h | AWS A5.9 ER410 | 13 Cr |
| 8 | F6 & Hardfaced | ASTM A217 (CA15) | – | AWS A5.9 ER410 | – |
| 8 A | F6 & Hardfaced | ASTM A217 (CA15) | – | AWS A5.9 ER410; AWS A5.13 E/R CoCr-a | 13 Cr |
| 9 | Monel | – | MFG Standard | – | Ni-Cu Alloy |
| 10 | 316 | ASTM A351 (CF8M) | ASTM A182 (F316) | AWS A5.9 ER410 | 18 Cr-8 Ni-Mo |
| 11 | Monel & Hardfaced | – | MFG Standard | See Trim 5/5 A | Ni-Cu Alloy |
| 12 | 316 & Hardfaced | ASTM A351 (CF8M) | ASTM A182 (F316) | AWS A5.9 ER316 | 18 Cr-8 Ni-Mo |
| 13 | Alloy 20 | ASTM A351 (CN7M) | ASTM B473 | AWS A5.9 ER320 | 19 Cr-29 Ni |

| | | | | | |
|-----------|----------------------|------------------|---|----------------------|----------------|
| 14 | Alloy 20 & Hardfaced | ASTM A351 (CN7M) | – | AWS A5.9 ER320 | 19 Cr-29 Ni |
| 15 | Hardfaced | – | – | AWS A5.13 E/R CoCr-a | 18 Cr-8 Ni |
| 16 | Hardfaced | – | – | AWS A5.13 E/R CoCr-a | 18 Cr-8 Ni-Mo |
| 17 | Hardfaced | – | – | AWS A5.13 E/R CoCr-a | 18 Cr-10 Ni-Cb |
| 18 | Hardfaced | – | – | AWS A5.13 E/R CoCr-a | 19 Cr-29 Ni |

Note h: forged or welded specifications are not applicable for trims 4 and 5 A; consult the manufacturer for special processing.

Soft Seated Valves

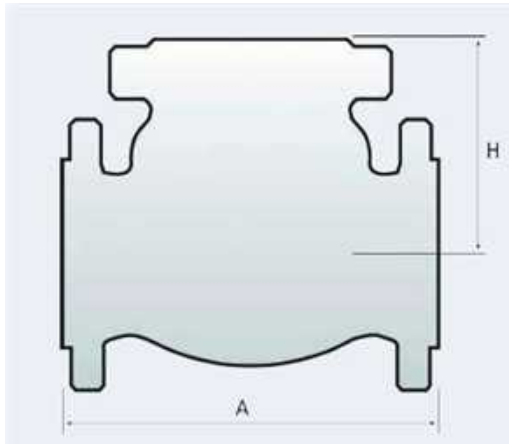
Soft-seated check valves are available for cryogenic and other special services requiring bubble-tight shut-off.

General Valve Features

- Bolted-bonnet, pressure-seal or wafer construction
- Graphite or PTFE packing, with leak-off/packing-expulsor options
- Full material traceability and certifications (ISO 9001, PED, ATEX, SIL, EN ISO 3834-2, AD 2000, etc.)
- Variety of end connections: flanged (ANSI B16.5), butt-weld (ANSI B16.25), socket-weld, threaded (NPT/BSP)
- Options for handwheel, gearbox, electric, pneumatic or hydraulic actuation

Check Valve Dimensions (ANSI B16.34, BS 1868, API 6D)

These tables outline the dimensions for check valves according to ANSI B16.34, BS 1868, and API 6D standards:



Class 150

| SIZE | FACE TO FACE (A) - RF | FACE TO FACE (A) - RTJ | FACE TO FACE (A) - BW | H | CV | Approx. Weight RF (Kg.) |
|------|-----------------------|------------------------|-----------------------|------|-------|-------------------------|
| 2" | 203 | 216 | 203 | 140 | 101 | 15 |
| 3" | 241 | 254 | 241 | 152 | 285 | 29 |
| 4" | 292 | 305 | 292 | 190 | 520 | 40 |
| 6" | 356 | 368 | 356 | 228 | 1245 | 78 |
| 8" | 495 | 508 | 495 | 292 | 2280 | 140 |
| 10" | 622 | 635 | 622 | 304 | 3570 | 215 |
| 12" | 698 | 711 | 698 | 342 | 5300 | 295 |
| 14" | 787 | 800 | 787 | 406 | 6500 | 408 |
| 16" | 864 | 876 | 864 | 508 | 8615 | 533 |
| 18" | 978 | 990 | 978 | 584 | 11500 | 670 |
| 20" | 978 | 990 | 978 | 622 | 14300 | 1000 |
| 24" | 1295 | 1308 | 1295 | 711 | 20865 | 1950 |
| 26" | 1295 | 1308 | 1295 | 762 | 25165 | 2300 |
| 28" | 1448 | 1460 | 1448 | 838 | 29513 | 2500 |
| 30" | 1524 | 1537 | 1524 | 889 | 33910 | 2600 |
| 32" | 1727 | 1740 | 1727 | 1016 | 43130 | 2800 |
| 36" | 1956 | 1968 | 1956 | 1092 | 61570 | 3200 |

| | | | | | | |
|------------|------|---|------|------|--------|------|
| 40" | 2159 | - | 2159 | 1162 | 82934 | 4100 |
| 42" | 2159 | - | 2159 | 1219 | 112960 | 4400 |
| 48" | 2540 | - | 2540 | 1320 | 173000 | 5250 |

Class 300

| SIZE | FACE TO FACE (A) - RF | FACE TO FACE (A) - RTJ | FACE TO FACE (A) - BW | H | CV | Approx. Weight RF (Kg.) |
|-------------|------------------------------|-------------------------------|------------------------------|----------|-----------|--------------------------------|
| 2" | 267 | 282 | 267 | 145 | 101 | 19 |
| 3" | 318 | 333 | 318 | 203 | 285 | 45 |
| 4" | 356 | 371 | 356 | 228 | 515 | 65 |
| 6" | 444 | 460 | 444 | 279 | 1245 | 115 |
| 8" | 533 | 549 | 533 | 342 | 2285 | 215 |
| 10" | 622 | 638 | 622 | 381 | 3575 | 310 |
| 12" | 711 | 727 | 711 | 431 | 5345 | 470 |
| 14" | 838 | 854 | 838 | 482 | 6510 | 550 |
| 16" | 864 | 879 | 864 | 508 | 8620 | 870 |
| 18" | 978 | 923 | 978 | 584 | 11155 | 1025 |
| 20" | 1016 | 1035 | 1016 | 660 | 13935 | 1500 |
| 24" | 1346 | 1368 | 1346 | 762 | 20420 | 2500 |
| 26" | 1346 | 1371 | 1346 | 762 | 25000 | 2800 |
| 28" | 1499 | 1524 | 1499 | 889 | 28750 | 3000 |
| 30" | 1594 | 1619 | 1594 | 977 | 33910 | 3400 |
| 32" | 1727 | 1755 | 1727 | 1016 | 42230 | 3700 |
| 36" | 2083 | 2111 | 2083 | 1143 | 61570 | 4300 |
| 40" | 2159 | - | 2159 | 1244 | 82210 | 5800 |
| 42" | 2159 | - | 2159 | 1270 | 111350 | 6950 |
| 48" | 2667 | - | 2667 | 1422 | 171500 | 8100 |

Class 600

| SIZE | FACE TO FACE (A) - RF | FACE TO FACE (A) - RTJ | FACE TO FACE (A) - BW | H | CV | Approx. Weight RF (Kg.) |
|-------------|------------------------------|-------------------------------|------------------------------|----------|-----------|--------------------------------|
| 2" | 292 | 295 | 292 | 145 | 101 | 20 |
| 3" | 356 | 359 | 356 | 203 | 285 | 48 |

| | | | | | | |
|------------|------|------|------|------|-------|------|
| 4" | 432 | 435 | 432 | 228 | 520 | 67 |
| 6" | 559 | 562 | 559 | 304 | 1245 | 110 |
| 8" | 660 | 663 | 660 | 406 | 2210 | 205 |
| 10" | 787 | 790 | 787 | 469 | 3400 | 325 |
| 12" | 838 | 841 | 838 | 533 | 5120 | 480 |
| 14" | 889 | 892 | 889 | 609 | 6150 | 600 |
| 16" | 991 | 994 | 991 | 660 | 8070 | 800 |
| 18" | 1092 | 1092 | 1092 | 774 | 10510 | 1490 |
| 20" | 1194 | 1200 | 1194 | 889 | 12855 | 1675 |
| 24" | 1397 | 1406 | 1397 | 965 | 18680 | 2300 |
| 26" | 1448 | 1460 | 1448 | 1016 | 24600 | 2710 |
| 28" | 1600 | 1612 | 1600 | 1066 | 29950 | 3125 |
| 30" | 1651 | 1666 | 1651 | 1168 | 34680 | 3710 |
| 36" | 2083 | 2098 | 2083 | 1320 | 45308 | 5800 |

Class 900

| SIZE | FACE TO FACE (A) - RF | FACE TO FACE (A) - RTJ | FACE TO FACE (A) - BW | H | CV | Approx. Weight RF (Kg.) |
|-------------|----------------------------------|-----------------------------------|----------------------------------|----------|-----------|------------------------------------|
| 2" | 368 | 381 | 368 | 170 | 101 | 43 |
| 3" | 381 | 384 | 381 | 304 | 26 | 90 |
| 4" | 457 | 460 | 457 | 335 | 485 | 100 |
| 6" | 610 | 612 | 610 | 442 | 1140 | 245 |
| 8" | 737 | 739 | 737 | 472 | 2010 | 425 |
| 10" | 838 | 841 | 838 | 548 | 3140 | 675 |
| 12" | 965 | 968 | 965 | 700 | 4590 | 900 |
| 14" | 1029 | 1038 | 1029 | 731 | 5565 | 1125 |
| 16" | 1130 | 1140 | 1130 | 822 | 7270 | 1600 |
| 18" | 1219 | 1232 | 1219 | 883 | 9575 | 2000 |
| 20" | 1321 | 1333 | 1321 | 914 | 11820 | 2700 |
| 24" | 1549 | 1568 | 1549 | 1067 | 17020 | 4100 |

| | | | | | | |
|------------|------|---|------|------|-------|-------|
| 26" | 1701 | - | 1701 | 1219 | 20866 | 5100 |
| 28" | 1828 | - | 1828 | 1279 | 24200 | 5750 |
| 30" | 2032 | - | 2032 | 1402 | 27780 | 6510 |
| 36" | 2562 | - | 2562 | 1625 | 41285 | 10180 |

Class 1500

| SIZE | FACE TO FACE (A) - RF | FACE TO FACE (A) - RTJ | FACE TO FACE (A) - BW | H | CV | Approx. Weight RF (Kg.) |
|-------------|------------------------------|-------------------------------|------------------------------|----------|-----------|--------------------------------|
| 2" | 368 | 381 | 368 | 170 | 76 | 43 |
| 3" | 470 | 483 | 470 | 305 | 240 | 70 |
| 4" | 546 | 559 | 546 | 335 | 425 | 115 |
| 6" | 705 | 711 | 705 | 442 | 1000 | 250 |
| 8" | 832 | 855 | 832 | 578 | 1750 | 470 |
| 10" | 991 | 1001 | 991 | 701 | 2735 | 800 |
| 12" | 1130 | 1142 | 1130 | 701 | 3990 | 1350 |
| 14" | 1257 | 1276 | 1257 | 792 | 4800 | 1800 |
| 16" | 1384 | 1406 | 1384 | 822 | 6265 | 2200 |
| 18" | 1537 | 1559 | 1537 | 914 | 8255 | 2600 |
| 20" | 1664 | 1686 | 1664 | 1005 | 10350 | 3400 |
| 24" | 1943 | 1971 | 1943 | 1158 | 14865 | 5160 |
| 28" | 1956 | - | 1956 | 1356 | 21328 | 6900 |
| 30" | 2057 | - | 2057 | 1417 | 24438 | 9000 |
| 36" | 2594 | - | 2594 | 1644 | 36285 | 14070 |

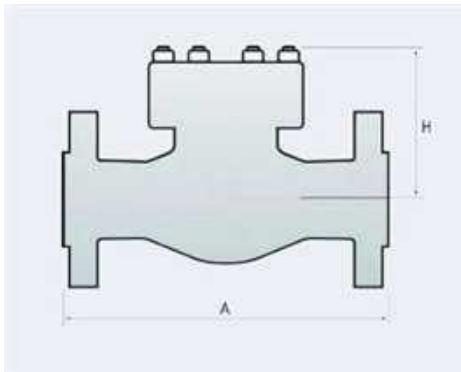
Class 2500

| SIZE (TAMAÑO) | FACE TO FACE (A) - RF | FACE TO FACE (A) - RTJ | FACE TO FACE (A) - BW | H | CV | Approx. Weight RF (Kg.) |
|----------------------|------------------------------|-------------------------------|------------------------------|----------|-----------|--------------------------------|
| 2" | 451 | 464 | 451 | 170 | 48 | 58 |
| 3" | 578 | 584 | 578 | 305 | 115 | 120 |
| 4" | 673 | 683 | 673 | 335 | 195 | 220 |
| 6" | 914 | 927 | 914 | 442 | 475 | 540 |

| | | | | | | |
|-----|------|------|------|------|-------|------|
| 8" | 1022 | 1038 | 1022 | 640 | 850 | 920 |
| 10" | 1270 | 1292 | 1270 | 762 | 1350 | 1629 |
| 12" | 1422 | 1444 | 1422 | 822 | 1970 | 2296 |
| 14" | 1519 | - | 1519 | 883 | 3638 | 3000 |
| 16" | 1691 | - | 1691 | 944 | 4763 | 3776 |
| 18" | 1900 | - | 1900 | 974 | 6050 | 4692 |
| 20" | 1900 | - | 1900 | 1036 | 7348 | 5500 |
| 24" | 2438 | - | 2438 | 1220 | 10646 | 7000 |

Check API 6A Valve Dimensions

This section provides the dimensions for check valves manufactured to the API 6A standard.



API 2000

| SIZE | A | H | CV | Approx. Weight RF (Kg.) |
|---------|-----|-----|------|-------------------------|
| 2 1/16" | 295 | 168 | 129 | 20 |
| 2 9/16" | 333 | 241 | 205 | 42 |
| 3 1/8" | 359 | 206 | 295 | 35 |
| 4 1/16" | 435 | 206 | 526 | 67 |
| 7 1/16" | 562 | 267 | 1182 | 136 |
| 9" | 664 | 315 | 2895 | 248 |

API 3000

| SIZE | A | H | CV | Approx. Weight RF (Kg.) |
|---------|-----|-----|-----|-------------------------|
| 2 1/16" | 371 | 181 | 115 | 32 |
| 2 9/16" | 422 | 245 | 170 | 45 |

| | | | | |
|----------------|-----|-----|------|-----|
| 3 1/8" | 384 | 229 | 265 | 48 |
| 4 1/16" | 460 | 229 | 473 | 95 |
| 7 1/16" | 613 | 290 | 1182 | 198 |
| 9" | 740 | 350 | 2895 | 356 |

API 5000

| SIZE | A | H | CV | Approx. Weight RF (Kg.) |
|----------------|----------|----------|-----------|--------------------------------|
| 2 1/16" | 371 | 190 | 87 | 40 |
| 2 9/16" | 422 | 241 | 142 | 61 |
| 3 1/8" | 473 | 241 | 216 | 100 |
| 4 1/16" | 549 | 311 | 393 | 160 |
| 7 1/16" | 711 | 394 | 926 | 232 |
| 9" | 841 | 466 | 2895 | 443 |

API 10000

| SIZE | A | H | CV | Approx. Weight RF (Kg.) |
|-----------------|----------|----------|-----------|--------------------------------|
| 1 13/16" | 464 | 238 | 100 | 40 |
| 2 1/16" | 521 | 267 | 87 | 71 |
| 2 9/16" | 565 | 362 | 142 | 106 |
| 3 1/16" | 619 | 362 | 216 | 175 |
| 4 1/16" | 670 | 467 | 393 | 280 |
| 5 1/8" | 737 | 490 | 949 | 332 |
| 7 1/16" | 889 | 591 | 926 | 406 |

API 15000

| SIZE | A | H | CV | Approx. Weight RF (Kg.) |
|-----------------|----------|----------|-----------|--------------------------------|
| 1 13/16" | 457 | 247 | 100 | 50 |
| 2 1/16" | 483 | 261 | 87 | 90 |
| 2 9/16" | 533 | 353 | 142 | 137 |
| 3 1/16" | 598 | 353 | 216 | 225 |
| 4 1/16" | 737 | 456 | 393 | 360 |

Manufacturing Range

| Standards | Sizes | Features / Design |
|--|--|--|
| API 6D, API 594, ANSI B16.34, BS 5153, DIN EN 593, ISO 5752 | 2"–64" (cast) 2"–24" (forged) up to 2" (piston lift) | Bolted-bonnet or pressure-seal Cast and forged bodies Full-bore piggable designs Metal-to-metal or soft seats Balanced tilting-disc and spring-loaded twin-disc variants |

Attachment 6

ENEQ Consult – Choke Valves Catalogue 2025

ENEQ Consult Ltd. delivers cost-effective mechanical equipment for nuclear, conventional, oil & gas, and petrochemical industries.

- **9 years** of solid performance
- **> 20 M€** project portfolio
- **> 50** completed projects, **> 10** in progress
- Exclusive partnerships with **15 manufacturers worldwide**
- Equipment compliant with **ASME, EN, N Stamp, DIN, ASTM, ISO, GOST**

Expertise:

- **Equipment Supply** – high-quality OEMs, cost-effective modernization and new-build NPP solutions, turnkey delivery
- **Engineering** – design critical analyses, FEA & CFD calculations, technical consulting
- **Service** – full project support from production to installation, commissioning, and after-sales

ENEQ Choke Valves

Choke valves are engineered to precisely control fluid pressure and flow in demanding upstream oil and gas applications, from standard production duties to the most severe service conditions. Designed to absorb a controlled fraction of inlet pressure, they convert the resulting energy into turbulence, heat, and noise while protecting downstream equipment. Available in single-stage configurations for non-critical processes or advanced multi-stage trims for cavitation and erosion control, these valves deliver reliable modulation and shut-off across a wide range of pressures and temperatures.

Manufactured in cast or forged bodies with globe, angle, or axial designs, and offered with flanged, butt weld, threaded, or custom end connections, Ringo choke valves can be fitted with specialized trims such as **MULTISTEP™**, **CAVLESS™**, **MULTICYL™**, and **CROSSTEP™** for severe service, flashing, and noise reduction. Certified to API 6A (PSL1–PSL4, PR1/PR2) and optionally to ASME B16.34, DIN, or GOST, they are available in a full spectrum of materials — from Carbon and Low-Alloy Steels to Stainless Steel, Duplex, Super Duplex, Nickel Alloys, Monel, Hastelloy, and Titanium — with hardfacing options including tungsten carbide, stellite, and chromium carbide for extreme wear resistance.

With temperature ratings from –59 °C to 560 °C and pressure classes up to ASME 4500# / API 15,000 PSI, Ringo choke valves are built for dependable performance in the harshest environments, ensuring long service life and precise control in oil and gas production, wellhead choke service, and other critical flow applications.

Table of axial flow valve types and their features:

1. Features and Standards

| Type (per catalogue) | Key Features | Typical Benefits / Applications | Construction & Materials | Standards |
|-------------------------------|---|--|---|---|
| Single-staged design | One pressure-reducing stage; simple trim (needle, plug, or cage); available in globe, angle, or axial body styles | Suitable for non-critical process conditions; moderate pressure drop control in oil, gas, and multiphase flows | Cast or forged bodies; flanged, butt weld, threaded, or hub ends; materials incl. Carbon Steel, Low Alloy Steel, Stainless Steel, Duplex, Super Duplex, Nickel Alloys, Titanium; trims with stainless or hardfaced surfaces | API 6A (PSL1–PSL4, PR1/PR2), ASME B16.34, DIN, GOST; pressure classes up to ASME 4500# / API 15,000 PSI |
| Multi-staged design | MULTISTEP™ or MULTICYL™ trims; staged energy dissipation; balanced flow paths | Controls very high ΔP; minimizes cavitation, flashing, and noise; extends service life in severe service | Same as above; multi-stage cage or stacked-disc trims; tungsten carbide or stellite hardfacing for erosion resistance | Same as above |
| Anti-cavitation trim | CAVLESS™ trim; directs vapor bubble collapse away from metal surfaces | Prevents cavitation damage; ideal for high-pressure liquid service | Same as above; anti-cavitation cage design; corrosion-resistant alloys for wetted parts | Same as above |
| Noise-attenuation trim | CROSSTEP™ or multi-path trim; tortuous flow paths; aerodynamic noise control | Meets strict noise limits in gas service; improves safety and environmental compliance | Same as above; multi-path drilled cage or stacked-disc trim; materials selected for acoustic damping and wear resistance | Same as above |

| | | | | |
|---------------------------------|---|---|--|---------------|
| Severe service execution | Heavy-duty forged body; hardfaced trims (tungsten carbide, stellite, chromium carbide); API 6A PSL3/4 | Handles erosive, corrosive, HP/HT fluids; critical wellhead choke and kill line service | Forged bodies in high-strength alloys; API 6A trims; full hardfacing; elastomers and seals rated for HP/HT | Same as above |
| Manual operation | Handwheel or gearbox-operated stem; variable orifice opening | Flexible flow control during well testing, start-up, or low-automation sites | Same as above; manual stem drive; replaceable bean or cage trims | Same as above |
| Actuated operation | Pneumatic, hydraulic, or electric actuator; remote or automated control | Enables precise, real-time flow regulation; integration with SCADA/DCS; subsea or unmanned platform use | Same as above; actuator mounting per API 6A; corrosion-resistant actuator housings; subsea-rated materials if required | Same as above |

2. RINGO CHOKES FEATURES

Ringo is API 6A certified for the production and testing of chokes according to all Product Specification Levels: PSL1, PSL2, PSL3, PSL3G, and PSL4. This certification also covers both Product Requirements: PR1 and PR2, depending on the service and customer needs. Additionally, our chokes can be designed and manufactured according to other standards like ASME B16.34 or GOST upon request.

| Pressure Rating | Temperature Rating | Characteristic | Shut-Off Class |
|---|---|----------------------------------|---|
| ASME 150#–4500# / API 2000–15000 PSI CWP | <ul style="list-style-type: none"> -59° to 560°C (-74°F to 1040°F) API Temperature Classifications: K, L, N, P, R, S, T, U, V, X, Y | Equal Percentage, Linear, On-Off | ANSI/FCI Class IV (Standard) (ANSI/FCI Class V and VI as optional) |

Minimum Materials Requirements

| Material Class | Body, Bonnet, End & Outlet Connections | Pressure-Controlling Parts, Stems & Mandrel Hangers |
|-----------------------------|--|---|
| AA - General Service | Carbon or Low-alloy Steel | Carbon or Low-alloy Steel |
| BB - General Service | Carbon or Low-alloy Steel | Stainless Steel |
| CC - General Service | Stainless Steel | Stainless Steel |
| DD - Sour Service | Carbon or Low-alloy Steel | Carbon or Low-alloy Steel ^b |
| EE - Sour Service | Carbon or Low-alloy Steel ^b | Stainless Steel |
| FF - Sour Service | Stainless Steel | Stainless Steel ^b |
| HH - Sour Service | CRAs ^{bcd} | CRAs ^{bcd} |
| ZZ - Sour Service | User Defined | User Defined |

Footnotes:

- **a:** As defined by NACE MR0175/ISO 15156 in compliance with NACE MRO175/ISO 15156.
- **b:** In compliance with NACE MRO175/ISO 15156.

- **c:** CRA required on retained fluid wetted surfaces only. CRA cladding of low alloy or stainless steel is permitted.
- **d:** CRA as defined in Clause 3 of this International Standard. NACE MR0175/ISO 15156 definition of CRA does not apply.


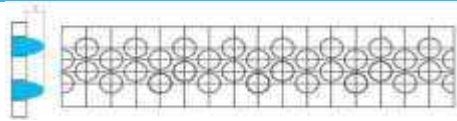
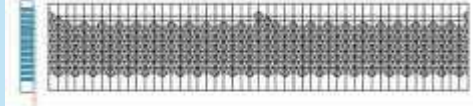
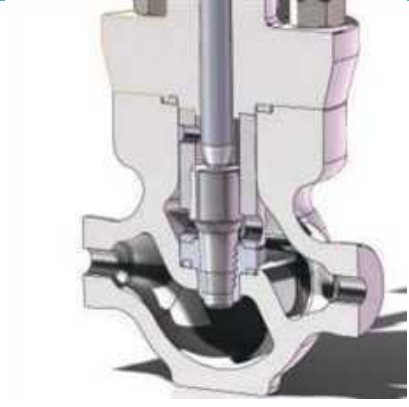
3. Material Options

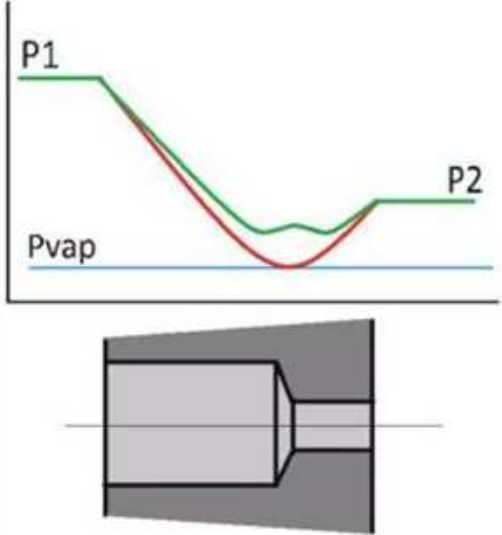
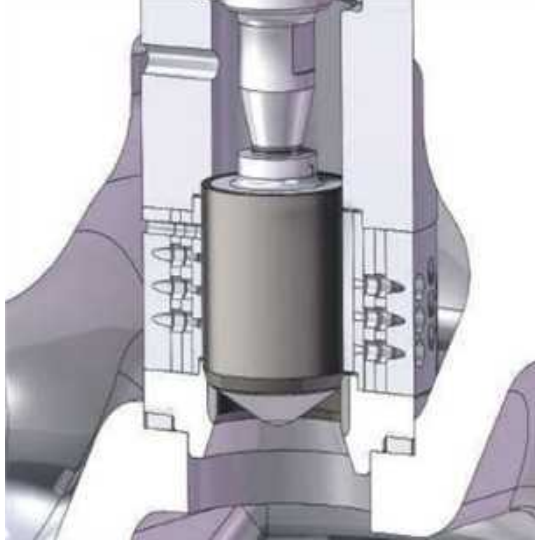

| Component / Type | Material Options / Description |
|------------------------------------|--|
| Body Materials | <ul style="list-style-type: none"> • Carbon Steel: A216-WCB / A105 / 4140 / 4130 • Cr-Mo Alloy Steel: A217-WC6, A217-WC9 / A182-F27 / A182-F11 • Cr-Mo-V Alloy Steel: A217-C12A, A182-F91 • Stainless Steel (18% Cr): A351-CF8M, A351-CF8C / A182-316 / A182-347 • Cr + Ni Stainless Steels: Alloy 20, A351-CK3MCUN, A182-F44 • Duplex & Super Duplex: A890 Gr 4A, A182 F51 / A890 Gr 6A, A182 F53, A182 F55 • Nickel-based Alloys: Hastelloy, Inconel, Monel • Titanium |
| Cladding and Overlays | <ul style="list-style-type: none"> • Stellite: Hardness HRC 45 RC & Maximum working temperature 500°C • Tungsten Carbide: Hardness HRC 74 RC & Maximum working temperature 550°C • Chromium Carbide: Hardness HRC 68 RC & Maximum working temperature 870°C • Inconel: Hardness HRC 23 RC & Maximum working temperature 700°C |
| Trim Materials | <ul style="list-style-type: none"> • Martensitic: A276-410, A276-420 • Austenitic: A276-316 • Cr + Ni Stainless Steels: Alloy 20, A182-F44 • Duplex & Super Duplex: A182-F51, A182-F55 • Nickel-based Alloys: Hastelloy, Inconel, Monel • Titanium |
| Full Tungsten Carbide Trims | Used where high hardness is required, such as in dirty fluids with particles. Produced by sinterization. |

| GENERAL SERVICE TRIM | | | | |
|----------------------|--|------------------------|--------------------------------|-----------------------------|
| TRIM CHARACTERISTIC | API 603/607 CLASS | TEMPERATURE LIMIT | APPLICATIONS | |
| ROTOR | | 300°C (500°F) | Fluid process flow | |
| VALVE | • Equal percentage • Equal percentage + Hand / Equal percentage | Class 150 Class 300 | 300°C (500°F) 300°C (500°F) | Variable process regulation |

| SEVERE SERVICE TRIM | | | | |
|------------------------|---|------------------------|--------------------------------|---|
| TRIM CHARACTERISTIC | API 603/607 CLASS | TEMPERATURE LIMIT | APPLICATIONS | |
| ROTOR | • Hand / Equal percentage | Class 150 Class 300 | 300°C (500°F) 300°C (500°F) | • Very low flow • High back • Flashing and self-eroding |
| VALVE | • Equal percentage • Hand / Equal percentage | Class 150 Class 300 | 300°C (500°F) 300°C (500°F) | • Hand / Equal percentage • Low flow |
| VALVE | • Hand / Equal percentage | Class 150 Class 300 | 300°C (500°F) 300°C (500°F) | • Hand / Equal percentage • High back • High back (API 607) Cap • Flashing and self-eroding • For Sealing service |
| VALVE | • Hand / Equal percentage | Class 150 Class 300 | 300°C (500°F) 300°C (500°F) | • Hand / Equal percentage • High back • High back (API 607) Cap • Flashing and self-eroding • Seal erosion • Severe process conditions |
| VALVE | • Hand / Equal percentage | Class 150 Class 300 | 300°C (500°F) 300°C (500°F) | • Hand / Equal percentage • High back • High back (API 607) Cap • Flashing and self-eroding • Seal erosion • Severe process conditions |
| PLUG VALVE | • Hand / Equal percentage | Class 150 | 300°C (500°F) | • High back • High back (API 607) Cap • Flashing and self-eroding • Seal erosion • Severe process conditions |
| PLUG VALVE w/ OPR Seal | • Hand / Equal percentage | Class 150 Class 300 | 300°C (500°F) 300°C (500°F) | • High back • High back (API 607) Cap • Flashing and self-eroding • Seal erosion • Severe process conditions |

4. Severe Service Adjustable Choke Trims

| Trim Type / Solution | Description & Key Features | Image |
|---------------------------|--|--|
| Contoured Trim | <p>A single-stage trim that is top and seat guided for maximum stability. It features an open flow path to prevent solid particles from getting trapped. The seat and plug are made from solid, wear-resistant materials like tungsten carbide to provide exceptional service life in extreme conditions.</p> |  |
| STD™ Cage | <p>A standard multi-hole cage designed for non-critical modulating services.</p> |  |
| LDB™ (Low dB) Cage | <p>A multi-hole cage with a pattern of small holes designed to reduce noise. It works by decreasing the diameter of the fluid jets.</p> |  |
| MULTISTEP™ | <p>A multi-stage trim used for small Cv values, typically in smaller choke valves. It can be added to other plug types to provide very high rangeability (up to 1:200) and is effective at low strokes during start-up. It is available in both "Flow Over the seat" and "Flow Under the seat" configurations.</p> |  |

| | | |
|-------------------------|---|--|
| <p>CAVLESS™</p> | <p>Features a cage with a double-drilled series of radial holes that create a nozzle effect. This design controls the location of the vena-contracta, directing the jet stream of cavitating liquid into the center of the cage and away from the valve's metal surfaces. It is only available in a "Flow Over the seat" configuration.</p> |  |
| <p>MULTICYL™</p> | <p>This trim uses a staged pressure reduction process with as many stages as necessary to keep the pressure drop below critical values. The trim is custom-designed to achieve the high xT and FI values required by the specific process conditions. It is only available in a "Flow Under the seat" configuration.</p> |  |
| <p>CROSTEP™</p> | <p>A multi-stage design that behaves like a multi-disc stack. The flow path creates a series of crossings that act as restrictions and expansions with the advantage of lower pressure recovery. The number of channels, crossings, and other parameters are calculated to best suit each specific set of conditions.</p> |  |

Attachment 7

ENEQ Consult – Control Valves Catalogue 2025

ENEQ Consult Ltd. delivers cost-effective mechanical equipment for nuclear, conventional, oil & gas, and petrochemical industries, with a strong focus on nuclear power plants using PWR reactor technology.

- **9 years** of solid performance
- **> 20 M€** project portfolio
- **> 50** completed projects, **> 10** in progress
- Exclusive partnerships with **15 manufacturers worldwide**
- Equipment compliant with **ASME, EN, N Stamp, DIN, ASTM, ISO, GOST**

Expertise:

- **Equipment Supply** – high-quality OEMs, cost-effective modernization and new-build NPP solutions, turnkey delivery
- **Engineering** – design critical analyses, FEA & CFD calculations, technical consulting
- **Service** – full project support from production to installation, commissioning, and after-sales

ENEQ Control Valves

Control valves are offered in **globe, angle, and three-way configurations** for precise flow, pressure, and temperature regulation in a wide variety of services, including oil and gas, petrochemical, cryogenic, and power generation applications. Designs are available in both **cast and forged bodies** with a range of end connections—including **flanged, butt-weld (BW), and socket-weld (SW)**—and can be supplied with specialized trims to handle severe service conditions.

Valves can be equipped with various trims such as **Miniflow™** for low flow rates, **Multistep™ and Multicyl™** for high pressure drop applications to prevent cavitation and erosion, and **LDB™ cages** for low-noise operation. Special designs for flashing service, high temperatures, and tight shut-off (Class IV, V, or VI) are available. All valves are manufactured according to international standards such as **ASME-ANSI, DIN, API, and BS**, with full material traceability in materials like Carbon Steel, Alloy Steel, Stainless Steel, Duplex, and Monel.

Table of control valve types and their features:

| Control Valve Type | Features |
|--|---|
| Cast Globe, Angle, and Threeway | Body Sizes: 3/4" to 16" (DN20 to DN400) Pressure Class: 150# to 2,500# (PN10 to PN400) End Connections: SW, BW, FLG |
| Forged Globe, Angle, and Threeway | Body Sizes: 3/4" to 16" (DN20 to DN400) Pressure Class: 150# to 2,500# (PN10 to PN400) End Connections: SW, BW |
| Cage Guided Valves | Sizes up to 32" (DN400) and pressure class up to 2,500# (PN400). Unbalanced plug disc for valve sizes up to 4" and balanced plug disc for valve sizes 3" and larger. Can achieve Class IV and V seat leak rates. Class VI (bubble tight) is an option for temperatures not exceeding 250°C / 480°F. Available with linear or equal percent characteristics, and standard or low dB cages. |
| Pressure Regulators | Self-actuated valve to control downstream or upstream pressure. Quick opening characteristic to minimize pressure deviation. |
| Choke Valves | Developed for high pressure drop applications on liquid, gas, or multiphase fluids for oil and gas wells. Used in production, gaslift-topside and water injection applications. Special designs include low noise or anti-cavitation features. Materials are selected to withstand erosion and interchangeable beans allow for use at different conditions. |
| Butterfly Valves | A convenient solution for very large flow rates combined with low to medium pressure conditions. |

1. Trim Types and Features

| Trim Type | Features |
|---------------------------------------|---|
| Miniflow™ | For very low flows and tight shut-off. ¹⁹ Suitable for modulating and on-off applications. |
| Multistep™ Trim | Designed for low and medium flows with medium to high pressure drops. ²¹ Recommended for high rangeability requirements. Avoids erosion or cavitation by splitting the pressure drop into smaller steps. |
| USS / STD™ or LDB™ Cage | Low noise (with LDB™ Cage). For flashing service and general-purpose applications. |
| BSS / STD™ or LDB™ Cage | For medium and large flows, and cavitating and flashing service. ²⁶ |
| Cavless™ / BSS™ Plug | For high-temperature service and medium and large flows. ²⁷ Offers tight shut-off and low noise (with LDB™ Cage). |
| Pilot Plug / STD™ or LDB™ Cage | For high pressure drop and large flows. |
| Multicyl™ / BSS™ Plug | For critical pressure drop steam or gas applications, and very high pressure drop liquid applications to prevent cavitation and trim erosion. |

2. Standards and Specifications

Control valves are designed and manufactured to conform to a variety of international standards, ensuring their suitability for a wide range of applications and industries.

Regarding design and construction, the overall valve design adheres to key international standards, including ASME-ANSI, DIN, API, and BS. The design of pressure-retaining components such as the body, bonnet, and bolting meets all applicable ANSI, ASME, and DIN standards. The sealing of the body-bonnet joint is achieved by using spiral wound gaskets, which are made from stainless steel wound with graphite or other filler materials. These gaskets are fully enclosed between the body and bonnet, functioning under the principle of controlled compression. To ensure this, manufacturing and maintenance procedures provide the correct torques for every bolting size.

For dimensions and connections, face-to-face dimensions are in accordance with ISA S75.12, 15, and 16. Valves are available with several end connections, including SW (Socket Weld), BW (Butt Weld), and FLG (Flanged).

Material selection is a critical aspect of valve design, based on factors like design pressure, temperature, and the type of fluid being handled. Standard materials for the body and bonnet include carbon steel, stainless steel, and alloy steel. For special applications, other alloys such as Duplex, Superduplex, Hastelloy, Inconel, and Monel can be provided. Additionally, materials compliant with NACE standards for sour service are available upon request.

Manufacturing Range

| VALVE TYPE | BODY SIZE | | PRESSURE CLASS | | END CONNECTIONS |
|--|------------|----------------|----------------|---------------|-----------------|
| | ANSI | DIN | ANSI | DIN | |
| Cast globe, angle and threeway- | 3/4" to 2" | DN20 to DN50 | 150# to 2.500# | PN10 to PN400 | SW, BW, FLG |
| | 3" to 16" | DN250 to DN400 | 150# to 2.500# | PN10 to PN400 | BW FLG |
| Forged globe, angle and threeway- | 3/4" to 2" | DN20 to DN50 | 150# to 2.500# | PN10 to PN400 | SW, BW |
| | 3" to 16" | DN250 to DN400 | 150# to 2.500# | PN10 to PN400 | BW |

3. Body and bonnet materials

The table below shows standard and optional materials for valve bodies and bonnets, along with their ASTM, DIN name, and DIN material numbers. The selection of these materials is based on the design pressure, temperature, and fluid type¹.

| | ASTM | DIN NAME | DIN MAT. N° | ASTM | DIN NAME | DIN MAT. N° |
|------------------------|-----------|---------------|-------------|-----------|---------------|-------------|
| Carbon steel | A105 | C22.8 | 1.0460 | A216 WCB | GS-C25 | 1.0619 |
| Alloy steel | A182 F11 | 13CrMo44 | 1.7335 | A217 WC6 | GS17CrMo55 | 1.7357 |
| | A182 F22 | 10CrMO9.10 | 1.7380 | A217 WC9 | GS16CrMo19.10 | 1.7379 |
| Stainless steel | A182 F316 | X5CrNiMo18.10 | 1.4401 | A351 CF8M | GXCrNiMo18.10 | 1.4408 |

| MATERIAL | FORGED | CAST |
|---------------------------|-------------|------------------------|
| Duplex steel | A 182 F44 | A 351-CK3MCUN |
| | A 182 F51 | A 890 Gr. 4A CD3MN |
| Super Duplex steel | A 182 F53 | A 890 Gr. 5A CE3MN |
| | A 182 F55 | A 890 Gr. 6A CD3MW-CuN |
| Inconel 625 | B564-N06625 | A494-CW6MC |

Trim materials

Selection of the internals material is based on two factors: corrosion resistance and wear resistance. Pressure drop and temperature conditions are considered to choose the best wear resistance material. Our selection includes, but is not limited to:

Standard materials for seat, plug, cage and balancing cylinder are 316 stainless steel and hardened 410 or 420 corrosion resistant stainless steel alloys. Higher hardness in trims with Stellite® overlay.

Optional materials are hardfaced series 300, 17-4PH and 440 stainless steel alloys. Other alloy trims available on application. Hastelloy, Monel, Colmonoy and other high hardness coatings. Tungsten carbide for extra high hardness is a good choice for highly erosive fluids. NACE materials are also offered at request

| MATERIAL | AISI NAME | DIN NAME | DIN MAT. NUMBER | HARDNESS (Rc) |
|--------------------------|-----------|--------------|-----------------|---------------|
| 410 SS | AISI 410 | X10Cr13 | 1.4006 | 34-38 |
| 420 SS | AISI 420 | X20Cr13 | 1.4021 | 47-51 |
| 316 SS | AISI 316 | X10CrNiTi189 | 1.4541 | |
| Duplex steel | | | | |
| Superduplex steel | | | | |
| Inconel | | | | |

4. ACTUATORS

The control valves can be operated by any type of actuators requested by the customer. For pneumatic actuators, they use the RV 300 model, which is described as stiff and versatile. Special designs are available to increase stiffness and natural frequency for seismic conditions. Standard materials for the RV 300 model include a cast steel yoke (WCB), stamped steel for cover and base plates, and a diaphragm made of reinforced Buna, Neoprene, or EPDM. All parts are protected against rust and corrosion.

Accessories such as positioners, converters, air-sets, solenoid valves, limit switches, and handwheels can be fitted as needed. ENEQ uses positioners and accessories from major manufacturers that provide the latest technology for smart instrumentation, including diagnostic capabilities and partial stroke testing.

Maximum thrust in N.

| OPERAT OR MODEL | EFFECTIVE DIAPHRAGM A | DIRECT ACTING TRAVEL (1) | | | | | REVERSE ACTING TRAVEL | | | | |
|-----------------------|-----------------------------|--------------------------|--------|----|----|----|-----------------------|--------|----|----|----|
| | | 1" | 2" | 3" | 4" | 5" | 1" | 2" | 3" | 4" | 5" |
| 330 | 387 cm ² | 13.630 * | | | | | 5.450* | | | | |
| 350 | 645 cm ² | 29.550 | 22.720 | | | | 13.640 | 9.090* | | | |

| | | | | | | | | | | | |
|-----|-----------------------|--------|--------|-------------|--------|--------|--------|--------|-------------|--------|--------|
| 380 | 1.032 cm ² | 50.910 | 43.640 | 36.360 * | | | 25.450 | 18.180 | 10.900 * | | |
| 390 | 1.032 cm ² | 53.820 | 52.730 | 50.910 | 47.270 | 36.360 | 30.980 | 25.600 | 20.220 | 14.840 | 9.450* |

Valve dimensions (all dimensions in mm.)

BW/SW/Threaded body

| VALVE SIZE | | 3/4" DN20 | 1 DN25 | 1.5" DN40 | 2" DN50 | 3" DN80 | 4 DN100 | 6" DN150 | 8" DN200 | 10 DN250 | 12 DN300 | 14" DN350 | 16" DN400 |
|----------------------|---|--------------|-----------|--------------|------------|------------|------------|-------------|-------------|-------------|-------------|--------------|--------------|
| 150# 300# 600# | A | 187 | 187 | 222 | 254 | 318 | 368 | 451 | 543 | 752 | 819 | 1.029 | 1.108 |
| | B | 217 | 217 | 217 | 217 | 282 | 320 | 392 | 443 | 535 | 630 | 640 | 759 |
| | C | 100 | 100 | 100 | 100 | 125 | 150 | 200 | 250 | 350 | 400 | 450 | 500 |
| 900# 1.500# | A | 194 | 197 | 235 | 292 | 318 | 368 | 508 | 610 | 762 | 914 | 1.257 | 1.422 |
| | B | 217 | 217 | 217 | 242 | 282 | 320 | 392 | 457 | 572 | 630 | 689 | 759 |
| | C | 100 | 100 | 100 | 100 | 125 | 150 | 200 | 250 | 350 | 400 | 450 | 500 |
| 2.500# | A | 216 | 216 | 260 | 318 | 381 | 406 | 610 | 762 | 1.016 | 1.118 | 1.803 | 1.930 |
| | B | 217 | 217 | 217 | 242 | 282 | 320 | 392 | 457 | 572 | 630 | 689 | 759 |
| | C | 100 | 100 | 100 | 100 | 125 | 150 | 200 | 250 | 350 | 400 | 450 | 500 |

Flanged body

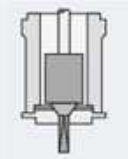
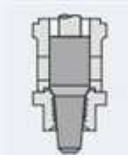
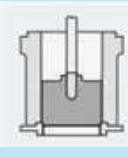
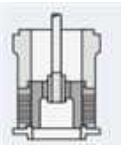
| VALVE SIZE | | 3/4" DN20 | 1 DN25 | 1.5" DN40 | 2" DN50 | 3" DN80 | 4 DN100 | 6 DN150 | 8" DN200 | 10 DN250 | 12 DN300 | 14" DN350 | 16" DN400 |
|----------------------|---|--------------|-----------|--------------|------------|------------|------------|------------|-------------|-------------|-------------|--------------|--------------|
| 150# PN 10 P16/25 | A | 184 | 184 | 222 | 254 | 298 | 352 | 451 | 543 | 673 | 737 | 889 | 1.016 |
| | B | 217 | 217 | 217 | 217 | 282 | 320 | 392 | 443 | 535 | 630 | 640 | 759 |
| | C | 100 | 100 | 100 | 100 | 125 | 150 | 200 | 250 | 350 | 400 | 450 | 500 |
| 300# PN 40 | A | 194 | 197 | 235 | 267 | 318 | 368 | 473 | 568 | 708 | 775 | 927 | 1.057 |
| | B | 217 | 217 | 217 | 217 | 282 | 320 | 392 | 443 | 535 | 630 | 640 | 759 |
| | C | 100 | 100 | 100 | 100 | 125 | 150 | 200 | 250 | 350 | 400 | 450 | 500 |
| 600# PN 64 PN 100 | A | 206 | 210 | 251 | 286 | 337 | 394 | 508 | 610 | 752 | 819 | 972 | 1.108 |
| | B | 217 | 217 | 217 | 217 | 282 | 320 | 392 | 443 | 535 | 630 | 640 | 759 |
| | C | 100 | 100 | 100 | 100 | 125 | 150 | 200 | 250 | 350 | 400 | 450 | 500 |
| 900# PN 160 | A | 273 | 273 | 311 | 340 | 387 | 464 | 600 | 781 | 864 | 1.016 | 1.257 | 1.422 |
| | B | 217 | 217 | 217 | 242 | 282 | 320 | 392 | 457 | 572 | 630 | 689 | 759 |
| | C | 100 | 100 | 100 | 100 | 125 | 150 | 200 | 250 | 350 | 400 | 450 | 500 |
| 1.500# PN 250 | A | 273 | 273 | 311 | 340 | 460 | 483 | 692 | 838 | 991 | 1.130 | 1.257 | 1.422 |
| | B | 217 | 217 | 217 | 242 | 282 | 320 | 392 | 457 | 572 | 630 | 689 | 759 |
| | C | 100 | 100 | 100 | 100 | 125 | 150 | 200 | 250 | 350 | 400 | 450 | 500 |
| | A | 308 | 318 | 359 | 400 | 498 | 575 | 819 | 1.022 | 1.270 | 1.321 | 1.471 | 1.621 |

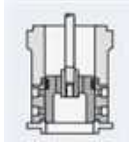
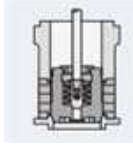
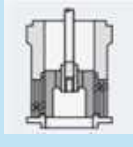
| | | | | | | | | | | | | | |
|----------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2.500# PN 320 PN 400 | B | 217 | 217 | 217 | 242 | 282 | 320 | 392 | 457 | 572 | 630 | 689 | 759 |
| | C | 100 | 100 | 100 | 100 | 125 | 150 | 200 | 250 | 350 | 400 | 450 | 500 |

Pneumatic actuator dimensions

| OPERATOR MODEL | DIMENSIONS | | | | | |
|----------------|------------|-----|-----|-----|-----------------|------------------|
| | E | F | G | K | H DIRECT ACTING | J REVERSE ACTING |
| 330 | 434 | 448 | 292 | 250 | 130 | 183 |
| 350 | 677 | 692 | 384 | 450 | 210 | 315 |
| 380 | 700 | 779 | 457 | 450 | 210 | 320 |
| 390 | 884 | 900 | 457 | 450 | 245 | 330 |

Trim Types

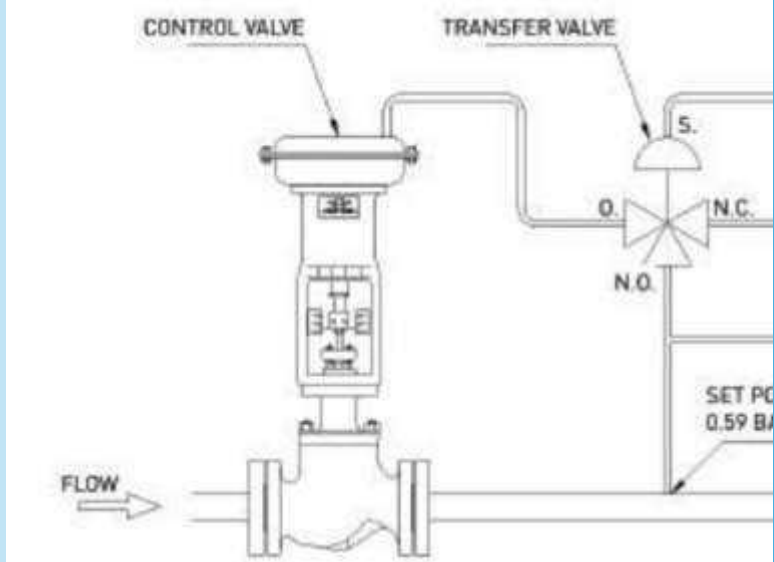
| TRIM | TRIM TYPE | ANSI B16.104-76 RATED SEAT LEAKAGE | TEMPERATURE LIMIT | APPLICATIONS |
|---|---|---|--|---|
|  <p>MINIFLOWT™</p> | <ul style="list-style-type: none"> • Modif. Equal percentage | Class IV STD Class V OPT | 550 C | Very low flows. Tight shut-off. Modulating and on-off applications. |
|  <p>MULTISTEPT™</p> | <ul style="list-style-type: none"> • Equal percentage • Modif. Equal percentage • Linear • Equal percentage | Class IV STD Class V STD | 550 C | Low and high pressure drop. Low flows. High pressure desuperheater cooling water control. Supercritical boiler start-up. Reheat and super-heat spray control. Pump recirculation or by-pass in small size boiler. |
|  <p>USS/STD™ LDB™ Cage</p> | Class IV STD Class V OPT Class VI OPT | 550 C | Most basic plug type. Low noise (with LDBM Cage). Modulating and on-off control. For flashing service. | 08 |
|  <p>BSS/STD™ or LDB™ Cage</p> | <ul style="list-style-type: none"> • Linear • Equal percentage | Class IV STD Class V OPT Class VI OPT | 250 C | Low and medium pressure drop. Tight shut off. Low noise (with LDBM Cage) Modulating and on-off control. Small actuators. |
| | Class II STD Class III OPT | 550 C | General purpose applications. | |

| | | | | |
|--|--|---|-------|---|
| CAVLESS™/BSS™ Plug  | <ul style="list-style-type: none"> • Linear | Class IV STD Class V STD Class VI OPT | 250 C | Medium and large flows. Cavitating and flashing service. Feedwater systems. |
| | | Class II | 550 C | Condensed systems (deaerator level control, drain services, etc.). Condensed recirculation systems. |
| PILOT Plug/STD™ or LDB™ Cage  | <ul style="list-style-type: none"> • Linear • Equal percentage | Class V STD | 550 C | High temperature service. Medium and large flows. Tight shut-off. Low noise (with LDBM Cage). HP and LP turbine by-pass. Steam dump. Steam throttling to atmosphere or to a condenser. |
| MULTICYL™/BSS™ Plug  | <ul style="list-style-type: none"> • Linear • Equal percentage | Class IV STD Class V STD Class VI OPT | 250 C | Isolation. Super-critical boiler start-up. High pressure drop. Large flows. Very critical pressure drop steam or gas applications. Very high pressure drop liquid applications for preventing cavitation and trim erosion damage. |
| | | Class II | 550 C | |


The main function of a control valve is varying the flow rate of the fluid by producing a pressure drop. This results in an energy loss which is converted into vibration or erosion. When handling high temperature water, cavitation is an added problem.

To minimize wearing and provide long life internals, selection of the best suited type of trim has the utmost importance. Also the correct materials have to be used.

5. Special Features Overview

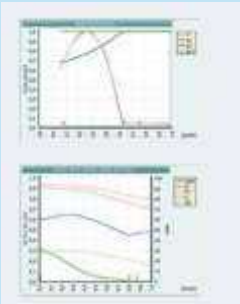


| Feature/ Valve | Image | Special Features |
|---------------------|--|---|
| Pressure Regulators |  | <ul style="list-style-type: none"> - Self-actuated design - Diaphragm controls upstream/downstream pressure - Quick-opening response |

| | |
|--------------------------------|---|
| <p>Choke Valves</p> | <ul style="list-style-type: none"> - Handles very high pressure drops - Anti-cavitation and low-noise trim options - Interchangeable beans for different conditions |
| <p>DESUPERHEATERS</p> | <div> </div> <ul style="list-style-type: none"> - Separates pressure reduction from cooling to avoid thermal expansion issues - Available in spray or Venturi style - Precise temperature control with wide turndown |
| <p>Ball Valves</p> | <ul style="list-style-type: none"> - LDB™ trim for cavitation suppression - Segmented/multidrilled plates reduce noise - Excellent shut-off capability |
| <p>Butterfly Valves</p> | <div> </div> <ul style="list-style-type: none"> - Disc profiling matches desired Cv curve - Conditioning baffles lower dynamic torque - Up to 20 dB(A) noise attenuation |

| | | |
|---|---|--|
| <p>Special Bonnets</p> |  | <ul style="list-style-type: none"> - Extended bonnets for very high or very low temperatures - Double-packing bonnet with leak-off connection, lubricator or hydraulic seal - Bellows-sealed bonnet for zero-leakage in hazardous or radioactive services |
| <p>Electric actuators</p> | <p>When electrical actuators are requested ROTORK, BERNARD , AUMA, LIMITORQUE, etc actuators or any other make are commonly used, following customer preferences. They accept 0-10 mA, 4-20 mA or other signals.</p> | |
| <p>Noise reduction special designs</p> | <p>Large, medium size valve in gas or steam service, may give unacceptable noise levels, even if multistage cages are used, and sonic conditions avoided.</p> <p>The answer to the problem is the increased number of holes of flow passages with the reduction of jet-diameters, and reduction of Fd factor. Depending on the size of the valve and the number of stage additional reductions, up to 25 dB(A) can be obtained.</p> <p>Again here, engineering programs let us to know the number of holes required to reduce noise level down to acceptable levels.</p> <p>When high pressure drops applications in gas or steam recommend the outlet pipe to be larger than inlet pipe, a good recommendation is to have one or more diffuser plates downstream the valve to match the pipe size. The combination of valve and baffles, diffusers or multihole plates, when correctly calculated, offers several advantages:</p> <ul style="list-style-type: none"> - Reduce the velocity of gas/ steam at valve outlet - Allows the use of smaller size valves, - Reduces the valve and baffle overall noise levels - Reduces noise and vibration transmitted by the downstream pipe | |


6. Sizing, Selection & Noise Reduction

Proprietary engineering software is used to calculate flow properties based on process specifications. The program selects the most accurate control valve configuration (size, pressure class, trim type) from an internal database.

| Topic / Section | Detailed Description | Image Placeholder |
|--|--|---|
| Parameters Calculated | <ul style="list-style-type: none"> - Cv calculation and % travel for different operating points - Fluid properties and state under operating conditions - Noise level prediction - Fluid velocities - Power loss inside the valve - Two-phase flow conditions (if applicable) - Actuator forces - Internal valve parameters |  |
| Output & Documentation | <p>Results can be exported to a standard datasheet format. The software can also include process graphs to optimize valve selection, noise control, and address specific process conditions such as cavitation or flashing.</p> | |
| Noise Reduction – Special Designs | <p>Large and medium-size valves in gas or steam service can produce high noise levels, even with multistage cages and without sonic conditions. This is addressed by increasing the number of flow passages and reducing jet diameters, lowering the Fd factor.</p> |  |
| Noise Reduction Performance | <p>Depending on valve size and number of stages, up to 25 dB(A) noise reduction can be achieved. Engineering tools determine the number of holes required to meet acceptable noise levels.</p> |  |
| Diffuser Plates & Baffles | <p>For high-pressure drop applications in gas or steam where the outlet pipe is larger than the inlet, diffuser plates downstream of the valve are recommended. Correctly calculated combinations of valve + baffles/diffusers offer:</p> <ul style="list-style-type: none"> - Reduced outlet velocity - Use of smaller valve sizes - Lower overall noise levels - Reduced vibration and noise in downstream piping | |

Technical advice is provided on the use, sizing, and design of baffles or diffuser plates to match specific application needs.


7. Miniflow™ Small Flow Valves

| Specification | Picture |
|--|--|
| <p>The Miniflow™ series is engineered for precise control of small to extremely small flow rates where medium to high pressure drops are present. These valves offer a Cv range from 3.84 down to 0.02, making them suitable for fine metering applications. They can be supplied with either linear or equal percentage flow characteristics, and their relatively large stroke ensures smooth, accurate modulation with excellent rangeability. High Fl and xT values provide inherent protection against cavitation and contribute to reduced noise levels. The design allows plugs and seats to be interchanged within the same body size, and the same internal components can be used across different body pressure ratings, simplifying maintenance and spares management.</p> |  |

Cv vs. Travel Table — CV10 to CV100

| SIZE | CV10 | CV20 | CV30 | CV40 | CV50 | CV60 | CV70 | CV80 | CV90 | CV100 | TRAVEL [mm] |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------------|
| 0 | 0,0009 | 0,0019 | 0,0032 | 0,0046 | 0,0070 | 0,0094 | 0,0123 | 0,0153 | 0,0182 | 0,0200 | 26 |
| T | 0,0013 | 0,0029 | 0,0048 | 0,0070 | 0,0106 | 0,0141 | 0,0185 | 0,0229 | 0,0273 | 0,0300 | 26 |
| 2 | 0,0026 | 0,0058 | 0,0095 | 0,0139 | 0,0212 | 0,0282 | 0,0370 | 0,0459 | 0,0547 | 0,0600 | 26 |
| 3 | 0,0053 | 0,0116 | 0,0190 | 0,0290 | 0,0423 | 0,0565 | 0,0741 | 0,0920 | 0,1094 | 0,1200 | 26 |
| 4 | 0,0105 | 0,0233 | 0,0381 | 0,0558 | 0,0847 | 0,1129 | 0,1482 | 0,1835 | 0,2188 | 0,2400 | 26 |
| 5 | 0,0212 | 0,0466 | 0,0762 | 0,1115 | 0,1694 | 0,2260 | 0,2965 | 0,3670 | 0,4376 | 0,4800 | 26 |
| 6 | 0,0423 | 0,0932 | 0,1525 | 0,2230 | 0,3388 | 0,4518 | 0,5929 | 0,7341 | 0,8753 | 0,9600 | 26 |
| 7 | 0,0847 | 0,1863 | 0,3049 | 0,4461 | 0,6776 | 0,9035 | 1,1859 | 1,4682 | 1,7506 | 1,9200 | 26 |
| 8 | 0,1698 | 0,3737 | 0,6115 | 0,8945 | 1,3590 | 1,8118 | 2,3780 | 2,9441 | 3,5100 | 3,8500 | 26 |

Multistep™ Trim

| Specification | Picture |
|---|---|
| <p>The Multistep™ trim employs a seat ring machined with multiple concentric grooves, each acting as a discrete throttling stage. As the fluid passes through successive grooves, the total pressure drop is divided into smaller, controlled steps. This staged reduction prevents the fluid from reaching cavitation or flashing conditions within the trim. The grooves are progressively larger in diameter and deeper along the flow path to maintain the desired velocity profile. The number of steps remains constant regardless of plug position, ensuring predictable performance across the valve's operating range. Standard materials include martensitic stainless steels such as 420 or 440, with optional stellited 316 for enhanced wear resistance. Typical applications include high-pressure desuperheater cooling water control, supercritical</p> |  |

boiler start-up service, spray water regulation, and pump recirculation duties. Rangeability is approximately 80:1.

Equal Percentage Curve (Cv Values)

This table shows the Cv values for the standard equal percentage inherent characteristic curve at 10% opening intervals.

| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm) |
|------|-------|------|------|------|------|------|------|------|------|------|------|-------------|
| 20 | 3/4 | 0,06 | 0,12 | 0,21 | 0,3 | 0,42 | 0,61 | 0,94 | 1,5 | 2,2 | 3,5 | 26 |
| 20/1 | 3/4/1 | 0,04 | 0,07 | 0,13 | 0,19 | 0,27 | 0,39 | 0,59 | 0,93 | 1,4 | 2,2 | 26 |
| 20/2 | 3/4/2 | 0,02 | 0,05 | 0,08 | 0,12 | 0,17 | 0,25 | 0,37 | 0,59 | 0,9 | 1,4 | 26 |
| 20/3 | 3/4\3 | 0,01 | 0,03 | 0,05 | 0,07 | 0,1 | 0,15 | 0,23 | 0,36 | 0,55 | 0,86 | 26 |
| 20/4 | 3/4/4 | 0,01 | 0,02 | 0,04 | 0,05 | 0,07 | 0,11 | 0,16 | 0,26 | 0,39 | 0,61 | 26 |
| 20/5 | 3/4/5 | 0,01 | 0,01 | 0,02 | 0,03 | 0,04 | 0,06 | 0,09 | 0,14 | 0,21 | 0,33 | 26 |
| 25 | 1 | 0,09 | 0,18 | 0,32 | 0,46 | 0,66 | 0,95 | 1,4 | 2,3 | 3,5 | 5,4 | 26 |
| 25/1 | 1/1 | 0,06 | 0,12 | 0,21 | 0,3 | 0,42 | 0,61 | 0,94 | 1,5 | 2,2 | 3,5 | 26 |
| 25/2 | 1\2 | 0,04 | 0,07 | 0,13 | 0,19 | 0,27 | 0,39 | 0,59 | 0,93 | 1,4 | 2,2 | 26 |
| 25\3 | 1\3 | 0,02 | 0,05 | 0,08 | 0,12 | 0,17 | 0,25 | 0,37 | 0,59 | 0,9 | 1,4 | 26 |
| 25/4 | 1/4 | 0,01 | 0,03 | 0,05 | 0,07 | 0,1 | 0,15 | 0,23 | 0,36 | 0,55 | 0,86 | 26 |
| 25/5 | 1\5 | 0,01 | 0,02 | 0,04 | 0,05 | 0,07 | 0,11 | 0,16 | 0,26 | 0,39 | 0,61 | 26 |
| 40 | 1.5 | 0,14 | 0,28 | 0,49 | 0,7 | 1,0 | 1,4 | 2,2 | 3,5 | 5,2 | 8,2 | 26 |
| 40\1 | 1.5\1 | 0,09 | 0,18 | 0,32 | 0,46 | 0,66 | 0,95 | 1,4 | 2,3 | 3,5 | 5,4 | 26 |
| 40/2 | 1.5/2 | 0,06 | 0,12 | 0,21 | 0,3 | 0,42 | 0,61 | 0,94 | 1,5 | 2,2 | 3,5 | 26 |
| 40\3 | 1.5\3 | 0,04 | 0,07 | 0,13 | 0,19 | 0,27 | 0,39 | 0,59 | 0,93 | 1,4 | 2,2 | 26 |
| 40\4 | 1.5/4 | 0,02 | 0,05 | 0,08 | 0,12 | 0,17 | 0,25 | 0,37 | 0,59 | 0,9 | 1,4 | 26 |
| 40\5 | 1.5/5 | 0,01 | 0,03 | 0,05 | 0,07 | 0,1 | 0,15 | 0,23 | 0,36 | 0,55 | 0,86 | 26 |
| 50 | 2 | 0,24 | 0,49 | 0,86 | 1,2 | 1,7 | 2,5 | 3,9 | 6,1 | 9,2 | 14,4 | 26 |
| 50/1 | 2\1 | 0,14 | 0,28 | 0,49 | 0,7 | 1,0 | 1,4 | 2,2 | 3,5 | 5,2 | 8,2 | 26 |
| 50/2 | 2\2 | 0,09 | 0,18 | 0,32 | 0,46 | 0,66 | 0,95 | 1,4 | 2,3 | 3,5 | 5,4 | 26 |
| 50/3 | 2\3 | 0,06 | 0,12 | 0,21 | 0,3 | 0,42 | 0,61 | 0,94 | 1,5 | 2,2 | 3,5 | 26 |
| 50/4 | 2/4 | 0,04 | 0,07 | 0,13 | 0,19 | 0,27 | 0,39 | 0,59 | 0,93 | 1,4 | 2,2 | 26 |
| 50/5 | 2/5 | 0,02 | 0,05 | 0,08 | 0,12 | 0,17 | 0,25 | 0,37 | 0,59 | 0,9 | 1,4 | 26 |

Equal Percentage Curve (Parameters)

| Parameter | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% |
|-----------|------|------|------|------|------|------|------|------|------|------|
| Cv/d2 | 0,04 | 0,09 | 0,17 | 0,25 | 0,32 | 0,35 | 0,79 | 1,25 | 1,90 | 2,97 |

| | | | | | | | | | | |
|----------------------|------|------|------|------|------|------|------|------|------|------|
| F_L | 0,99 | 0,98 | 0,98 | 0,97 | 0,97 | 0,97 | 0,96 | 0,96 | 0,95 | 0,95 |
| X_T | 0,84 | 0,84 | 0,84 | 0,83 | 0,83 | 0,82 | 0,81 | 0,80 | 0,78 | 0,76 |

Modified Equal Percentage Curve (Cv Values)

This table shows the Cv values for the modified equal percentage inherent characteristic curve at 10% opening intervals.


| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm) |
|-------------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|--------------------|
| 20 | 3/4 | 0,15 | 0,33 | 0,54 | 0,79 | 1,2 | 1,6 | 2,1 | 2,6 | 3,1 | 3,4 | 26 |
| 20\1 | 3/4\1 | 0,09 | 0,2 | 0,33 | 0,49 | 0,74 | 0,99 | 1,3 | 1,6 | 1,9 | 2,1 | 26 |
| 20/2 | 3/4/2 | 0,06 | 0,12 | 0,21 | 0,3 | 0,46 | 0,61 | 0,79 | 1 | 1,2 | 1,3 | 26 |
| 20/3 | 3/4\3 | 0,04 | 0,08 | 0,13 | 0,19 | 0,28 | 0,38 | 0,5 | 0,63 | 0,74 | 0,82 | 26 |
| 20/4 | 3/4/4 | 0,02 | 0,05 | 0,08 | 0,12 | 0,19 | 0,25 | 0,33 | 0,41 | 0,48 | 0,54 | 26 |
| 20/5 | 3/4/5 | 0,01 | 0,03 | 0,05 | 0,07 | 0,11 | 0,15 | 0,19 | 0,24 | 0,28 | 0,31 | 26 |
| 25 | 1 | 0,23 | 0,5 | 0,83 | 1,2 | 1,8 | 2,5 | 3,2 | 4,1 | 4,8 | 5,3 | 26 |
| 25\1 | 1/1 | 0,15 | 0,33 | 0,54 | 0,79 | 1,2 | 1,6 | 2,1 | 2,6 | 3,1 | 3,4 | 26 |
| 25/2 | 1/2 | 0,09 | 0,2 | 0,33 | 0,49 | 0,74 | 0,99 | 1,3 | 1,6 | 1,9 | 2,1 | 26 |
| 25\3 | 1\3 | 0,06 | 0,12 | 0,21 | 0,3 | 0,46 | 0,61 | 0,79 | 1 | 1,2 | 1,3 | 26 |
| 25\4 | 1\4 | 0,04 | 0,08 | 0,13 | 0,19 | 0,28 | 0,38 | 0,5 | 0,63 | 0,74 | 0,82 | 26 |
| 25/5 | 1/5 | 0,02 | 0,05 | 0,08 | 0,12 | 0,19 | 0,25 | 0,33 | 0,41 | 0,48 | 0,54 | 26 |
| 40 | 1.5 | 0,35 | 0,77 | 1,3 | 1,9 | 2,8 | 3,8 | 4,9 | 6,2 | 7,3 | 8,1 | 26 |
| 40\1 | 1.5\1 | 0,23 | 0,5 | 0,83 | 1,2 | 1,8 | 2,5 | 3,2 | 4,1 | 4,8 | 5,3 | 26 |
| 40/2 | 1.5/2 | 0,15 | 0,33 | 0,54 | 0,79 | 1,2 | 1,6 | 2,1 | 2,6 | 3,1 | 3,4 | 26 |
| 40\3 | 1.5\3 | 0,09 | 0,2 | 0,33 | 0,49 | 0,74 | 0,99 | 1,3 | 1,6 | 1,9 | 2,1 | 26 |
| 40\4 | 1.5\4 | 0,06 | 0,12 | 0,21 | 0,3 | 0,46 | 0,61 | 0,79 | 1 | 1,2 | 1,3 | 26 |
| 40\5 | 1.5/5 | 0,04 | 0,08 | 0,13 | 0,19 | 0,28 | 0,38 | 0,5 | 0,63 | 0,74 | 0,82 | 26 |
| 50 | 2 | 0,61 | 1,4 | 2,3 | 3,3 | 5 | 6,7 | 8,7 | 11 | 12,9 | 14,3 | 26 |
| 50/1 | 2\1 | 0,35 | 0,77 | 1,3 | 1,9 | 2,8 | 3,8 | 4,9 | 6,2 | 7,3 | 8,1 | 26 |
| 50/2 | 2/2 | 0,23 | 0,5 | 0,83 | 1,2 | 1,8 | 2,5 | 3,2 | 4,1 | 4,8 | 5,3 | 26 |
| 50/3 | 2\3 | 0,15 | 0,33 | 0,54 | 0,79 | 1,2 | 1,6 | 2,1 | 2,6 | 3,1 | 3,4 | 26 |
| 50/4 | 2/4 | 0,09 | 0,2 | 0,33 | 0,49 | 0,74 | 0,99 | 1,3 | 1,6 | 1,9 | 2,1 | 26 |
| 50/5 | 2/5 | 0,06 | 0,12 | 0,21 | 0,3 | 0,46 | 0,61 | 0,79 | 1 | 1,2 | 1,3 | 26 |

Modified Equal Percentage Curve (Parameters)

| | | | | | | | | | | |
|----------------------|------|------|------|------|------|------|------|------|------|------|
| Cv/d2 | 0,12 | 0,27 | 0,45 | 0,67 | 1 | 1,36 | 1,77 | 2,24 | 2,64 | 2,9 |
| F_L | 0,99 | 0,98 | 0,98 | 0,97 | 0,97 | 0,97 | 0,96 | 0,96 | 0,95 | 0,95 |

| | | | | | | | | | | |
|-------|------|------|------|------|------|------|------|------|------|------|
| X_r | 0,84 | 0,84 | 0,84 | 0,83 | 0,83 | 0,82 | 0,81 | 0,80 | 0,78 | 0,76 |
|-------|------|------|------|------|------|------|------|------|------|------|

8. USS™ / STD™ & LDB™ Cage

| Specification | Picture |
|--|--|
| <p>The USS™ trim is available in two cage configurations: the STD™ cage, featuring a drilled-hole pattern for general service, and the LDB™ cage, which incorporates design features to reduce aerodynamic noise. Both designs offer good rangeability, with the STD™ cage providing a cost-effective solution for clean service conditions. The unbalanced plug design is recommended for service temperatures above 250 °C. Hole spacing within the cage is carefully arranged to prevent jet interaction, which can otherwise lead to vibration and noise. Flow characteristics can be supplied as linear or equal percentage. Standard materials include 410/420 stainless steel, 316 stainless steel, stellited 316, 440 stainless steel, and 17-4PH, with other alloys available on request. These trims are suited to general-purpose duties involving clean fluids, whether in modulating or on-off service.</p> |  |

Linear Inherent Characteristic Curve (USS/STD Trim)

This table shows the Cv values for plug-characterized trims (sizes 3/4" to 1.5") and STD Cage trims (sizes 2" to 8").

| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm) |
|------|-------|------|-----|-----|-----|-----|-----|-----|-----|-----|------|-------------|
| 20 | 3/4 | 0,54 | 1,8 | 3,2 | 4,6 | 5,9 | 7,1 | 8,3 | 9,6 | 11 | 12 | 20 |
| 20/1 | 3/4\1 | 0,36 | 1,2 | 2,2 | 3 | 3,9 | 4,7 | 5,5 | 6,4 | 7,3 | 8 | 20 |
| 25 | 1 | 0,77 | 2,6 | 4,6 | 6,5 | 8,3 | 10 | 12 | 14 | 15 | 17 | 20 |
| 25\1 | 1\1 | 0,50 | 1,7 | 3 | 4,2 | 5,4 | 6,5 | 7,6 | 8,8 | 10 | 11 | 20 |
| 40 | 1.5 | 1,5 | 4,8 | 8,2 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 20 |
| 40/1 | 1.5/1 | 1 | 3,4 | 5,7 | 8 | 10 | 13 | 15 | 17 | 19 | 21 | 20 |
| 50 | 2 | 2,7 | 8,6 | 15 | 21 | 26 | 32 | 37 | 43 | 49 | 54 | 20 |
| 50/1 | 2\1 | 1,9 | 6 | 10 | 14 | 19 | 22 | 26 | 30 | 34 | 38 | 20 |
| 80 | 3 | 6 | 19 | 33 | 46 | 60 | 72 | 84 | 97 | 110 | 122 | 32 |
| 80/1 | 3\1 | 4,2 | 14 | 23 | 32 | 42 | 50 | 59 | 68 | 77 | 85 | 32 |
| 100 | 4 | 10,8 | 35 | 58 | 82 | 106 | 127 | 150 | 173 | 194 | 216 | 45 |

| | | | | | | | | | | | | |
|----------------|-----|------|------|------|------|------|------|------|------|------|------|----|
| 100/1 | 4\1 | 7,5 | 24 | 41 | 57 | 74 | 90 | 104 | 120 | 135 | 150 | 45 |
| 150 | 6 | 25 | 78 | 132 | 186 | 240 | 289 | 338 | 390 | 441 | 490 | 64 |
| 150/1 | 6\1 | 17 | 55 | 93 | 130 | 168 | 202 | 237 | 274 | 309 | 343 | 64 |
| 200 | 8 | 43 | 138 | 233 | 328 | 423 | 510 | 596 | 690 | 778 | 864 | 85 |
| 200/1 | 8\1 | 30 | 97 | 163 | 230 | 296 | 357 | 417 | 484 | 544 | 605 | 85 |
| F _L | | 0,97 | 0,97 | 0,96 | 0,95 | 0,94 | 0,93 | 0,93 | 0,92 | 0,91 | 0,91 | |
| X _r | | 0,8 | 0,8 | 0,8 | 0,8 | 0,79 | 0,78 | 0,76 | 0,73 | 0,72 | 0,7 | |

Equal Percentage Inherent Characteristic Curve (USS/STD Trim)

This table shows the Cv values for plug-characterized trims (sizes 3/4" to 1.5") and STD Cage trims (sizes 2" to 8").

| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm) |
|----------------|-------|------|------|------|------|------|------|------|------|------|------|-------------|
| 20 | 3/4 | 0,16 | 0,3 | 0,6 | 0,9 | 1,3 | 1,8 | 2,7 | 4,2 | 6 | 9 | 20 |
| 20/1 | 3/4\1 | 0,11 | 0,2 | 0,4 | 0,6 | 0,8 | 1,2 | 1,8 | 2,8 | 4 | 6 | 20 |
| 25 | 1 | 0,25 | 0,5 | 1 | 1,4 | 2 | 2,8 | 4,2 | 6,5 | 9,3 | 14 | 20 |
| 25\1 | 1\1 | 0,16 | 0,3 | 0,6 | 0,9 | 1,3 | 1,8 | 2,7 | 4,2 | 6 | 9 | 20 |
| 40 | 1.5 | 0,41 | 0,9 | 1,6 | 2,3 | 3,2 | 4,6 | 6,9 | 10,6 | 15,3 | 23 | 20 |
| 40/1 | 1.5\1 | 0,29 | 0,6 | 1,1 | 1,6 | 2,2 | 3,2 | 4,8 | 7,4 | 10,7 | 16 | 20 |
| 50 | 2 | 0,80 | 1,6 | 2,8 | 4 | 6 | 8 | 12 | 19 | 26 | 40 | 20 |
| 50/1 | 2\1 | 0,56 | 1,1 | 2 | 2,8 | 4 | 6 | 8,4 | 13 | 18 | 28 | 20 |
| 80 | 3 | 1,8 | 3,6 | 6,3 | 9 | 13 | 18 | 27 | 41 | 59 | 90 | 32 |
| 80/1 | 3\1 | 1,2 | 2,5 | 4,4 | 6,3 | 9 | 13 | 19 | 29 | 42 | 63 | 32 |
| 100 | 4 | 3,2 | 6,4 | 11 | 16 | 22 | 32 | 48 | 74 | 106 | 160 | 45 |
| 100/1 | 4\1 | 2,2 | 4,5 | 7,8 | 11 | 16 | 22 | 34 | 52 | 74 | 112 | 45 |
| 150 | 6 | 7,2 | 15 | 25 | 36 | 50 | 72 | 108 | 166 | 238 | 360 | 64 |
| 150/1 | 6\1 | 5 | 10 | 18 | 25 | 35 | 50 | 76 | 116 | 166 | 252 | 64 |
| 200 | 8 | 13 | 26 | 45 | 64 | 90 | 128 | 192 | 294 | 422 | 640 | 85 |
| 200/1 | 8\1 | 9 | 18 | 32 | 45 | 63 | 90 | 135 | 207 | 297 | 450 | 85 |
| F _L | | 0,97 | 0,97 | 0,96 | 0,95 | 0,94 | 0,93 | 0,93 | 0,92 | 0,91 | 0,91 | |
| X _r | | 0,8 | 0,8 | 0,8 | 0,8 | 0,79 | 0,78 | 0,76 | 0,73 | 0,72 | 0,7 | |

Linear Inherent Characteristic Curve (LDB Cage)

This table shows the Cv values for LDB Cage trims with a linear characteristic.

| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm) |
|----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-------------|
| 50 | 2 | 2,4 | 7,7 | 13 | 18 | 24 | 29 | 34 | 39 | 44 | 49 | 20 |

| | | | | | | | | | | | | |
|----------------------|-----|------|------|------|------|------|------|------|------|------|------|----|
| 50/1 | 2\1 | 1,7 | 5,4 | 9,2 | 13 | 17 | 20 | 23 | 27 | 31 | 34 | 20 |
| 80 | 3 | 5,5 | 18 | 30 | 42 | 54 | 65 | 76 | 88 | 99 | 110 | 32 |
| 80/1 | 3\1 | 3,8 | 13 | 21 | 29 | 38 | 45 | 53 | 62 | 69 | 77 | 32 |
| 100 | 4 | 9,7 | 31 | 53 | 74 | 96 | 115 | 135 | 156 | 176 | 195 | 45 |
| 100/1 | 4\1 | 6,8 | 22 | 37 | 52 | 67 | 81 | 94 | 109 | 123 | 137 | 45 |
| 150 | 6 | 22 | 70 | 119 | 167 | 216 | 260 | 304 | 352 | 396 | 440 | 64 |
| 150/1 | 6\1 | 16 | 50 | 84 | 118 | 152 | 183 | 214 | 248 | 279 | 310 | 64 |
| 200 | 8 | 39 | 125 | 211 | 296 | 382 | 460 | 538 | 624 | 702 | 780 | 85 |
| 200/1 | 8\1 | 27 | 86 | 146 | 205 | 265 | 319 | 373 | 432 | 486 | 540 | 85 |
| F_L | | 0,98 | 0,98 | 0,97 | 0,96 | 0,95 | 0,94 | 0,94 | 0,93 | 0,92 | 0,92 | |
| X_r | | 0,81 | 0,81 | 0,81 | 0,81 | 0,8 | 0,79 | 0,77 | 0,74 | 0,73 | 0,71 | |

Equal Percentage Inherent Characteristic Curve (LDB Cage)

This table shows the Cv values for LDB Cage trims with an equal percentage characteristic.

| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm) |
|----------------------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|--------------------|
| 50 | 2 | 0,72 | 1,4 | 2,5 | 3,6 | 5 | 7 | 11 | 17 | 24 | 36 | 20 |
| 50/1 | 2\1 | 0,5 | 1 | 1,7 | 2,5 | 4 | 5 | 8 | 12 | 17 | 25 | 20 |
| 80 | 3 | 1,6 | 3,2 | 5,6 | 8 | 12 | 16 | 24 | 37 | 53 | 81 | 32 |
| 80/1 | 3\1 | 1,1 | 2,2 | 4 | 5,6 | 8 | 12 | 17 | 26 | 37 | 57 | 32 |
| 100 | 4 | 2,9 | 5,7 | 10 | 14 | 20 | 29 | 43 | 66 | 95 | 144 | 45 |
| 100/1 | 4\1 | 2 | 4 | 7 | 10 | 14 | 20 | 30 | 46 | 66 | 100 | 45 |
| 150 | 6 | 6,5 | 13 | 23 | 33 | 46 | 65 | 98 | 150 | 215 | 325 | 64 |
| 150/1 | 6\1 | 4,6 | 9,2 | 16 | 23 | 32 | 46 | 69 | 106 | 152 | 230 | 64 |
| 200 | 8 | 11,5 | 23 | 41 | 58 | 81 | 116 | 174 | 267 | 383 | 580 | 85 |
| 200/1 | 8\1 | 8 | 16 | 28 | 41 | 57 | 81 | 122 | 186 | 267 | 405 | 85 |
| F_L | | 0,98 | 0,98 | 0,97 | 0,96 | 0,95 | 0,94 | 0,94 | 0,93 | 0,92 | 0,92 | |
| X_r | | 0,81 | 0,81 | 0,81 | 0,81 | 0,8 | 0,79 | 0,77 | 0,74 | 0,73 | 0,71 | |

9. BSS™ / STD™ & LDB™ Cage

Specification

Design and Performance

The BSS/STD™ and LDB™ Cage trims are designed for general-purpose control valve applications. The STD cage is a cost-effective design featuring a drilled hole pattern that provides excellent rangeability. The LDB cage follows the same design philosophy but is engineered with superior features for noise reduction.

A key design feature is their versatility with different plug types:

- **Balanced Plug:** Used for services up to 250°C, where fluid flows into the cage and down through the seat ring. This configuration provides stable operation and allows for smaller, less expensive actuators while maintaining tight shut-off.
- **Unbalanced Plug:** Used for services exceeding 250°C, with a flow path up through the seat ring and out of the cage.

Both cage designs utilize a carefully controlled hole pattern that minimizes jet interaction, which helps to reduce resultant noise levels. The standard seat leakage rating is Class IV, with Class VI available as an option.

Applications and Noise Attenuation

These trims are suitable for most clean compressible and non-compressible fluid services, for both modulating and on/off control. The choice between the STD and LDB cage depends on the specific service conditions. The STD cage is a general-purpose solution, while the LDB cage is specified for applications where noise from critical pressure drops or low-level cavitation is a concern.

The primary advantage of the LDB cage is its ability to treat noise at the source. By using a greater number of smaller orifices, the LDB design can achieve noise attenuation of 10 to 15 dBA compared to a standard cage, with little impact on flow capacity. This multi-orifice design is engineered to reduce flow jet interaction and turbulence, making it a superior choice for noisy services.

Materials of Construction

A wide range of materials is available to suit various service conditions. Standard materials include 410/420 corrosion-resistant steel and 316 stainless steel. For more demanding or highly erosive applications, special materials can be provided, such as

Picture



Hastelloy, Monel, Colmonoy, and Tungsten carbide. NACE-compliant materials are also available upon request. Standard materials for the valve body and bonnet include carbon steel, alloy steel, and stainless steel.

STD Cage - Linear Inherent Characteristic Curve

| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm) |
|-------|------|------|-----|-----|-------|-------|-------|-------|-------|-------|-------|-------------|
| 50 | 2 | 2,7 | 8,6 | 15 | 21 | 26 | 32 | 37 | 43 | 49 | 54 | 20 |
| 50/1 | 2\1 | 1,9 | 6 | 10 | 14 | 19 | 22 | 26 | 30 | 34 | 38 | 20 |
| 80 | 3 | 6 | 19 | 33 | 46 | 60 | 72 | 84 | 97 | 110 | 122 | 32 |
| 80/1 | 3\1 | 4,2 | 14 | 23 | 32 | 42 | 50 | 59 | 68 | 77 | 85 | 32 |
| 100 | 4 | 10,8 | 35 | 58 | 82 | 106 | 127 | 150 | 173 | 194 | 216 | 45 |
| 100/1 | 4\1 | 7,5 | 24 | 41 | 57 | 74 | 90 | 104 | 120 | 135 | 150 | 45 |
| 150 | 6 | 25 | 78 | 132 | 186 | 240 | 289 | 338 | 390 | 441 | 490 | 64 |
| 150/1 | 6\1 | 17 | 55 | 93 | 130 | 168 | 202 | 237 | 274 | 309 | 343 | 64 |
| 200 | 8 | 43 | 138 | 233 | 328 | 423 | 510 | 596 | 690 | 778 | 864 | 85 |
| 200/1 | 8\1 | 30 | 97 | 163 | 230 | 296 | 357 | 417 | 484 | 544 | 605 | 85 |
| 250 | 10 | 68 | 216 | 365 | 513 | 662 | 800 | 932 | 1.080 | 1.215 | 1.350 | 107 |
| 250/1 | 10/1 | 47 | 151 | 255 | 360 | 463 | 560 | 652 | 756 | 850 | 945 | 107 |
| 300 | 12 | 98 | 312 | 527 | 740 | 956 | 1.150 | 1.346 | 1.560 | 1.755 | 1.950 | 127 |
| 300/1 | 12/1 | 68 | 218 | 369 | 519 | 669 | 805 | 940 | 1.090 | 1.229 | 1.365 | 127 |
| 350 | 14 | 133 | 424 | 716 | 1.007 | 1.300 | 1.560 | 1.829 | 2.120 | 2.380 | 2.650 | 152 |
| 350/1 | 14/1 | 93 | 297 | 501 | 705 | 909 | 1.094 | 1.280 | 1.484 | 1.670 | 1.855 | 152 |
| 400 | 16 | 173 | 554 | 934 | 1.315 | 1.695 | 2.040 | 2.387 | 2.768 | 3.114 | 3.460 | 177 |
| 400/1 | 16/1 | 121 | 387 | 653 | 920 | 1.186 | 1.430 | 1.670 | 1.936 | 2.178 | 2.420 | 177 |

STD Cage - Equal Percentage Inherent Characteristic Curve

| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm) |
|-------|------|------|------|-----|-----|-----|-----|-----|-----|-----|------|-------------|
| 50 | 2 | 0,80 | 1,6 | 2,8 | 4 | 6 | 8 | 12 | 19 | 26 | 40 | 20 |
| 50/1 | 2\1 | 0,56 | 1,1 | 2 | 2,8 | 4 | 6 | 8,4 | 13 | 18 | 28 | 20 |
| 80 | 3 | 1,8 | 3,6 | 6,3 | 9 | 13 | 18 | 27 | 41 | 59 | 90 | 32 |
| 80/1 | 3\1 | 1,2 | 2,5 | 4,4 | 6,3 | 9 | 13 | 19 | 29 | 42 | 63 | 32 |
| 100 | 4 | 3,2 | 6,4 | 11 | 16 | 22 | 32 | 48 | 74 | 106 | 160 | 45 |
| 100/1 | 4\1 | 2,2 | 4,5 | 7,8 | 11 | 16 | 22 | 34 | 52 | 74 | 112 | 45 |
| 150 | 6 | 7,2 | 14,5 | 25 | 36 | 50 | 72 | 108 | 166 | 238 | 360 | 64 |
| 150/1 | 6\1 | 5 | 10 | 18 | 25 | 35 | 50 | 76 | 116 | 166 | 252 | 64 |
| 200 | 8 | 13 | 26 | 45 | 64 | 90 | 128 | 192 | 294 | 422 | 640 | 85 |

| | | | | | | | | | | | | |
|--------------------|------|------|------|------|------|------|------|------|-------|-------|-------|-----|
| 200/1 | 8\1 | 9 | 18 | 32 | 45 | 63 | 90 | 135 | 207 | 297 | 450 | 85 |
| 250 | 10 | 20 | 40 | 70 | 100 | 140 | 200 | 300 | 460 | 660 | 1.000 | 107 |
| 250/1 | 10/1 | 14 | 28 | 49 | 70 | 98 | 140 | 210 | 322 | 462 | 700 | 107 |
| 300 | 12 | 29 | 58 | 101 | 144 | 202 | 288 | 432 | 662 | 950 | 1.440 | 127 |
| 300/1 | 12/1 | 20 | 40 | 71 | 101 | 141 | 202 | 303 | 465 | 667 | 1.010 | 127 |
| 350 | 14 | 39 | 78 | 137 | 196 | 274 | 392 | 588 | 902 | 1.294 | 1.960 | 152 |
| 350/1 | 14/1 | 27 | 55 | 96 | 137 | 192 | 274 | 411 | 630 | 904 | 1.370 | 152 |
| 400 | 16 | 51 | 102 | 179 | 256 | 358 | 512 | 768 | 1.178 | 1.690 | 2.560 | 177 |
| 400/1 | 16/1 | 36 | 72 | 125 | 179 | 251 | 358 | 537 | 823 | 1.181 | 1.790 | 177 |
| F _L (1) | | 0,97 | 0,97 | 0,96 | 0,95 | 0,94 | 0,93 | 0,93 | 0,92 | 0,91 | 0,91 | |
| F _L (2) | | 0,87 | 0,87 | 0,85 | 0,85 | 0,84 | 0,83 | 0,83 | 0,82 | 0,81 | 0,81 | |
| X _T (1) | | 0,8 | 0,8 | 0,8 | 0,8 | 0,79 | 0,78 | 0,76 | 0,73 | 0,72 | 0,7 | |
| X _T (2) | | 0,75 | 0,75 | 0,73 | 0,72 | 0,7 | 0,68 | 0,68 | 0,67 | 0,65 | 0,65 | |

Notes:

- (1) F_L and X_T values are for flow up through the seat ring and out of the cage.
- (2) F_L and X_T values are for flow into the cage and down through the seat ring.

LDB Cage - Linear Inherent Characteristic Curve

| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm) |
|-------|------|-----|-----|-----|-----|-------|-------|-------|-------|-------|-------|-------------|
| 50 | 2 | 2,4 | 7,7 | 13 | 18 | 24 | 29 | 34 | 39 | 44 | 49 | 20 |
| 50/1 | 2\1 | 1,7 | 5,4 | 9,2 | 13 | 17 | 20 | 23 | 27 | 31 | 34 | 20 |
| 80 | 3 | 5,5 | 18 | 30 | 42 | 54 | 65 | 76 | 88 | 99 | 110 | 32 |
| 80/1 | 3\1 | 3,8 | 13 | 21 | 29 | 38 | 45 | 53 | 62 | 69 | 77 | 32 |
| 100 | 4 | 9,7 | 31 | 53 | 74 | 96 | 115 | 135 | 156 | 176 | 195 | 45 |
| 100/1 | 4\1 | 6,8 | 22 | 37 | 52 | 67 | 81 | 94 | 109 | 123 | 137 | 45 |
| 150 | 6 | 22 | 70 | 119 | 167 | 216 | 260 | 304 | 352 | 396 | 440 | 64 |
| 150/1 | 6\1 | 16 | 50 | 84 | 118 | 152 | 183 | 214 | 248 | 279 | 310 | 64 |
| 200 | 8 | 39 | 125 | 211 | 296 | 382 | 460 | 538 | 624 | 702 | 780 | 85 |
| 200/1 | 8\1 | 27 | 86 | 146 | 205 | 265 | 319 | 373 | 432 | 486 | 540 | 85 |
| 250 | 10 | 61 | 194 | 328 | 462 | 595 | 717 | 838 | 972 | 1.094 | 1.215 | 107 |
| 250/1 | 10/1 | 43 | 136 | 230 | 323 | 417 | 502 | 587 | 680 | 765 | 850 | 107 |
| 300 | 12 | 87 | 280 | 472 | 665 | 857 | 1.032 | 1.207 | 1.400 | 1.575 | 1.750 | 127 |
| 300/1 | 12/1 | 61 | 196 | 331 | 465 | 600 | 723 | 845 | 980 | 1.102 | 1.225 | 127 |
| 350 | 14 | 119 | 381 | 643 | 904 | 1.166 | 1.404 | 1.642 | 1.904 | 2.142 | 2.380 | 152 |
| 350/1 | 14/1 | 84 | 267 | 451 | 635 | 818 | 985 | 1.152 | 1.336 | 1.503 | 1.670 | 152 |

| | | | | | | | | | | | | |
|-------|------|-----|-----|-----|-------|-------|-------|-------|-------|-------|-------|-----|
| 400 | 16 | 156 | 498 | 840 | 1.182 | 1.524 | 1.835 | 2.146 | 2.488 | 2.799 | 3.110 | 177 |
| 400/1 | 16/1 | 109 | 348 | 587 | 827 | 1.066 | 1.283 | 1.501 | 1.740 | 1.958 | 2.175 | 177 |

LDB Cage - Equal Percentage Inherent Characteristic Curve

| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm) |
|--------------------|------|------|------|------|------|------|------|------|-------|-------|-------|-------------|
| 50 | 2 | 0,72 | 1,4 | 2,5 | 3,6 | 5 | 7 | 11 | 17 | 24 | 36 | 20 |
| 50/1 | 2\1 | 0,5 | 1 | 1,7 | 2,5 | 4 | 5 | 8 | 11,5 | 17 | 25 | 20 |
| 80 | 3 | 1,6 | 3,2 | 5,6 | 8 | 12 | 16 | 24 | 37 | 53 | 81 | 32 |
| 80/1 | 3\1 | 1,1 | 2,2 | 4 | 5,6 | 8 | 12 | 17 | 26 | 37 | 57 | 32 |
| 100 | 4 | 2,9 | 5,7 | 10 | 14 | 20 | 29 | 43 | 66 | 95 | 144 | 45 |
| 100/1 | 4\1 | 2 | 4 | 7 | 10 | 14 | 20 | 30 | 46 | 66 | 100 | 45 |
| 150 | 6 | 6,5 | 13 | 23 | 33 | 46 | 65 | 98 | 150 | 215 | 325 | 64 |
| 150/1 | 6\1 | 4,6 | 9,2 | 16 | 23 | 32 | 46 | 69 | 106 | 152 | 230 | 64 |
| 200 | 8 | 11,5 | 23 | 41 | 58 | 81 | 116 | 174 | 267 | 383 | 580 | 85 |
| 200/1 | 8\1 | 8 | 16 | 28 | 41 | 57 | 81 | 122 | 186 | 267 | 405 | 85 |
| 250 | 10 | 18 | 36 | 63 | 90 | 126 | 180 | 270 | 414 | 594 | 900 | 107 |
| 250/1 | 10/1 | 12,5 | 25 | 44 | 63 | 88 | 126 | 189 | 290 | 416 | 630 | 107 |
| 300 | 12 | 26 | 52 | 91 | 130 | 182 | 260 | 390 | 598 | 858 | 1.300 | 127 |
| 300/1 | 12/1 | 18 | 36 | 64 | 91 | 127 | 182 | 273 | 419 | 601 | 910 | 127 |
| 350 | 14 | 35 | 70 | 123 | 176 | 246 | 352 | 528 | 810 | 1.162 | 1.760 | 152 |
| 350/1 | 14/1 | 25 | 49 | 86 | 123 | 172 | 246 | 369 | 566 | 812 | 1.230 | 152 |
| 400 | 16 | 46 | 92 | 161 | 230 | 322 | 460 | 690 | 1.058 | 1.518 | 2.300 | 177 |
| 400/1 | 16/1 | 32 | 64 | 113 | 161 | 225 | 322 | 483 | 741 | 1.063 | 1.610 | 177 |
| F _L (1) | | 0,98 | 0,98 | 0,97 | 0,96 | 0,95 | 0,94 | 0,94 | 0,93 | 0,92 | 0,92 | |
| F _L (2) | | 0,88 | 0,88 | 0,87 | 0,86 | 0,85 | 0,84 | 0,84 | 0,83 | 0,82 | 0,82 | |
| X _T (1) | | 0,81 | 0,81 | 0,81 | 0,81 | 0,8 | 0,79 | 0,77 | 0,74 | 0,73 | 0,71 | |
| X _T (2) | | 0,77 | 0,77 | 0,76 | 0,74 | 0,72 | 0,71 | 0,71 | 0,69 | 0,67 | 0,67 | |

Notes:

- (1) F_L and X_T values are for flow up through the seat ring and out of the cage.
- (2) F_L and X_T values are for flow into the cage and down through the seat ring.

10. Cavless™ Trim

Specification

Picture

Design and Operating Principle

The Cavless™ trim is a specialized valve internal designed primarily to mitigate the damaging effects of low-level cavitation and flashing in liquid services. Its name signifies "less cavitation," as it controls the cavitation process rather than eliminating it entirely.

The core of the design is a cage featuring a series of double-drilled, timed radial holes. These holes are arranged in diametrically opposed pairs, creating a nozzle effect that directs fluid jets toward the center of the cage. This clever design controls the location of the

vena contracta (the point of lowest pressure and highest velocity), forcing the harmful implosion of cavitation bubbles to occur in the liquid stream, away from the metal surfaces of the plug and cage. This significantly reduces erosion, vibration, and noise.

The trim is available in two distinct configurations depending on the application:

- Cavitation Service: Uses a balanced plug with the flow directed over the seat (into the cage and down through the seat ring).
- Flashing Service: Uses an unbalanced plug with the flow directed under the seat (up through the seat ring and out of the cage).

Performance and Applications

The Cavless™ trim offers excellent reduction in vibration and Sound Pressure Level (SPL) while maintaining a high flow capacity. It provides stable operation during throttling and a tight shut-off, with a standard rated seat leakage of Class IV per ANSI B16.104 and a good rangeability of 25 to 1.

For the balanced plug configuration used in cavitation service, the maximum allowable service temperature is 300°C. The temperature limits for the unbalanced plug in flashing service are determined by the material selection.

Typical applications include:

- Feedwater systems
- Flashing services



- Condensate systems, such as deaerator level control and drain services
- Condensate recirculation systems

Materials of Construction

The standard materials for the plug, cage, and seat ring are martensitic corrosion-resistant steels such as type 420. For more severe conditions, options like hardfaced 316 stainless steel and 17-4PH are available. The valve body and bonnet are typically made from carbon steel, alloy steel, or stainless steel

Table 1: Cv values of the valve at 10% opening intervals - Linear Inherent Characteristic Curve

| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm) |
|--------------------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------------|
| 50 | 2 | 1,5 | 5 | 9 | 13 | 16,5 | 20 | 23,5 | 27,5 | 31 | 35 | 26 |
| 50/1 | 2\1 | 1 | 3,7 | 6,5 | 9,5 | 12 | 14,5 | 17 | 19,5 | 22,5 | 25 | 26 |
| 80 | 3 | 3,5 | 11,7 | 21 | 29,5 | 38 | 45,5 | 53 | 62 | 70 | 78 | 38 |
| 80/1 | 3\1 | 2,3 | 7,8 | 14 | 20 | 25,5 | 31 | 36 | 42 | 47,5 | 53 | 38 |
| 100 | 4 | 4,8 | 16,5 | 29,5 | 41 | 53 | 64 | 74,5 | 87 | 98,5 | 110 | 45 |
| 100/1 | 4\1 | 3,2 | 11 | 19,5 | 27,5 | 35,5 | 43 | 50,5 | 58,5 | 66,5 | 74 | 45 |
| 150 | 6 | 11 | 36,5 | 65 | 92 | 118 | 142 | 167 | 194 | 219 | 245 | 64 |
| 150/1 | 6\1 | 7 | 24 | 43 | 61 | 78 | 94 | 110 | 129 | 145 | 162 | 64 |
| 200 | 8 | 21,5 | 73 | 130 | 183 | 236 | 284 | 333 | 388 | 438 | 490 | 76 |
| 200/1 | 8\1 | 14 | 48 | 84 | 119 | 153 | 185 | 216 | 252 | 285 | 318 | 76 |
| 250 | 10 | 32 | 107 | 191 | 268 | 346 | 417 | 488 | 568 | 642 | 717 | 107 |
| 250/1 | 10\1 | 20 | 68 | 121 | 171 | 221 | 266 | 311 | 362 | 410 | 457 | 107 |
| 300 | 12 | 56 | 189 | 336 | 474 | 611 | 735 | 860 | 1.002 | 1.133 | 1.265 | 127 |
| 300/1 | 12\1 | 34,5 | 116 | 206 | 291 | 375 | 451 | 527 | 615 | 695 | 776 | 127 |
| 350 | 14 | 78 | 263 | 467 | 657 | 842 | 1.020 | 1.192 | 1.389 | 1.568 | 1.754 | 152 |
| 350/1 | 14\1 | 48 | 162 | 288 | 406 | 524 | 630 | 737 | 859 | 971 | 1.084 | 152 |
| 400 | 16 | 105 | 355 | 631 | 888 | 1.145 | 1.379 | 1.613 | 1.879 | 2.125 | 2.372 | 177 |
| 400/1 | 16\1 | 65 | 218 | 388 | 546 | 704 | 848 | 991 | 1.155 | 1.306 | 1.458 | 177 |
| F _L (1) | | 0,96 | 0,96 | 0,95 | 0,94 | 0,93 | 0,92 | 0,92 | 0,91 | 0,9 | 0,9 | |
| F _L (2) | | 0,86 | 0,85 | 0,84 | 0,83 | 0,83 | 0,82 | 0,81 | 0,81 | 0,8 | 0,8 | |
| X _T (1) | | 0,82 | 0,82 | 0,82 | 0,82 | 0,81 | 0,8 | 0,78 | 0,75 | 0,74 | 0,72 | |
| X _T (2) | | 0,73 | 0,72 | 0,7 | 0,68 | 0,68 | 0,67 | 0,65 | 0,65 | 0,64 | 0,64 | |

- (1) F_L and X_T values are for flow under the seat (flashing).
- (2) F_L and X_T values are for flow over the seat (cavitating).

11. Pilot™ / STD™ & LDB™ Cage

Specification

Picture

Design and Performance

The Pilot™ plug is a specialized trim designed for large-size valves (4 inches and above) that operate at high temperatures and require tight shut-off with a balanced trim. A key advantage of this design is that it minimizes the required actuator size, even when high sealing is necessary. This plug is combined with either a standard STD™ cage for general use or a low-noise LDB™ cage for applications where noise is a concern.

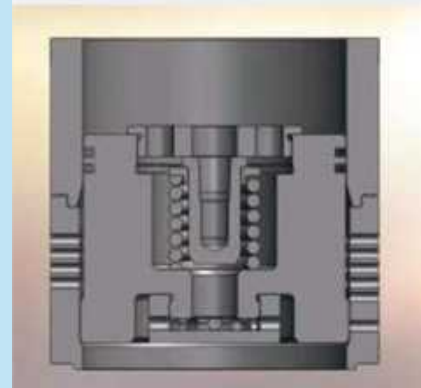
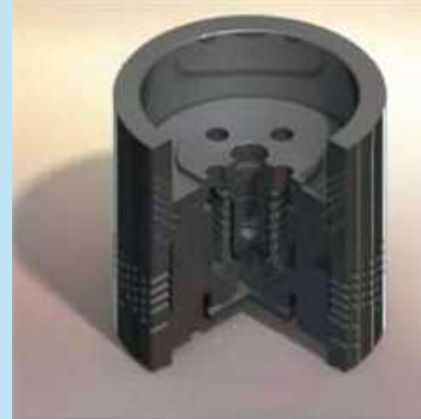
The trim is engineered for a flow path that directs fluid over the seat and down through the seat ring. It delivers high performance with a Leakage Class V rating per ANSI B16.104, a rangeability of 25:1, and an impressive service temperature range of -30°C to 565°C. The cage-guided balanced plug ensures stable operation during throttling and is suitable for both modulating and on/off applications in liquid and gas services.

Applications and Noise Attenuation

This trim configuration is primarily used for demanding, high-energy applications involving medium to large flows at high temperatures. Common uses include:

- HP and LP Turbine Bypass
- Steam dump and steam throttling to atmosphere or a condenser
- Super-critical boiler start-up
- Isolation and high-temperature pressure reduction for steam and water
- Liquid services where flashing and cavitation are not present

A significant feature, particularly with the LDB cage, is its noise reduction capability. The document explains noise control through "source treatment," which aims to prevent noise generation from the outset. The LDB cage is an example of this, using a carefully engineered pattern of multiple orifices to reduce flow jet interaction and turbulence. This design can achieve a sound level reduction of 10 to 15 dBA compared to the STD cage with little sacrifice in flow capacity.



Materials of Construction

A variety of materials are available to match service conditions. Standard options for the trim components include 410/420 corrosion-resistant steel and 316 stainless steel (including stellited versions). For highly erosive or corrosive fluids, special materials such as Hastelloy™, Monel™, Colmonoy™, and Tungsten carbide are available. NACE-compliant materials can also be provided upon request.

PILOT Plug with STD Cage - Linear Inherent Characteristic Curve

| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm) |
|----------------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------------|
| 100 | 4 | 10,8 | 35 | 58 | 82 | 106 | 127 | 150 | 173 | 194 | 216 | 51 |
| 100/1 | 4/1 | 7,5 | 24 | 41 | 57 | 74 | 90 | 104 | 120 | 135 | 150 | 51 |
| 150 | 6 | 25 | 78 | 132 | 186 | 240 | 289 | 338 | 390 | 441 | 490 | 72 |
| 150/1 | 6/1 | 17 | 55 | 93 | 130 | 168 | 202 | 237 | 274 | 309 | 343 | 72 |
| 200 | 8 | 43 | 138 | 233 | 328 | 423 | 510 | 596 | 690 | 778 | 864 | 95 |
| 200/1 | 8/1 | 30 | 97 | 163 | 230 | 296 | 357 | 417 | 484 | 544 | 605 | 95 |
| 250 | 10 | 68 | 216 | 365 | 513 | 662 | 800 | 932 | 1.080 | 1.215 | 1.350 | 117 |
| 250/1 | 10/1 | 47 | 151 | 255 | 360 | 463 | 560 | 652 | 756 | 850 | 945 | 117 |
| 300 | 12 | 98 | 312 | 527 | 740 | 956 | 1.150 | 1.346 | 1.560 | 1.755 | 1.950 | 139 |
| 300/1 | 12/1 | 68 | 218 | 369 | 519 | 669 | 805 | 940 | 1.090 | 1.229 | 1.365 | 139 |
| 350 | 14 | 133 | 424 | 716 | 1.007 | 1.300 | 1.560 | 1.820 | 2.120 | 2.380 | 2.650 | 164 |
| 350/1 | 14/1 | 93 | 297 | 501 | 705 | 909 | 1.094 | 1.280 | 1.484 | 1.670 | 1.855 | 164 |
| 400 | 16 | 173 | 554 | 934 | 1.315 | 1.695 | 2.040 | 2.387 | 2.768 | 3.114 | 3.460 | 191 |
| 400/1 | 16/1 | 121 | 387 | 653 | 920 | 1.186 | 1.430 | 1.670 | 1.936 | 2.178 | 2.420 | 191 |
| F _L | | 0,87 | 0,87 | 0,85 | 0,85 | 0,84 | 0,83 | 0,83 | 0,82 | 0,81 | 0,81 | |
| X _r | | 0,75 | 0,75 | 0,73 | 0,72 | 0,7 | 0,68 | 0,68 | 0,67 | 0,65 | 0,65 | |

PILOT Plug with STD Cage - Equal Percentage Inherent Characteristic Curve

| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm)* |
|-------|------|-----|------|-----|-----|-----|-----|-----|-----|-----|------|--------------|
| 100 | 4 | 3,2 | 6,4 | 11 | 16 | 22 | 32 | 48 | 74 | 106 | 160 | 51 |
| 100/1 | 4/1 | 2,2 | 4,5 | 7,8 | 11 | 16 | 22 | 34 | 52 | 74 | 112 | 51 |
| 150 | 6 | 7,2 | 14,5 | 25 | 36 | 50 | 72 | 108 | 166 | 238 | 360 | 72 |
| 150/1 | 6/1 | 5 | 10 | 18 | 25 | 35 | 50 | 76 | 116 | 166 | 252 | 72 |
| 200 | 8 | 13 | 26 | 45 | 64 | 90 | 128 | 192 | 294 | 422 | 640 | 95 |
| 200/1 | 8/1 | 9 | 18 | 32 | 45 | 63 | 90 | 135 | 207 | 297 | 450 | 95 |

| | | | | | | | | | | | | |
|-------|------|------|------|------|------|------|------|------|-------|-------|-------|-----|
| 250 | 10 | 20 | 40 | 70 | 100 | 140 | 200 | 300 | 460 | 660 | 1.000 | 117 |
| 250/1 | 10/1 | 14 | 28 | 49 | 70 | 98 | 140 | 210 | 322 | 462 | 700 | 117 |
| 300 | 12 | 29 | 58 | 101 | 144 | 202 | 288 | 432 | 662 | 950 | 1.440 | 139 |
| 300/1 | 12/1 | 20 | 40 | 71 | 101 | 141 | 202 | 303 | 465 | 667 | 1.010 | 139 |
| 350 | 14 | 39 | 78 | 137 | 196 | 274 | 392 | 588 | 902 | 1.294 | 1.960 | 164 |
| 350/1 | 14/1 | 27 | 55 | 96 | 137 | 192 | 274 | 411 | 630 | 904 | 1.370 | 164 |
| 400 | 16 | 51 | 102 | 179 | 256 | 358 | 512 | 768 | 1.178 | 1.690 | 2.560 | 191 |
| 400/1 | 16/1 | 36 | 72 | 125 | 179 | 251 | 358 | 537 | 823 | 1.181 | 1.790 | 191 |
| FL | | 0,87 | 0,87 | 0,85 | 0,85 | 0,84 | 0,83 | 0,83 | 0,82 | 0,81 | 0,81 | |
| Xr | | 0,75 | 0,75 | 0,73 | 0,72 | 0,7 | 0,68 | 0,68 | 0,67 | 0,65 | 0,65 | |

Note: (*) Indicated travel includes pilot travel plus main plug travel.

PILOT Plug with LDB Cage - Linear Inherent Characteristic Curve

| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm) |
|-------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------------|
| 100 | 4 | 9,7 | 31 | 53 | 74 | 96 | 115 | 135 | 156 | 176 | 195 | 51 |
| 100/1 | 4/1 | 6,8 | 22 | 37 | 52 | 67 | 81 | 94 | 109 | 123 | 137 | 51 |
| 150 | 6 | 22 | 70 | 119 | 167 | 216 | 260 | 304 | 352 | 396 | 440 | 72 |
| 150/1 | 6/1 | 16 | 50 | 84 | 118 | 152 | 183 | 214 | 248 | 279 | 310 | 72 |
| 200 | 8 | 39 | 125 | 211 | 296 | 382 | 460 | 538 | 624 | 702 | 780 | 95 |
| 200/1 | 8/1 | 27 | 86 | 146 | 205 | 265 | 319 | 373 | 432 | 486 | 540 | 95 |
| 250 | 10 | 61 | 194 | 328 | 462 | 595 | 717 | 838 | 972 | 1.094 | 1.215 | 117 |
| 250/1 | 10/1 | 43 | 136 | 230 | 323 | 417 | 502 | 587 | 680 | 765 | 850 | 117 |
| 300 | 12 | 87 | 280 | 472 | 665 | 857 | 1.032 | 1.207 | 1.400 | 1.575 | 1.750 | 139 |
| 300/1 | 12/1 | 61 | 196 | 331 | 465 | 600 | 723 | 845 | 980 | 1.102 | 1.225 | 139 |
| 350 | 14 | 119 | 381 | 643 | 904 | 1.166 | 1.404 | 1.642 | 1.904 | 2.142 | 2.380 | 164 |
| 350/1 | 14/1 | 84 | 267 | 451 | 635 | 818 | 985 | 1.152 | 1.336 | 1.503 | 1.670 | 164 |
| 400 | 16 | 156 | 498 | 840 | 1.182 | 1.524 | 1.835 | 2.146 | 2.488 | 2.799 | 3.110 | 191 |
| 400/1 | 16/1 | 109 | 348 | 587 | 827 | 1.066 | 1.283 | 1.501 | 1.740 | 1.958 | 2.175 | 191 |
| FL | | 0,88 | 0,88 | 0,87 | 0,86 | 0,85 | 0,84 | 0,84 | 0,83 | 0,82 | 0,82 | |
| Xr | | 0,77 | 0,77 | 0,76 | 0,74 | 0,72 | 0,71 | 0,71 | 0,69 | 0,67 | 0,67 | |

PILOT Plug with LDB Cage - Equal Percentage Inherent Characteristic Curve

| DN | INCH | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | TRAVEL (mm) |
|-------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-------------|
| 100 | 4 | 2,9 | 5,7 | 10 | 14 | 20 | 29 | 43 | 66 | 95 | 144 | 51 |
| 100/1 | 4/1 | 2 | 4 | 7 | 10 | 14 | 20 | 30 | 46 | 66 | 100 | 51 |
| 150 | 6 | 6,5 | 13 | 23 | 33 | 46 | 65 | 98 | 150 | 215 | 325 | 72 |

| | | | | | | | | | | | | |
|-------------------------|------|------|------|------|------|------|------|------|-------|-------|-------|-----|
| 150/1 | 6/1 | 4,6 | 9,2 | 16 | 23 | 32 | 46 | 69 | 106 | 152 | 230 | 72 |
| 200 | 8 | 11,5 | 23 | 41 | 58 | 81 | 116 | 174 | 267 | 383 | 580 | 95 |
| 200/1 | 8/1 | 8 | 16 | 28 | 41 | 57 | 81 | 122 | 186 | 267 | 405 | 95 |
| 250 | 10 | 18 | 36 | 63 | 90 | 126 | 180 | 270 | 414 | 594 | 900 | 117 |
| 250/1 | 10/1 | 12,5 | 25 | 44 | 63 | 88 | 126 | 189 | 290 | 416 | 630 | 117 |
| 300 | 12 | 26 | 52 | 91 | 130 | 182 | 260 | 390 | 598 | 858 | 1.300 | 139 |
| 300/1 | 12/1 | 18 | 36 | 64 | 91 | 127 | 182 | 273 | 419 | 601 | 910 | 139 |
| 350 | 14 | 35 | 70 | 123 | 176 | 246 | 352 | 528 | 810 | 1.162 | 1.760 | 164 |
| 350/1 | 14/1 | 25 | 49 | 86 | 123 | 172 | 246 | 369 | 566 | 812 | 1.230 | 164 |
| 400 | 16 | 46 | 92 | 161 | 230 | 322 | 460 | 690 | 1.058 | 1.518 | 2.300 | 191 |
| 400/1 | 16/1 | 32 | 64 | 113 | 161 | 225 | 322 | 483 | 741 | 1.063 | 1.610 | 191 |
| F_L(1) | | 0,88 | 0,88 | 0,87 | 0,86 | 0,85 | 0,84 | 0,84 | 0,83 | 0,82 | 0,82 | |
| F_L(2) | | 0,77 | 0,77 | 0,76 | 0,74 | 0,72 | 0,71 | 0,71 | 0,69 | 0,67 | 0,67 | |

12. Multicyl™ / BSS™ Plug – Multistage Valves

Specification

The Multicyl™ trim is intended for high differential pressure gas and steam services where sonic velocities may be reached, as well as for liquid services prone to cavitation. It consists of multiple concentric cylinders, each with a pattern of drilled holes or slots, arranged so that the pressure drop is taken in a series of controlled stages. The number of stages, the partial pressure drop per stage, and the Cv of each cylinder are calculated for the specific application. This staged approach prevents the fluid from reaching critical conditions within the trim, thereby avoiding cavitation, erosion, and excessive noise. The design achieves high xT and Fl values, and for small Cv requirements, the Multistep™ design is used instead.

Picture



(Cv data is application-specific and not standardised.)

13. Control Valve Manufacturing Range

| Standards | Sizes | Features (Design - Materials) |
|--------------------|---|---|
| ANSI B16.34 | <ul style="list-style-type: none"> • 16" ANSI 150/2500 • 4" ANSI 4500 | <ul style="list-style-type: none"> • Cage guided globe • Top guided globe • Angle type • 3-Way type • Butterfly type |

Attachment 8

ENEQ Consult – Gate Valves Catalogue 2025

ENEQ Consult Ltd. delivers cost-effective mechanical equipment for nuclear, conventional, oil & gas, and petrochemical industries, with a strong focus on nuclear power plants using PWR reactor technology.

- **9 years** of solid performance
- **> 20 M€** project portfolio
- **> 50** completed projects, **> 10** in progress
- Exclusive partnerships with **15 manufacturers worldwide**
- Equipment compliant with **ASME, EN, N Stamp, DIN, ASTM, ISO, GOST**

Expertise:

- **Equipment Supply** – high-quality OEMs, cost-effective modernization and new-build NPP solutions, turnkey delivery
- **Engineering** – design critical analyses, FEA & CFD calculations, technical consulting
- **Service** – full project support from production to installation, commissioning, and after-sales

ENEQ Gate Valve Portfolio Overview

| Series / Design | Pressure Rating | Size Range | Max Temp (°C) | Connections / Construction | Actuation Options | Stem / Wedge Type | Standards |
|-----------------------------------|---------------------------------------|----------------------------|---------------|---|---|---|---|
| S25 | PN 10 – 25 bar | DN 40 – 500 mm | 200 | flanged, weld ends, combination | handwheel, gearbox, electric | rotating non-rising stem; flexible wedge | EN 1984; EN 12266-1 |
| S38 | PN 10 – 100 bar | DN 40 – 500 mm, 800 mm | 540 | flanged, weld ends, combination | handwheel, gearbox, electric, remote, pneumatic/hydraulic | non-rotating rising stem; flexible or plate wedge | EN 1984; EN 12266-1 |
| S43 | PN 160 – 500 bar (630 on request) | DN 50 – 350 mm, 275 mm | 600 | flanged, weld ends | handwheel, gearbox, electric, remote, pneumatic/hydraulic | non-rotating rising stem; flexible wedge; self-sealing bonnet | EN 1984; EN 12266-1 |
| Standard / API Gate Valves | Class 150 – 4500; API 6A 2000 – 15000 | 2" – 72" (DN 50 – 1800 mm) | – | bolted bonnet; pressure seal; welded bonnet | handwheel, gearbox, electric, pneumatic/hydraulic | solid wedge; flexible wedge; split wedge; parallel slide; through-conduit; double-expanding | ANSI B16.34; API 600; API 6D; API 6A; BS 1414; ASME III; AD 2000; RCC-M |

GATE VALVE S25

PN 10–25; DN 40–500; T_{MAX}: 200°C



GATE VALVE S25

APPLICATION

- water, steam, gas, other working substances in the energy sector

CONNECTION

- flanged, weld ends, combination

OPERATION

- handwheel,
- gearbox,
- electric actuator

DESCRIPTION

- shut-off gate valve
- rotating non-rising stem
- flexible wedge
- complies with the requirements of the directive 2014/68/EU, and standard EN 1984
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

- drain plug
- by-pass
- PTFE gland packing and the packing in a separation plane
- PTFE packing in the seat
- gland packing with leakage suction

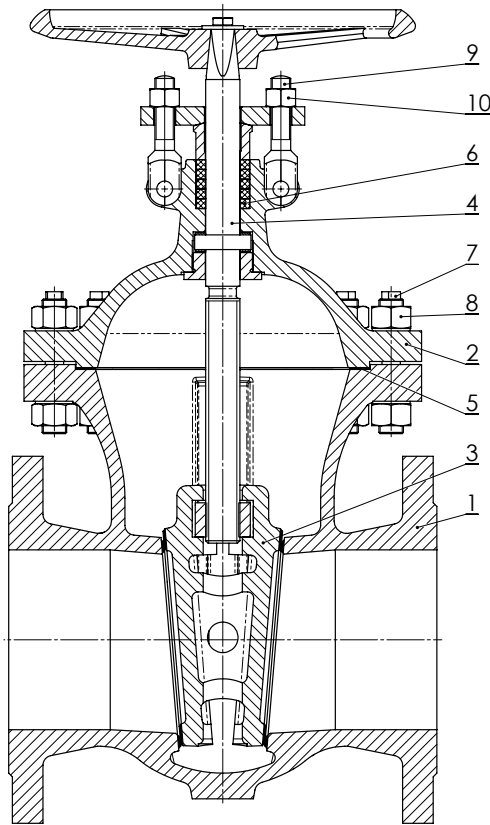
PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | |
|------------------------------|----|---|-----|-----|-----|-----|----|------|------|------|
| | | -105 | -60 | -50 | -30 | -10 | 50 | 100 | 150 | 200 |
| 1.0619 (GP240GH) | 10 | - | - | - | - | 10 | 10 | 9,3 | 8,7 | 7,8 |
| | 16 | - | - | - | - | 16 | 16 | 14,9 | 13,9 | 12,4 |
| | 25 | - | - | - | - | 25 | 25 | 23,3 | 21,7 | 19,4 |
| 1.4408 (GX5CrNiMo19-11-2) | 10 | - | - | 10 | 10 | 10 | 10 | 7,8 | 7,0 | 6,4 |
| | 16 | - | - | 16 | 16 | 16 | 16 | 14,9 | 13,5 | 12,4 |
| | 25 | - | - | 25 | 25 | 25 | 25 | 23,3 | 21,1 | 19,4 |

Other materials on request

USED MATERIALS

| Pos. | Part | Material | |
|------|--------------------------------------|---|-------------------------------|
| 1 | Body | 1.0619 (GP240GH) | 1.4408 (GX5CrNiMo19-11-2) |
| | Hard facing of body sealing surface | 13Cr | - |
| 2 | Bonnet | 1.0619 (GP240GH) | 1.4408 (GX5CrNiMo19-11-2) |
| 3 | Wedge | 1.0619 (GP240GH) | 1.4408 (GX5CrNiMo19-11-2) |
| | Hard facing of wedge sealing surface | 13Cr | X10CrNiMn18-8-6 |
| 4 | Stem | 1.4021 (X20Cr13) | 1.4571 (X6CrNiMoTi17-12-2) |
| 5 | Gasket | Graphite sealing RGS-3 (PN 16-40) / Camprofile sealing with expanded graphite (PN 63-100) | |
| 6 | Gland packing | Graphite | |
| 7 | Bolt | 25CrMo4 | A2-70 |
| 8 | Nut | C35E+QT | A2-70 |
| 9 | Bolt | 25CrMo4 | A2-70 |
| 10 | Nut | C35E+QT | A2-70 |



VALVE DIMENSIONS

1. Flanged

Face-to-face dimensions: as required by the customer

Flanges: EN 1092-1

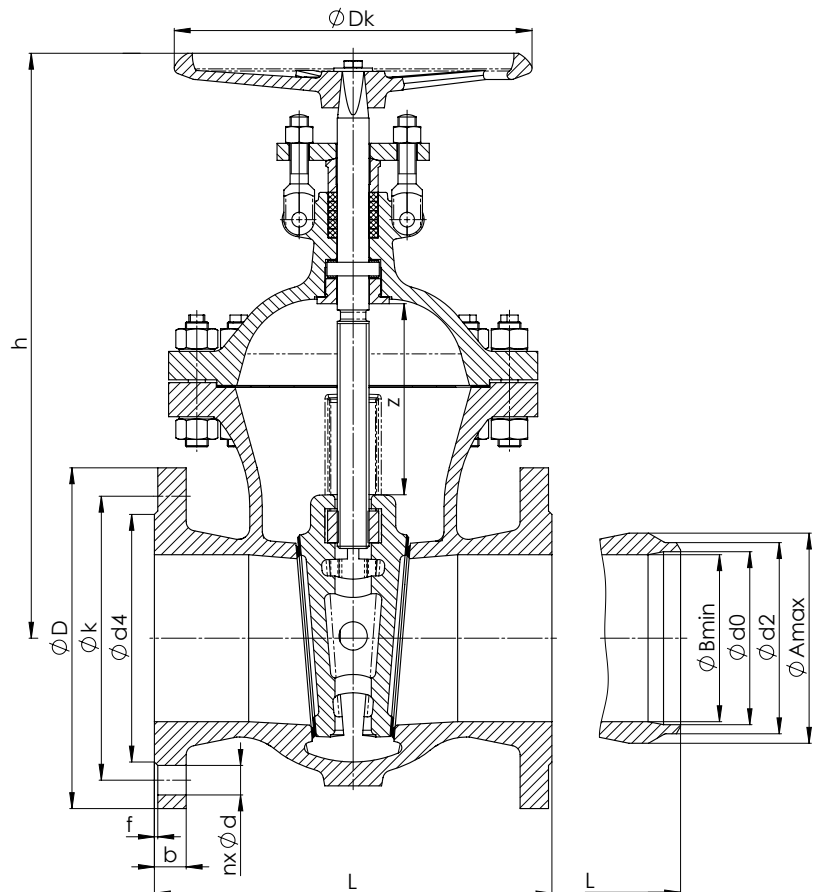
2. Weld ends

Face-to-face dimensions: as per table

Weld ends: as per table

Groove form: DIN 2559 – sheet 1 – form 22

Other adjustments on your request



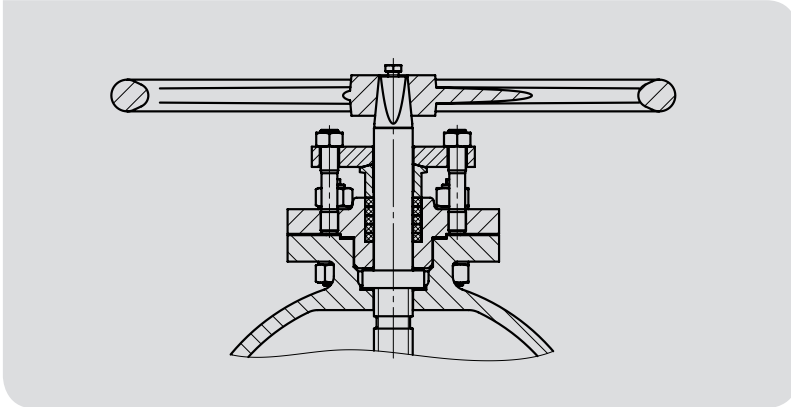
GATE VALVE S25

| Nominal pressure | Nominal size | Face-to-face | Stroke | Handwheel | Centre-to-top-height | Flanged | | | | | | | Weld ends | | | | | |
|------------------|--------------|--------------|--------|-----------|----------------------|---------|----|--------|--------|---------|---------|--------|-----------|--------|--------|--------|-------------|--------------|
| | | | | | | PN | DN | L [mm] | z [mm] | Dk [mm] | h [mm] | n [mm] | d [mm] | k [mm] | D [mm] | b [mm] | d4 × f [mm] | m [kg] |
| 16 | 40 | 240 | 70 | 200 | 300 | 4 | 18 | 110 | 150 | 18 | 88 × 3 | 23 | 49 | 43 | 68 | 37 | 21 | 48,3 × 2,6 |
| | 50 | 250 | 70 | 200 | 300 | 4 | 18 | 125 | 165 | 18 | 102 × 3 | 23 | 61 | 54 | 80 | 49 | 21 | 60,3 × 3,2 |
| | 65 | 270 | 100 | 250 | 330 | 8 | 18 | 145 | 185 | 18 | 122 × 3 | 35 | 77 | 69 | 89 | 65 | 32 | 76,1 × 3,6 |
| | 80 | 280 | 100 | 250 | 360 | 8 | 18 | 160 | 200 | 20 | 138 × 3 | 38 | 90 | 81 | 115 | 80 | 34 | 88,9 × 4,0 |
| | 100 | 300 | 125 | 315 | 420 | 8 | 18 | 180 | 220 | 20 | 158 × 3 | 51 | 115 | 104 | 130 | 100 | 44 | 114,3 × 5,0 |
| | 125 | 325 | 150 | 315 | 470 | 8 | 18 | 210 | 250 | 22 | 188 × 3 | 74 | 141 | 130,5 | 161 | 122 | 65 | 139,7 × 4,5 |
| | 150 | 350 | 175 | 315 | 500 | 8 | 22 | 240 | 285 | 22 | 212 × 3 | 94 | 170 | 156,5 | 192 | 147 | 83 | 168,3 × 5,6 |
| | 200 | 400 | 235 | 400 | 610 | 12 | 22 | 295 | 340 | 24 | 268 × 3 | 155 | 222 | 204,5 | 246 | 197 | 138 | 219,1 × 7,1 |
| | 250 | 450 | 285 | 500 | 720 | 12 | 26 | 355 | 405 | 26 | 320 × 3 | 237 | 276 | 256,5 | 298 | 250 | 213 | 273 × 8,0 |
| | 300 | 500 | 340 | 500 | 785 | 12 | 26 | 410 | 460 | 28 | 378 × 4 | 322 | 325 | 308,5 | 352 | 300 | 291 | 323,9 × 8,0 |
| | 350 | 550 | 380 | 630 | 885 | 16 | 26 | 470 | 520 | 30 | 438 × 4 | 439 | 359 | 336,5 | 408 | 347 | 391 | 355,6 × 8,8 |
| | 400 | 600 | 430 | 630 | 985 | 16 | 30 | 525 | 580 | 32 | 490 × 4 | 642 | 411 | 383 | 460 | 395 | 575 | 406,4 × 11,0 |
| | 450 | 650 | 520 | 720 | 1150 | 20 | 30 | 585 | 640 | 46 | 550 × 4 | 963 | 461 | 430,5 | 514 | 450 | 888 | 457 × 12,5 |
| | 500 | 700 | 600 | 800 | 1300 | 20 | 33 | 650 | 715 | 48 | 610 × 4 | 1058 | 512 | 478 | 558 | 500 | 961 | 508 × 14,2 |
| 25 | 40 | 240 | 70 | 200 | 300 | 4 | 18 | 110 | 150 | 18 | 88 × 3 | 23 | 49 | 43 | 68 | 37 | 21 | 48,3 × 2,6 |
| | 50 | 250 | 70 | 200 | 300 | 4 | 18 | 125 | 165 | 20 | 102 × 3 | 23 | 61 | 54 | 80 | 49 | 21 | 60,3 × 3,2 |
| | 65 | 270 | 100 | 250 | 360 | 8 | 18 | 145 | 185 | 22 | 122 × 3 | 35 | 77 | 69 | 89 | 65 | 32 | 76,1 × 3,6 |
| | 80 | 280 | 100 | 250 | 420 | 8 | 18 | 160 | 200 | 24 | 138 × 3 | 38 | 90 | 81 | 115 | 80 | 34 | 88,9 × 4,0 |
| | 100 | 300 | 125 | 315 | 470 | 8 | 22 | 190 | 235 | 24 | 162 × 3 | 51 | 115 | 104 | 130 | 100 | 44 | 114,3 × 5,0 |
| | 125 | 325 | 150 | 315 | 500 | 8 | 26 | 220 | 270 | 26 | 188 × 3 | 74 | 141 | 130,5 | 161 | 122 | 65 | 139,7 × 4,5 |
| | 150 | 350 | 175 | 315 | 610 | 8 | 26 | 250 | 300 | 28 | 218 × 3 | 94 | 170 | 156,5 | 192 | 147 | 83 | 168,3 × 5,6 |
| | 200 | 400 | 235 | 400 | 720 | 12 | 26 | 310 | 360 | 30 | 278 × 3 | 155 | 222 | 204,5 | 246 | 197 | 138 | 219,1 × 7,1 |
| | 250 | 450 | 285 | 500 | 785 | 12 | 30 | 370 | 425 | 32 | 335 × 3 | 237 | 276 | 256,5 | 298 | 250 | 213 | 273 × 8,0 |
| | 300 | 500 | 340 | 500 | 885 | 16 | 30 | 430 | 485 | 34 | 395 × 3 | 322 | 325 | 308,5 | 352 | 300 | 291 | 323,9 × 8,0 |
| | 350 | 550 | 380 | 630 | 985 | 16 | 33 | 490 | 555 | 38 | 450 × 4 | 439 | 359 | 336,5 | 408 | 347 | 391 | 355,6 × 8,8 |
| | 400 | 600 | 430 | 630 | 1200 | 16 | 36 | 550 | 620 | 40 | 505 × 4 | 642 | 411 | 383 | 460 | 395 | 575 | 406,4 × 11,0 |
| | 450 | 650 | 520 | 720 | 1150 | 20 | 36 | 600 | 670 | 46 | 555 × 4 | 963 | 461 | 430,5 | 514 | 450 | 888 | 457 × 12,5 |
| | 500 | 700 | 600 | 800 | 1300 | 20 | 36 | 660 | 730 | 48 | 615 × 4 | 1058 | 512 | 478 | 558 | 500 | 961 | 508 × 14,2 |

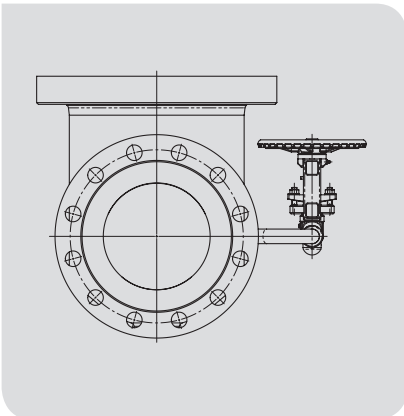
Dimensions for PN 10 on request

DESIGN VARIANTS

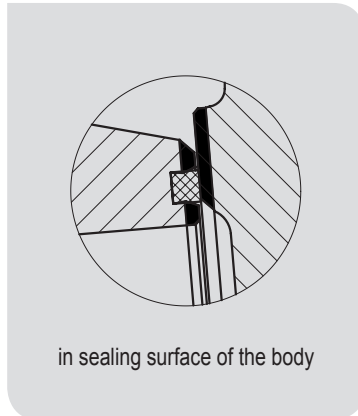
DESIGN OF PLUG



BY - PASS

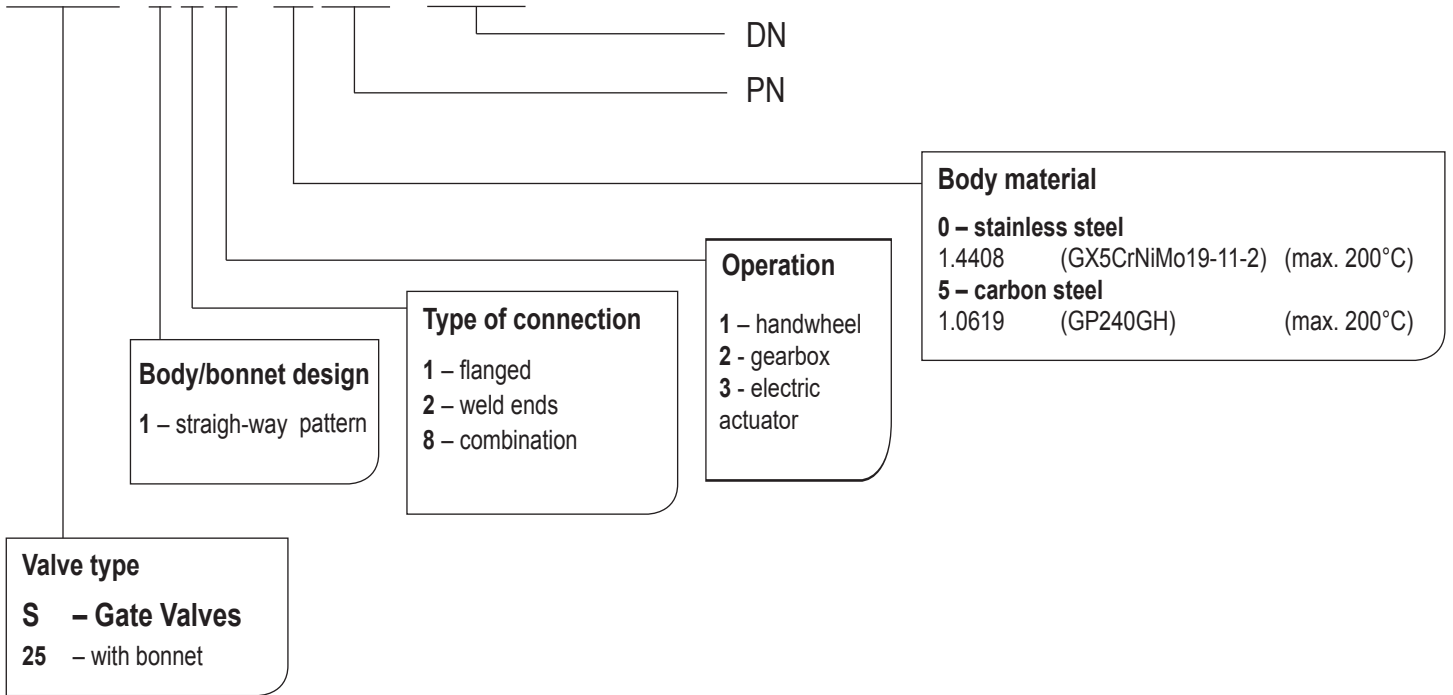


PTFE RING



VALVE DESCRIPTION CODE

S25 111-016-150



VALVE INSTALLATION

The recommended valve position is with the stem and the control elements perpendicular upwards or with the stem tilted max. about 90 degrees to the horizontal plane.

Assembly with hanging stem is not permitted.

It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

GATE VALVE S38

PN 10–100; DN 40–500, 800; T_{MAX}: 540 °C



GATE VALVE S38

APPLICATION

- water, steam, gas, other working substances in the energy sector

CONNECTION

- flanged, weld ends, combination

OPERATION

- handwheel, electric actuator, gearbox, remote control, adjustment for pneumatic or hydraulic actuator

DESCRIPTION

- shut-off gate valve
- non-rotating rising stem
- non-rising handwheel
- flexible or plate wedge
- complies with the requirements of the directive 2014/68/EU, standard EN 1984
- testing is carried out according to standard EN 12266-1, part 2

BASIC DESIGN OPTIONS

- position indicator
- limit switches
- TA-Luft (Type S38.2)
- protection cover for the stem
- drain plug
- hard facing of a back seat
- by-pass
- PTFE gland packing and the packing in a separation plane
- PTFE gasket in the seat
- gland packing with leakage suction

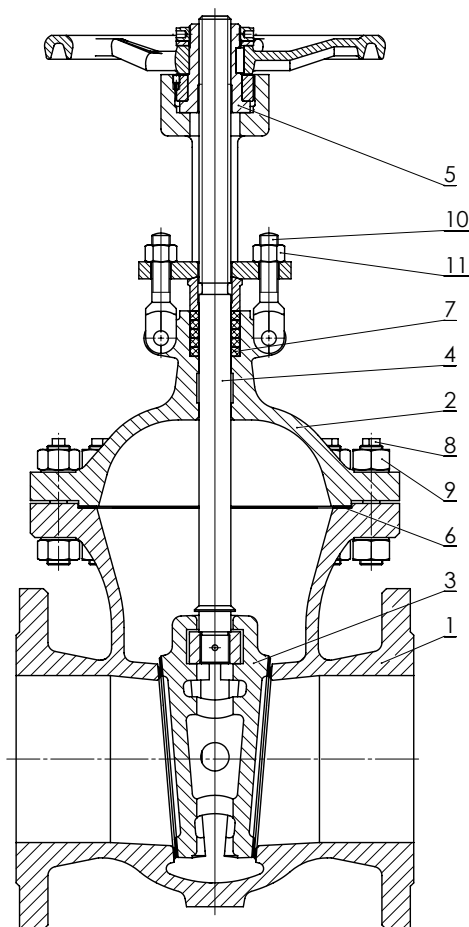
PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | |
|-----------------------------------|-----|---|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|
| | | -105 | -60 | -50 | -30 | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 540 |
| GP240GH (1.0619) | 10 | - | - | - | - | 10 | 10 | 9,3 | 8,7 | 7,8 | 7,1 | 6,4 | 6,0 | 5,8 | - | - | - |
| | 16 | - | - | - | - | 16 | 16 | 14,9 | 13,9 | 12,4 | 11,4 | 10,3 | 9,6 | 9,2 | - | - | - |
| | 25 | - | - | - | - | 25 | 25 | 23,3 | 21,7 | 19,4 | 17,8 | 16,1 | 15,0 | 14,4 | - | - | - |
| | 40 | - | - | - | - | 40 | 40 | 37,3 | 35,0 | 30,2 | 28,4 | 25,8 | 24,0 | 23,1 | - | - | - |
| | 63 | - | - | - | - | 63 | 63 | 58,8 | 54,6 | 47,6 | 44,8 | 40,6 | 37,8 | 36,4 | - | - | - |
| | 100 | - | - | - | - | 100 | 100 | 93,3 | 86,7 | 75,6 | 71,1 | 64,4 | 60,0 | 57,8 | - | - | - |
| G17CrMo5-5 (1.7357) | 10 | - | - | - | - | 10 | 10 | 10 | 10 | 10 | 9,8 | 9,1 | 8,4 | 8,0 | 7,6 | 6,1 | 2,8 |
| | 16 | - | - | - | - | 16 | 16 | 16 | 16 | 16 | 15,6 | 14,6 | 13,5 | 12,8 | 12,1 | 9,7 | 4,5 |
| | 25 | - | - | - | - | 25 | 25 | 25 | 25 | 25 | 24,4 | 22,8 | 21,1 | 20,0 | 18,9 | 15,2 | 7,1 |
| | 40 | - | - | - | - | 40 | 40 | 40 | 40 | 40 | 39,1 | 36,4 | 33,8 | 32,0 | 30,2 | 24,4 | 11,4 |
| | 63 | - | - | - | - | 63 | 63 | 63 | 63 | 63 | 61,6 | 57,4 | 53,2 | 50,4 | 47,6 | 38,4 | 18,0 |
| | 100 | - | - | - | - | 100 | 100 | 100 | 100 | 100 | 97,8 | 91,1 | 84,4 | 80,0 | 75,6 | 60,9 | 28,6 |
| GX5CrNi- Mo19-11-2 (1.4408) | 10 | - | - | 10 | 10 | 10 | 10 | 7,8 | 7,0 | 6,4 | 6,0 | 5,6 | - | - | - | - | - |
| | 16 | - | - | 16 | 16 | 16 | 16 | 14,9 | 13,5 | 12,4 | 11,7 | 11,0 | - | - | - | - | - |
| | 25 | - | - | 25 | 25 | 25 | 25 | 23,3 | 21,1 | 19,4 | 18,3 | 17,2 | - | - | - | - | - |
| | 40 | - | - | 40 | 40 | 40 | 40 | 37,3 | 33,8 | 31,1 | 29,3 | 27,6 | - | - | - | - | - |
| | 63 | - | - | 63 | 63 | 63 | 63 | 58,8 | 53,2 | 49,0 | 46,2 | 43,4 | - | - | - | - | - |
| | 100 | - | - | 100 | 100 | 100 | 100 | 93,3 | 84,4 | 77,8 | 73,3 | 68,9 | - | - | - | - | - |
| GX5Cr- NiNb19-11 (1.4552) | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 13,8 | 12,7 | 11,6 | 11,0 | 10,4 | 10,0 | 9,6 | 9,3 | 8,8 | - |
| | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 21,5 | 19,8 | 18,1 | 17,2 | 16,3 | 15,6 | 15,0 | 14,5 | 13,8 | - |
| | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 34,5 | 31,7 | 29,0 | 27,5 | 26,0 | 25,0 | 24,0 | 23,2 | 22,0 | - |
| | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 54,3 | 50,0 | 45,7 | 43,3 | 41,0 | 39,4 | 37,8 | 36,5 | 34,7 | - |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 86,2 | 79,3 | 72,5 | 68,7 | 65,0 | 62,5 | 60,0 | 59,0 | 56,5 | - |
| G20Mo5 (1.5419) | 16 | - | - | - | - | 16 | 16 | 16 | 16 | 16 | 14,8 | 13,7 | 12,9 | 11,9 | 11,0 | 7,0 | - |
| | 25 | - | - | - | - | 25 | 25 | 25 | 25 | 24,0 | 22,0 | 20,0 | 19,2 | 18,6 | 17,2 | 11,0 | - |
| | 40 | - | - | - | - | 40 | 40 | 40 | 40 | 40 | 37,0 | 34,2 | 32,3 | 29,9 | 27,6 | 17,7 | - |
| | 63 | - | - | - | - | 63 | 63 | 63 | 61,0 | 59,0 | 55,0 | 51,0 | 48,0 | 46,0 | 43,5 | 27,9 | - |
| | 100 | - | - | - | - | 100 | 100 | 95,0 | 89,0 | 83,0 | 79,0 | 75,0 | 71,0 | 68,0 | 63,0 | 44,2 | - |
| G21Mn5 (1.1138) | 10 | - | - | - | 10 | 10 | 10 | 9,3 | 8,8 | 8,0 | 7,4 | 6,8 | - | - | - | - | - |
| | 16 | - | - | - | 16 | 16 | 16 | 14,8 | 14,0 | 12,8 | 11,8 | 10,8 | - | - | - | - | - |
| | 25 | - | - | - | 25 | 25 | 25 | 23,0 | 21,0 | 19,2 | 18,2 | 17,2 | - | - | - | - | - |
| | 40 | - | - | - | 40 | 40 | 40 | 37,0 | 35,0 | 32,0 | 29,5 | 27,0 | - | - | - | - | - |
| | 63 | - | - | - | 63 | 63 | 63 | 42,0 | 40,0 | 38,0 | 36,0 | 35,0 | - | - | - | - | - |
| | 100 | - | - | - | 100 | 100 | 100 | 66,0 | 63,0 | 60,2 | 58,0 | 56,0 | - | - | - | - | - |
| 42 2707.6, 42 2707.9 | 16 | - | 16 | 16 | 16 | 16 | 16 | 16 | 10,1 | 9,6 | 9,3 | 9,1 | 7,7 | 7,5 | 7,2 | - | - |
| | 25 | - | 25 | 25 | 25 | 25 | 25 | 25 | 15,8 | 15,0 | 14,5 | 14,2 | 12,1 | 11,7 | 11,3 | - | - |
| | 40 | - | 40 | 40 | 40 | 40 | 40 | 40 | 25,3 | 24,0 | 23,2 | 22,7 | 19,4 | 18,7 | 18,0 | - | - |
| | 63 | - | 63 | 63 | 63 | 63 | 63 | 63 | 39,9 | 37,8 | 36,5 | 35,7 | 30,5 | 29,4 | 28,4 | - | - |
| | 100 | - | 100 | 100 | 100 | 100 | 100 | 100 | 63,3 | 60,0 | 58,0 | 56,7 | 48,4 | 46,7 | 45,1 | - | - |

Special materials on request: 1.7363, 1.4308

GATE VALVE S38

USED MATERIALS



| Pos. | Part | Material | | | | | | |
|------|--|--|--------------------------------|-------------------------------|-------------------------------|--------------------------------|---------------------|-------------------------------|
| 1 | Body | GP240GH (1.0619) | G17CrMo5-5 (1.7357) | GX5CrNiMo19-11-2 (1.4408) | GX5CrNiNb19-11 (1.4552) | G20Mo5 (1.5419) | G21Mn5 (1.1138) | 42 2707.6, .9 |
| | Hard facing of body sealing surface | 13Cr | Stellite 6 | - | - | 13Cr | 13Cr | 13Cr |
| 2 | Bonnet | GP240GH (1.0619) | G17CrMo5-5 (1.7357) | GX5CrNiMo19-11-2 (1.4408) | GX5CrNiNb19-11 (1.4552) | G20Mo5 (1.5419) | G21Mn5 (1.1138) | 42 2707.6, .9 |
| 3 | Wedge | GP240GH (1.0619) | G17CrMo5-5 (1.7357) | GX5CrNiMo19-11-2 (1.4408) | GX5CrNiNb19-11 (1.4552) | G20Mo5 (1.5419) | G21Mn5 (1.1138) | 42 2707.6, .9 |
| | Hard facing of wedge sealing surface | 13Cr | Stellite 6 | X10CrNiMn18-8-6 | X10CrNiMn18-8-6 | 13Cr | 13Cr | 13Cr |
| 4 | Stem | X20Cr13 (1.4021) | X22CrMoV12-1+QT (1.4923+QT) | X6CrNiMoTi17-12-2 (1.4571) | X6CrNiMoTi17-12-2 (1.4571) | X22CrMoV12-1+QT (1.4923+QT) | X20Cr13 (1.4021) | X6CrNiMoTi17-12-2 (1.4571) |
| 5 | Stem nut | 9S20K (1.0711) / 42 3046,01 | | | | | | |
| 6 | Gasket | Graphite sealing RGS-3 (PN 16-40) / Camprofile gasket sealing with expanded graphite (PN 63-100) | | | | | | |
| 7 | Gland packing | Graphite | | | | | | |
| 8 | Bolt | 25CrMo4 (1.7218) | 21CrMoV5-7 (1.7709) | A2-70 | A2-70 | 21CrMoV5-7 (1.7709) | A2-70 | A2-70 |
| 9 | Nut | C35E+QT (1.1181+QT) | 25CrMo4 (1.7218) | A2-70 | A2-70 | 25CrMo4 (1.7218) | A2-70 | A2-70 |
| 10 | Bolt | 25CrMo4 (1.7218) | 25CrMo4 (1.7218) | A2-70 | A2-70 | 25CrMo4 (1.7218) | A2-70 | A2-70 |
| 11 | Nut | C35E+QT (1.1181+QT) | C35E+QT (1.1181+QT) | A2-70 | A2-70 | C35E+QT (1.1181+QT) | A2-70 | A2-70 |

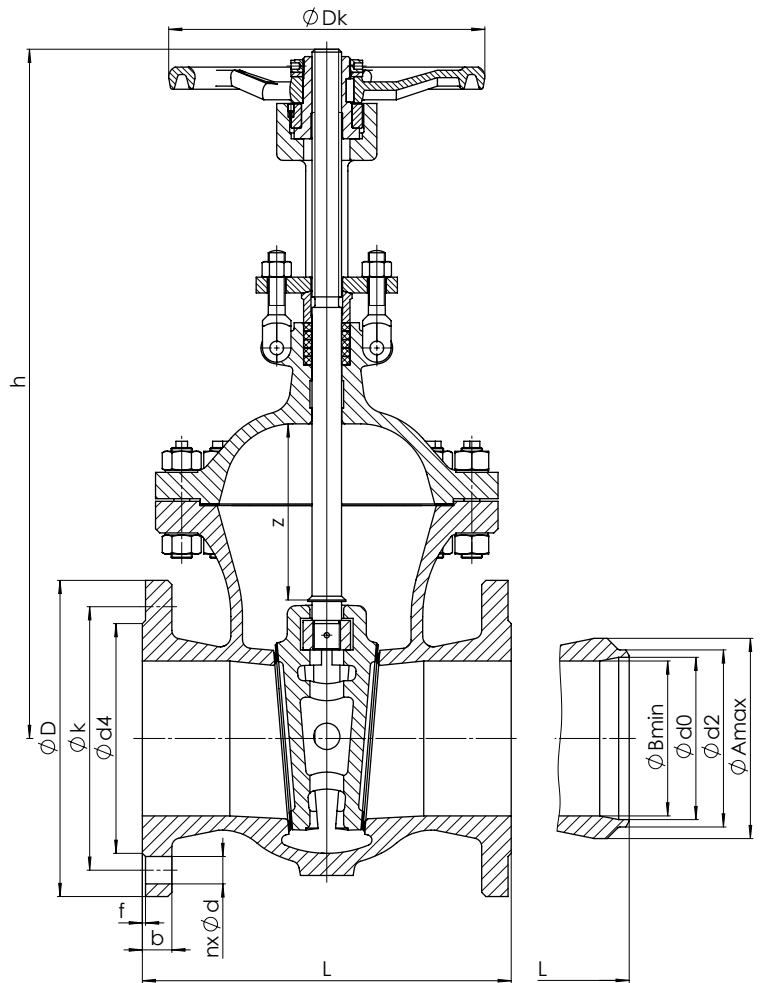
VALVE DIMENSIONS

1. Flanged

Face-to-face dimensions: EN 558 – line 15, 26
 Flange: EN 1092-1

2. Weld ends

Face-to-face dimensions: EN 12982 – line 15
 Weld ends: DIN 3239 – part 1
 Groove form: DIN 2559 – sheet 1 – form 22



| Nominal pressure | Nominal size | Face-to-face | Stroke | Handwheel | Electric actuator (connection according to ISO 5210) | Centre-to-top | Flanged | | | | | | | | | | Weld ends | | | | |
|------------------|--------------|--------------|--------|-----------|--|---------------|---------|----|-----------|-----------|------------|----|------------|------------|-----------|-----------|-----------|-----------|-----------|----------------|-----------|
| | | | | | | | PN | DN | L [mm] | z [mm] | Dk [mm] | - | h1 [mm] | h3 [mm] | n [mm] | d [mm] | k [mm] | D [mm] | b [mm] | d4 × f [mm] | m [kg] |
| 16 | 40 | 240 | 70 | 200 | F10-A | 360 | 312 | 4 | 18 | 110 | 150 | 18 | 88x3 | 26 | 49 | 43 | 68 | 37 | 24 | 48,3x2,6 | |
| | 50 | 250 | 70 | 200 | F10-A | 365 | 320 | 4 | 18 | 125 | 165 | 18 | 102x3 | 26 | 61 | 54 | 80 | 49 | 24 | 60,3x3,2 | |
| | 65 | 270 | 100 | 250 | F10-A | 470 | 418 | 8 | 18 | 145 | 185 | 18 | 122x3 | 39 | 77 | 69 | 89 | 65 | 36 | 76,1x3,6 | |
| | 80 | 280 | 100 | 250 | F10-A | 470 | 418 | 8 | 18 | 160 | 200 | 20 | 138x3 | 41 | 90 | 81 | 115 | 80 | 37 | 88,9x4,0 | |
| | 100 | 300 | 125 | 315 | F10-A | 525 | 472 | 8 | 18 | 180 | 220 | 20 | 158x3 | 53 | 115 | 104 | 130 | 100 | 46 | 114,3x5,0 | |
| | 125 | 325 | 150 | 315 | F10-A | 640 | 570 | 8 | 18 | 210 | 250 | 22 | 188x3 | 82 | 141 | 130,5 | 161 | 122 | 73 | 139,7x4,5 | |
| | 150 | 350 | 175 | 315 | F10-A | 655 | 605 | 8 | 22 | 240 | 285 | 22 | 212x3 | 102 | 170 | 156,5 | 192 | 147 | 91 | 168,3x5,6 | |
| | 200 | 400 | 235 | 400 | F10-A | 825 | 774 | 12 | 22 | 295 | 340 | 24 | 268x3 | 168 | 222 | 204,5 | 246 | 197 | 151 | 219,1x7,1 | |
| | 250 | 450 | 285 | 500 | F14-B2 | 1035 | 966 | 12 | 26 | 355 | 405 | 26 | 320x3 | 260 | 276 | 256,5 | 298 | 250 | 236 | 273x8,0 | |
| | 300 | 500 | 340 | 500 | F14-B2 | 1185 | 1122 | 12 | 26 | 410 | 460 | 28 | 378x4 | 370 | 325 | 308,5 | 352 | 300 | 339 | 323,9x8,0 | |
| | 350 | 550 | 380 | 630 | F14-A | 1345 | 1259 | 16 | 26 | 470 | 520 | 30 | 438x4 | 445 | 359 | 336,5 | 408 | 347 | 397 | 355,6x8,8 | |
| | 400 | 600 | 430 | 630 | F14-A | 1505 | 1420 | 16 | 30 | 525 | 580 | 32 | 490x4 | 740 | 411 | 383 | 460 | 395 | 677 | 406,4x11,0 | |
| | 450 | 650 | 520 | 720 | F16-B2 | 1870 | 1798 | 20 | 30 | 585 | 640 | 46 | 550x4 | 1110 | 461 | 430,5 | 514 | 450 | 1045 | 457x12,5 | |
| | 500 | 700 | 600 | 800 | F25-B2 | 1780 | 1654 | 20 | 33 | 650 | 715 | 48 | 610x4 | 1220 | 512 | 478 | 558 | 500 | 1133 | 508x14,2 | |
| | 800 | 1000 | 790 | - | F25-B2 | 2460 | * | 24 | 39 | 950 | 1025 | 41 | 900x5 | 2115 | * | * | 856 | 790 | 1970 | 813x12,5 | |

* At customer's request

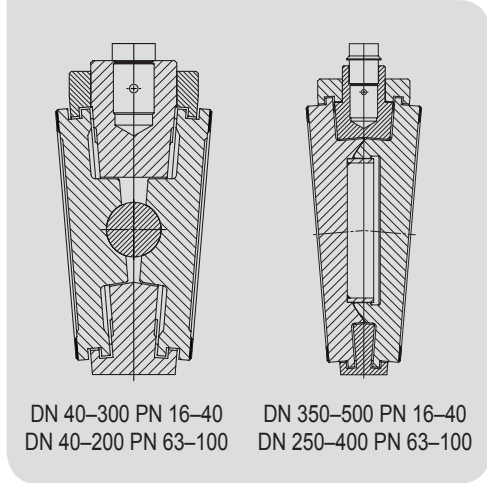
GATE VALVE S38

| Nominal pressure | Nominal size | Face-to-face | Stroke | Handwheel | Electric actuator (connection according to ISO 5210) | Centre-to-top | Flanged | | | | | | | | | | Weld ends | | | | |
|------------------|--------------|--------------|--------|-----------|--|---------------|---------|----|-----------|-----------|------------|-------|------------|------------|-----------|-----------|-----------|-----------|------------|----------------|-----------|
| | | | | | | | PN | DN | L [mm] | z [mm] | Dk [mm] | - | h1 [mm] | h3 [mm] | n [mm] | d [mm] | k [mm] | D [mm] | b [mm] | d4 × f [mm] | m [kg] |
| 25 | 40 | 240 | 70 | 200 | F10-A | 360 | 312 | 4 | 18 | 110 | 150 | 18 | 88x3 | 26 | 49 | 43 | 68 | 37 | 24 | 48,3x2,6 | |
| | 50 | 250 | 70 | 200 | F10-A | 365 | 320 | 4 | 18 | 125 | 165 | 20 | 102x3 | 26 | 61 | 54 | 80 | 49 | 24 | 60,3x3,2 | |
| | 65 | 270 | 100 | 250 | F10-A | 470 | 418 | 8 | 18 | 145 | 185 | 22 | 122x3 | 39 | 77 | 69 | 89 | 65 | 36 | 76,1x3,6 | |
| | 80 | 280 | 100 | 250 | F10-A | 470 | 418 | 8 | 18 | 160 | 200 | 24 | 138x3 | 41 | 90 | 81 | 115 | 80 | 37 | 88,9x4,0 | |
| | 100 | 300 | 125 | 315 | F10-A | 525 | 472 | 8 | 22 | 190 | 235 | 24 | 162x3 | 55 | 115 | 104 | 130 | 100 | 49 | 114,3x5,0 | |
| | 125 | 325 | 150 | 315 | F10-A | 635 | 568 | 8 | 26 | 220 | 270 | 26 | 188x3 | 82 | 141 | 130,5 | 161 | 122 | 73 | 139,7x4,5 | |
| | 150 | 350 | 175 | 315 | F14-A | 655 | 603 | 8 | 26 | 250 | 300 | 28 | 218x3 | 102 | 170 | 156,5 | 192 | 147 | 91 | 168,3x5,6 | |
| | 200 | 400 | 235 | 400 | F14-B2 | 825 | 768 | 12 | 26 | 310 | 360 | 30 | 278x3 | 168 | 222 | 204,5 | 246 | 197 | 151 | 219,1x7,1 | |
| | 250 | 450 | 285 | 500 | F14-B2 | 1035 | 960 | 12 | 30 | 370 | 425 | 32 | 335x3 | 260 | 276 | 256,5 | 298 | 250 | 236 | 273x8,0 | |
| | 300 | 500 | 340 | 500 | F14-B2 | 1185 | 1118 | 16 | 30 | 430 | 485 | 34 | 395x3 | 370 | 325 | 308,5 | 352 | 300 | 339 | 323,9x8,0 | |
| | 350 | 550 | 380 | 630 | F14-A | 1345 | 1258 | 16 | 33 | 490 | 555 | 38 | 450x4 | 445 | 359 | 336,5 | 408 | 347 | 397 | 355,6x8,8 | |
| | 400 | 600 | 430 | 630 | F16-B2 | 1500 | 1415 | 16 | 36 | 550 | 620 | 40 | 505x4 | 740 | 411 | 383 | 460 | 395 | 677 | 406,4x11,0 | |
| | 450 | 650 | 520 | 720 | F16-B2 | 1870 | 1798 | 20 | 36 | 600 | 670 | 46 | 555x4 | 1120 | 461 | 430,5 | 514 | 450 | 1045 | 457x12,5 | |
| | 500 | 700 | 600 | 800 | F25-B2 | 1780 | 1654 | 20 | 36 | 660 | 730 | 48 | 615x4 | 1230 | 512 | 478 | 558 | 500 | 1133 | 508x14,2 | |
| 40 | 40 | 240 | 58 | 200 | F10-A | 360 | 312 | 4 | 18 | 110 | 150 | 18 | 88x3 | 26 | 49 | 43 | 68 | 37 | 24 | 48,3x2,6 | |
| | 50 | 250 | 60 | 200 | F10-A | 365 | 320 | 4 | 18 | 125 | 165 | 20 | 102x3 | 26 | 61 | 54 | 80 | 49 | 24 | 60,3x3,2 | |
| | 65 | 290 | 92 | 250 | F10-A | 468 | 420 | 8 | 18 | 145 | 185 | 22 | 122x3 | 39 | 77 | 69 | 89 | 65 | 35 | 76,1x3,6 | |
| | 80 | 310 | 92 | 250 | F10-A | 468 | 420 | 8 | 18 | 160 | 200 | 24 | 138x3 | 42 | 90 | 81 | 115 | 80 | 37 | 88,9x4,0 | |
| | 100 | 350 | 115 | 315 | F10-A | 522 | 420 | 8 | 22 | 190 | 235 | 24 | 162x3 | 62 | 115 | 104 | 135 | 100 | 56 | 114,3x5,0 | |
| | 125 | 400 | 115 | 315 | F10-A | 522 | 420 | 8 | 26 | 220 | 270 | 26 | 188x3 | 90 | 141 | 130,5 | 165 | 125 | 81 | 139,7x4,5 | |
| | 150 | 450 | 165 | 315 | F14-B2 | 656 | 602 | 8 | 26 | 250 | 300 | 28 | 218x3 | 126 | 170 | 156,5 | 192 | 147 | 115 | 168,3x5,6 | |
| | 200 | 550 | 224 | 400 | F14-B2 | 825 | 768 | 12 | 30 | 320 | 375 | 34 | 285x3 | 198 | 222 | 204,5 | 252 | 200 | 177 | 219,1x7,1 | |
| | 250 | 650 | 279 | 500 | F14-B2 | 1033 | 967 | 12 | 33 | 385 | 450 | 38 | 345x3 | 322 | 276 | 256,5 | 308 | 250 | 288 | 273x8,0 | |
| | 300 | 750 | 340 | 500 | F14-A | 1223 | 1158 | 16 | 33 | 450 | 515 | 42 | 410x4 | 550 | 325 | 308,5 | 364 | 300 | 503 | 323,9x8,0 | |
| | 350 | 850 | 381 | 630 | F16-B2 | 1378 | 1293 | 16 | 36 | 510 | 580 | 46 | 465x4 | 850 | 359 | 336,5 | 420 | 350 | 781 | 355,6x8,8 | |
| 400 | 950 | 442 | 720 | F25-B2 | 1507 | 1420 | 16 | 39 | 585 | 660 | 50 | 535x4 | 1120 | 411 | 383 | 470 | 397 | 1022 | 406,4x11,0 | | |
| 63 | 40 | 240 | 58 | 200 | F10-A | 360 | 312 | 4 | 22 | 125 | 170 | 26 | 88x3 | 31 | 49 | 43 | 75 | 37 | 27 | 48,3x2,6 | |
| | 50 | 250 | 60 | 200 | F10-A | 365 | 320 | 4 | 22 | 135 | 180 | 26 | 102x3 | 31 | 61 | 54 | 90 | 49 | 27 | 60,3x3,2 | |
| | 65 | 290 | 92 | 250 | F10-A | 468 | 418 | 8 | 22 | 160 | 205 | 26 | 122x3 | 55 | 77 | 69 | 105 | 65 | 50 | 76,1x3,6 | |
| | 80 | 310 | 92 | 250 | F10-A | 468 | 418 | 8 | 22 | 170 | 215 | 28 | 138x3 | 60 | 90 | 81 | 122 | 80 | 54 | 88,9x4,0 | |
| | 100 | 350 | 115 | 315 | F14-A | 522 | 472 | 8 | 26 | 200 | 250 | 30 | 162x3 | 93 | 115 | 104 | 145 | 100 | 84 | 114,3x5,0 | |
| | 125 | 400 | 115 | 315 | F14-A | 522 | 472 | 8 | 30 | 240 | 295 | 34 | 188x3 | 93 | 141 | 130,5 | 178 | 125 | 84 | 139,7x4,5 | |
| | 150 | 450 | 176 | 500 | F14-B2 | 720 | 658 | 8 | 33 | 280 | 345 | 36 | 218x3 | 188 | 170 | 156,5 | 204 | 147 | 167 | 168,3x5,6 | |
| | 200 | 550 | 224 | 500 | F14-A | 898 | 839 | 12 | 36 | 345 | 415 | 42 | 285x3 | 326 | 222 | 204,5 | 264 | 200 | 288 | 219,1x7,1 | |
| | 250 | 650 | 268 | 630 | F16-A | 1124 | 1128 | 12 | 36 | 400 | 470 | 46 | 345x3 | 500 | 276 | 256,5 | 320 | 247 | 452 | 237x8,8 | |
| | 300 | 750 | 324 | 720 | F25-B2 | 1117 | 1117 | 16 | 36 | 460 | 530 | 52 | 410x4 | 860 | 325 | 308,5 | 358 | 300 | 793 | 323,9x11,0 | |
| | 350 | 850 | 381 | 720 | F25-B2 | 1410 | 1410 | 16 | 39 | 525 | 600 | 56 | 465x4 | 880 | 359 | 336,5 | 434 | 350 | 812 | 355,6x12,5 | |
| 400 | 950 | 446 | 720 | F25-B2 | 1510 | 1430 | 16 | 42 | 585 | 670 | 60 | 535x4 | 1180 | 411 | 377 | 490 | 400 | 1051 | 406,4x14,2 | | |
| 100 | 40 | 240 | 58 | 200 | F10-A | 360 | 312 | 4 | 22 | 125 | 170 | 26 | 88x3 | 35 | 49 | 43 | 75 | 37 | 31 | 48,3x2,6 | |
| | 50 | 250 | 60 | 200 | F10-A | 365 | 320 | 4 | 26 | 145 | 195 | 28 | 102x3 | 40 | 61 | 54 | 90 | 49 | 34 | 60,3x3,2 | |
| | 65 | 290 | 92 | 250 | F10-A | 468 | 418 | 8 | 26 | 170 | 220 | 30 | 122x3 | 56 | 77 | 69 | 105 | 65 | 50 | 76,1x3,6 | |
| | 80 | 310 | 92 | 250 | F10-A | 468 | 418 | 8 | 26 | 180 | 230 | 32 | 138x3 | 62 | 90 | 81 | 122 | 80 | 54 | 88,9x4,0 | |
| | 100 | 350 | 115 | 315 | F14-A | 522 | 472 | 8 | 30 | 210 | 265 | 36 | 162x3 | 90 | 115 | 104 | 145 | 100 | 84 | 114,3x5,0 | |
| | 125 | 400 | 115 | 315 | F14-A | 522 | 472 | 8 | 33 | 250 | 315 | 40 | 188x3 | 110 | 139,7 | 119,7 | 178 | 125 | 89 | 139,7x6,3 | |
| | 150 | 450 | 184 | 500 | F14-B2 | 712 | 655 | 12 | 33 | 290 | 355 | 44 | 218x3 | 227 | 170 | 154 | 204 | 147 | 199 | 168,3x7,1 | |
| | 200 | 550 | 228 | 630 | F16-B2 | 937 | 839 | 12 | 36 | 360 | 430 | 52 | 285x3 | 460 | 222 | 199,5 | 264 | 200 | 410 | 219,1x10,0 | |
| | 250 | 650 | 268 | 720 | F25-A | 1124 | 1028 | 12 | 39 | 430 | 505 | 60 | 345x3 | 609 | 276 | 248,5 | 320 | 247 | 528 | 273x12,5 | |
| | 300 | 750 | 324 | 720 | F25-B1 | 1117 | 1208 | 16 | 42 | 500 | 585 | 68 | 410x4 | 1032 | 325 | 295,5 | 358 | 300 | 914 | 323,9x14,2 | |
| 350 | 850 | 412 | 720 | F30-A | 1439 | 1365 | 16 | 48 | 560 | 655 | 74 | 465x4 | 1320 | 359 | 324 | 460 | 350 | 1152 | 355,6x16,0 | | |

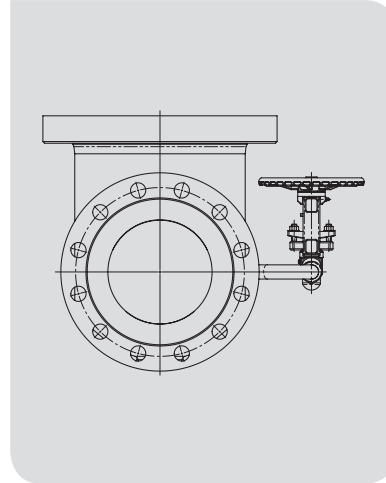
Dimensions for pressure PN 10 on request | DN 800 PN 16 – oval gate valve | * At customer's request

DESIGN VARIANTS

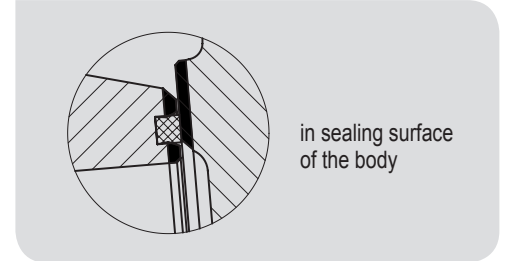
PLATE WEDGE



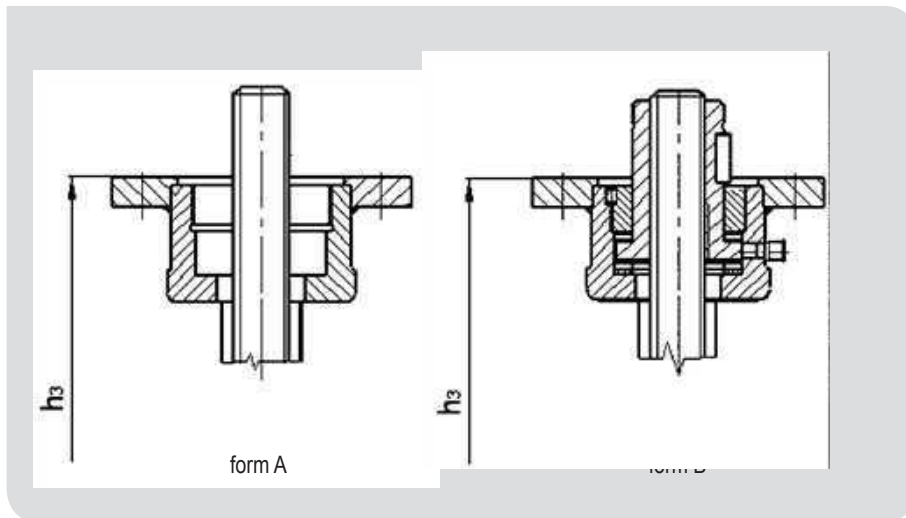
BY – PASS



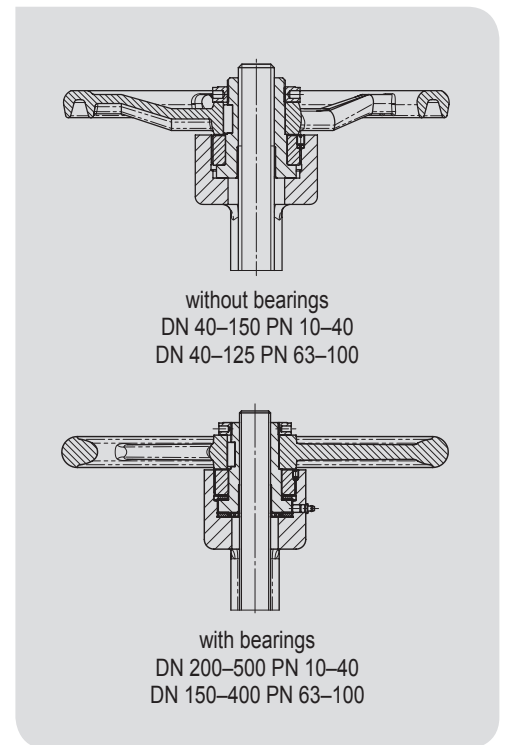
PTFE RING



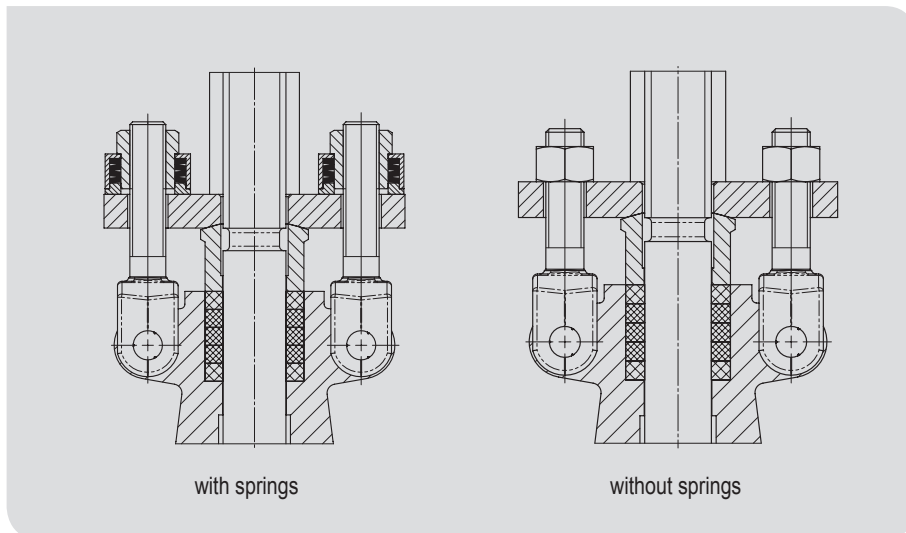
ADJUSTMENT FOR CONNECTION OF ELECTRIC ACTUATOR



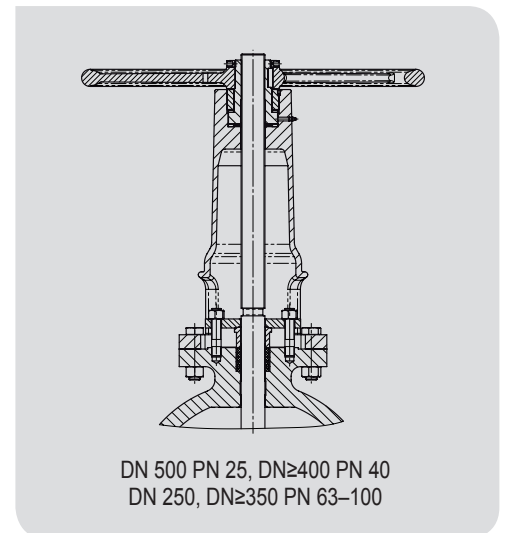
OPERATION BY HANDWHEEL



TA-LUFT

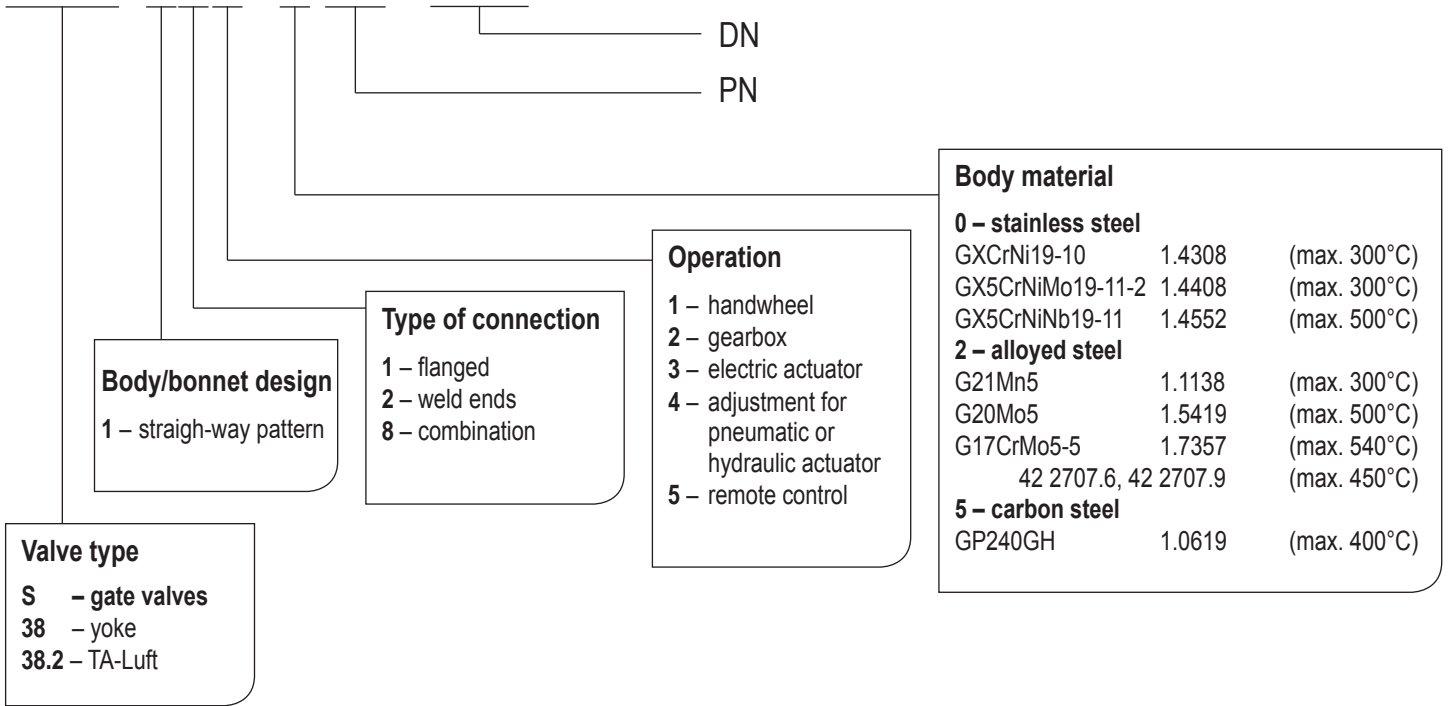


DESIGN OF YOKE



VALVE DESCRIPTION CODE

S38 111-016-150



VALVE INSTALLATION

The position of the valve must be with the stem and operating element vertically up or with the stem tilted to the horizontal plane at an angle of max. 90 degrees.

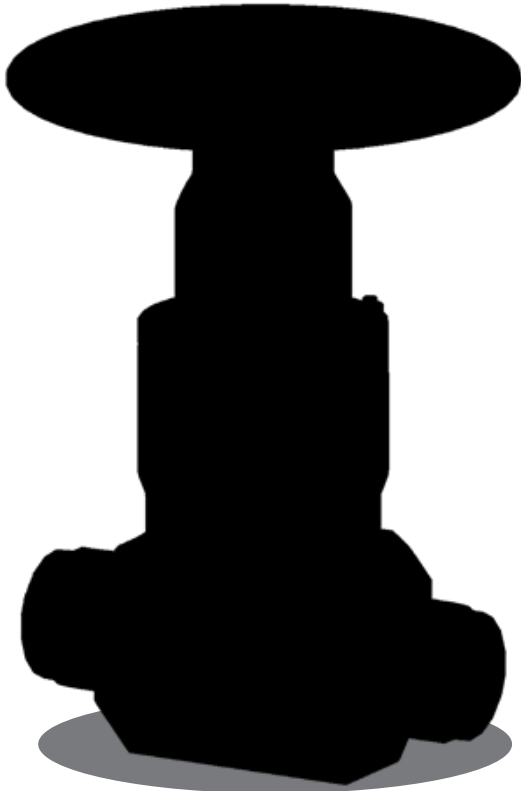
During the installation and use of the valve, the following points have to be respected:

- operating conditions must be in accordance with the operating parameters of the valve
- proper function of the valve can be affected by presence of impurities in the pipeline and flowing medium, therefore it is necessary to keep the working environment and pipeline clean, for example with the use of filters
- the used medium must comply with the corrosion resistance of the valve
- use of a damaged valve is prohibited

The service life of a valve can be significantly extended by regular maintenance and repairs carried out by qualified personnel.

GATE VALVE S43

PN 160–500 (630); DN 50/50–350/275; T_{MAX}: 600 °C



GATE VALVE S43

APPLICATION

- water, steam, gas, other working substances in the energy sector

CONNECTION

- weld ends, flanged

OPERATION

- handwheel, electric actuator, gearbox, remote control, attachment for pneumatic or hydraulic actuator

DESCRIPTION

- shut-off gate valve
- non-rotating rising stem
- non-rising handwheel
- self-sealing bonnet
- flexible wedge
- sealing surface is welded by hard facing Stellite 6
- complies with the requirements of the directive 2014/68/EU
- testing is carried out according to standard EN 12266-1, part 2

BASIC DESIGN OPTIONS

- position indicator
- limit switches
- TA-Luft (Typ S43)
- protection cover for the stem
- drain plug
- by-pass
- drilled wedge
- safety valve

PROTECTION OF THE SPACE ABOVE THE WEDGE

At the customer's request, the valves can be equipped with protection of the space above the wedge from extreme pressure increase. This case may occur after the system is decommissioned, when the amount of fluid in the middle part of the closed valve is cooled (the space above the wedge). If after some time we start the valve in the closed state to heat (using a by-pass), due to the increase in temperature, there will be a high pressure increase in the space above the wedge.

If during the production process such a situation may arise, it is necessary to indicate in the order the requirement to put a valve with a space guard above the wedge (the inside of the valve).

Types of protection:

- a) drilling a wedge - the input side
- b) using safety valve P 10.01
- c) external by-pass - using two high pressure valves connected to the central part

The use of a safety valve, although the most expensive, is a universal solution. Can be used on all valves and all production parameters. When using a safety valve, the valve is two-way. The safety device is installed on the condensation circuit, which is led out of the valve body, outside its thermal insulation. Due to the replacement of the membrane bolt during the production process, part of the safety valve is the flywheel, which can be used to close the safety valve when replacing. To set the allowable overpressure limit, you must specify the manufacturing parameters of the valve in the order.

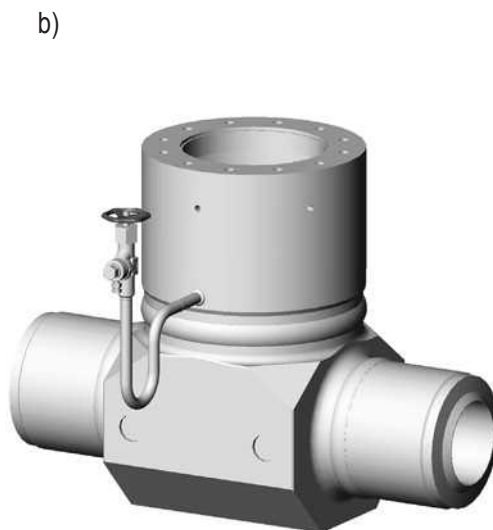
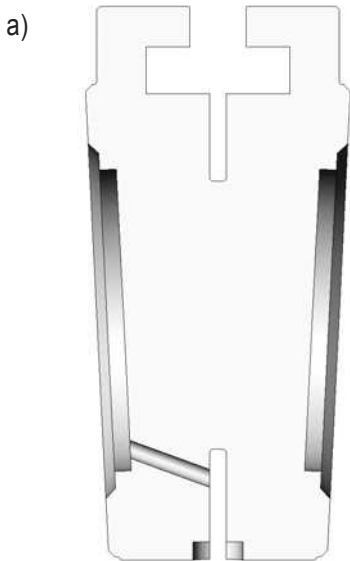
Example of recommended membrane

Operating parameters of the valve: working pressure $P_p = 23.5$ MPa, production temperature $T_p = 250$ °C.

Bursting pressure of the membrane: $1.3 P_p = 1.3 * 23.5 = 30.55$ MPa and at a temperature of 250 °C.

The entry in the order: valve operating parameters $P_p = 23.5$ MPa - $T_p = 250$ °C (bursting pressure of 30.55 MPa at temperature of 250 °C).

At high pressure drops and on the basis of the customer's requirements, it is possible to produce valves with by-pass valves.

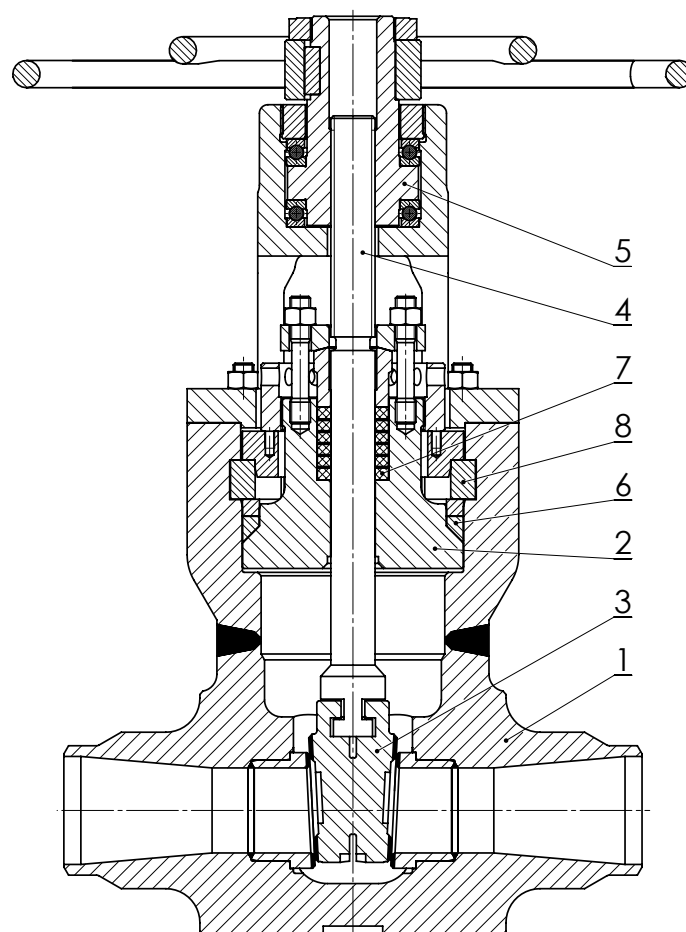


PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | |
|----------------------------------|------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 530 | 550 | 570 | 590 | 600 |
| 1.0460 (P250GH) | 160 | 160 | 160 | 160 | 148 | 135 | 120 | 105 | 88 | 70 | 51 | - | - | - | - | - | - |
| | 250 | 250 | 250 | 250 | 230 | 211 | 188 | 164 | 137 | 109 | 80 | - | - | - | - | - | - |
| | 320 | 320 | 320 | 320 | 295 | 270 | 240 | 210 | 175 | 140 | 102 | - | - | - | - | - | - |
| | 400 | 400 | 400 | 400 | 368 | 357 | 316 | 276 | 230 | 172 | 132 | - | - | - | - | - | - |
| 1.7383 (11CrMo9-10) | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 145 | 123 | 100 | 70 | 50 | 40 | 30 | 25 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 227 | 191 | 156 | 109 | 78 | 63 | 47 | 39 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 290 | 245 | 200 | 140 | 100 | 80 | 60 | 50 |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 355 | 237 | 179 | 134 | 100 | 80 |
| 1.7715 (14MoV6-3) | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 154 | 147 | 101 | 76 | 56 | - | - |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 240 | 230 | 158 | 119 | 87 | - | - |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 307 | 294 | 202 | 152 | 111 | - | - |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 274 | 208 | 154 | - | - |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 342 | 260 | 192 | - | - |
| 1.5415 (16Mo3) | 160 | 160 | 160 | 160 | 160 | 145 | 130 | 115 | 111 | 107 | 89 | 71 | 36 | - | - | - | - |
| | 250 | 250 | 250 | 250 | 250 | 227 | 203 | 179 | 173 | 166 | 139 | 111 | 56 | - | - | - | - |
| | 320 | 320 | 320 | 320 | 320 | 290 | 260 | 229 | 221 | 213 | 178 | 142 | 72 | - | - | - | - |
| | 400 | 400 | 400 | 400 | 400 | 362 | 324 | 286 | 277 | 267 | 222 | 177 | 90 | - | - | - | - |
| 1.7335 (13CrMo4-5) | 160 | 160 | 160 | 160 | 160 | 160 | 151 | 141 | 133 | 126 | 115 | 105 | 61 | 40 | 25 | - | - |
| | 250 | 250 | 250 | 250 | 250 | 250 | 235 | 220 | 208 | 196 | 180 | 163 | 95 | 62 | 39 | - | - |
| | 320 | 320 | 320 | 320 | 320 | 320 | 301 | 282 | 266 | 251 | 230 | 209 | 122 | 79 | 50 | - | - |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 389 | 352 | 314 | 288 | 261 | 165 | 103 | 69 | - | - |
| 1.6368 (15NiCu- MoNb5-6-4) | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 154 | 151 | 148 | 145 | - | - | - | - | - | - |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 241 | 236 | 231 | 227 | - | - | - | - | - | - |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 308 | 302 | 296 | 290 | - | - | - | - | - | - |
| | 400* | 400 | 400 | 400 | 400 | 400 | 400 | 385 | 378 | 370 | 363 | - | - | - | - | - | - |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 462 | 437 | 405 | 403 | - | - | - | - | - | - |
| | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 582 | 550 | 510 | 508 | - | - | - | - | - | - |
| 1.4903 (X10Cr- MoVNb9-1) | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 144 | 118 | 100 | 82 | 65 | 56 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 225 | 184 | 156 | 129 | 101 | 88 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 288 | 235 | 200 | 165 | 130 | 112 |
| | 400* | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 360 | 294 | 250 | 206 | 162 | 140 |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 471 | 452 | 432 | 412 | 393 | 337 | 279 | 225 | 178 | 158 |
| | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 594 | 569 | 544 | 519 | 495 | 425 | 351 | 283 | 224 | 199 |

* Design of gate valve from pressure series PN 160-320 | Other materials on request

USED MATERIALS



| Pos. | Part | Material | | | | | | |
|------|--|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|---|--|
| 1 | Body | 1.0460 (P250GH) | 1.7383 (11CrMo9-10) | 1.7715 (14MoV6-3) | 1.5415 (16Mo3) | 1.7335 (13CrMo4-5) | 1.4903 (X10CrMoVNb9-1) | 1.6368 (15NiCu- MoNb5-6-4) |
| | Hard facing of seat sealing surface | Stellite 6 | Stellite 6 | Stellite 6 | Stellite 6 | Stellite 6 | Stellite 6 | Stellite 6 |
| 2 | Bonnet | 1.0460 (P250GH) | 1.7383 (11CrMo9-10) | 1.7715 (14MoV6-3) | 1.5415 (16Mo3) | 1.7335 (13CrMo4-5) | 1.4903 (X10CrMoVNb9-1) | 1.6368 (15NiCu- MoNb5-6-4) |
| 3 | Wedge | 1.0460/1.0425 (P250GH) | 1.7383 (11CrMo9-10) | 1.7715 (14MoV6-3) | 1.5415 (16Mo3) | 1.7335 (13CrMo4-5) | 1.4903 (X10CrMoVNb9-1) | 1.6368 (15NiCu- MoNb5-6-4) |
| | Hard facing of wedge sealing surface | Stellite 6 | Stellite 6 | Stellite 6 | Stellite 6 | Stellite 6 | Stellite 6 | Stellite 6 |
| 4 | Stem | X22CrMoV12- 1+QT1 (1.4923+QT1) | X22CrMoV12- 1+QT1 (1.4923+QT1) | X22CrMoV12- 1+QT1 (1.4923+QT1) | X22CrMoV12- 1+QT1 (1.4923+QT1) | X22CrMoV12- 1+QT1 (1.4923+QT1) | X6NiCrTiMoVB25- 15-2+P (1.4980+P) | X6NiCrTi- MoVB25-15-2+P (1.4980+P) |
| 5 | Stem nut | CW307G R680 | CW307G R680 | CW307G R680 | CW307G R680 | CW307G R680 | CW307G R680 | CW307G R680 |
| 6 | Bonnet sealing | Graphite pressed | Graphite pressed | Graphite pressed | Graphite pressed | Graphite pressed | Graphite pressed | Graphite pressed |
| 7 | Gland packing | Graphite knitted + pressed | Graphite knitted + pressed | Graphite knitted + pressed | Graphite knitted + pressed | Graphite knitted + pressed | Graphite knitted + pressed | Graphite knitted + pressed |
| 8 | Divided ring | 1.7715 (14MoV6-3) | 1.7383 (11CrMo9-10) | 1.7715 (14MoV6-3) | 1.7715 (14MoV6-3) | 1.7715 (14MoV6-3) | 1.4903 (X10CrMoVNb9-1) | 1.6368 (15NiCu- MoNb5-6-4) |

VALVE DIMENSIONS

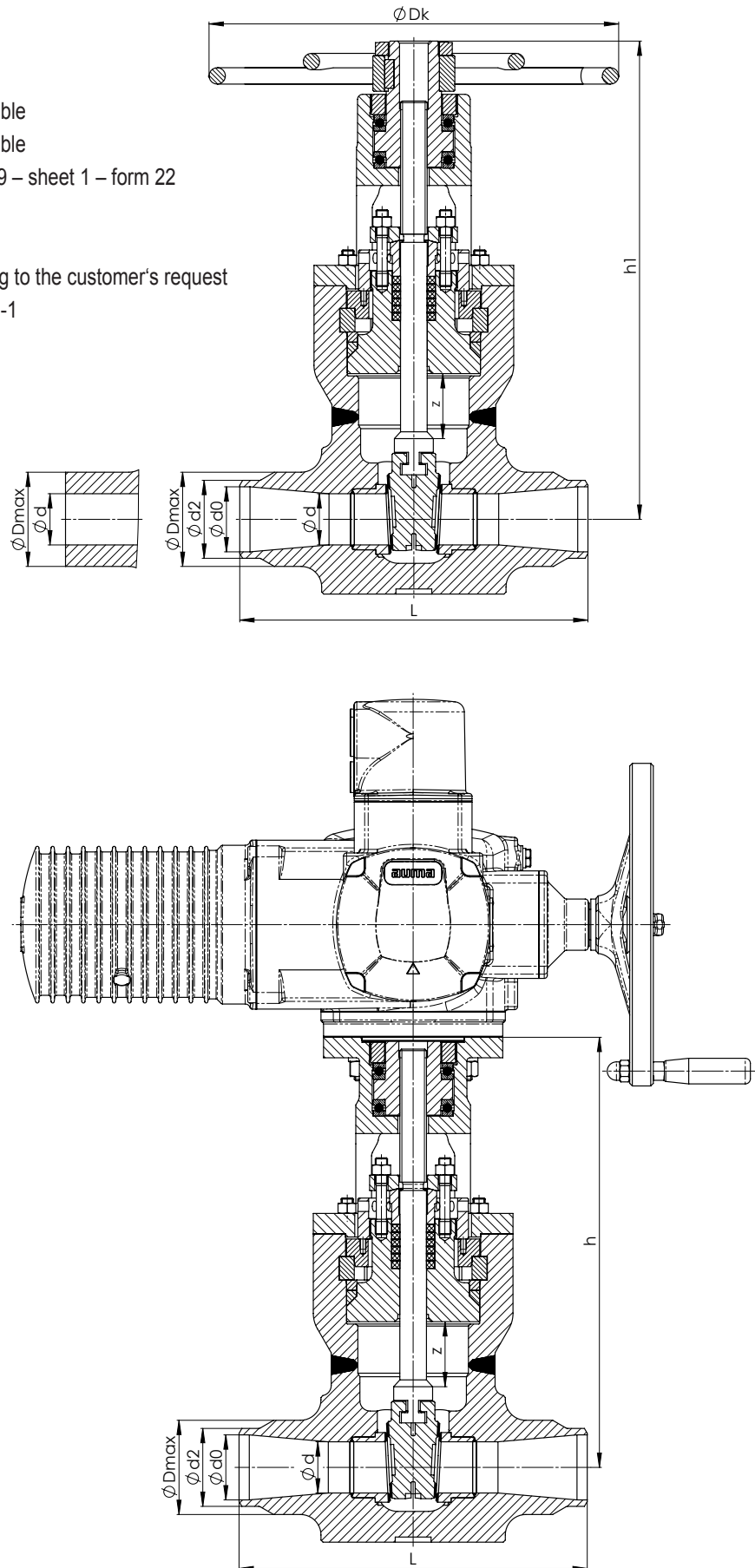
1. Weld ends

Face-to-face dimensions: as per table
 Dimensions of welding ends: as per table
 Groove form: DIN 2559 – sheet 1 – form 22

2. Flanged

Face-to-face dimensions: according to the customer's request
 Flanges: EN 1092-1

Other adjustments on request



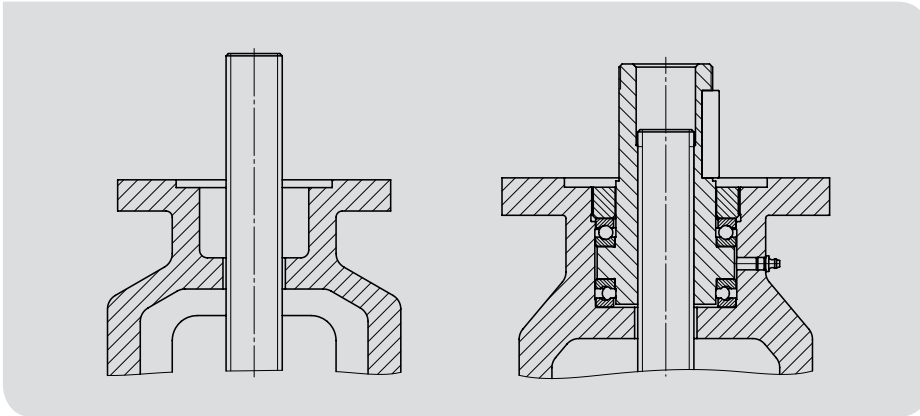
GATE VALVE S43

| Nominal pressure | Nominal size | Face-to-face | Stroke | Handwheel | E-actuator (connection ISO 5210) | Centre-to-top | Centre-to-top | Weld ends | | | | | | | | | |
|------------------|--------------|--------------|--------|-----------|----------------------------------|---------------|---------------|-----------|-------|--------|-------|--------|-------|---------------------|----|-------------|--------|
| | | | | | | | | PN 160 | | PN 250 | | PN 320 | | PN 400-500 | | Dmax/d [mm] | m [kg] |
| | | | | | | | | d2 | d0 | d2 | d0 | d2 | d0 | d2 | d0 | | |
| PN | DN | L [mm] | z [mm] | Dk [mm] | - | h [mm] | h1 [mm] | d2 | d0 | d2 | d0 | d2 | d0 | d2 | d0 | | |
| 160 | 50/50 | 300 | 65 | 400 | F14-B2 | 470 | 420 | 60,3 | 50,3 | 63,5 | 47,5 | 70 | 50 | - | - | 92/50 | 74 |
| | 65/50 | 340 | 65 | 400 | F14-B2 | 470 | 420 | 76,1 | 63,5 | 76,1 | 58,5 | 88,9 | 63,9 | - | - | 92/50 | 77 |
| | 80/65 | 390 | 80 | 400 | F14-B2 | 495 | 435 | 88,9 | 74,7 | 101,6 | 76,6 | 101,6 | 73,2 | - | - | 110/65 | 94 |
| | 100/80 | 450 | 105 | 500 | F14-B2 | 570 | 505 | 114,3 | 96,7 | 127 | 98,6 | 133 | 98 | - | - | 136/80 | 147 |
| | 125/110 | 550 | 130 | 630 | F16-B2 | 670 | 595 | 139,7 | 117,7 | 152,4 | 117,4 | 168,3 | 123,9 | - | - | 184/110 | 253 |
| | 150/125 | 550 | 140 | 710 | F16-B1 | 790 | 745 | 168,3 | 143,3 | 177,8 | 137,8 | 193,7 | 143,7 | - | - | 210/125 | 348 |
| | 200/150 | 700 | 180 | gearbox | F16-B1 | 920 | 840 | 219,1 | 183,1 | 244,5 | 188,5 | 244,5 | 180,5 | - | - | 245/150 | 610 |
| | 250/200 | 850 | 230 | gearbox | F25-B1 | 1125 | 995 | 273 | 229 | 298,5 | 234,5 | 323,9 | 233,9 | - | - | 325/200 | 1130 |
| | 300/250 | 1000 | 270 | gearbox | F30-A | 1065 | 1065 | 323,9 | 273,9 | 355,6 | 283,6 | 355,6 | 265,6 | - | - | 372/250 | 1715 |
| | 350/275 | 1200 | 305 | gearbox | F35-A | 1190 | 1190 | 355,6 | 299,6 | 406,4 | 316,4 | 406,4 | 296,4 | - | - | 420/275 | 2645 |
| 250-320 | 50/50 | 300 | 65 | 400 | F14-B2 | 470 | 420 | 60,3 | 50,3 | 63,5 | 47,5 | 70 | 50 | - | - | 92/50 | 74 |
| | 65/50 | 340 | 65 | 400 | F14-B2 | 470 | 420 | 76,1 | 63,5 | 76,1 | 58,5 | 88,9 | 63,9 | - | - | 92/50 | 77 |
| | 80/65 | 390 | 80 | 400 | F14-B2 | 495 | 435 | 88,9 | 74,7 | 101,6 | 76,6 | 101,6 | 73,2 | - | - | 110/65 | 94 |
| | 100/80 | 450 | 105 | 500 | F14-B2 | 570 | 505 | 114,3 | 96,7 | 127 | 98,6 | 133 | 98 | - | - | 136/80 | 147 |
| | 125/110 | 550 | 130 | 630 | F16-B2 | 670 | 595 | 139,7 | 117,7 | 152,4 | 117,4 | 168,3 | 123,9 | - | - | 184/110 | 253 |
| | 150/125 | 550 | 140 | gearbox | F16-B1 | 790 | 745 | 168,3 | 143,3 | 177,8 | 137,8 | 193,7 | 143,7 | - | - | 210/125 | 348 |
| | 200/150 | 700 | 180 | gearbox | F25-B2 | 920 | 840 | 219,1 | 183,1 | 244,5 | 188,5 | 244,5 | 180,5 | - | - | 245/150 | 610 |
| | 250/200 | 850 | 230 | gearbox | F30-B2 | 1125 | 995 | 273 | 229 | 298,5 | 234,5 | 323,9 | 233,9 | - | - | 325/200 | 1130 |
| | 300/250 | 1000 | 270 | gearbox | F35-A | 1065 | 1065 | 323,9 | 273,9 | 355,6 | 283,6 | 355,6 | 265,6 | - | - | 372/250 | 1715 |
| | 350/275 | 1200 | 305 | gearbox | F35-A | 1190 | 1190 | 355,6 | 299,6 | 406,4 | 316,4 | 406,4 | 296,4 | - | - | 420/275 | 2645 |
| 400-500 | 50/50 | 300 | 70 | 400 | F14-B2 | 510 | 450 | - | - | - | - | - | - | On customer request | | 92/45 | 105 |
| | 65/50 | 340 | 70 | 400 | F14-B2 | 510 | 450 | - | - | - | - | - | - | On customer request | | 95/50 | 106 |
| | 80/65 | 390 | 85 | 500 | F14-B2 | 570 | 500 | - | - | - | - | - | - | On customer request | | 110/65 | 144 |
| | 100/80 | 450 | 105 | 630 | F16-B2 | 610 | 535 | - | - | - | - | - | - | On customer request | | 145/80 | 196 |
| | 125/110 | 550 | 125 | gearbox | F25-B2 | 795 | 710 | - | - | - | - | - | - | On customer request | | 190/110 | 367 |
| | 150/125 | 550 | 150 | gearbox | F25-B2 | - | 790 | - | - | - | - | - | - | On customer request | | 222/125 | 572 |
| | 200/150 | 750 | 185 | gearbox | F25-A | - | 795 | - | - | - | - | - | - | On customer request | | 252/150 | 895 |
| | 250/200 | 900 | 225 | gearbox | F30-A, F35-A | - | 953 | - | - | - | - | - | - | On customer request | | 344/200 | 1624 |
| | 300/250 | 1100 | 275 | gearbox | F35-A | - | 1125 | - | - | - | - | - | - | On customer request | | 425/250 | 2779 |
| | 350/275 | 1200 | 315 | gearbox | F35-A | - | 1205 | - | - | - | - | - | - | On customer request | | 450/275 | 3501 |

L can be adjusted to customer requirements | * On customer request

DESIGN VARIANTS

ADJUSTMENT FOR CONNECTION OF ELECTRIC ACTUATOR

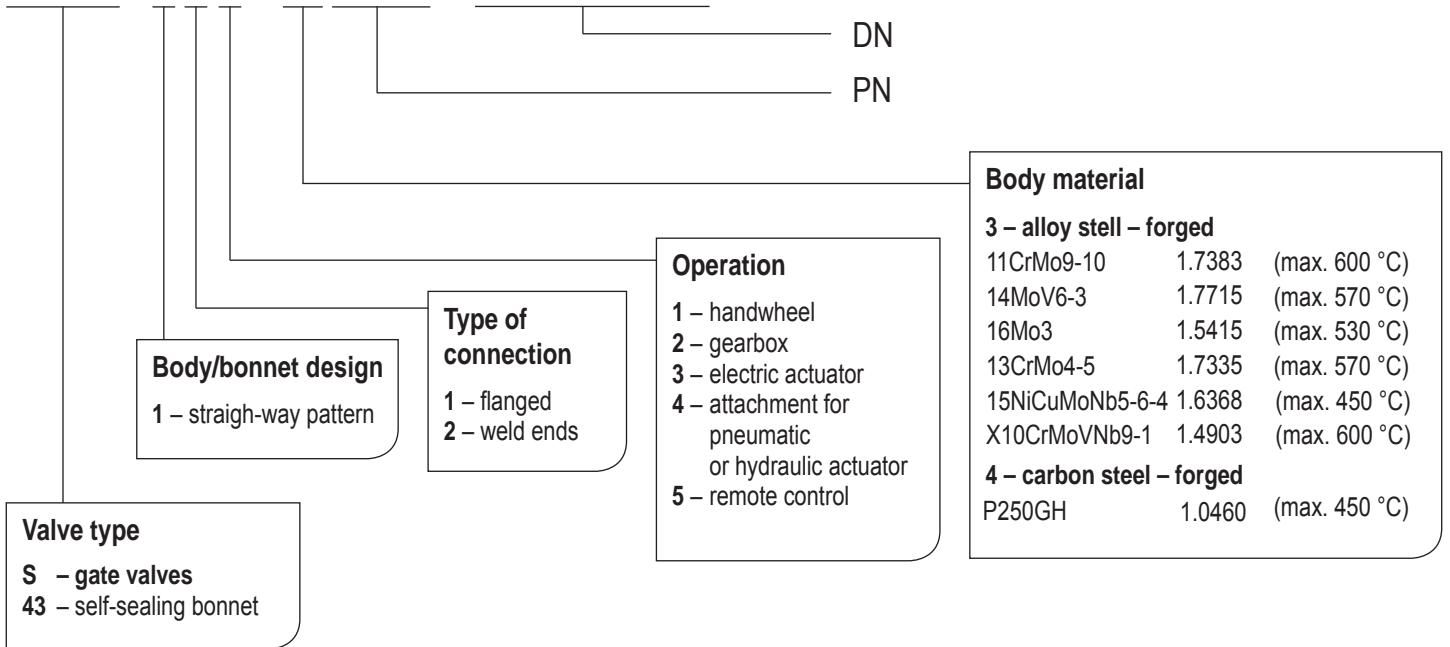


BY - PASS



VALVE DESCRIPTION CODE

S43 123–3320–150/125



VALVE INSTALLATION

When installed in the duct, the position of handwheel operated valves is arbitrary. In case of a gate valve operated by electric actuator, the position of control elements is arbitrary, however in the upper half to the horizontal plane. Recommended assembly position of the gate valve with actuator is vertical. In case of installation of the gate valve operated by electric actuator with stem in horizontal position, it is necessary to mount the gate valve at the flange of the yoke.

During the installation and use of the valve, the following points have to be respected:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

Standard / API Gate Valves

1. Program Overview

- Standard gate valves: solid wedge, flexible wedge and split wedge
- Parallel-slide gate valves
- Through-conduit gate valves to API 6D and API 6A
- Single- and double-expanding gate valves
- Bolted bonnet, pressure-seal and cryogenic designs

2. Standards · Sizes · Features

| Standards | Sizes | Features (Design – Materials) |
|---|--|---|
| ANSI B16.34 API 600 API 6D BS – 1414 | 72" ANSI 150 64" ANSI 300 48" ANSI 600/900 36" ANSI 1500/2500 24" ANSI 4500 | Bolted bonnet Pressure seal Cast and forged Solid Wedge Flexible Split Wedge Parallel Slide Through conduit Special Designs Double Block and Bleed |
| API 6A | 2 1/16" – 7 1/16" class 2000 2 1/16" – 7 1/16" class 3000 2 1/16" – 9" class 5000 1 13/16" – 7 1/16" class 10000 1 13/16" – 5 1/8" class 15000 | Bolted bonnet Pressure seal Cast and forged Solid Wedge Flexible Split Wedge Parallel Slide Through conduit Special Designs Double Block and Bleed |

Gate valves are designed to meet requirements of ANSI B16.34, API 600, API 6D ANSI B16.5, ANSI B16.10, API 602 and API 6A.

3. Gate Valve Designs.

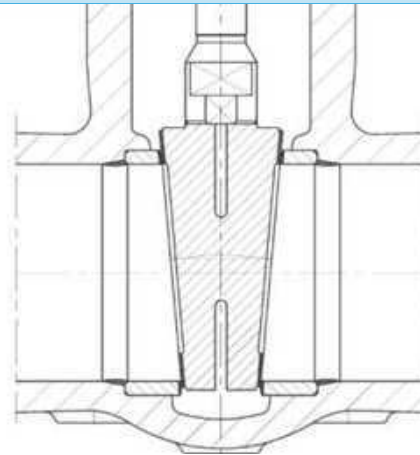
| Gate Valve Configuration | Image |
|--------------------------|-------|
|--------------------------|-------|

Solid Wedge Design

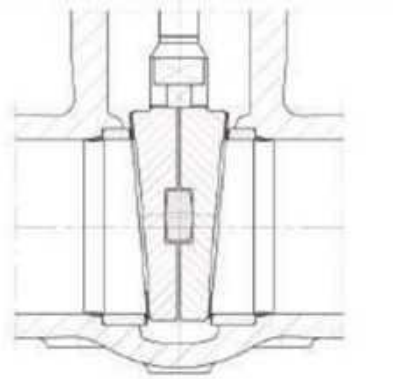
The wedge is made in one solid piece; the downstream side seals against the seat when upstream pressure pushes the wedge into the downstream seat.

**Flexible Wedge Design**

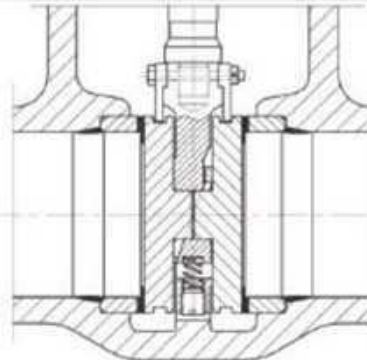
The wedge has a machined groove in its central part providing flexibility in the disc to adapt to minor misalignment or deformation.

**Split Wedge Design**

The wedge is made in two separate halves, allowing each half to move independently and maintain a tight seal under high thermal or mechanical distortion.

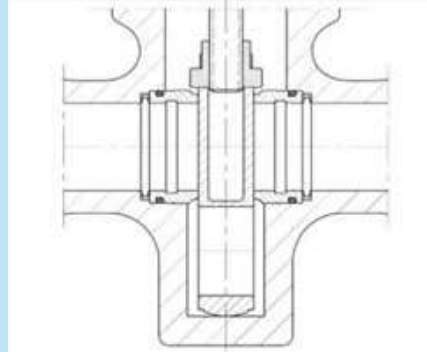
**Parallel Slide Gate Valves**

Seats are perfectly parallel and the disc doesn't contact them during travel. Only at end-of-stroke does the mechanism press the disc against both seats—ideal for large temperature swings and fast shut-off.

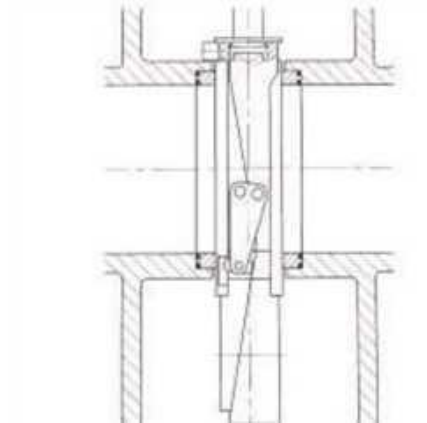


Through Conduit

Full-bore design per API 6D/6A for piggable lines or mandatory double-block-and-bleed service. Floating seats seal by upstream pressure against the disc. Available in metal or soft seating for oil & gas applications.

**Double Expanding Gate**

Metal-to-metal seated, double-block-and-bleed gate available per API 6D & API 6A for the highest isolation integrity.

**4. Materials****Page 12 – Valve Materials****Body/Bonnet Materials (mirrored)**

| Material Family | Designations |
|---|--|
| Carbon Steel (General Use) | WCB; WCC; WCA; A 105N |
| Carbon Steel (Low Temperature) | LCB; LCC; LCA; LC3; LF2; LF3; LF6 |
| Alloy Steel (High Temperature) | WC1; WC6; WC9; C5; C12; C12A; F1; F11; F22; F5; F9; F91 |
| Martensitic Steel | CA15; CA6NM; F6 |
| Stainless Steel (Corrosion Resistant) | CF8; CF8M; CF3; CF3M; CF8C; F304; F316; F304L; F316L; F321; F347 |
| Duplex & Superduplex Stainless Steel | CD4MCu; CD4MCuN; CK3MCuN; F51; F44; F52; F53 |
| Nickel Base Alloys | Inconel 625; Hastelloy (CW-12MW); Incoloy 825; Monel |

*) Table based on ASTM materials. Equivalent DIN materials are also available upon request.

Trim Materials

Different combinations of trim material consistent with body / bonnet material according API 600 are available.

Different hard facings for sealing areas can be used being the most common ones: stellite-6 & 12, 13% Cr, Bohler skwan,

Cobalt free alloys, and Tungsten Carbide for API 6A applications.

Different hardened martensitic steels upto 48 HRC are also available for globe valves wearing resistant trims.

| Trim # | Nominal Trim | Cast Spec | Forged Spec | Welded Spec | Material Type |
|--------|----------------|------------------|---------------------------|---|---------------|
| 1 | F6 | ASTM A217 (CA15) | ASTM A105 (F6A) | AWS A5.9 ER410 | 13 Cr |
| 2 | 304 | ASTM A351 (CF8) | ASTM A182 (F304) | AWS A5.9 ER308 | 18 Cr-8 Ni |
| 3 | F310 | – | ASTM A182 (F310) | AWS A5.9 ER410 | 25 Cr-20 Ni |
| 4 | Hard F6 | – | Note h | – | 13 Cr |
| 5 | Hardfaced | – | – | AWS A5.13 ER/R CoCr-a | 13 Cr |
| 5 A | Hardfaced | – | – | Note h | 13 Cr |
| 6 | F6 & Cu-Ni | ASTM A217 (CA15) | ASTM A182 (F6A) Note h | AWS A5.9 ER410 | 13 Cr |
| 7 | F6 & Hardfaced | ASTM A217 (CA15) | Note h | AWS A5.9 ER410 | 13 Cr |
| 8 | F6 & Hardfaced | ASTM A217 (CA15) | – | AWS A5.9 ER410 | – |
| 8 A | F6 & Hardfaced | ASTM A217 (CA15) | – | AWS A5.9 ER410; AWS A5.13 E/R CoCr-a | 13 Cr |
| 9 | Monel | – | MFG Standard | – | Ni-Cu Alloy |
| 10 | 316 | ASTM A351 (CF8M) | ASTM A182 (F316) | AWS A5.9 ER410 | 18 Cr-8 Ni-Mo |

| | | | | | |
|-----------|----------------------|------------------|------------------|----------------------|----------------|
| 11 | Monel & Hardfaced | – | MFG Standard | See Trim 5/5 A | Ni-Cu Alloy |
| 12 | 316 & Hardfaced | ASTM A351 (CF8M) | ASTM A182 (F316) | AWS A5.9 ER316 | 18 Cr-8 Ni-Mo |
| 13 | Alloy 20 | ASTM A351 (CN7M) | ASTM B473 | AWS A5.9 ER320 | 19 Cr-29 Ni |
| 14 | Alloy 20 & Hardfaced | ASTM A351 (CN7M) | – | AWS A5.9 ER320 | 19 Cr-29 Ni |
| 15 | Hardfaced | – | – | AWS A5.13 E/R CoCr-a | 18 Cr-8 Ni |
| 16 | Hardfaced | – | – | AWS A5.13 E/R CoCr-a | 18 Cr-8 Ni-Mo |
| 17 | Hardfaced | – | – | AWS A5.13 E/R CoCr-a | 18 Cr-10 Ni-Cb |
| 18 | Hardfaced | – | – | AWS A5.13 E/R CoCr-a | 19 Cr-29 Ni |

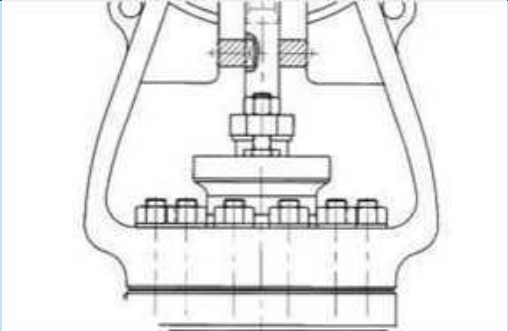
Note h: forged or welded specifications are not applicable for trims 4 and 5 A; consult the manufacturer for special processing.

Soft Seated Valves

For cryogenic or other special applications soft seated valves are also available.

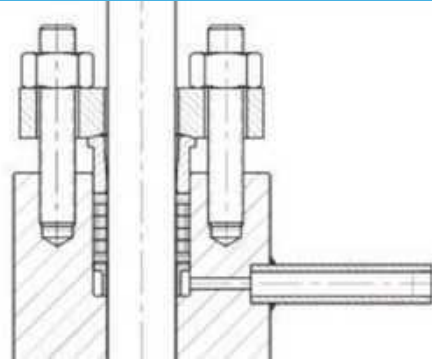
5. General Features

General Valve Features

| Feature | Picture |
|---|--|
| <p>OS & Y Construction All designs of gate valves are normally with OS & Y (outside screw & yoke construction). Valve is provided with yoke which allows access to the valve stem.</p> |  |

Leak-Off & Packing Expulsor

When leakage through packing must be prevented, the valve is provided with a leak-off which indicates packing leakage. When packing must be replaced quickly, a packing expulsor can be provided for immediate replacement.

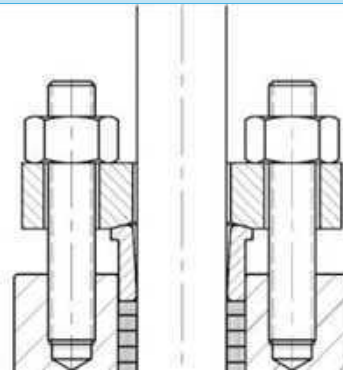


Handwheel, Gear & Motor Operation

Valves can be manually operated via handwheel or gearbox, or automatically by electric, pneumatic, or hydraulic actuators.

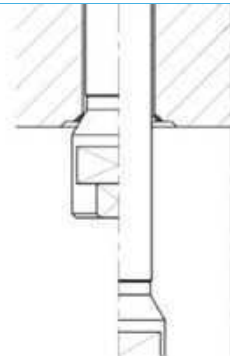
Stuffing Box & Packing

Valves are equipped with graphite, PTFE, or similar packing to prevent leakage through the stem area to the atmosphere.



Back Seat

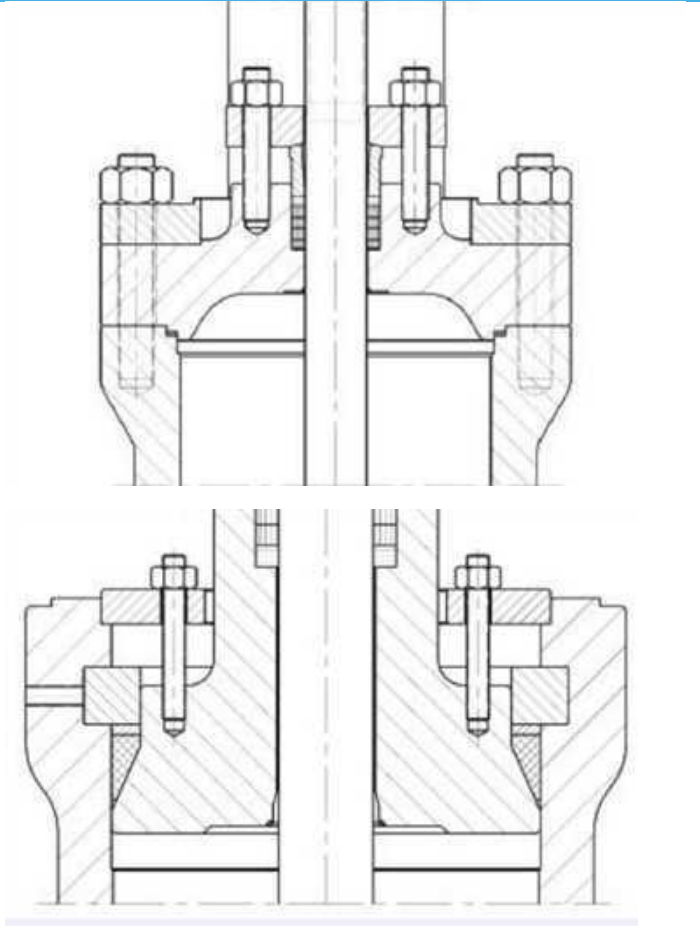
Gate and globe valves include a back seat feature, allowing the packing to be changed while the valve remains under pressure.



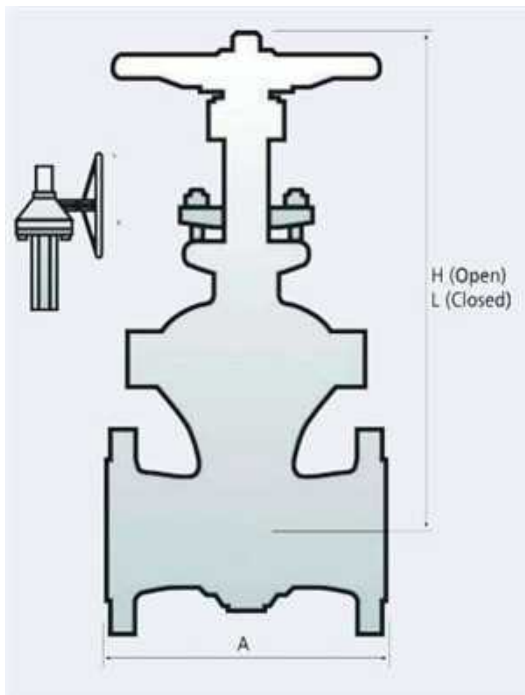
Body-Bonnet Construction

Body-bonnet construction can be either bolted bonnet, pressure seal, or welded bonnet. Bolted bonnet is normally applicable for low-medium pressure (up to 600#). For larger pressures (900# and above), both pressure seal and bolted bonnet can be used.

Pressure seal design reduces the weight of the valve since it avoids large diameter body-bonnet connection flanges and large size body-bonnet bolting. Welded bonnet design is only used for small sizes up to 2”.



6. Gate Valve Dimensions (API 600 / ANSI B16 · API 6D)



6.1 Class 150

Class 150 – Gate Valve Dimensions

| SIZE (") | RF (mm) ^(A) | RTJ (mm) ^(A) | BW (mm) ^(A) | H (mm) | L (mm) | K | CV | Approx. Weight RF (kg) |
|----------|------------------------|-------------------------|------------------------|--------|--------|---|---------|------------------------|
| 2 | 178 | 191 | 216 | 296 | 261 | – | 200 | 16 |
| 3 | 203 | 216 | 282 | 533 | 457 | – | 710 | 40 |
| 4 | 229 | 241 | 305 | 645 | 538 | – | 1 300 | 52 |
| 6 | 267 | 279 | 403 | 850 | 693 | – | 3 100 | 90 |
| 8 | 292 | 305 | 419 | 1 079 | 863 | – | 5 720 | 145 |
| 10 | 330 | 343 | 457 | 1 308 | 1 036 | – | 8 940 | 225 |
| 12 | 356 | 368 | 502 | 1 447 | 1 130 | – | 13 350 | 310 |
| 14 | 381 | 394 | 572 | 1 651 | 1 272 | – | 16 275 | 445 |
| 16 | 406 | 419 | 610 | 1 879 | 1 447 | – | 21 560 | 540 |
| 18 | 432 | 444 | 660 | 2 184 | 1 701 | – | 28 720 | 800 |
| 20 | 457 | 470 | 711 | 2 431 | 1 795 | – | 35 760 | 990 |
| 24 | 508 | 521 | 813 | 2 837 | 2 189 | – | 52 165 | 1 600 |
| 26 | 559 | – | 864 | 3 086 | 2 387 | – | 63 500 | 1 850 |
| 28 | 610 | – | 914 | 3 327 | 2 590 | – | 74 800 | 2 100 |
| 30 | 610 | – | 914 | 3 606 | 2 819 | – | 86 235 | 2 700 |
| 32 | 610 | – | 965 | 3 708 | 2 870 | – | 103 000 | 3 100 |
| 36 | 711 | – | 1 016 | 3 924 | 2 997 | – | 129 500 | 3 950 |
| 40 | 812 | – | 1 066 | 4 318 | 3 302 | – | 175 860 | 4 650 |
| 42 | 812 | – | 1 143 | 4 546 | 3 479 | – | 223 300 | 5 100 |
| 48 | 1 066 | – | 1 371 | 5 181 | 3 962 | – | 335 500 | 6 500 |

^(A) Face to Face (A) dimensions.

Class 300 – Gate Valve Dimensions

Columns **RF (mm)^(A)**, **RTJ (mm)^(A)**, and **BW (mm)^(A)** are Face to Face (A) dimensions.

| SIZE (") | RF (mm) ^(A) | RTJ (mm) ^(A) | BW (mm) ^(A) | H (mm) | L (mm) | K | CV | Approx. Weight RF (kg) |
|----------|------------------------|-------------------------|------------------------|--------|--------|---|--------|------------------------|
| 2 | 216 | 232 | 216 | 312 | 277 | – | 200 | 18 |
| 3 | 282 | 298 | 282 | 596 | 520 | – | 710 | 52 |
| 4 | 305 | 321 | 305 | 716 | 609 | – | 1 300 | 85 |
| 6 | 403 | 419 | 403 | 984 | 825 | – | 3 100 | 150 |
| 8 | 419 | 435 | 419 | 1 219 | 1 009 | – | 5 720 | 240 |
| 10 | 457 | 473 | 457 | 1 460 | 1 193 | – | 8 940 | 380 |
| 12 | 502 | 518 | 502 | 1 600 | 1 282 | – | 13 350 | 430 |
| 14 | 762 | 778 | 762 | 1 790 | 1 422 | – | 16 275 | 730 |

| | | | | | | | | |
|----|-------|-------|-------|-------|-------|---|---------|--------|
| 16 | 838 | 854 | 838 | 1 968 | 1 549 | - | 21 560 | 930 |
| 18 | 914 | 930 | 914 | 2 273 | 1 803 | - | 28 790 | 1 300 |
| 20 | 991 | 1 010 | 991 | 2 482 | 1 955 | - | 34 840 | 1 625 |
| 24 | 1 143 | 1 165 | 1 143 | 3 054 | 2 425 | - | 51 050 | 2 800 |
| 26 | 1 245 | 1 269 | 1 245 | 3 219 | 2 540 | - | 62 011 | 3 100 |
| 28 | 1 346 | 1 371 | 1 346 | 3 378 | 2 641 | - | 73 046 | 3 600 |
| 30 | 1 397 | 1 422 | 1 397 | 3 530 | 2 743 | - | 84 765 | 4 200 |
| 32 | 1 524 | 1 552 | 1 524 | 3 695 | 2 857 | - | 100 580 | 4 850 |
| 36 | 1 727 | 1 755 | 1 727 | 3 987 | 3 048 | - | 125 825 | 5 900 |
| 40 | 1 955 | 1 983 | 1 955 | 4 445 | 3 713 | - | 171 740 | 8 100 |
| 42 | 2 032 | - | 2 032 | 4 699 | 3 916 | - | 217 000 | 9 750 |
| 48 | 2 986 | - | 2 986 | 5 435 | 4 501 | - | 326 000 | 13 050 |

^(A) Face to Face (A) dimensions.

Class 600 – Gate Valve Dimensions

| Size (") | RF (mm) ^(A) | RTJ (mm) ^(A) | BW (mm) ^(A) | H (mm) | L (mm) | K (mm) | CV | Approx. Weight RF (kg) |
|----------|------------------------|-------------------------|------------------------|--------|--------|--------|---------|------------------------|
| 2 | 292 | 295 | 292 | 327 | 292 | - | 200 | 23 |
| 3 | 356 | 358 | 356 | 609 | 533 | - | 710 | 85 |
| 4 | 432 | 434 | 432 | 755 | 647 | - | 1 300 | 120 |
| 6 | 559 | 561 | 559 | 1 073 | 914 | - | 3 100 | 230 |
| 8 | 660 | 663 | 660 | 1 301 | 1 092 | - | 5 500 | 390 |
| 10 | 787 | 790 | 787 | 1 441 | 1 181 | - | 8 485 | 620 |
| 12 | 838 | 841 | 838 | 1 644 | 1 333 | - | 12 850 | 880 |
| 14 | 889 | 892 | 889 | 1 841 | 1 473 | - | 15 370 | 1 350 |
| 16 | 991 | 993 | 991 | 2 070 | 1 651 | - | 20 170 | 1 700 |
| 18 | 1 092 | 1 095 | 1 092 | 2 184 | 1 727 | - | 26 200 | 2 140 |
| 20 | 1 194 | 1 200 | 1 193 | 2 540 | 2 019 | - | 32 100 | 2 450 |
| 24 | 1 397 | 1 406 | 1 397 | 2 755 | - | 2 383 | 46 750 | 4 550 |
| 26 | 1 448 | 1 460 | 1 448 | 2 921 | - | 2 500 | 56 300 | 5 260 |
| 28 | 1 549 | 1 562 | 1 549 | 3 136 | - | 2 663 | 65 900 | 5 960 |
| 30 | 1 651 | 1 664 | 1 651 | 3 327 | - | 2 840 | 75 520 | 6 700 |
| 32 | 1 778 | 1 794 | 1 778 | 3 581 | - | 3 100 | 85 180 | 8 312 |
| 36 | 2 083 | 2 098 | 2 083 | 4 013 | - | 3 450 | 114 250 | 10 125 |
| 40 | 2 149 | - | 2 149 | 4 241 | - | 3 600 | 156 127 | 14 300 |
| 42 | 2 260 | - | 2 260 | 4 322 | - | 3 950 | 197 272 | 16 460 |
| 48 | 2 667 | - | 2 667 | 5 461 | - | 4 600 | 296 300 | 22 900 |

Class 900 – Gate Valve Dimensions

| Size (") | RF (mm) | RTJ (mm) | BW (mm) | H (mm) | L (mm) | K (mm) | CV | Approx. Weight RF (kg) |
|----------|---------|----------|---------|--------|--------|--------|---------|------------------------|
| 2 | 368 | 371 | 368 | 468 | 433 | – | 155 | 70 |
| 3 | 381 | 384 | 381 | 685 | 609 | – | 650 | 105 |
| 4 | 457 | 460 | 457 | 774 | 673 | – | 1 200 | 140 |
| 6 | 610 | 612 | 610 | 1 016 | 863 | – | 2 850 | 300 |
| 8 | 737 | 739 | 737 | 1 282 | 1 079 | – | 5 025 | 530 |
| 10 | 838 | 841 | 838 | 1 485 | 1 231 | – | 7 850 | 950 |
| 12 | 965 | 968 | 965 | 1 682 | 1 384 | – | 11 500 | 1 400 |
| 14 | 1 029 | 1 038 | 1 029 | 1 924 | 1 574 | – | 13 900 | 1 800 |
| 16 | 1 130 | 1 140 | 1 130 | – | – | 2 159 | 18 150 | 2 400 |
| 18 | 1 219 | 1 232 | 1 219 | – | – | 2 362 | 23 910 | 3 000 |
| 20 | 1 321 | 1 333 | 1 321 | – | – | 2 463 | 29 550 | 3 800 |
| 24 | 1 549 | 1 568 | 1 549 | – | – | 3 048 | 42 570 | 4 900 |
| 26 | 1 574 | – | 1 574 | – | – | 3 436 | 52 167 | 6 160 |
| 28 | 1 663 | – | 1 663 | – | – | 3 787 | 60 500 | 7 728 |
| 30 | 1 778 | – | 1 778 | – | – | 4 100 | 69 452 | 10 080 |
| 32 | 1 854 | – | 1 854 | – | – | 4 270 | 79 092 | 12 320 |
| 36 | 2 032 | – | 2 032 | – | – | 4 712 | 103 212 | 15 120 |

Class 1500

| SIZE | FACE TO FACE (A) RF | FACE TO FACE (A) RTJ | FACE TO FACE (A) BW | H | L | K | CV | Approx. Weight RF (Kg.) |
|------|------------------------|-------------------------|------------------------|------|-----|------|-------|----------------------------|
| 2" | 451 | 454 | 451 | 460 | 425 | - | 164 | 80 |
| 3" | 578 | 584 | 578 | 696 | 625 | - | 275 | 275 |
| 4" | 673 | 683 | 673 | 819 | 733 | - | 460 | 460 |
| 6" | 914 | 927 | 914 | 1000 | 877 | - | 1100 | 1100 |
| 8" | 1022 | 1038 | 1022 | - | - | 1567 | 1970 | 1970 |
| 10" | 1270 | 1292 | 1270 | - | - | 1680 | 3130 | 3130 |
| 12" | 1422 | 1444 | 1422 | - | - | 1840 | 4535 | 4535 |
| 14" | 1526 | - | 1526 | - | - | 1974 | 8368 | 5500 |
| 16" | 1699 | - | 1699 | - | - | 2080 | 10955 | 7210 |
| 18" | 1908 | - | 1908 | - | - | 2214 | 14481 | 9415 |
| 20" | 2012 | - | 2012 | - | - | 2427 | 17587 | 11450 |
| 24" | 2220 | - | 2220 | - | - | 2672 | 21338 | 16575 |

Class 2500

| SIZE | FACE TO FACE (A) RF | FACE TO FACE (A) RTJ | FACE TO FACE (A) BW | H | L | K | CV | Approx. Weight RF (Kg.) |
|------|------------------------|-------------------------|------------------------|------|------|------|-------|----------------------------|
| 2" | 368 | 371 | 368 | 468 | 433 | - | 200 | 70 |
| 3" | 470 | 472 | 470 | 781 | 711 | - | 600 | 130 |
| 4" | 546 | 549 | 546 | 876 | 774 | - | 1070 | 200 |
| 6" | 705 | 711 | 705 | 1104 | 965 | - | 2500 | 410 |
| 8" | 832 | 841 | 832 | 1422 | 1244 | - | 4370 | 720 |
| 10" | 991 | 1000 | 991 | 1784 | 1562 | - | 6850 | 1400 |
| 12" | 1130 | 1146 | 1130 | - | - | 1955 | 9980 | 2500 |
| 14" | 1257 | 1276 | 1257 | - | - | 2057 | 12000 | 3200 |
| 16" | 1384 | 1406 | 1384 | - | - | 2311 | 15675 | 3800 |
| 18" | 1537 | 1559 | 1537 | - | - | 2438 | 20640 | 4400 |
| 20" | 1664 | 1686 | 1664 | - | - | 2590 | 25880 | 5200 |
| 24" | 1943 | 1971 | 1943 | - | - | 2946 | 31175 | 9500 |
| 26" | 3032 | - | 3032 | - | - | 3253 | 45514 | 10235 |
| 28" | 2209 | - | 2209 | - | - | 3573 | 53320 | 11500 |
| 30" | 2286 | - | 2286 | - | - | 3933 | 61095 | 15525 |
| 32" | 2413 | - | 2413 | - | - | 4313 | 73478 | 18400 |
| 36" | 2565 | - | 2565 | - | - | 4705 | 96862 | 21735 |

9. API 6A Gate Valve Dimensions

API 6A, Class 2000

| SIZE | FACE TO FACE (A) | H | L | K | CV | Approx. Weight (Kg.) |
|---------|------------------|------|------|-----|------|----------------------|
| 2-1/16" | 508 | 660 | 609 | 76 | 28 | 32 |
| 2-9/16" | 546 | 698 | 647 | 76 | 60 | 50 |
| 3-1/8" | 571 | 794 | 742 | 89 | 100 | 75 |
| 4-1/16" | 609 | 889 | 838 | 89 | 230 | 120 |
| 5-1/8" | 698 | 952 | 901 | 101 | 370 | 185 |
| 6-1/4" | 749 | 1047 | 996 | 101 | 630 | 250 |
| 7-1/16" | 787 | 1155 | 1104 | 114 | 820 | 300 |
| 9" | 863 | 1282 | 1231 | 127 | 1340 | 450 |
| 11" | 990 | 1485 | 1434 | 127 | 2000 | 675 |

Export to Sheets

API 6A, Class 3000

| SIZE | FACE TO FACE (A) | H | L | K | CV | Approx. Weight (Kg.) |
|---------|------------------|------|------|-----|------|----------------------|
| 2-1/16" | 508 | 660 | 609 | 76 | 28 | 32 |
| 2-9/16" | 546 | 698 | 647 | 76 | 60 | 50 |
| 3-1/8" | 571 | 794 | 742 | 89 | 100 | 75 |
| 4-1/16" | 609 | 889 | 838 | 89 | 230 | 120 |
| 5-1/8" | 698 | 952 | 901 | 101 | 370 | 185 |
| 6-1/4" | 749 | 1047 | 996 | 101 | 630 | 250 |
| 7-1/16" | 787 | 1155 | 1104 | 114 | 820 | 300 |
| 9" | 863 | 1282 | 1231 | 127 | 1340 | 450 |
| 11" | 990 | 1485 | 1434 | 127 | 2000 | 675 |

Export to Sheets

API 6A, Class 5000

| SIZE | FACE TO FACE (A) | H | L | K | CV | Approx. Weight (Kg.) |
|---------|------------------|------|------|-----|------|----------------------|
| 2-1/16" | 508 | 660 | 609 | 76 | 28 | 32 |
| 2-9/16" | 546 | 698 | 647 | 76 | 60 | 50 |
| 3-1/8" | 571 | 794 | 742 | 89 | 100 | 75 |
| 4-1/16" | 609 | 889 | 838 | 89 | 230 | 120 |
| 5-1/8" | 698 | 952 | 901 | 101 | 370 | 185 |
| 6-1/4" | 749 | 1047 | 996 | 101 | 630 | 250 |
| 7-1/16" | 787 | 1155 | 1104 | 114 | 820 | 300 |
| 9" | 863 | 1282 | 1231 | 127 | 1340 | 450 |
| 11" | 990 | 1485 | 1434 | 127 | 2000 | 675 |

Export to Sheets

API 6A, Class 10000

| SIZE | FACE TO FACE (A) | H | L | K | CV | Approx. Weight (Kg.) |
|------|------------------|---|---|---|----|----------------------|
|------|------------------|---|---|---|----|----------------------|

| | | | | | | |
|-----------------|-----|------|------|-----|-----|-----|
| 1-13/16" | 444 | 559 | 508 | 76 | 12 | 16 |
| 2-1/16" | 508 | 660 | 609 | 76 | 28 | 32 |
| 2-9/16" | 546 | 698 | 647 | 76 | 60 | 50 |
| 3-1/8" | 571 | 794 | 742 | 89 | 100 | 75 |
| 4-1/16" | 609 | 889 | 838 | 89 | 230 | 120 |
| 5-1/8" | 698 | 952 | 901 | 101 | 370 | 185 |
| 6-1/4" | 749 | 1047 | 996 | 101 | 630 | 250 |
| 7-1/16" | 787 | 1155 | 1104 | 114 | 820 | 300 |

Export to Sheets

API 6A, Class 15000

| SIZE | FACE TO FACE (A) | H | L | K | CV | Approx. Weight (Kg.) |
|-----------------|------------------|-----|-----|----|-----|----------------------|
| 1-13/16" | 444 | 559 | 508 | 76 | 12 | 16 |
| 2-1/16" | 508 | 660 | 609 | 76 | 28 | 32 |
| 2-9/16" | 546 | 698 | 647 | 76 | 60 | 50 |
| 3-1/8" | 571 | 794 | 742 | 89 | 100 | 75 |
| 4-1/16" | 609 | 889 | 838 | 89 | 230 | 120 |

MANUFACTURING RANGE

| Standards | Sizes | Features Design - Materials |
|--------------------|---|--|
| ANSI B16.34 | 1/2" - 72" ANSI 150 | Bolted bonnet |
| API 600 | 1/2" - 64" ANSI 300 | Pressure seal |
| API 6D | 1/2" - 48" ANSI 600/900 | Cast and forged |
| BS-1414 | 1/2" - 36" ANSI 1500/2500, 1/2" - 24" ANSI 4500 | Solid Wedge Flexible Split Wedge |
| API 6A | 2-1/16" to 7-1/16" class 2000 2-1/16" to 7-1/16" class 3000 2-1/16" to 9" class 5000 1-13/16" to 7-1/16" class 10000 | Parallel Slide Through conduit, Special Designs Double Block and Bleed |

| | | |
|--|--------------------------------|--|
| | 1-13/16" to 5-1/8" class 15000 | |
|--|--------------------------------|--|

Attachment 9

ENEQ Consult – Globe Valves Catalogue 2025

ENEQ Consult Ltd. delivers cost-effective mechanical equipment for nuclear, conventional, oil & gas, and petrochemical industries, with a strong focus on nuclear power plants using PWR reactor technology.

- **9 years** of solid performance
- **> 20 M€** project portfolio
- **> 50** completed projects, **> 10** in progress
- Exclusive partnerships with **15 manufacturers worldwide**
- Equipment compliant with **ASME, EN, N Stamp, DIN, ASTM, ISO, GOST**

Expertise:

- **Equipment Supply** – high-quality OEMs, cost-effective modernization and new-build NPP solutions, turnkey delivery
- **Engineering** – design critical analyses, FEA & CFD calculations, technical consulting
- **Service** – full project support from production to installation, commissioning, and after-sales

Globe Valve Portfolio Overview

| Series/Design | Pressure Rating | Size Range | Features/Design |
|--|-----------------|------------|--|
| Shut-off globe valve C09/C09.4 | PN 10-40 | DN 15-200 | Max Temp: 400°C; Connection: Flanged, weld ends; Actuation: Handwheel, gearbox, electric actuator, (remote control, pneumatic on request); Stem/Wedge: Rotating rising stem |
| Shut-off globe valve with bellows C09.1/C09.5 | PN 10-40 | DN 15-200 | Max Temp: 400°C; Connection: Flanged, weld ends, combination; Actuation: Handwheel, gearbox, electric actuator, remote control, pneumatic actuator; Stem/Wedge: Shut-off with bellows, control cone with bellows |
| Drain valve C09 | PN 10-40 | DN 15-200 | Max Temp: 400°C; Connection: Flanged, weld ends, combination; Actuation: Handwheel, gearbox, electric actuator, |

| | | | |
|--|------------|-----------|--|
| | | | remote control, pneumatic actuator; Stem/Wedge: Shut-off globe valve |
| High-pressure shut-off globe valve with regulating disc V30/V40 | PN 63-160 | DN 50-150 | Max Temp: 550°C; Connection: Flanged, weld ends, combination; Actuation: Handwheel, gearbox, electric actuator, remote control, pneumatic/hydraulic actuator attachment; Stem/Wedge: Regulating disc |
| High-pressure shut-off globe valve V46.2/V40.2 | PN 10-160 | DN 15-200 | Max Temp: 600°C; Connection: Flanged, weld ends, threaded ends, socket-weld, combination; Actuation: Handwheel, gearbox, electric actuator, remote control, pneumatic/hydraulic actuator attachment; Stem/Wedge: Non-rotating stem |
| High-pressure shut-off globe valve V10.1 | PN 160-400 | DN 10-25 | Connection: Weld ends, socket weld |
| High-pressure shut-off globe valve V58/V43 | PN 160-400 | DN 15-200 | Max Temp: 600°C; Connection: Flanged, weld ends, threaded ends; Actuation: Handwheel, gearbox, electric actuator, pneumatic/hydraulic actuator attachment, remote control |
| High-pressure shut-off globe valve V60 | PN 160-400 | DN 50-200 | Max Temp: 600°C; Connection: Flanged, weld ends; Actuation: Handwheel, gearbox, electric actuator, pneumatic/hydraulic actuator attachment; Stem/Wedge: Bellows-sealed |
| High-pressure shut-off globe valve V15/V15.1 | PN 160-400 | DN 10-100 | Max Temp: 600°C; Connection: Flanged, weld ends; Actuation: Handwheel, gearbox, electric actuator, remote control, pneumatic/hydraulic actuator attachment |
| High-pressure shut-off globe valve V46.3/V40.3 | PN 10-160 | DN 15-200 | Max Temp: 600°C; Connection: Flanged, weld ends, threaded ends, socket-weld; Actuation: Handwheel, gearbox, electric actuator, remote control, pneumatic/hydraulic actuator attachment; Stem/Wedge: Non-rotating stem |
| Shut-off globe valve with regulating disc V53.2 | PN 10-40 | DN 15-200 | Max Temp: 400°C; Connection: Flanged, weld ends; Actuation: Handwheel, gearbox, electric actuator, remote control, pneumatic actuator; Stem/Wedge: Shut-off globe valve with regulating disc |

| | | | |
|---------------------|---------------|---|---|
| Globe Valves | ANSI 150-4500 | 1/2"-48" (ANSI 150/300) 1/2"-36" (ANSI 600/900) 1/2"-24" (ANSI 1500/2500) 1/2"-12" (ANSI 4500) | Bolted Bonnet, Pressure seal; Cast and forged; Zero steam leakage; Non-return; "Y" pattern, Bellows seal, Stop check, Angle globe valve designs |
|---------------------|---------------|---|---|

SHUT-OFF GLOBE VALVE C09/C09.4

PN 10–40; DN 15–200; T_{max}: 400 °C



SHUT-OFF GLOBE VALVE C09/C09.4

APPLICATION

- water, steam, gas, oil, petroleum products, non-aggressive and aggressive substances

CONNECTION

- flanged, weld ends

OPERATION

- handwheel, gearbox, electric actuator, (remote control, pneumatic actuator on request)

DESCRIPTION

- shut-off globe valve C09 and shut-off globe valve with control cone C09.4
- rotating rising stem
- standard bonnet construction
- design of the body is straight
- sealing surface is welded by hard facing (13Cr) or Stellite 6 (except for stainless steel types)
- complies with the requirements of the directive 2014/68 / EU and standard EN 13 709
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

- control cone (for rough control) - type C09.4
- according to TRD 201
- TA-Luft

SHUT-OFF GLOBE VALVE C09/C09.4

| Pos. | Part | Material | | | | | | | | | | | |
|------|--------------------------------|--------------------|------------|---------|------------|------------------------|------|---------|------------|------------------------|----------------------------|--------|------|
| | | Material | | | | Material | | | | | | | |
| 1 | Body | GP240GH (1.0619) | | | | G21Mn5 (1.1138) | | | | GX5CrNi19-10 (1.4308) | GX5CrNiMo19-11-2 (1.4408) | | |
| | Hard facing of sealing surface | 13Cr | 13Cr | 18Cr9Ni | 18Cr9Ni | Stellite 6 | 13Cr | 18Cr9Ni | Stellite 6 | - | | | |
| 2 | Yoke | GP 240 GH (1.0619) | | | | G21Mn5 (1.1138) | | | | GX5CrNi19-10 (1.4308) | GX5CrNiMo19-11-2 (1.4408) | | |
| 3 | Disc | P250GH (1.0460) | | | | X6CrNiTi18-10 (1.4541) | | | | X6CrNiTi18-10 (1.4541) | X6CrNiMoTi17-12-2 (1.4571) | | |
| | Hard facing of sealing surface | 13Cr | Stellite 6 | 18Cr9Ni | Stellite 6 | Stellite 6 | - | | | | - | | |
| 4 | Stem | X20Cr13 (1.4021) | | | | X20Cr13 (1.4021) | | | | X5CrNi18-10 (1.4301) | X6CrNiMoTi17-12-2 (1.4571) | | |
| 5 | Gasket | Graphite | | | | | | | | Grafit | PTFE | Grafit | PTFE |
| 6 | Gland packing | Graphite | | | | | | | | Grafit | PTFE | Grafit | PTFE |
| 7 | Bolt | A2-70 | | | | | | | | | | | |
| 8 | Nut | A2-70 | | | | | | | | | | | |

VALVE DIMENSIONS

1. Flanged

Face-to-face dimensions:

EN 558 – line 1

Flanges:

EN 1092-1

2. Weld ends

Face-to-face dimensions:

EN 12982 – line 1

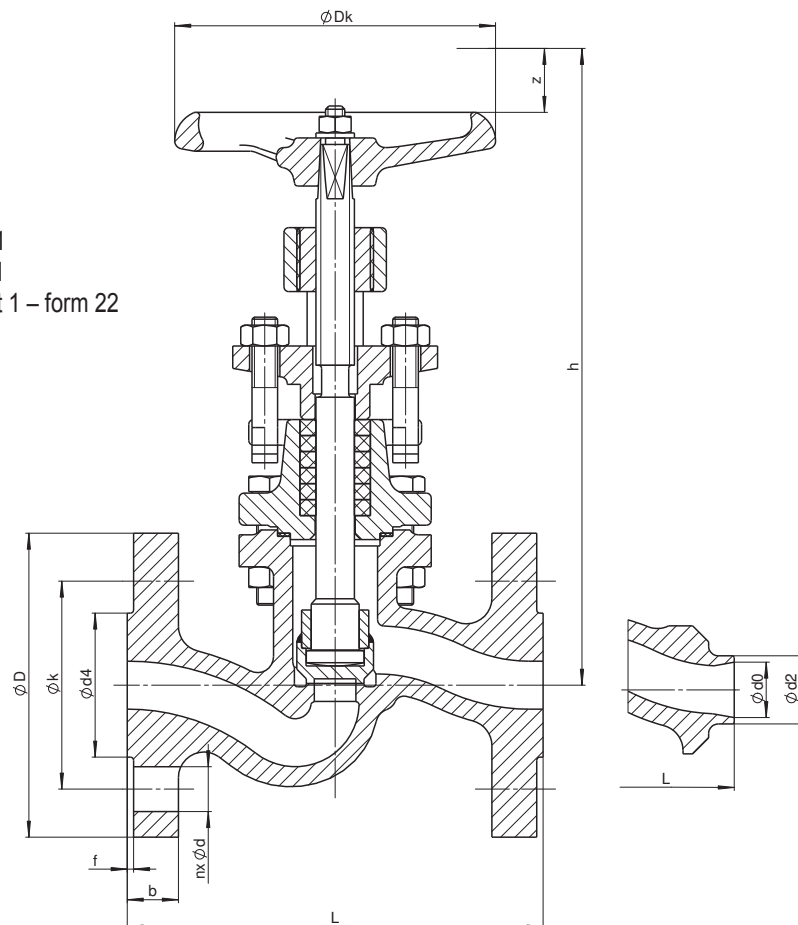
Dimensions of welding ends:

DIN 3239 – part 1

Groove form:

DIN 2559 – sheet 1 – form 22

Other adjustments on request

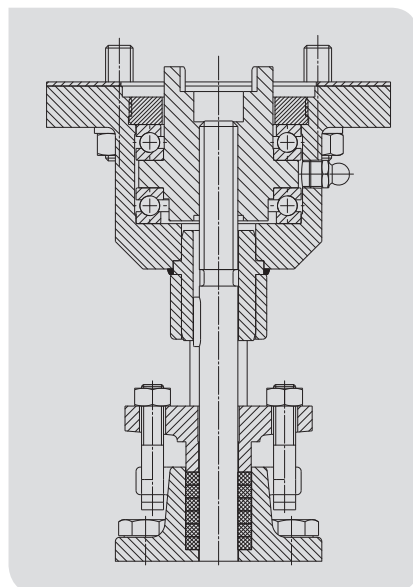


SHUT-OFF GLOBE VALVE C09/C09.4

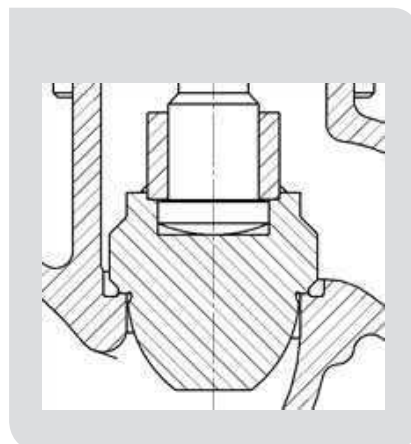
| Nominal pressure | Nominal size | Face-to-face | Centre-to-top-height | Stroke | Handwheel | Flanged | | | | | | | Weld ends | | | |
|------------------|--------------|--------------|----------------------|--------|-----------|---------|--------|--------|--------|--------|-----------|--------|-----------|---------|-----------|----------------|
| | | | | | | n | d [mm] | k [mm] | D [mm] | b [mm] | d4xf [mm] | m [kg] | d2 [mm] | d0 [mm] | m [kg] | Pipe dimension |
| PN | DN | L [mm] | h [mm] | z [mm] | Dk [mm] | | | | | | | | | | | |
| 10, 16 | 15 | 130 | 200 | 20 | 125 | 4 | 14 | 65 | 95 | 16 | 45x2 | 3,5 | 22 | 17 | 2,9 | 21,3x2,0 |
| | 20 | 150 | 243 | 24 | 125 | 4 | 14 | 75 | 105 | 18 | 58x2 | 5,5 | 28 | 22 | 3,2 | 26,9x2,3 |
| | 25 | 160 | 250 | 30 | 125 | 4 | 14 | 85 | 115 | 18 | 68x2 | 6,0 | 34 | 28,5 | 3,5 | 33,7x2,6 |
| | 32 | 180 | 258 | 23 | 160 | 4 | 18 | 100 | 140 | 18 | 78x2 | 9,0 | 43 | 37 | 3,9 | 42,4x2,6 |
| | 40 | 200 | 290 | 30 | 200 | 4 | 18 | 110 | 150 | 18 | 88x3 | 12,0 | 49 | 43 | 6,2 | 48,3x2,6 |
| | 50 | 230 | 295 | 35 | 200 | 4 | 18 | 125 | 165 | 18 | 102x3 | 15,0 | 61 | 54 | 7,8 | 60,3x3,2 |
| | 65 | 290 | 320 | 25 | 200 | 8 | 18 | 145 | 185 | 18 | 122x3 | 22,0 | 77 | 69 | 17,0 | 76,1x3,6 |
| | 80 | 310 | 355 | 37 | 200 | 8 | 18 | 160 | 200 | 20 | 138x3 | 27,0 | 90 | 81 | 21,0 | 88,9x4,0 |
| | 100 | 350 | 390 | 45 | 250 | 8 | 18 | 180 | 220 | 20 | 158x3 | 39,0 | 115 | 104 | 32,0 | 114,3x5,0 |
| | 125 | 400 | 560 | 65 | 320 | 8 | 18 | 210 | 250 | 22 | 188x3 | 57,0 | 141 | 130,5 | 47,0 | 139,7x4,5 |
| 150 | 480 | 710 | 130 | 320 | 8 | 22 | 240 | 285 | 22 | 212x3 | 82,0 | 170 | 156,5 | 69,0 | 168,3x5,6 | |
| 10 | 200 | 600 | 874 | 104 | 630 | 8 | 22 | 295 | 340 | 24 | 268x3 | 194,5 | 222 | 204,5 | 179,5 | 219,1x7,1 |
| 16 | 200 | 600 | 874 | 104 | 630 | 12 | 22 | 295 | 340 | 24 | 268x3 | 194,3 | 222 | 204,5 | 179,5 | 219,1x7,1 |
| 25, 40 | 15 | 130 | 200 | 20 | 125 | 4 | 14 | 65 | 95 | 16 | 45x2 | 3,5 | 22 | 17 | 2,5 | 21,3x2,0 |
| | 20 | 150 | 243 | 24 | 125 | 4 | 14 | 75 | 105 | 18 | 58x2 | 5,5 | 28 | 22 | 4,0 | 26,9x2,3 |
| | 25 | 160 | 250 | 30 | 125 | 4 | 14 | 85 | 115 | 18 | 68x2 | 6,0 | 34 | 28,5 | 4,0 | 33,7x2,6 |
| | 32 | 180 | 258 | 23 | 160 | 4 | 18 | 100 | 140 | 18 | 78x2 | 9,0 | 43 | 37 | 6,0 | 42,4x2,6 |
| | 40 | 200 | 290 | 30 | 200 | 4 | 18 | 110 | 150 | 18 | 88x3 | 12,0 | 49 | 43 | 8,0 | 48,3x2,6 |
| | 50 | 230 | 295 | 35 | 200 | 4 | 18 | 125 | 165 | 20 | 102x3 | 15,0 | 61 | 54 | 11,0 | 60,3x3,2 |
| | 65 | 290 | 340 | 25 | 200 | 8 | 18 | 145 | 185 | 22 | 122x3 | 31,0 | 77 | 69 | 25,0 | 76,1x3,6 |
| | 80 | 310 | 355 | 37 | 250 | 8 | 18 | 160 | 200 | 24 | 138x3 | 36,0 | 90 | 81 | 29,0 | 88,9x4,0 |
| | 100 | 350 | 420 | 45 | 320 | 8 | 22 | 190 | 235 | 24 | 162x3 | 50,0 | 115 | 104 | 41,0 | 114,3x5,0 |
| | 125 | 400 | 570 | 65 | 400 | 8 | 26 | 220 | 270 | 26 | 188x3 | 83,0 | 141 | 130,5 | 72,0 | 139,7x4,5 |
| 150 | 480 | 665 | 65 | 500 | 8 | 26 | 250 | 300 | 28 | 218x3 | 112,0 | 170 | 156,5 | 97,0 | 168,3x5,6 | |
| 25 | 200 | 600 | 874 | 104 | 630 | 12 | 26 | 310 | 360 | 30 | 278x3 | 220,0 | 222 | 204,5 | 192,0 | 219,1x7,1 |
| 40 | 200 | 600 | 874 | 104 | 630 | 12 | 30 | 320 | 375 | 34 | 285x3 | 221,0 | 222 | 204,5 | 192,0 | 219,1x7,1 |

DESIGN VARIANTS

ADJUSTMENT FOR ACTUATOR - FORM C ACCORDING TO DIN 3338



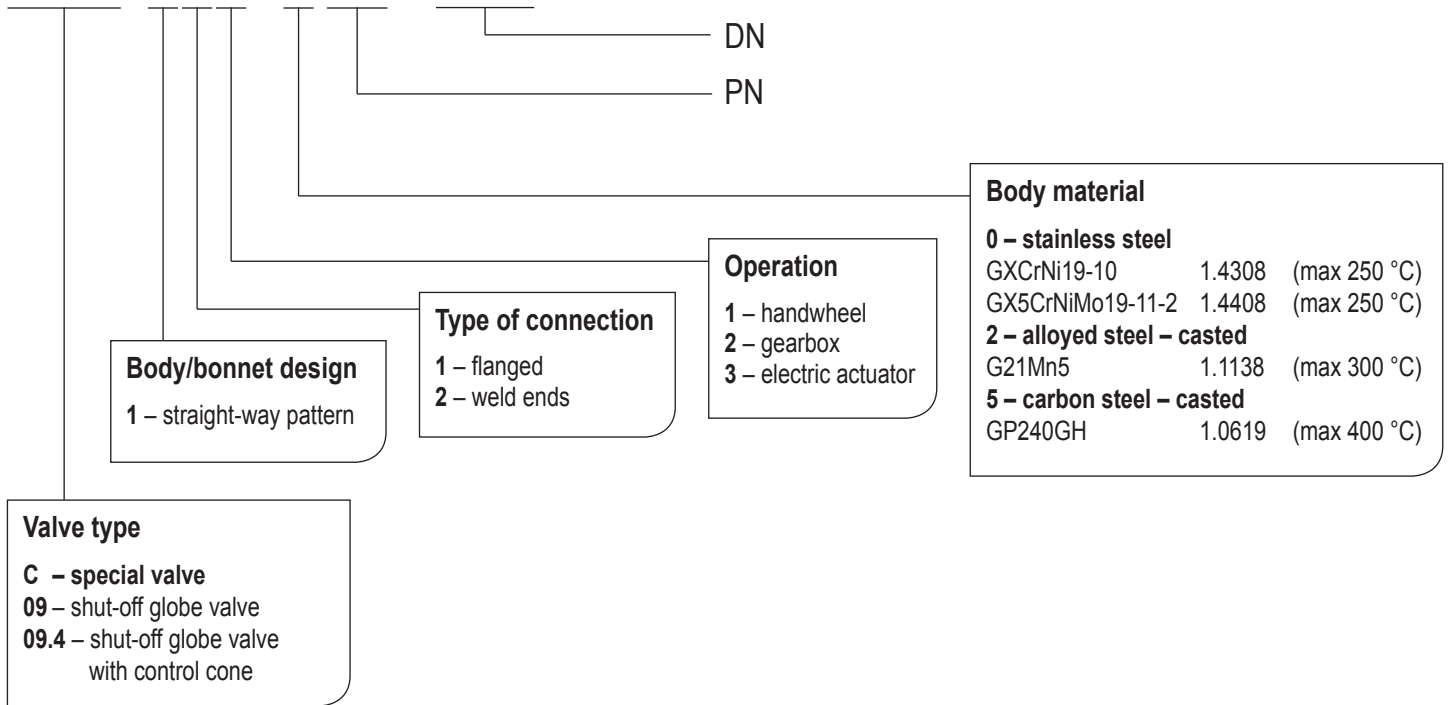
CONTROL CONE



SHUT-OFF GLOBE VALVE C09/C09.4

VALVE DESCRIPTION CODE

C09 111-540-150



VALVE INSTALLATION

Valve can be installed in any position. Medium must flow in accordance with the direction indicated on the body. It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with the operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and the flowing medium, therefore it is necessary keep working environment and pipeline clean
- medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

SHUT – OFF GLOBE VALVE WITH BELLOWS C09.1/C09.5

PN 10–40; DN 15–80; T_{MAX}: 400 °C



SHUT – OFF GLOBE VALVE WITH BELLOWS C09.1/C09.5

APPLICATION

- water, steam, gas, oil, petroleum products, non-aggressive and aggressive substances

CONNECTION

- flanged, weld ends

OPERATION

- handwheel, gearbox, electric actuator

DESCRIPTION

- shut-off globe valve C09.1 and shut-off globe valve with control cone and with bellows C09.5
- non-rotating rising stem
- the bellows prevents the medium from penetrating into the gland space
- standard bonnet construction
- design of the body is straight sealing
- sealing surface is welded by hard facing (13Cr) or Stellite 6 (except for stainless steel types)
- complies with the requirements of the directive 2014/68/EU and standard EN 13 709
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

- control cone (for rough control) - type C09.5
- according to TRD 201
- TA-Luft

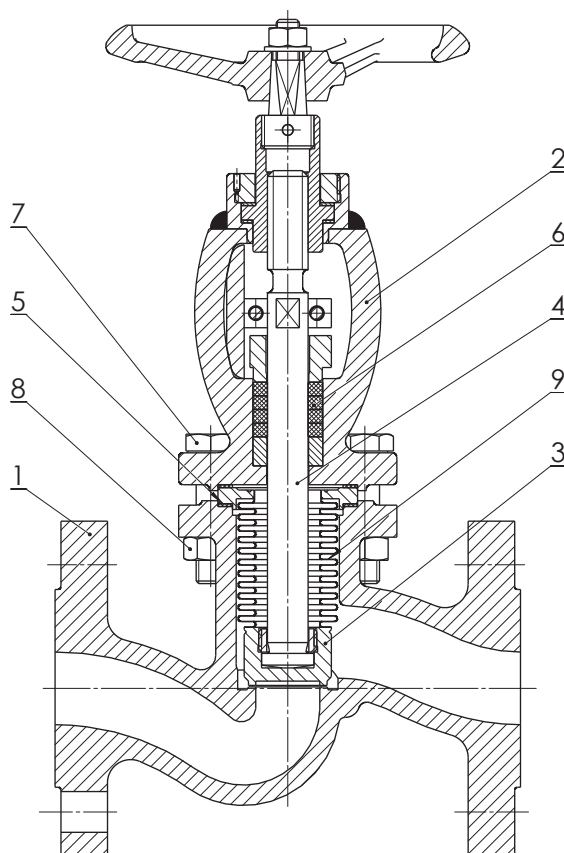
SHUT – OFF GLOBE VALVE WITH BELLOWS C09.1/C09.5

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | |
|--|----|---|-----|-----|------|------|------|------|------|------|-----|------|
| | | -50 | -30 | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 |
| GX5CrNiMo 19-11-2 (1.4408) ¹⁾ | 10 | 10 | 10 | 10 | 10 | 9,3 | 8,4 | 7,8 | 7,3 | - | - | - |
| | 16 | 16 | 16 | 16 | 16 | 14,9 | 13,5 | 12,4 | 11,7 | - | - | - |
| | 25 | 25 | 25 | 25 | 25 | 23,3 | 21,1 | 19,4 | 18,3 | - | - | - |
| | 40 | 40 | 40 | 40 | 40 | 37,3 | 33,8 | 31,1 | 29,3 | - | - | - |
| GX5CrNi19-10 (1.4308) | 10 | 10 | 10 | 10 | 9,3 | 8,4 | 7,6 | 6,9 | 6,4 | - | - | - |
| | 16 | 16 | 16 | 16 | 14,9 | 13,5 | 12,1 | 11 | 10,3 | - | - | - |
| | 25 | 25 | 25 | 25 | 23,3 | 21,1 | 18,9 | 17,2 | 16,1 | - | - | - |
| | 40 | 40 | 40 | 40 | 37,3 | 33,8 | 30,2 | 27,6 | 25,8 | - | - | - |
| G21Mn5 (1.1138) | 10 | - | 10 | 10 | 10 | 9,2 | 8,7 | 7,9 | 7,2 | 6,5 | - | - |
| | 16 | - | 16 | 16 | 16 | 14,8 | 14 | 12,8 | 11,8 | 10,8 | - | - |
| | 25 | - | 25 | 25 | 25 | 23 | 21 | 19,2 | 18,2 | 17,2 | - | - |
| | 40 | - | 40 | 40 | 40 | 37 | 35 | 32 | 29,5 | 27 | - | - |
| GP240GH (1.0619) | 10 | - | - | 10 | 10 | 9,3 | 8,7 | 7,8 | 7,1 | 6,4 | 6 | 5,8 |
| | 16 | - | - | 16 | 16 | 14,9 | 13,9 | 12,4 | 11,4 | 10,3 | 9,6 | 9,2 |
| | 25 | - | - | 25 | 25 | 23,3 | 21,7 | 19,4 | 17,8 | 16,1 | 15 | 14,4 |
| | 40 | - | - | 40 | 40 | 37,3 | 34,7 | 30,2 | 28,4 | 25,8 | 24 | 23,1 |

1) Application for temperatures from -196 °C to +250 °C on request

USED MATERIALS



SHUT – OFF GLOBE VALVE WITH BELLOWS C09.1/C09.5

| Pos. | Part | Material | | | | | | | | | | |
|------|--------------------------------|------------------------|------------|---------|------------|------------------------|------|---------|------------------------|----------------------------|--------|------|
| 1 | Body | GP240GH (1.0619) | | | | G21Mn5 (1.1138) | | | GX5CrNi19-10 (1.4308) | GX5CrNiMo19-11-2 (1.4408) | | |
| | Hard facing of sealing surface | 13Cr | 13Cr | 18Cr9Ni | 18Cr9Ni | Stellite 6 | 13Cr | 18Cr9Ni | Stellite 6 | - | | |
| 2 | Yoke | GP 240 GH (1.0619) | | | | G21Mn5 (1.1138) | | | GX5CrNi19-10 (1.4308) | GX5CrNiMo19-11-2 (1.4408) | | |
| 3 | Disc | P250GH (1.0460) | | | | X6CrNiTi18-10 (1.4541) | | | X6CrNiTi18-10 (1.4541) | X6CrNiMoTi17-12-2 (1.4571) | | |
| | Hard facing of sealing surface | 13Cr | Stellite 6 | 18Cr9Ni | Stellite 6 | Stellite 6 | - | - | - | - | | |
| 4 | Stem | X20Cr13 (1.4021) | | | | X20Cr13 (1.4021) | | | X5CrNi18-10 (1.4301) | X6CrNiMoTi17-12-2 (1.4571) | | |
| 5 | Gasket | Graphite | | | | | | | Grafit | PTFE | Grafit | PTFE |
| 6 | Gland packing | Graphite | | | | | | | Grafit | PTFE | Grafit | PTFE |
| 7 | Bolt | A2-70 | | | | | | | | | | |
| 8 | Nut | A2-70 | | | | | | | | | | |
| 9 | Bellows | X6CrNiTi18-10 (1.4541) | | | | | | | | | | |

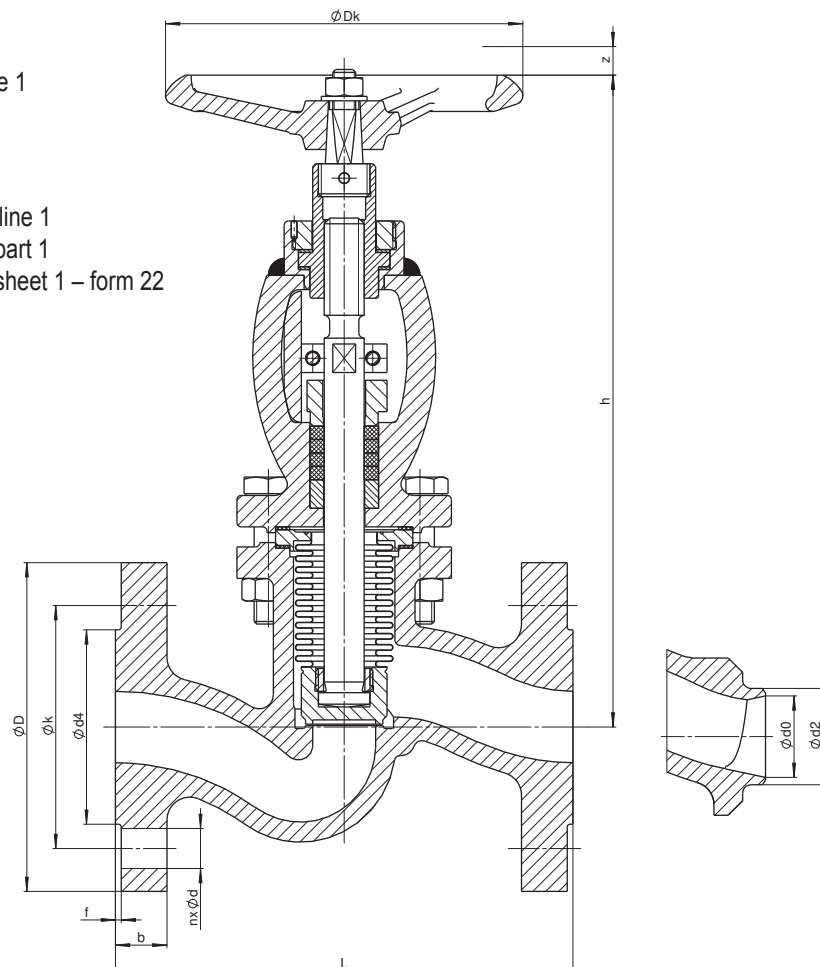
VALVE DIMENSIONS

1. Flanged

Face-to-face dimensions: EN 558 – line 1
 Flanges: EN 1092-1

2. Weld ends

Face-to-face dimensions: EN 12982 – line 1
 Dimensions of welding ends: DIN 3239 – part 1
 Groove form: DIN 2559 – sheet 1 – form 22

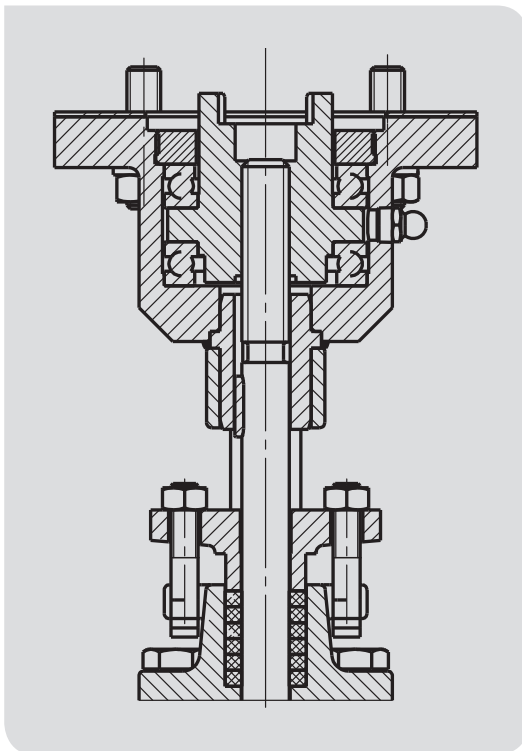


SHUT – OFF GLOBE VALVE WITH BELLOWS C09.1/C09.5

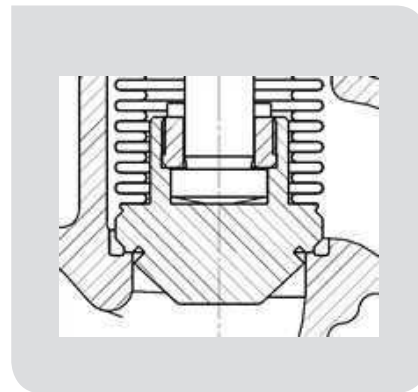
| Nominal pressure | Nominal size | Face-to-face | Centre-to-top-height | Stroke | Handwheel | Flanged | | | | | | | Weld ends | | | |
|------------------|--------------|--------------|----------------------|--------|-----------|---------|----|--------|--------|--------|---------|------|-----------|--------|--------|----------|
| | | | | | | PN | DN | L [mm] | h [mm] | z [mm] | Dk [mm] | n | d [mm] | k [mm] | D [mm] | b [mm] |
| 10, 16, 25, 40 | 15 | 130 | 186 | 4 | 125 | 4 | 14 | 65 | 95 | 16 | 45×2 | 3,5 | 22 | 17 | 2,5 | 21,3×2,0 |
| | 20 | 150 | 225 | 6 | 125 | 4 | 14 | 75 | 105 | 18 | 58×2 | 5,5 | 28 | 22 | 4,0 | 26,9×2,3 |
| | 25 | 160 | 230 | 8 | 125 | 4 | 14 | 85 | 115 | 18 | 68×2 | 6,0 | 34 | 28,5 | 4,5 | 33,7×2,6 |
| | 32 | 180 | 250 | 9 | 160 | 4 | 18 | 100 | 140 | 18 | 78×2 | 9,0 | 43 | 37 | 6,0 | 42,4×2,6 |
| | 40 | 200 | 275 | 11 | 200 | 4 | 18 | 110 | 150 | 18 | 88×3 | 11,5 | 49 | 43 | 8,5 | 48,3×2,6 |
| | 50 | 230 | 290 | 13 | 200 | 4 | 18 | 125 | 165 | 20 | 102×3 | 16,5 | 61 | 54 | 12,0 | 60,3×3,2 |
| 25, 40 | 65 | 290 | 425 | 16 | 250 | 8 | 18 | 145 | 185 | 22 | 122×3 | 36,5 | 77 | 69 | 30,5 | 76,1×3,6 |
| | 80 | 310 | 425 | 16 | 250 | 8 | 18 | 160 | 200 | 24 | 138×3 | 41,0 | 90 | 81 | 34,0 | 88,9×4,0 |

DESIGN VARIANTS

**ADJUSTMENT FOR ACTUATOR
– FORM C ACCORDING TO EN ISO 5210**

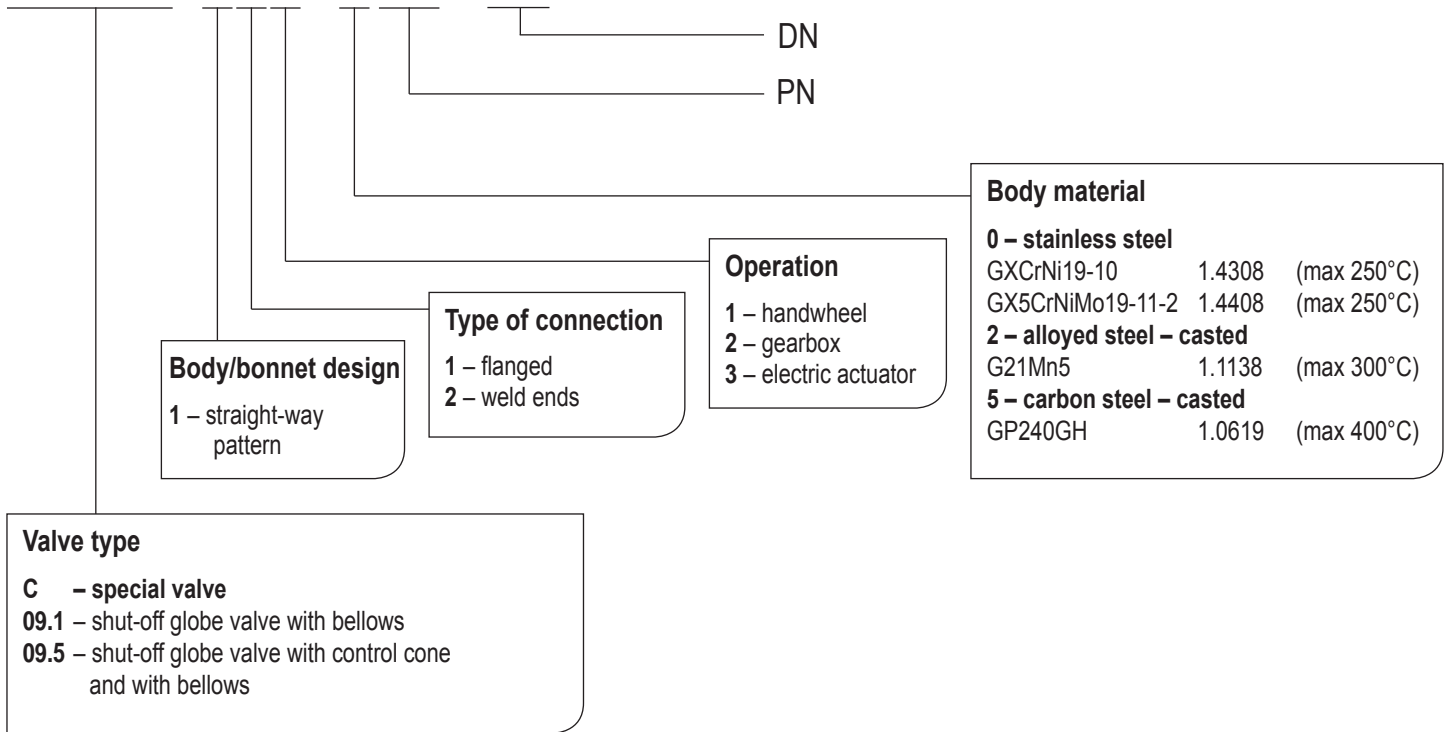


CONTROL CONE



VALVE DESCRIPTION CODE

C09.1 111–540–80



VALVE INSTALLATION

Valve can be installed in any position. Medium must flow in accordance with the direction indicated on the body. It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean
- medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

DRAIN VALVE C09

PN 10, 16; DN 80, 100, 150, 200, 300; T_{MAX}: 200 °C



DRAIN VALVE C09

APPLICATION

- liquids

CONNECTION

- flanged, according to standard EN 1092-1

OPERATION

- handwheel, pneumatic actuator, electric actuator

DESCRIPTION

- rotation rising stem (only with handwheel)
- complies with the requirements of the directive 2014/68/EU
- testing is carried out according to standard EN 12266-1, part 2

BASIC DESIGN OPTIONS

OPERATION BY HANDWHEEL:

- valve for steam
- position indicator

OPERATION BY PNEUMATIC ACTUATOR:

- pneumatic control valve
- air filter and grease nipple
- throttle valve to control closing speed

DRAIN VALVE C09

PRESSURE-TEMPERATURE-RATINGS

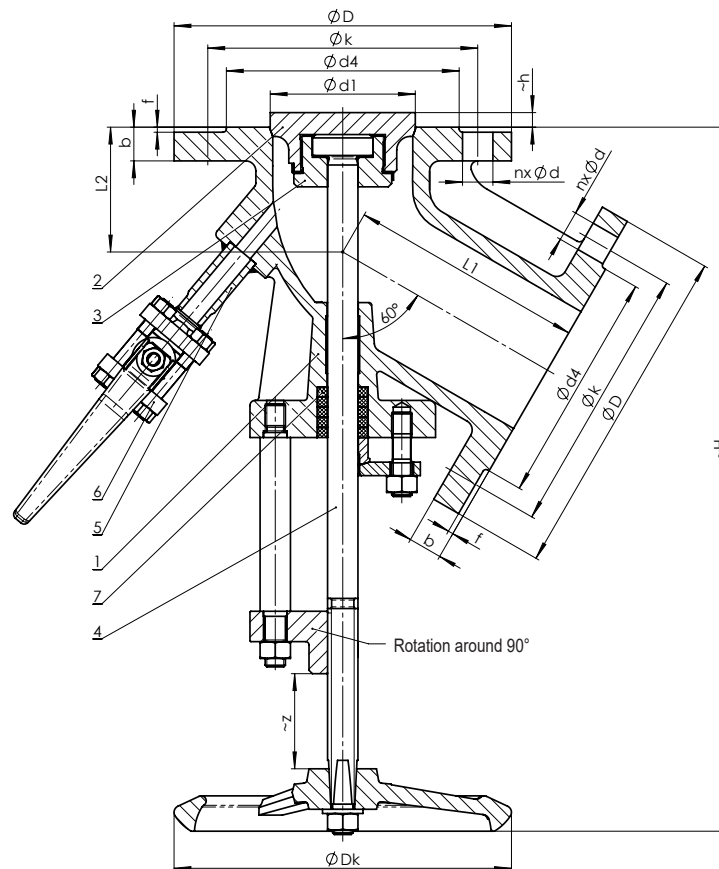
| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | |
|------------------------------|----|---|-----|----|------|------|------|
| | | -60 | -10 | 50 | 100 | 150 | 200 |
| GX5CrNiMo19-11-2 (1.4408) | 10 | 10 | 10 | 10 | 9,3 | 8,4 | 7,8 |
| | 16 | 16 | 16 | 16 | 14,9 | 13,5 | 12,4 |

Warning: Pressure-temperature-ratings specified in the table only apply to the pressure cover of the valve, do not apply to pneumatic actuator.

USED MATERIALS (see the picture below)

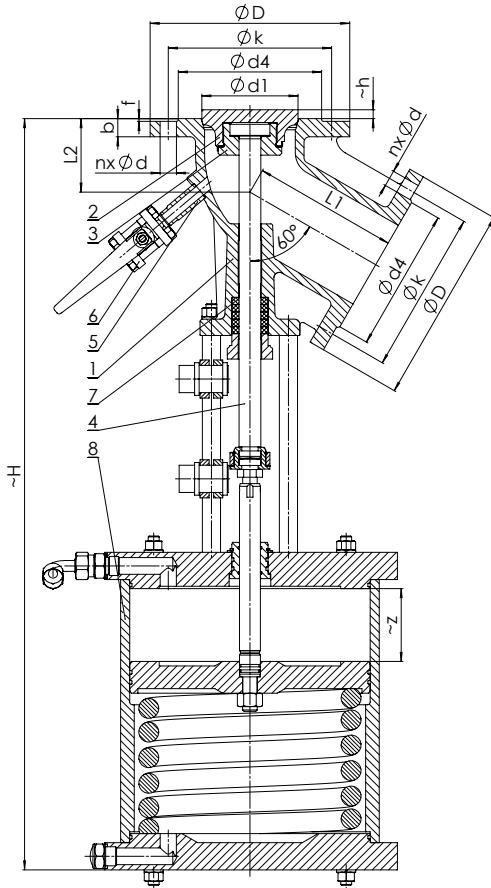
| | | |
|---|-----------------|---------------------------|
| 1 | Body | GX5CrNiMo19-11-2 (1.4408) |
| 2 | Disc | X5CrNiMo17-12-2 (1.4401) |
| 3 | Bushing | X5CrNiMo17-12-2 (1.4401) |
| 4 | Stem | X5CrNiMo17-12-2 (1.4401) |
| 5 | Tube | X6CrNiTi 18-10 (1.4541) |
| 6 | Valve for steam | GX5CrNiMo19-11-2 (1.4408) |
| 7 | Gasket | PTFE |

VALVE DIMENSIONS – operation by handwheel

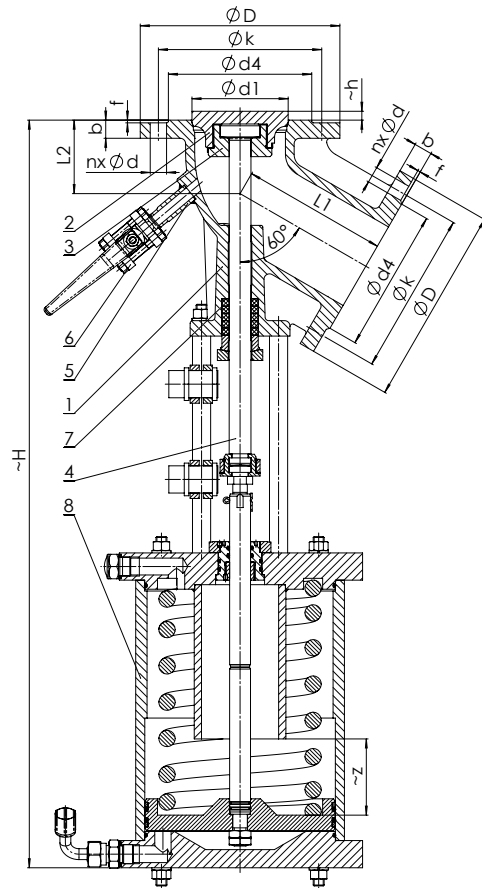


DRAIN VALVE C09

Disc at the top, spring opens



Disc at the top, spring closes



| PN | DN | H [mm] | h [mm] | h2 [mm] | L1 [mm] | L2 [mm] | z [mm] | D [mm] | d1 [mm] | d2 [mm] | d3 [mm] | d4 [mm] | d5 [mm] | k [mm] | n x d [mm] | b [mm] | b2 [mm] | f [mm] | m [kg] |
|----|-----|--------------------|--------|---------|---------|---------|--------|--------|---------|---------|---------|---------|---------|--------|------------|--------|---------|--------|-------------------|
| 10 | 80 | * | 9 | * | 140 | 74 | 56 | 200 | 86 | * | * | 138 | * | 160 | 8x18 | 20 | * | 3 | * |
| | 100 | 824 ¹⁾ | 11 | 10 | 160 | 81 | 80 | 220 | 106 | 65 | 100 | 158 | 145 | 180 | 8x18 | 20 | 15 | 3 | 103 ¹⁾ |
| | 150 | 1000 ¹⁾ | 11 | 15 | 212 | 118 | 114 | 285 | 156 | 100 | 150 | 212 | 210 | 240 | 8x22 | 22 | 20 | 3 | 145 ¹⁾ |
| | 200 | 1200 ¹⁾ | 14 | 20 | 243 | 112 | 134 | 340 | 203 | 153 | 250 | 268 | 270 | 295 | 8x22 | 24 | 25 | 3 | 221 ¹⁾ |
| | 300 | * | 16 | * | 305 | 162 | 202 | 445 | 307 | * | * | 370 | * | 400 | 12x22 | 26 | * | 4 | * |

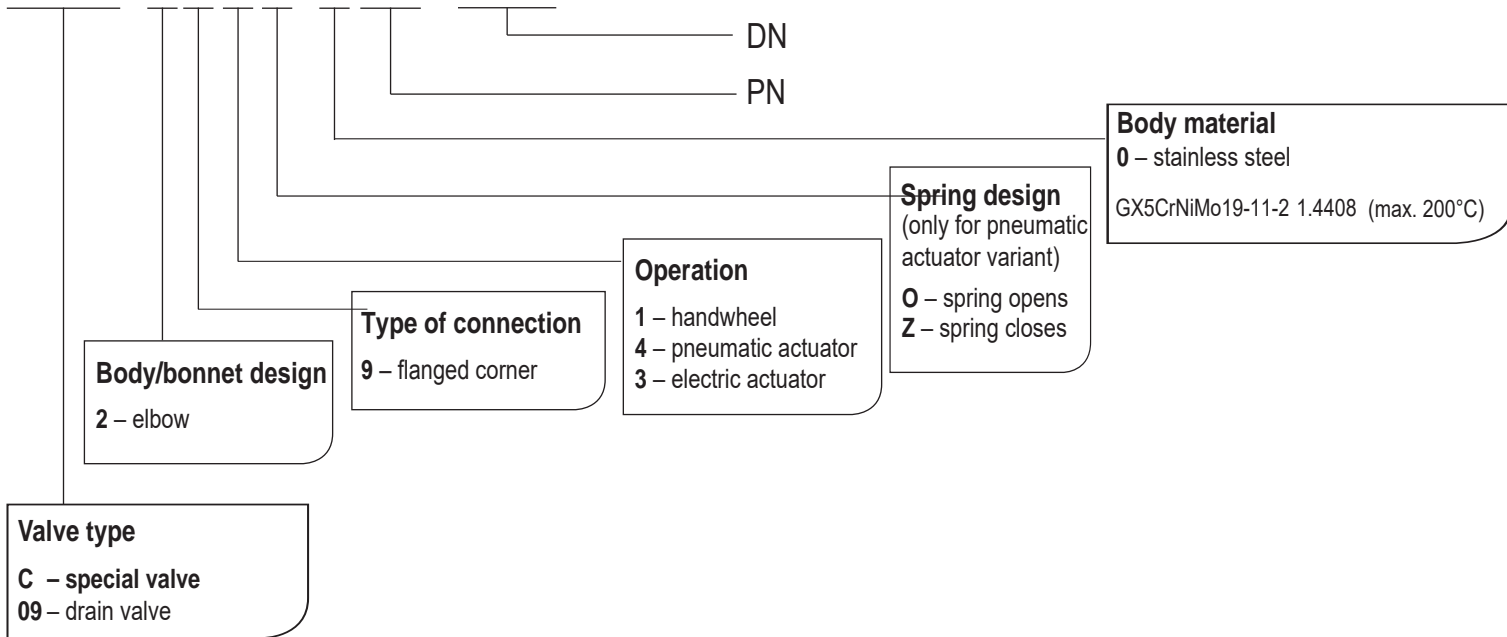
* Values on request

¹⁾ Variable values based on the working pressure of the media

Note: Before ordering, you must specify the working pressure of the medium, in accordance with which the pneumatic actuator will be designed.

VALVE DESCRIPTION CODE

C09 294Z-010-100



VALVE INSTALLATION

The recommended position of the valve is with the stem and the controls vertically down.

Installation and use the valve following points have to be respected:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

HIGH-PRESSURE SAFETY VALVE P10.01

PN 500; DN 10; T_{MAX}: 570 °C



HIGH-PRESSURE SAFETY VALVE P10.01

APPLICATION

- water, steam, gas, oil, petroleum products

CONNECTION

- weld ends

OPERATION

- handwheel

DESCRIPTION

- rotating rising stem
- safety (shut-off) valve
- asbestos-free packing and gasket
- design of the body is straight
- shut-off disc
- complies with the requirements of the directive 2014/68/EU and standard EN 13709
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

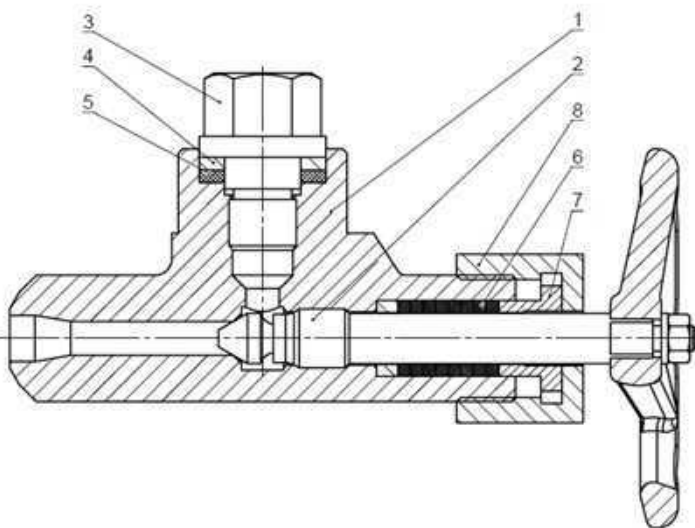
- safety pressure membrane from INCONEL

HIGH-PRESSURE SAFETY VALVE P10.01

PRESSURE-TEMPERATURE-RATING

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | |
|------------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -10 | 50 | 100 | 200 | 300 | 350 | 400 | 450 | 500 | 520 | 540 | 555 | 570 |
| 15128 (ČSN 41 5128) | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 154 | 147 | 117 | 86 | 71 | 56 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 240 | 230 | 182 | 134 | 111 | 87 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 307 | 294 | 233 | 172 | 142 | 111 |
| | 400 | 400 | 400 | 400 | 384 | 368 | 354 | 340 | 328 | 316 | 265 | 214 | 177 | 140 |
| | 500 | 500 | 500 | 500 | 480 | 460 | 443 | 425 | 410 | 395 | 332 | 268 | 222 | 175 |

USED MATERIALS



| Pos. | Part | Material |
|------|--------------------------------|---|
| 1 | Body | 15 128* |
| | Hard facing of sealing surface | X22CrMoV12-1+QT1 (1.4923)+QT1 |
| 2 | Disc, Stem | X22CrMoV12-1+QT1 (1.4923)+QT1 X22CrMoV12-1+QT1 (1.4923)+QT1 |
| 3 | Plug with membrane | X22CrMoV12-1 (1.4923) |
| 4 | Washer | Ni Resist |
| 5 | Gasket | Grafit |
| 6 | Packing | Grafit |
| 7 | Bushing | Ni Resist |
| 8 | Nut | 15128 |

* Other materials on request

HIGH-PRESSURE SAFETY VALVE P10.01

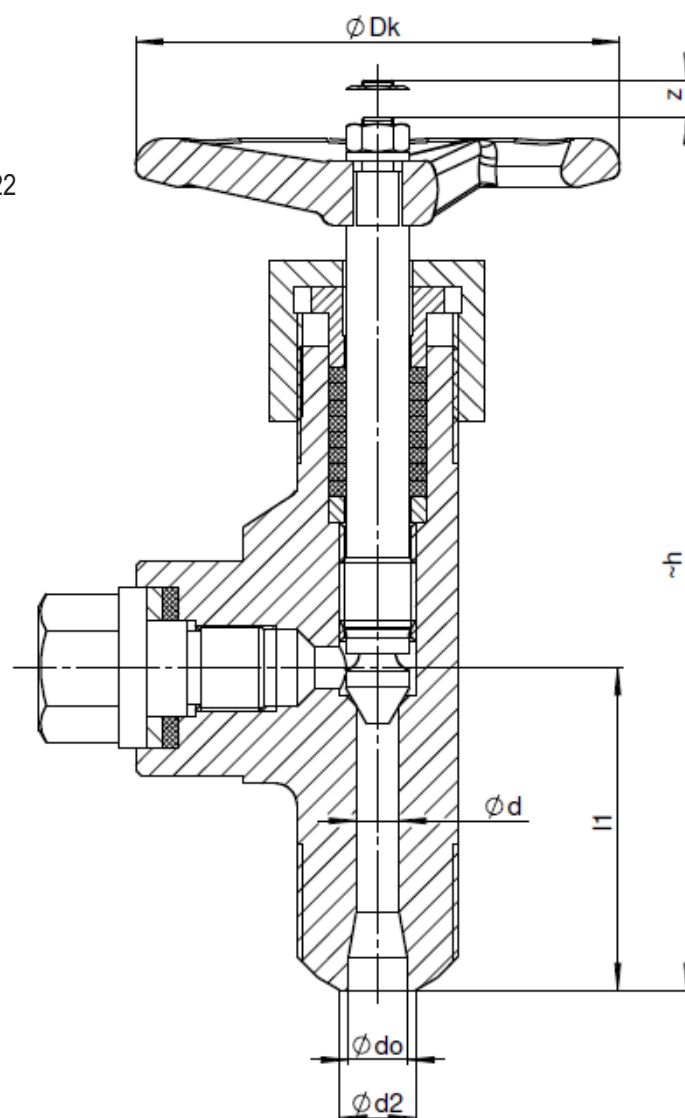
VALVE DIMENSIONS

Weld ends

Face-to face dimensions: as per table

Dimensions of welding ends: DiN 3239 – part 1

Groove form: DiN 2559 – sheet 1 – form 22



WELD ENDS

| Nominal pressure | Nominal size | Face-to-face | Centre-to-top | Diameter drilling | Stroke | Handwheel | Weld ends | | Pipe dimensions | Approximate weight |
|------------------|--------------|--------------|---------------|-------------------|--------|-----------|-----------|-------|-----------------|--------------------|
| PN | DN | l | h | d | z | D_k | d_2 | d_0 | | m [kg] |
| 160 | 10 | 60 | 160 | 8 | 7 | 90 | 18 | 13 | 17,2x2,0 | 1,6 |
| 250 | | | | | | 90 | 18 | 12 | 17,2x2,6 | |
| 320 | | | | | | 90 | 18 | 12 | 17,2x2,6 | |
| 400 | | | | | | 90 | 18 | 10 | 17,2x3,6 | |
| 500 | | | | | | 90 | 22 | 11,5 | 21,3x5,0 | |

USE OF SAFETY VALVE

At the customer's request, the valves can be equipped with protection of the space above the wedge from extreme pressure increase. This case may occur after the system is decommissioned, when the amount of fluid in the middle part of the closed valve is cooled (the space above the wedge). If after some time we start the valve in the closed state to heat (using a by-pass), due to the increase in temperature, there will be a high pressure increase in the space above the wedge.

If during the production process such a situation may arise, it is necessary to indicate in the order the requirement to put a valve with a space guard above the wedge (the inside of the valve).

Types of protection:

- a) drilling a wedge - the input side
- b) using safety valve P 10.01
- c) external by-pass - using two high pressure valves connected to the central part

The use of a safety valve, although the most expensive, is a universal solution. Can be used on all valves and all production parameters. When using a safety valve, the valve is two-way. The safety device is installed on the condensation circuit, which is led out of the valve body, outside its thermal insulation. Due to the replacement of the membrane bolt during the production process, part of the safety valve is the flywheel, which can be used to close the safety valve when replacing. To set the allowable overpressure limit, you must specify the manufacturing parameters of the valve in the order.

Example of recommended membrane

Operating parameters of the valve: working pressure $P_p = 23.5$ MPa, production temperature $T_p = 250$ °C.

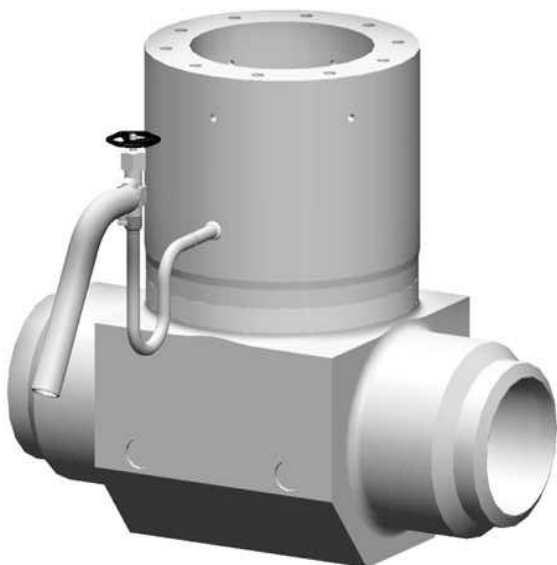
Bursting pressure of the membrane: $1.3 P_p = 1.3 * 23.5 = 30.55$ MPa and at a temperature of 250 °C.

The entry in the order: valve operating parameters $P_p = 23.5$ MPa - $T_p = 250$ °C (bursting pressure of 30.55 MPa at temperature of 250 °C).

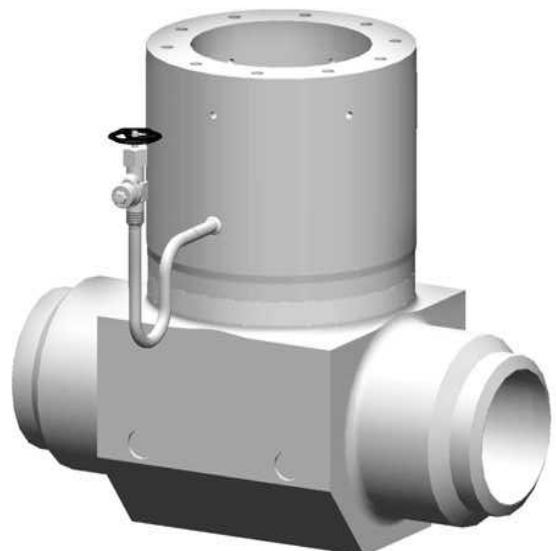
At high pressure drops and on the basis of the customer's requirements, it is possible to produce valves with by-pass valves.

POSITION OF THE VALVE ON THE BODY OF THE GATE VALVE S43

a)

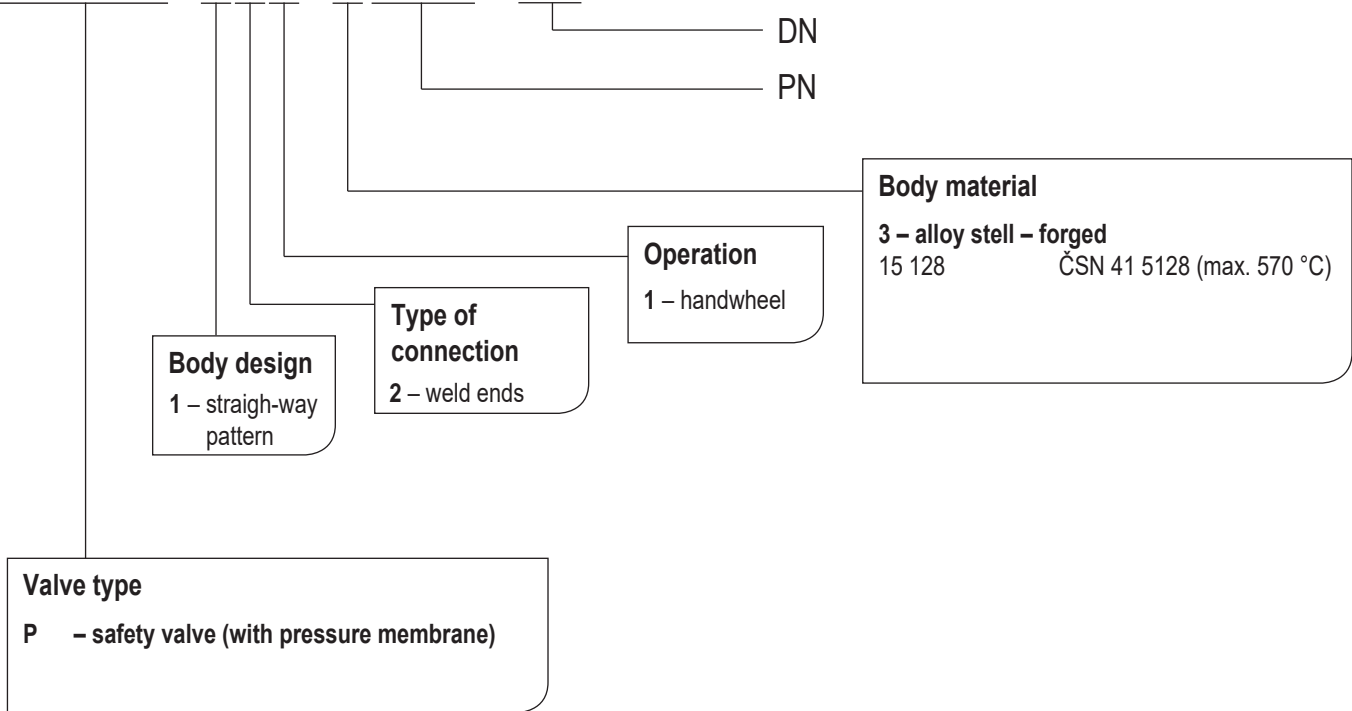


b)



VALVE DESCRIPTION CODE

P10.01 111-3500-10



VALVE INSTALLATION

Valve can be installed in any position. Medium must flow under the cone in accordance with the direction indicated on the valve body. It is necessary to consider the following points during assembly and operation:

During the installation and use of the valve, the following points have to be respected:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V30/V40

PN 63–160; DN 50–150; T_{MAX} : 550 °C



HIGH-PRESSURE SHUT-OFF GLOBE VALVE V30/V40

APPLICATION

- water, steam, gas, oil, petroleum products, non-aggressive substances

CONNECTION

- flanged, weld ends, combination

OPERATION

- handwheel, gearbox, electric actuator, attachment for pneumatic or hydraulic actuator, remote control

DESCRIPTION

- shut-off globe valve V30 and shut-off globe valve with control cone V40
- design of the body is straight
- rotating rising stem
- sealing surface is welded by hard facing (13Cr) or Stellite 6
- complies with the requirements of the directive 2014/68/EU and standard EN 13 709
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

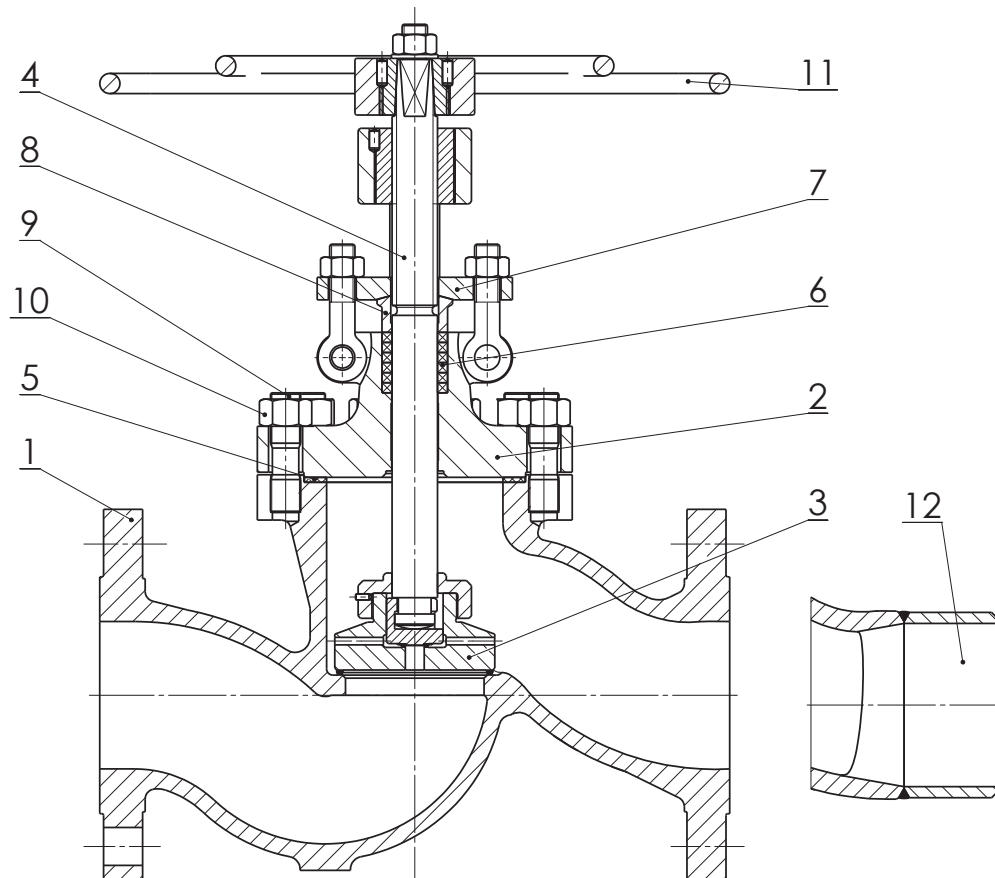
- control cone (for rough control) – type V40
- by-pass (balanced disk) for DN 65-150
- branch from forged steel – at the customer's request
- position indicator
- limit switches
- PTFE – gland packing and bonnet gasket
- locking device
- according to TRD 201

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V30/V40

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | |
|----------------------------------|-----|---|-----|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|------|------|------|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 500 | 510 | 520 | 530 | 540 | 550 |
| GX5CrNiMo 19-11-2 (1.4408) | 63 | 63 | 63 | 47,3 | 42,1 | 37,4 | 32,3 | 25,4 | 20,3 | 16,7 | - | - | - | - | - | - | - | - |
| | 100 | 100 | 100 | 75 | 66,9 | 59,4 | 51,3 | 40,3 | 32,3 | 26,5 | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GP240GH (1.0619) | 63 | 63 | 63 | 59 | 55 | 48 | 45 | 41 | 38 | 36 | 35 | - | - | - | - | - | - | - |
| | 100 | 100 | 100 | 93 | 87 | 76 | 71 | 64 | 60 | 58 | 55 | - | - | - | - | - | - | - |
| | 160 | 160 | 160 | 149 | 136 | 124 | 113 | 103 | 96 | 92 | 89 | - | - | - | - | - | - | - |
| G17CrMo5-5 (1.7357) | 63 | 63 | 63 | 63 | 63 | 63 | 62 | 57 | 53 | 51 | 48 | 47 | 38 | 33 | 26 | 24,4 | 18,1 | 13,7 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 98 | 91 | 84 | 80 | 76 | 75 | 61 | 52 | 42 | 38,7 | 28,7 | 21,8 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 152 | 146 | 139 | 127 | 118 | 97 | 79 | 62 | 46 | 35 |

USED MATERIALS



HIGH-PRESSURE SHUT-OFF GLOBE VALVE V30/V40

| Pos. | Part | Material | | |
|------|--------------------------------|-----------------------------------|--------------------------------------|-------------------------------|
| 1 | Body | GP240GH (1.0619) | G17CrMo5-5 (1.7357) | GX5CrNiMo19-11-2 (1.4408) |
| | Hard facing of sealing surface | 13Cr | Stellite 6 | Stellite 6 |
| 2 | Yoke | GP240GH (1.0619) | G17CrMo5-5 (1.7357) | GX5CrNiMo19-11-2 (1.4408) |
| 3 | Disc | P250GH (1.0460) | X22CrMoV12-1 (1.4923) | X6CrNiMoTi17-12-2 (1.4571) |
| | Hard facing of sealing surface | 13Cr | Stellite 6 | Stellite 6 |
| 4 | Stem | X20Cr13 (1.4021) | X22CrMoV12-1 (1.4923) | X6CrNiMoTi17-12-2 (1.4571) |
| 5 | Gasket | Graphite Kammprofil | | |
| 6 | Gland packing | Graphite | | |
| 7 | Gland flange | P265GH (1.0425) | P265GH (1.0425) | X6CrNiMoTi17-12-2 (1.4571) |
| 8 | Gland | P250GH (1.0460) | P250GH (1.0460) | X6CrNiMoTi17-12-2 (1.4571) |
| 9 | Bolt | 21CrMoV5-7 (1.7709) | 21CrMoV5-7 (1.7709) | A2-70 |
| 10 | Nut | 25CrMo4 (1.7218) | 21CrMoV5-7 (1.7709) | A2-70 |
| 11 | Handwheel | EN-GJS-400-15 (0.7040) / 11523.0 | | |
| 12 | Branch | P250GH; 16Mo3 (1.0460; 1.5415) | 16Mo3; 13CrMo4-5 (1.5415; 1.7335) | X6CrNiMoTi17-12-2 (1.4571) |

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V30/V40

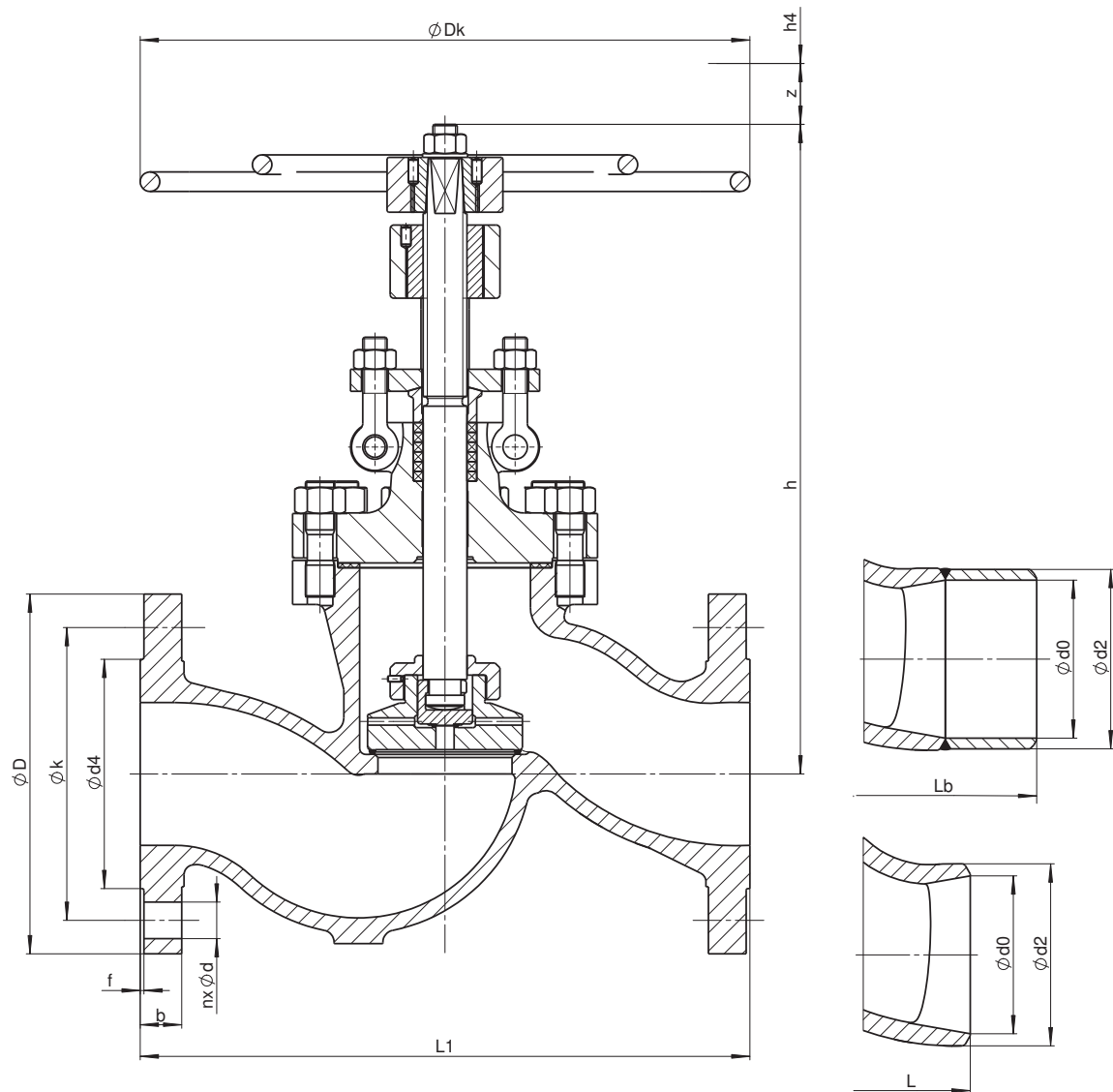
VALVE DIMENSIONS

1. Flanged

Face-to-face dimensions: EN 558 – line 1
Flanges: EN 1092-1

2. Weld ends

Face-to-face dimensions: EN 12982 – line 65 (DIN3202 – 2/S3), DN50 = 260mm
Face-to-face dimensions with branches: as per table (Lb) or on request
Dimensions of welding ends: DIN 3239 – part 1
Groove form: DIN 2559 – sheet 1 – form 22

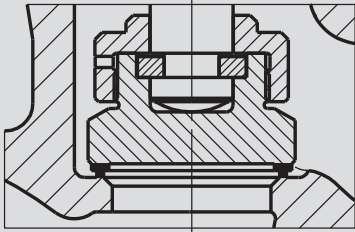


HIGH-PRESSURE SHUT-OFF GLOBE VALVE V30/V40

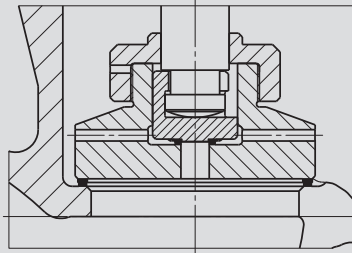
| Nominal pressure | Nominal size | Stroke | Handwheel | Centre-to-top | Dismantling height | Flanged | | | | | | | | Weld ends | | | | | |
|------------------|--------------|--------|-----------|---------------|--------------------|---------|----|--------|---------|--------|---------|---------|-----|-----------|--------|--------|--------|-----------|------------|
| | | | | | | PN | DN | z [mm] | Dk [mm] | h [mm] | h4 [mm] | L1 [mm] | n | d [mm] | k [mm] | D [mm] | b [mm] | d4xf [mm] | m [kg] |
| 63 | 50 | 47 | 250 | 360 | 140 | 300 | 4 | 22 | 135 | 180 | 26 | 102×3 | 32 | 260 | 400 | 61 | 54 | 24 | 60,3×3,2 |
| | 65 | 34 | 315 | 408 | 170 | 340 | 8 | 22 | 160 | 205 | 26 | 122×3 | 45 | 340 | 480 | 77 | 69 | 36 | 76,1×3,6 |
| | 80 | 64 | 400 | 459 | 190 | 380 | 8 | 22 | 170 | 215 | 28 | 138×3 | 57 | 380 | 520 | 90 | 81 | 49 | 88,9×4,0 |
| | 100 | 71 | 400 | 484 | 200 | 430 | 8 | 26 | 200 | 250 | 30 | 162×3 | 83 | 430 | 570 | 115 | 104 | 71 | 114,3×5,0 |
| | 125 | 85 | 500 | 538 | 230 | 500 | 8 | 30 | 240 | 295 | 34 | 188×3 | 110 | 500 | 650 | 141 | 130,5 | 84 | 139,7×4,5 |
| | 150 | 95 | 500 | 580 | 260 | 550 | 8 | 33 | 280 | 345 | 36 | 218×3 | 170 | 550 | 710 | 170 | 156,5 | 118 | 168,3×5,6 |
| 100 | 50 | 47 | 250 | 360 | 140 | 300 | 4 | 26 | 145 | 195 | 28 | 102×3 | 34 | 260 | 400 | 61 | 54 | 25 | 60,3×3,2 |
| | 65 | 34 | 315 | 408 | 170 | 340 | 8 | 26 | 170 | 220 | 30 | 122×3 | 49 | 340 | 480 | 77 | 69 | 36 | 76,1×3,6 |
| | 80 | 64 | 400 | 459 | 190 | 380 | 8 | 26 | 180 | 230 | 32 | 138×3 | 63 | 380 | 520 | 90 | 81 | 49 | 88,9×4,0 |
| | 100 | 71 | 400 | 484 | 200 | 430 | 8 | 30 | 210 | 265 | 36 | 162×3 | 94 | 430 | 570 | 115 | 104 | 71 | 114,3×5,0 |
| | 125 | 85 | 500 | 538 | 230 | 500 | 8 | 33 | 250 | 315 | 40 | 188×3 | 123 | 500 | 650 | 141 | 127 | 90 | 139,7×6,3 |
| | 150 | 95 | 500 | 580 | 260 | 550 | 12 | 33 | 290 | 355 | 44 | 218×3 | 181 | 550 | 710 | 170 | 154 | 129 | 168,3×7,1 |
| 160 | 50 | 47 | 250 | 360 | 140 | 300 | 4 | 26 | 145 | 195 | 30 | 102×3 | 35 | 260 | 400 | 61 | 52,5 | 26 | 60,3×4 |
| | 65 | 34 | 315 | 408 | 170 | 340 | 8 | 26 | 170 | 220 | 34 | 122×3 | 50 | 340 | 480 | 77 | 65 | 37 | 76,1×5,6 |
| | 80 | 64 | 400 | 459 | 190 | 380 | 8 | 26 | 180 | 230 | 36 | 138×3 | 64 | 380 | 520 | 90 | 76,5 | 50 | 88,9×6,3 |
| | 100 | 71 | 400 | 484 | 200 | 430 | 8 | 30 | 210 | 265 | 40 | 162×3 | 95 | 430 | 570 | 115 | 98,5 | 72 | 114,3×8 |
| | 125 | 85 | 500 | 538 | 230 | 500 | 8 | 33 | 250 | 315 | 44 | 188×3 | 125 | 500 | 650 | 141 | 120,5 | 92 | 139,7×10 |
| | 150 | 95 | 630 | 580 | 260 | - | 12 | 33 | 290 | 355 | 50 | 218×3 | 183 | 550 | 710 | 170 | 144,5 | 131 | 168,3×12,5 |

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V30/V40

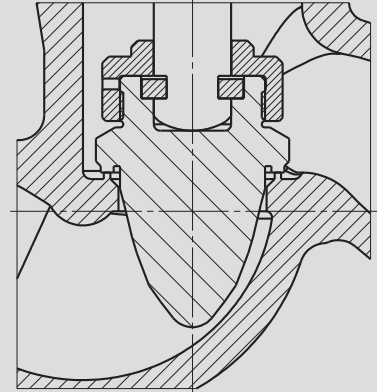
DESIGN VARIANTS



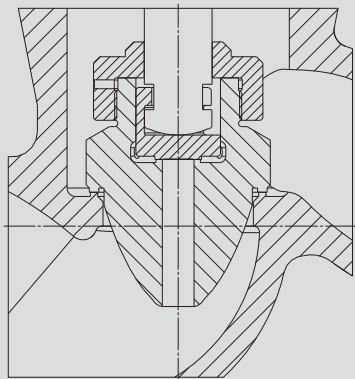
V 30 DN 50



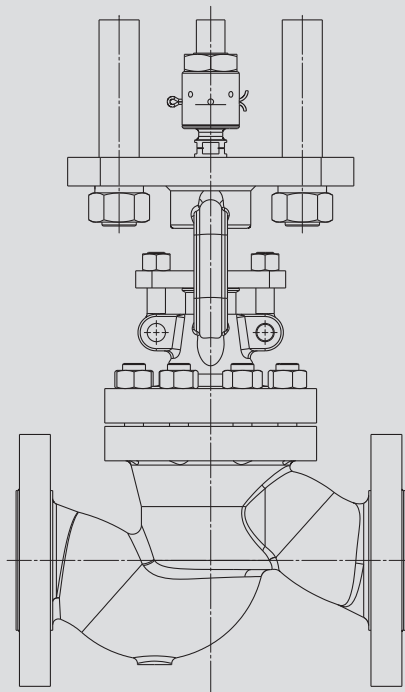
V 30 DN 65-150



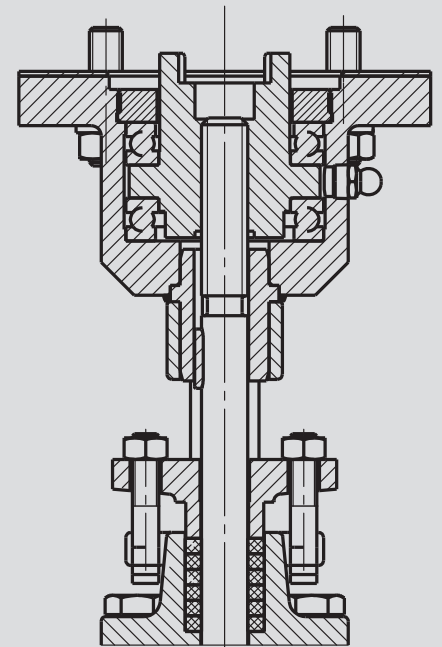
V40 DN 50



V40 DN 65-150



attachment with traction electric actuator

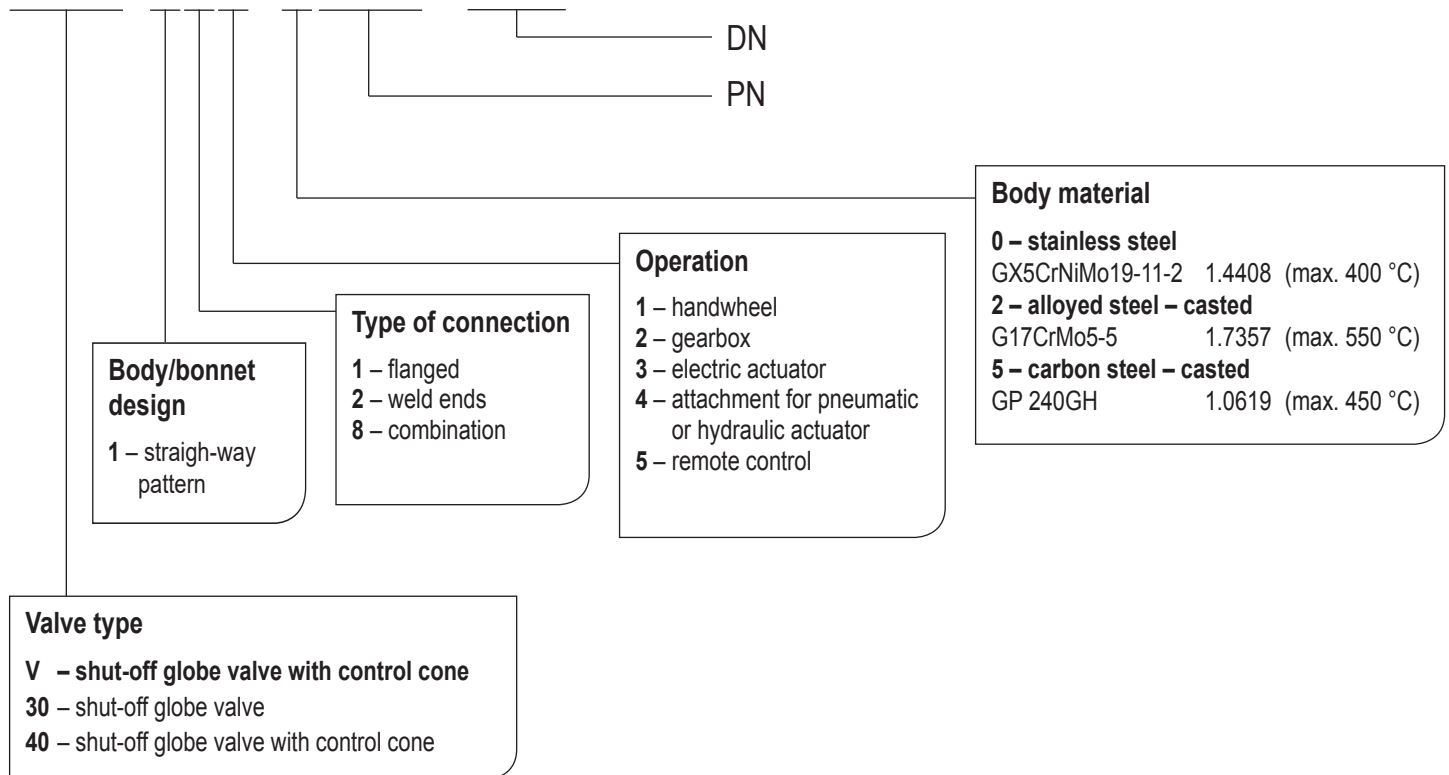


attachment for rotary electric actuator

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V30/V40

VALVE DESCRIPTION CODE

V30 111–2160–100



VALVE INSTALLATION

Valve can be installed in any position. Medium must flow in accordance with the direction indicated on the body. It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.2/V40.2

PN 63–500; DN 10–65; T_{MAX} : 600 °C



HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.2/V40.2

APPLICATION

- water, steam, gas, oil, petroleum products, non-aggressive and aggressive substances

CONNECTION

- flanged, weld ends, socket weld, threaded ends, combination

OPERATION

- handwheel, gearbox, electric actuator, attachment for pneumatic or hydraulic actuator, remote control

DESCRIPTION

- shut-off globe valve V46.2 and shut-off globe valve with control cone V40.2
- non-rotating rising stem
- one-piece stem with throttle cone
- one-piece forged body without cover
- stem gland packing in body
- sealing surface is welded by hard facing (13Cr) or Stellite 6
- conical seat
- position indicator
- complies with the requirements of the directive 2014/68/EU and standard EN 13 709
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

- control cone (for rough control) - type V40
- according to TRD 201
- locking device
- limit switches
- gland with scraper ring

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.2/V40.2

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | |
|-------------------------------|-----|---|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 280 | 300 | 350 | 380 | 390 | 400 | 410 | 420 | 430 | 440 | 450 |
| P250GH (C22.8) (1.0460) | 63 | 63 | 63 | 63 | 63 | 63 | 56,7 | 53,2 | 50,4 | 44,9 | 41,0 | 40,2 | 39,4 | 38,4 | 37,5 | 36,5 | 35,6 | 34,7 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 90,0 | 84,5 | 80,0 | 71,3 | 65,0 | 63,8 | 62,5 | 61,0 | 59,5 | 58,0 | 56,5 | 55,0 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 144 | 135 | 128 | 114 | 104 | 102 | 100 | 97,6 | 95,2 | 92,8 | 90,4 | 88,0 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 225 | 212 | 200 | 178 | 163 | 159 | 156 | 153 | 149 | 145 | 141 | 138 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 288 | 271 | 256 | 228 | 208 | 204 | 200 | 195 | 190 | 186 | 181 | 176 |
| | 400 | 400 | 400 | 400 | 400 | 400 | 360 | 340 | 320 | 285 | 260 | 255 | 250 | 244 | 238 | 232 | 226 | 220 |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | |
|-------------------|-----|---|-----|-----|-----|-----|------|-------|------|------|------|------|------|------|-----|-----|-----|-----|-----|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 575 | 580 | 600 |
| 16Mo3 (1.5415) | 63 | 63 | 63 | 63 | 63 | 59 | 56,7 | 52,9 | 50,4 | 44,1 | 36,5 | 25,7 | 20,4 | 16,3 | - | - | - | - | - |
| | 100 | 100 | 100 | 100 | 100 | 94 | 90 | 84 | 80 | 70 | 58 | 40,8 | 32,4 | 25,8 | - | - | - | - | - |
| | 160 | 160 | 160 | 160 | 160 | 151 | 144 | 134 | 128 | 112 | 92,8 | 65,3 | 51,8 | 41,3 | - | - | - | - | - |
| | 250 | 250 | 250 | 250 | 250 | 238 | 225 | 210 | 200 | 175 | 145 | 102 | 81 | 64,5 | - | - | - | - | - |
| | 320 | 320 | 320 | 320 | 320 | 302 | 288 | 268,8 | 256 | 224 | 186 | 131 | 104 | 82,6 | - | - | - | - | - |
| | 400 | 400 | 400 | 400 | 400 | 379 | 360 | 336 | 320 | 280 | 232 | 163 | 130 | 103 | - | - | - | - | - |
| | 500 | 500 | 500 | 500 | 500 | 473 | 450 | 420 | 400 | 350 | 290 | 204 | 162 | 129 | - | - | - | - | - |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | |
|-----------------------|-----|---|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|-----|-----|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 570 | 580 | 600 |
| 13CrMo4-5 (1.7335) | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 56,7 | 55,3 | 52,3 | 50,4 | 40,3 | 32,8 | 27,1 | 21,2 | 17,0 | 10,5 | - | - |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 90 | 87,8 | 83 | 80 | 64 | 52,0 | 43,0 | 33,6 | 27,0 | 16,6 | - | - |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 144 | 140 | 133 | 128 | 102 | 83,2 | 68,8 | 53,8 | 43,2 | 26,6 | - | - |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 225 | 220 | 208 | 200 | 160 | 130 | 108 | 84 | 67,5 | 41,5 | - | - |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 288 | 281 | 266 | 256 | 205 | 166 | 138 | 108 | 86,4 | 53,1 | - | - |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 360 | 351 | 332 | 320 | 256 | 208 | 172 | 134 | 108 | 66,4 | - | - |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 450 | 439 | 415 | 400 | 320 | 260 | 215 | 168 | 135 | 83,0 | - | - |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | |
|------------------------|-----|---|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 575 | 580 | 600 |
| 11CrMo9-10 (1.7383) | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 56,7 | 54,2 | 51,7 | 50,4 | 40,3 | 35,3 | 30,2 | 26,5 | 22,7 | 16,4 | 15,1 | 11,6 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 90,0 | 86,0 | 82,0 | 80,0 | 64,0 | 56,0 | 48,0 | 42,0 | 36,0 | 26,0 | 24,0 | 18,4 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 144 | 138 | 131 | 128 | 102 | 89,6 | 76,8 | 67,2 | 57,6 | 41,6 | 38,4 | 29,4 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 225 | 215 | 205 | 200 | 160 | 140 | 120 | 105 | 90,0 | 65,0 | 60,0 | 46,0 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 288 | 275 | 262 | 256 | 205 | 179 | 154 | 134 | 115 | 83,2 | 76,8 | 58,9 |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 360 | 344 | 328 | 320 | 256 | 224 | 192 | 168 | 144 | 104 | 96,0 | 73,6 |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 450 | 430 | 410 | 400 | 320 | 280 | 240 | 210 | 180 | 130 | 120 | 92 |

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.2/V40.2

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | |
|---|-----|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 575 | 580 | 600 |
| X6CrNiMoTi 17-12-2 (1.4571) ¹⁾ | 63 | 63 | 61,7 | 57,9 | 54,9 | 53,3 | 51,4 | 50,1 | 50,1 | 49,9 | 49,9 | 49,9 | 49,6 | 49,6 | 49,4 | 49,1 | 48,6 | 40,3 | 35,3 |
| | 100 | 100 | 98,0 | 92,5 | 87,2 | 84,2 | 81,6 | 79,6 | 79,6 | 79,2 | 79,2 | 79,2 | 78,8 | 78,8 | 78,4 | 78,0 | 77,2 | 64,0 | 56,0 |
| | 160 | 160 | 157 | 148 | 140 | 135 | 131 | 127 | 127 | 127 | 127 | 127 | 126 | 126 | 125 | 125 | 124 | 102 | 89,6 |
| | 250 | 250 | 245 | 231 | 218 | 211 | 204 | 199 | 199 | 198 | 198 | 198 | 197 | 197 | 196 | 195 | 193 | 160 | 140 |
| | 320 | 320 | 314 | 293 | 279 | 270 | 261 | 255 | 255 | 253 | 253 | 253 | 252 | 248 | 236 | 228 | 193 | 160 | 140 |
| | 400 | 400 | 392 | 370 | 349 | 337 | 326 | 318 | 318 | 317 | 317 | 317 | 315 | 310 | 295 | 285 | 193 | 160 | 140 |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | |
|---|-----|---|------|------|------|------|------|------|
| | | -196 | 20 | 100 | 200 | 300 | 350 | 400 |
| X6CrNiMoTi 17-12-2 (1.4571) ²⁾ | 63 | 63,0 | 63,0 | 60,5 | 51,7 | 42,8 | 40,3 | 37,8 |
| | 100 | 100 | 100 | 96,0 | 82,0 | 68,0 | 64,0 | 60,0 |
| | 160 | 160 | 160 | 154 | 131 | 109 | 102 | 96,0 |
| | 250 | 250 | 250 | 240 | 205 | 170 | 160 | 150 |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | | |
|--|-----|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 480 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 | 600 |
| X10CrMoVnB9-1 (F91) (1.4903) ³⁾ | 63 | 69,3 | 69,3 | 69,3 | 69,3 | 69,3 | 69,3 | 63,0 | 63,0 | 63,0 | 63,0 | 61,7 | 60,5 | 59,2 | 58,0 | 52,9 | 50,8 | 49,1 | 40,1 | 37,3 | 35,4 |
| | 100 | 110 | 110 | 110 | 110 | 110 | 110 | 100 | 100 | 100 | 100 | 98,0 | 96,0 | 94,0 | 92,0 | 84,0 | 80,6 | 78,0 | 63,6 | 59,2 | 56,2 |
| | 160 | 176 | 176 | 176 | 176 | 176 | 176 | 160 | 160 | 160 | 160 | 157 | 154 | 150 | 147 | 134 | 129 | 125 | 102 | 94,7 | 89,9 |
| | 250 | 275 | 275 | 275 | 275 | 275 | 275 | 250 | 250 | 250 | 250 | 245 | 240 | 235 | 230 | 210 | 202 | 195 | 159 | 148 | 141 |
| | 320 | 352 | 352 | 352 | 352 | 352 | 352 | 320 | 320 | 320 | 320 | 314 | 307 | 301 | 294 | 269 | 258 | 250 | 204 | 189 | 180 |
| | 400 | 440 | 440 | 440 | 440 | 440 | 440 | 400 | 400 | 400 | 400 | 392 | 384 | 376 | 368 | 336 | 322 | 312 | 254 | 236 | 224 |
| | 500 | 550 | 550 | 550 | 550 | 550 | 550 | 500 | 500 | 500 | 500 | 490 | 480 | 470 | 460 | 420 | 403 | 390 | 318 | 296 | 281 |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | |
|----------------------------------|-----|---|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 570 |
| 14MoV6-3 (1.7715) (15 128) | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 59,6 | 57,0 | 54,3 | 52,9 | 44,4 | 38,8 | 33,3 | 29,1 | 24,9 | 18,3 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 94,6 | 90,4 | 86,2 | 84,0 | 70,4 | 61,6 | 52,8 | 46,2 | 39,6 | 29,0 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 151 | 145 | 138 | 134 | 113 | 98,6 | 84,5 | 73,9 | 63,4 | 46,4 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 237 | 226 | 216 | 210 | 176 | 154 | 132 | 116 | 99 | 72,5 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 303 | 289 | 276 | 269 | 225 | 197 | 169 | 148 | 127 | 92,8 |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 378 | 362 | 345 | 336 | 282 | 246 | 211 | 185 | 158 | 116 |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 473 | 452 | 431 | 420 | 352 | 308 | 264 | 231 | 198 | 145 |

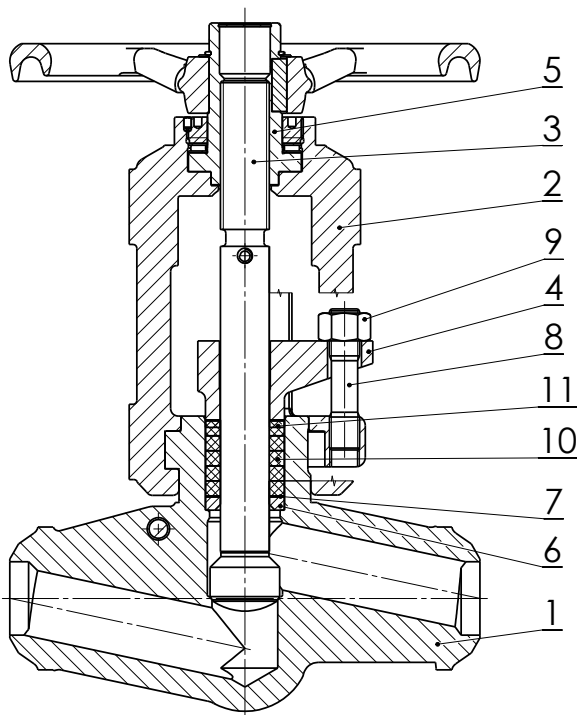
1) Use of valve above 400°C only for media without risk of intercrystalline corrosion

2) Application for temperatures from - 196 °C to + 400 °C, material variant 2

3) Application for temperatures up to + 650 °C - on request

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.2/V40.2

USED MATERIALS



| Pos. | Part | Material | | | | | | | |
|------|--------------------------------------|---|--------------------------|-----------------------|------------------------|----------------------------------|-----------------------------------|---|--|
| 1 | Body | P250GH (1.0460) (C22.8) | 16Mo3 (1.5415) | 13CrMo4-5 (1.7335) | 11CrMo9-10 (1.7383) | 14MoV6-3 (1.7715) (15 128) | X10Cr-MoVNb9-1 (1.4903), (F91) | X6CrNiMo-Ti17-12-2 (1.4571) ¹⁾ (A182-F316Ti) | X6CrNiMoTi 17-12-2 (1.4571) ²⁾ (A182-F316Ti) |
| | Hard facing of sealing surface | 13Cr ³⁾ | Stellite 6 | | | | | | |
| 2 | Yoke | G17CrMo9-10 (1.7379) | | | | | | | GX5CrNiMo 19-11-2 (1.4408) |
| 3 | Stem | X20Cr13 (1.4021) | X22CrMoV12-1 (1.4923) | | | | | | X6CrNiMo-Ti17-12-2 (1.4571) |
| | Hard facing of sealing surface | Hardened ³⁾ | Stellite 6 | | | | | | |
| 4 | Gland | G17CrMo9-10 (1.7379) (1.7380, 1.0425, 1.0460) | 10CrMo9-10 (1.7380) | | | | | | GX5CrNiMo 19-11-2 (1.4408) |
| 5 | Stem nut | C45 (1.0503) | | | | | | | CuAl10Fe3Mn2 (2.0936) |
| 6 | Ring | A439 D2 NiResist , GX70CrMo29-2 (1.4136) | | | | | | | |
| 7 | Scraper ring | CrNi-steel graphite | | | | | | | |
| 8 | Bolt | 21CrMoV5-7 (1.7709) | | | | | | | A2-70 |
| 9 | Nut | 25CrMo4 (1.7218) | | | | | | | A2 |
| 10 | Gasket | Graphite pressed | | | | | | | |
| 11 | Gasket | Graphite knitted | | | | | | | |

1) Use of valve above 400 °C only for media without risk of intercrystalline corrosion

2) Application for temperatures from - 196 °C to + 400 °C, material variant 2

3) Option on request - Stellite 6

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.2/V40.2

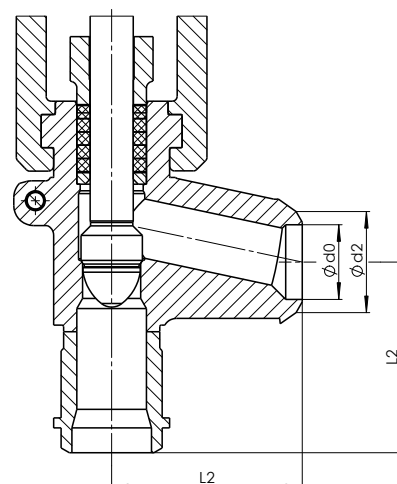
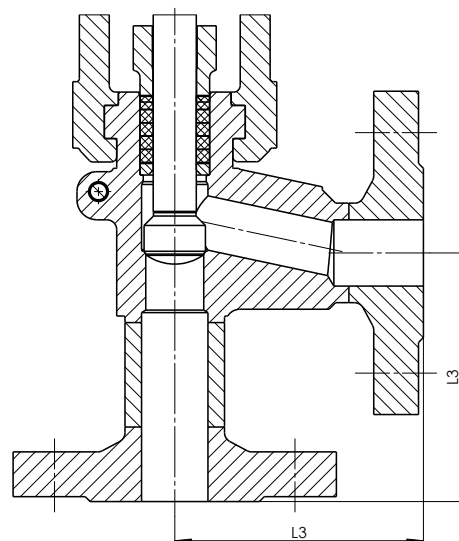
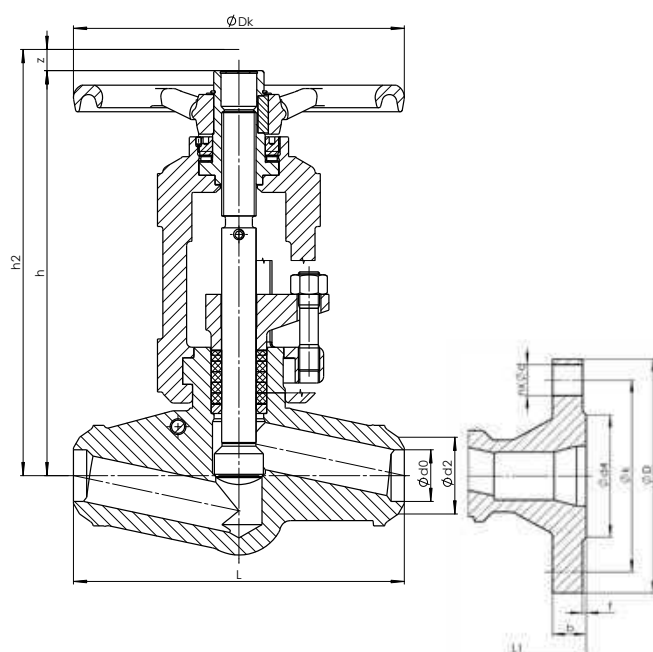
VALVE DIMENSIONS

1. Flanged

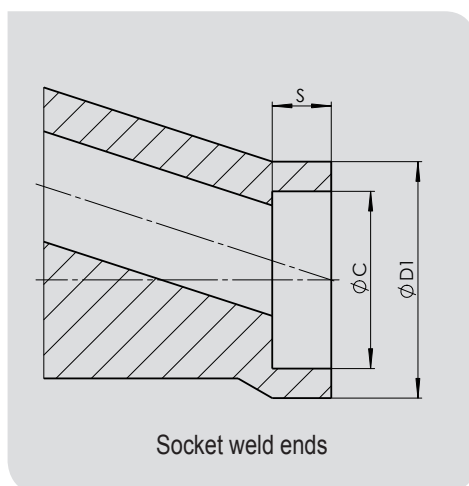
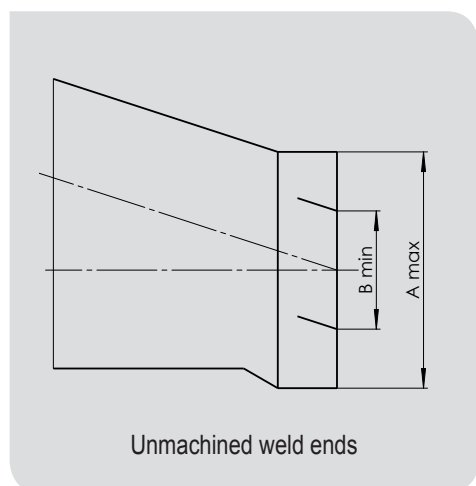
Face-to-face dimensions: as per table
 Flanges: EN 1092-1, (DIN 250/1972), sealing bar – Form B1
 Other variants at the customer's request.

2. Weld ends, socket weld

Face-to-face dimensions: as per table
 Dimensions of welding ends: EN 12627
 (on request according to invalid standard DIN 3239-1)
 Groove form: ISO 9692-1
 (on request according to invalid standard DIN 2559-1)
 Socket weld: ASME B16.11, DIN 3239 – part 2



WELDING ENDS



HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.2/V40.2

WELDING DESIGN

| Nominal pressure | Nominal size | Face-to-face | Face-to-face (Angle valve) | Centre-to-top | Disassembly height | Stroke | Centre-to-top (E-actuator) | E-actuator connection EN ISO 5210 | Handwheel | Weld ends ¹⁾ | | Socket weld acc. to B16.11 or DIN 3239-2 | | | Unmachined weld ends | | Approximate weight | Pipe dimension |
|------------------|--------------|--------------|-------------------------------|---------------|-----------------------|--------|-------------------------------|---|-------------------|-------------------------|-------|--|------------------------|-----------|-------------------------|-----------|-----------------------|----------------|
| | | | | | | | | | | d_2 | d_0 | $\varnothing D_{1-0,5}$ | $\varnothing C^{+0,2}$ | S_{min} | A_{max} | B_{min} | | |
| PN | DN | L | L2 | h | h_2 | z | h_3 | | $\varnothing D_k$ | | | | | | | | | |
| 63, 100 | 10 | 150 | 105 | 225 | 330 | 11 | 288 | F10 B1 | 200 | 18 | 13,2 | 33 | 18 | 9,5 | 35 | 9 | 6,5 | 17,2x2,0 |
| | 15 | 150 | 105 | 225 | 330 | 11 | 288 | F10 B1 | 200 | 22 | 17,3 | 33 | 22 | 9,5 | 35 | 14 | 6,4 | 21,3x2,0 |
| | 20 | 160 | 110 | 240 | 360 | 18 | 288 | F10 B1 | 250 | 28 | 22,3 | 48 | 27,5 | 12,7 | 50 | 19 | 9,0 | 26,9x2,3 |
| | 25 | 160 | 110 | 240 | 360 | 18 | 288 | F10 B1 | 250 | 35 | 28,5 | 48 | 34,5 | 12,7 | 50 | 24 | 8,5 | 33,7x2,6 |
| | 32 | 250 | - | 320 | 430 | 28 | 290 | F10 B1 | 250 | 44 | 37,2 | 76 | 43 | 12,7 | 75 | 29 | 18,2 | 42,4x2,6 |
| | 40 | 250 | - | 320 | 430 | 28 | 290 | F10 B1 | 250 | 50 | 43,1 | 76 | 49 | 12,7 | 75 | 35 | 18,6 | 48,3x2,6 |
| | 50 | 250 | - | 320 | 430 | 28 | 290 | F10 B1 | 250 | 62 | 53,9 | 76 | 61 | 15,9 | 75 | 35 | 18,6 | 60,3x3,2 |
| | 65 | 340 | - | 454 | 600 | 40 | 316 | F14 B1 | 500 | 78 | 68,9 | 120 | 74 | 16 | 100 | 48 | 58 | 76,1x3,6 |
| 160 | 10 | 150 | 105 | 225 | 330 | 11 | 288 | F10 B1 | 200 | 18 | 13,2 | 33 | 18 | 9,5 | 35 | 9 | 6,5 | 17,2x2,0 |
| | 15 | 150 | 105 | 225 | 330 | 11 | 288 | F10 B1 | 200 | 22 | 17,3 | 33 | 22 | 9,5 | 35 | 14 | 6,4 | 21,3x2,0 |
| | 20 | 160 | 110 | 240 | 360 | 18 | 288 | F10 B1 | 250 | 28 | 22,3 | 48 | 27,5 | 12,7 | 50 | 19 | 9,0 | 26,9x2,3 |
| | 25 | 160 | 110 | 240 | 360 | 18 | 288 | F10 B1 | 250 | 35 | 27,3 | 48 | 34,5 | 12,7 | 50 | 24 | 8,5 | 33,7x3,2 |
| | 32 | 250 | - | 320 | 430 | 28 | 290 | F10 B1 | 250 | 44 | 35,2 | 76 | 43 | 12,7 | 75 | 29 | 18,2 | 42,4x3,6 |
| | 40 | 250 | - | 320 | 430 | 28 | 290 | F10 B1 | 250 | 50 | 41,1 | 76 | 49 | 12,7 | 75 | 35 | 18,6 | 48,3x3,6 |
| | 50 | 250 | - | 320 | 430 | 28 | 290 | F10 B1 | 250 | 62 | 51,3 | 76 | 61 | 15,9 | 75 | 35 | 18,6 | 60,3x4,5 |
| | 65 | 340 | - | 454 | 600 | 40 | 316 | F14 B1 | 500 | 78 | 64,9 | 120 | 74 | 16 | 100 | 48 | 58 | 76,1x5,6 |
| 250 | 10 | 150 | 105 | 225 | 330 | 11 | 288 | F10 B1 | 200 | 18 | 12,0 | 33 | 18 | 9,5 | 35 | 9 | 6,5 | 17,2x2,6 |
| | 15 | 150 | 105 | 225 | 330 | 11 | 288 | F10 B1 | 200 | 22 | 16,1 | 33 | 22 | 9,5 | 35 | 14 | 6,4 | 21,3x2,6 |
| | 20 | 160 | 110 | 240 | 360 | 18 | 288 | F10 B1 | 250 | 28 | 19,7 | 48 | 27,5 | 12,7 | 50 | 19 | 9,0 | 26,9x3,6 |
| | 25 | 160 | 110 | 240 | 360 | 18 | 288 | F10 B1 | 250 | 35 | 26,5 | 48 | 34,5 | 12,7 | 50 | 24 | 8,5 | 33,7x3,6 |
| | 32 | 250 | - | 320 | 430 | 28 | 316 | F14 B1 | 355 | 44 | 33,4 | 76 | 43 | 12,7 | 75 | 29 | 18,2 | 42,4x4,5 |
| | 40 | 250 | - | 320 | 430 | 28 | 316 | F14 B1 | 355 | 50 | 38,3 | 76 | 49 | 12,7 | 75 | 35 | 18,6 | 48,3x5,0 |
| | 50 | 250 | - | 320 | 430 | 28 | 316 | F14 B1 | 355 | 62 | 44,3 | 76 | 61 | 15,9 | 75 | 35 | 18,6 | 60,3x8,0 |
| | 65 | 340 | - | 454 | 600 | 40 | 316 | F14 B1 | 500 | 78 | 58,5 | 120 | 74 | 16 | 100 | 48 | 58 | 76,1x8,8 |
| 320 | 10 | 150 | 105 | 225 | 330 | 11 | 288 | F10 B1 | 200 | 18 | 12,0 | 33 | 18 | 9,5 | 35 | 9 | 6,5 | 17,2x2,6 |
| | 15 | 150 | 105 | 225 | 330 | 11 | 288 | F10 B1 | 200 | 22 | 14,9 | 33 | 22 | 9,5 | 35 | 14 | 6,4 | 21,3x3,2 |
| | 20 | 160 | 110 | 240 | 360 | 18 | 290 | F10 B1 | 250 | 28 | 18,9 | 48 | 27,5 | 12,7 | 50 | 19 | 9,0 | 26,9x4,0 |
| | 25 | 160 | 110 | 240 | 360 | 18 | 290 | F10 B1 | 250 | 35 | 23,7 | 48 | 34,5 | 12,7 | 50 | 24 | 8,5 | 33,7x5,0 |
| | 32 | 250 | - | 320 | 430 | 28 | 316 | F14 B1 | 355 | 44 | 29,8 | 76 | 43 | 12,7 | 75 | 29 | 18,2 | 42,4x6,3 |
| | 40 | 250 | - | 320 | 430 | 28 | 316 | F14 B1 | 355 | 50 | 35,7 | 76 | 49 | 12,7 | 75 | 35 | 18,6 | 48,3x6,3 |
| | 50 | 250 | - | 320 | 430 | 28 | 316 | F14 B1 | 355 | 62 | 42,7 | 76 | 61 | 15,9 | 75 | 35 | 18,6 | 60,3x8,8 |
| | 65 | 340 | - | 454 | 600 | 40 | 340 | F16 B1 | 630 | 78 | 54,1 | 120 | 74 | 16 | 100 | 48 | 60 | 76,1x11 |
| 400 | 10 | 150 | 105 | 225 | 330 | 11 | 288 | F10 B1 | 250 | 18 | 10,0 | - | - | - | 35 | 9 | 7,2 | 17,2x3,6 |
| | 15 | 150 | 105 | 225 | 330 | 11 | 288 | F10 B1 | 250 | 22 | 14,1 | - | - | - | 35 | 14 | 7,1 | 21,3x3,6 |
| | 20 | 160 | 110 | 240 | 360 | 18 | 290 | F10 B1 | 250 | 28 | 17,9 | - | - | - | 48 | 18 | 9,1 | 26,9x4,5 |
| | 25 | 160 | 110 | 240 | 360 | 18 | 290 | F10 B1 | 250 | 35 | 22,5 | - | - | - | 48 | 22 | 9,0 | 33,7x5,6 |
| | 32 | 250 | - | 320 | 430 | 28 | 316 | F14 B1 | 355 | 44 | 28,2 | - | - | - | 78 | 30 | 19,8 | 42,4x7,1 |
| | 40 | 250 | - | 320 | 430 | 28 | 316 | F14 B1 | 355 | 50 | 30,7 | - | - | - | 78 | 32 | 19,0 | 48,3x8,8 |
| | 50 | 250 | - | 320 | 430 | 28 | 316 | F14 B1 | 355 | 62 | 40,3 | - | - | - | 78 | 38 | 19,0 | 60,3x10 |
| | 65 | 340 | - | 454 | 600 | 40 | 340 | F16 B1 | - | 78 | 47,7 | - | - | - | 100 | 48 | - | 76,1x14,2 |

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.2/V40.2

| PN | DN | L | L2 | h | h ₂ | z | h ₃ | | ∅D _k | d ₂ | d ₀ | ∅D _{1-0,5} | ∅C ^{+0,2} | S _{min} | A _{max} | B _{min} | m [kg] | |
|-----|----|-----|-----|-----|----------------|----|----------------|--------|-----------------|----------------|----------------|---------------------|--------------------|------------------|------------------|------------------|--------|-----------|
| 500 | 10 | 150 | 105 | 225 | 330 | 11 | 290 | F10 B1 | 250 | 18 | 10,0 | - | - | - | 35 | 9 | 7,2 | 17,2x3,6 |
| | 15 | 150 | 105 | 225 | 330 | 11 | 290 | F10 B1 | 250 | 22 | 13,3 | - | - | - | 35 | 14 | 7,1 | 21,3x4,0 |
| | 20 | 160 | 110 | 240 | 360 | 18 | 290 | F10 B1 | 250 | 28 | 16,9 | - | - | - | 48 | 18 | 9,1 | 26,9x5,0 |
| | 25 | 160 | 110 | 240 | 360 | 18 | 290 | F10 B1 | 250 | 35 | 21,1 | - | - | - | 48 | 22 | 9,0 | 33,7x6,3 |
| | 32 | 250 | - | 320 | 430 | 28 | 316 | F14 B1 | 355 | 44 | 26,4 | - | - | - | 78 | 30 | 19,8 | 42,4x8,0 |
| | 40 | 250 | - | 320 | 430 | 28 | 316 | F14 B1 | 355 | 50 | 28,3 | - | - | - | 78 | 32 | 19,0 | 48,3x10 |
| | 50 | 250 | - | 320 | 430 | 28 | 316 | F14 B1 | 355 | 62 | 35,3 | - | - | - | 78 | 38 | 19,0 | 60,3x12,5 |
| | 65 | 340 | - | 454 | 600 | 40 | - | - | - | 78 | 47,7 | - | - | - | 100 | 48 | - | 76,1x14,2 |

1) Dimensions d0 is based on the internal diameter of the pipes

Missing data in the chart on request.

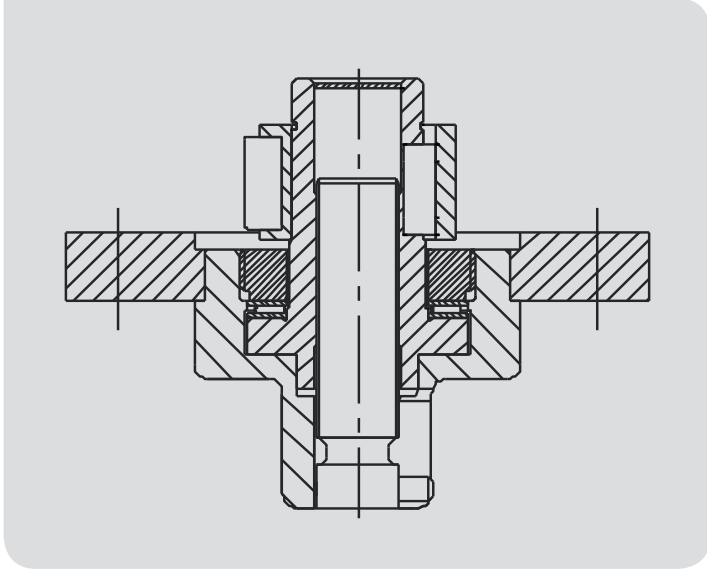
FLANGE DESIGN

| Nominal pressure | Nominal size | Face-to face | Face-to face Angle Valve | Number of holes | Hole | Pitch circle | Flange diameter | Flange thickness | Smooth bar | Approximate weight |
|------------------|--------------|--------------|--------------------------|-----------------|------|--------------|-----------------|------------------|-------------------|--------------------|
| PN | DN | L1 | L3 | n | ∅d | ∅k | ∅D | b | ∅d _{4xf} | m [kg] |
| 63, 100 | 10 | 230 | 105 | 4 | 14 | 70 | 100 | 20 | 40x2 | 10,0 |
| | 15 | 230 | 105 | 4 | 14 | 75 | 105 | 20 | 45x2 | 10,9 |
| | 20 | 260 | 115 | 4 | 18 | 90 | 130 | 22 | 58x2 | 14,0 |
| | 25 | 260 | 115 | 4 | 18 | 100 | 140 | 24 | 68x2 | 14,5 |
| | 32 | 390 | 150 | 4 | 22 | 110 | 155 | 24 | 78x2 | 27,0 |
| | 40 | 390 | 150 | 4 | 22 | 125 | 170 | 26 | 88x3 | 29,0 |
| 63 | 50 | 390 | 150 | 4 | 22 | 135 | 180 | 26 | 102x3 | 31,0 |
| 100 | 50 | 390 | 150 | 4 | 26 | 145 | 195 | 28 | 102x3 | 31,0 |
| 63 | 65 | 540 | - | 8 | 22 | 160 | 205 | 26 | 122x3 | - |
| 100 | 65 | 540 | - | 8 | 26 | 170 | 220 | 30 | 122x3 | - |
| 160 | 10 | 230 | 105 | 4 | 14 | 70 | 100 | 20 | 40x2 | 10,0 |
| | 15 | 230 | 105 | 4 | 14 | 75 | 105 | 20 | 45x2 | 10,9 |
| | 25 | 260 | 115 | 4 | 18 | 100 | 140 | 24 | 68x2 | 14,5 |
| | 40 | 390 | 150 | 4 | 22 | 125 | 170 | 28 | 88x3 | 29,0 |
| | 50 | 390 | 150 | 4 | 26 | 145 | 195 | 30 | 102x3 | 31,0 |
| | 65 | 540 | - | 8 | 26 | 170 | 220 | 34 | 122x3 | - |
| 250 | 10 | 230 | 115 | 4 | 18 | 85 | 125 | 24 | 40x2 | 10,0 |
| | 15 | 230 | 115 | 4 | 18 | 90 | 130 | 26 | 45x2 | 10,9 |
| | 25 | 260 | 130 | 4 | 22 | 105 | 150 | 28 | 68x2 | 14,5 |
| | 40 | 390 | - | 4 | 26 | 135 | 185 | 34 | 88x3 | 29,0 |
| | 50 | 390 | - | 8 | 26 | 150 | 200 | 38 | 102x3 | 31,0 |
| | 65 | 540 | - | 8 | 26 | 180 | 230 | 42 | 122x3 | - |
| 320 | 10 | 230 | 115 | 4 | 18 | 85 | 125 | 24 | 40x2 | 10,0 |
| | 15 | 230 | 115 | 4 | 18 | 90 | 130 | 26 | 45x2 | 10,9 |
| | 25 | 260 | 130 | 4 | 22 | 115 | 160 | 34 | 68x2 | 17,5 |
| | 40 | 390 | 150 | 4 | 26 | 145 | 195 | 38 | 88x3 | 32,0 |
| | 50 | 390 | 175 | 8 | 26 | 160 | 210 | 42 | 102x3 | 36,0 |
| | 65 | 540 | - | 8 | 30 | 200 | 255 | 51 | 122x3 | - |
| 400 | 10 | 230 | 115 | 4 | 18 | 85 | 125 | 28 | 40x2 | 10,0 |
| | 15 | 230 | 115 | 4 | 22 | 100 | 145 | 30 | 45x2 | 10,9 |
| | 25 | 260 | 130 | 4 | 26 | 130 | 180 | 38 | 68x2 | 17,5 |
| | 40 | 390 | - | 4 | 30 | 165 | 220 | 48 | 88x3 | 32,0 |
| | 50 | 390 | - | 8 | 30 | 180 | 235 | 52 | 102x3 | 36,0 |
| | 65 | 540 | - | 8 | 33 | 225 | 290 | 64 | 122x3 | - |

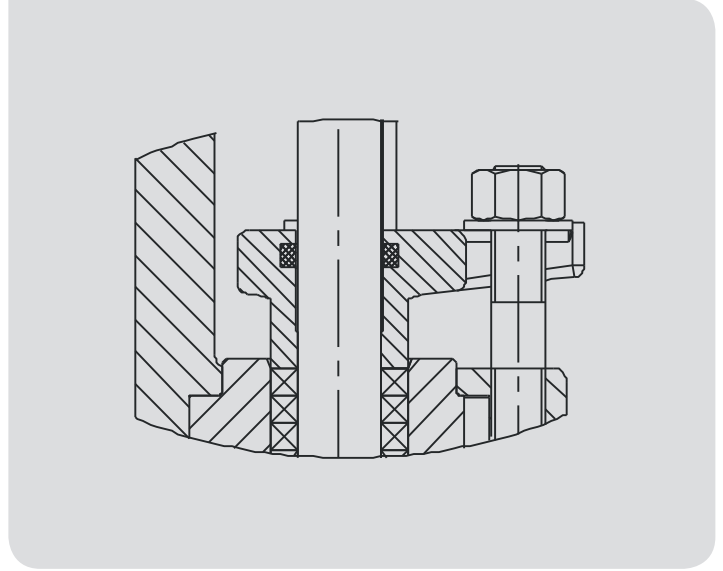
Missing data in the chart on request.

DESIGN VARIANTS

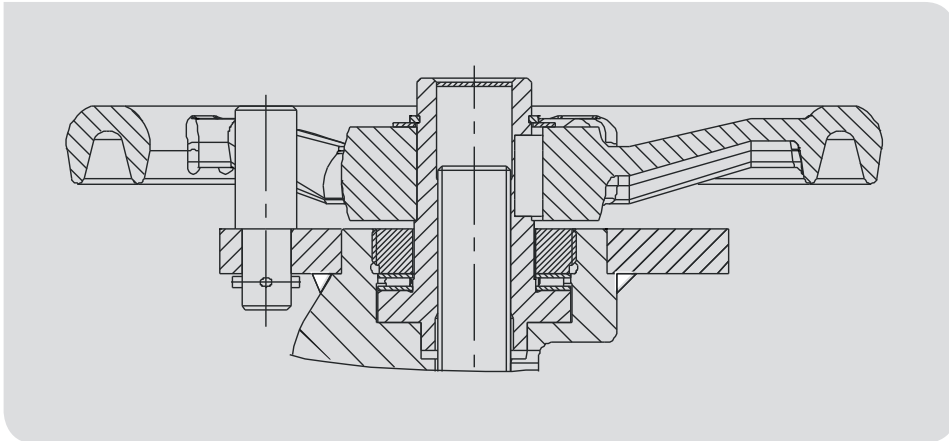
ATTACHMENT FOR ACTUATOR



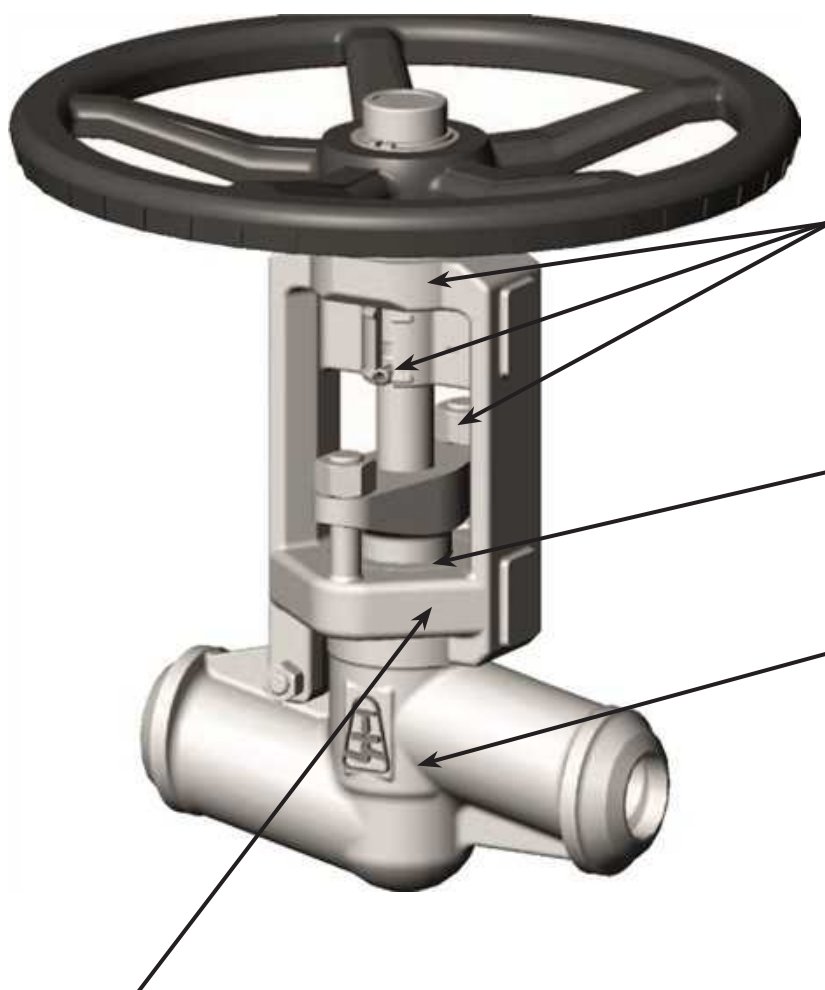
GASKET WITH SCRAPER RING



LOCKING DEVICE



BASIC FEATURES



High reliable valve

- Only one sealed place
- To prevent vibrations, the disc is part of the stem

Easy use

- Position indicator as standard
- Wider distance between the yoke-arms for easy maintenance
- Bearings for easy operation

Long service life of the packing

- Stem with low roughness
- Non-rotating stem

Long service life of the seats

- Seats are hard faced with corrosion proof 13Cr steel or Stellite 6

Reduced construction height

Reduced operational costs

- Lower pipeline weighting by reason of low weight

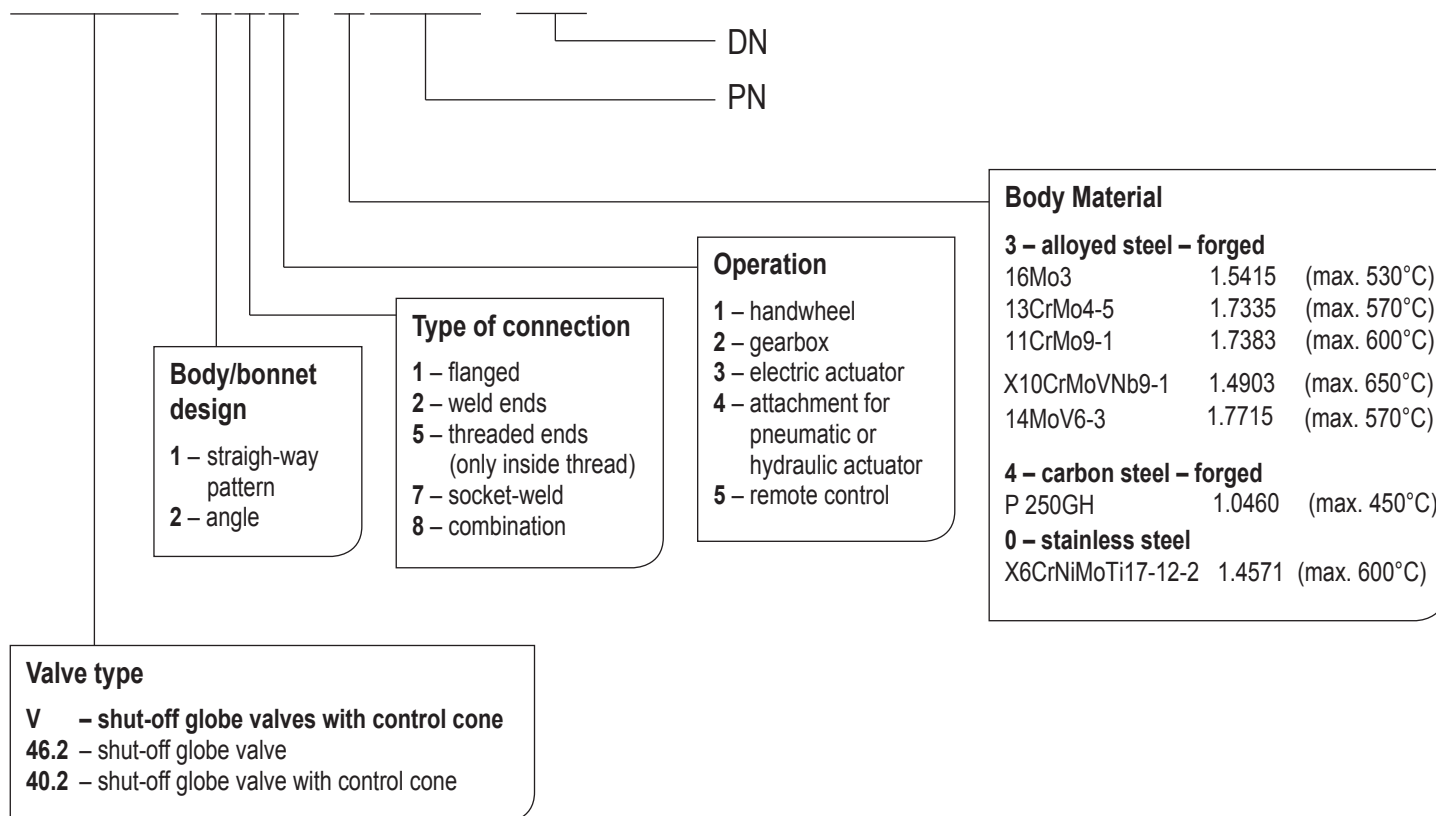
Reduced service costs

- Bayonet connection of body and yoke makes possible fast yoke dismantling
- Lowered seat depth makes easier and speeds up service action
- Easy seat repair – lowered seat depth compared to similar globe valves
- Due to absent of cover connection the control and tightening necessity of cover connection screws is cancelled

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.2/V40.2

VALVE DESCRIPTION CODE

V46.2 111–3250–25



VALVE INSTALLATION

Valve can be installed in any position. Medium must flow under the cone in accordance with the direction indicated on the valve body. It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary to keep working environment a pipeline clean, for example with using filters
- the medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of a valve can be significantly extended by regular maintenance and repairs carried out by qualified personnel.

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V58/V43

PN 160–400; DN 65–150; T_{\max} : 550 °C



HIGH-PRESSURE SHUT-OFF GLOBE VALVE V58/V43

APPLICATION

- water, steam, gas, oil, petroleum products, non-aggressive and aggressive substances

CONNECTION

- flanged, weld ends, union nut, socket weld, combination

OPERATION

- handwheel, gearbox, electric actuator, attachment for pneumatic or hydraulic actuators, remote control

DESCRIPTION

- high-pressure shut-off globe valve V58 and high-pressure shut-off globe valve with control cone V43
- non-rotating rising stem
- one-piece body design without cover
- design of the body is straight
- conical seat
- sealing surface is welded by hard facing (13Cr) or Stellite 6
- complies with the requirements of the directive 2014/68/EU and standard EN 13 709
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

- control cone (for rough control) – type V43
- with external by-pass (for DN 80-150 standard in closed design)
- locking device
- position indicator

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V58/V43

| Pos. | Part | Material | | |
|------|-------------------------------------|---------------------|---------------------|--------------------------|
| 1 | Body | GP240GH/1.0619 | G17CrMo5-5/1.7357 | GX5CrNiMo19-11-2/1.4408 |
| | Hard facing of body sealing surface | 13Cr | Stellite 6 | Stellite 6 |
| 2 | Yoke | G17CrMo5-5/1.7357 | G17CrMo5-5/1.7357 | G17CrMo5-5/1.7357 |
| 3 | Disc | X20Cr13/1.4021 | X22CrMoV12-1/1.4923 | X6CrNiMoTi17-12-2/1.4571 |
| | Hard facing of disc sealing surface | Hardening | Stellite 6 | Stellite 6 |
| 4 | Stem | X20Cr13/1.4021 | X22CrMoV12-1/1.4923 | X6CrNiMoTi17-12-2/1.4571 |
| 5 | Gland packing | Graphite | | |
| 6 | Gland | GP240GH/1.0619+N | GP240GH+N/1.0619+N | 12 060.1 |
| 7 | Stem nut | CuAl10Fe3Mn2/2.0936 | 10S20/1.0721 | X6CrNiMoTi17-12-2/1.4571 |
| 8 | Handwheel | EN-GJL-250/0.6025 | | |
| 9 | Branch | P250GH/1.0460 | 13CrMo4-5/1.7335 | X6CrNiMoTi17-12-2/1.4571 |

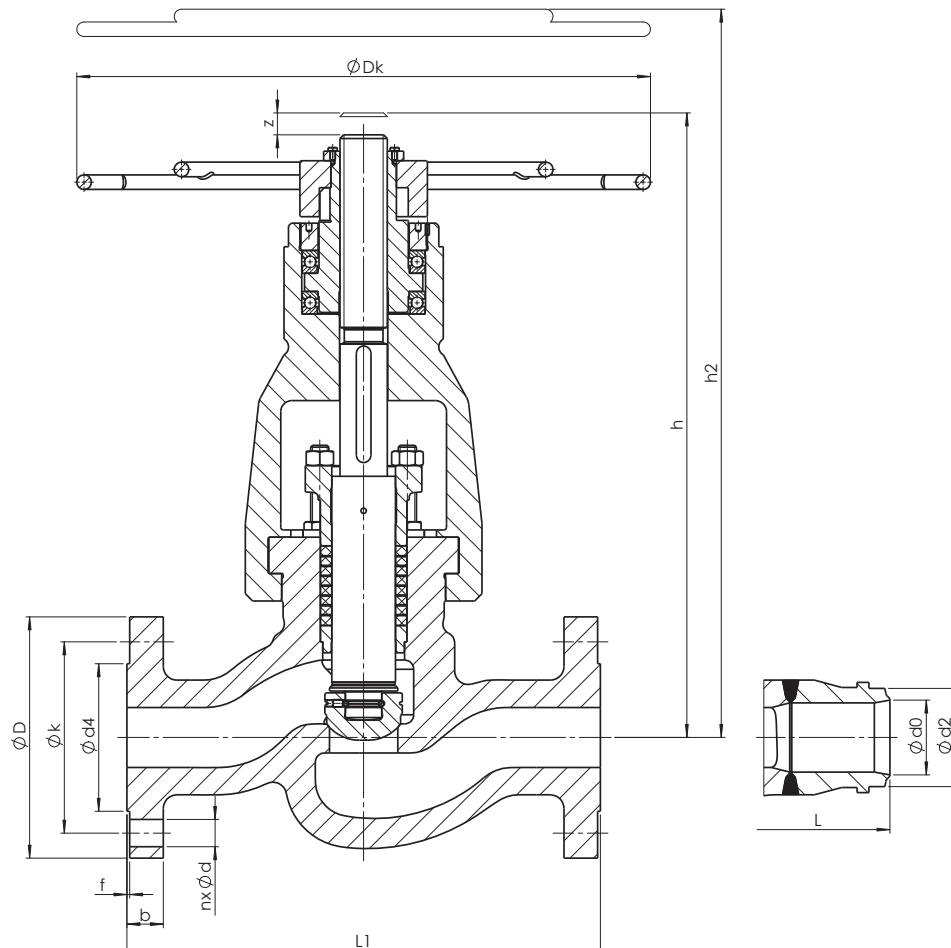
VALVE DIMENSIONS

1. Flanged

Face-to-face dimensions: DIN 3202 – part 1 – line F2 (PN 160), line F3 (PN 250)
 Flanges: EN 1092-1, (DIN 2501 – sheet 1/1972)

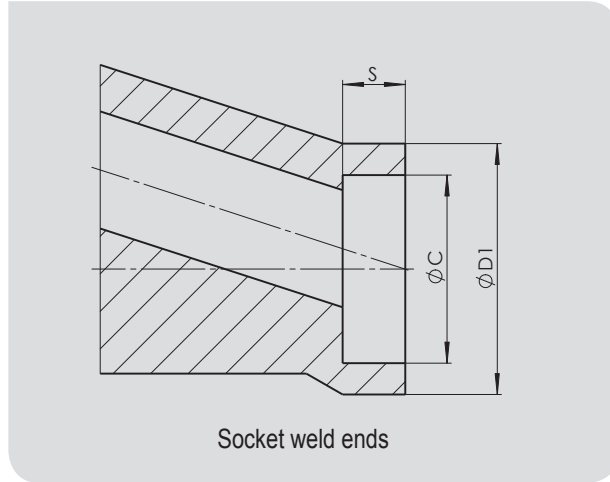
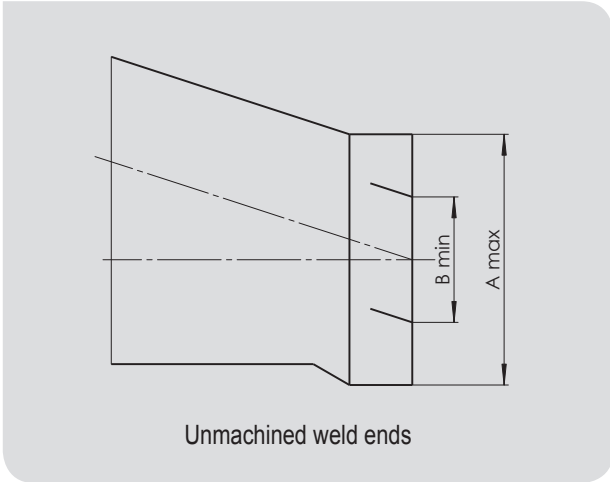
2. Weld ends

Face-to-face dimensions: according to standards of the manufacturer or upon the demand of the customer
 Weld ends: DIN 3239 – part 1
 Groove form: DIN 2559 – sheet 1 – form 22

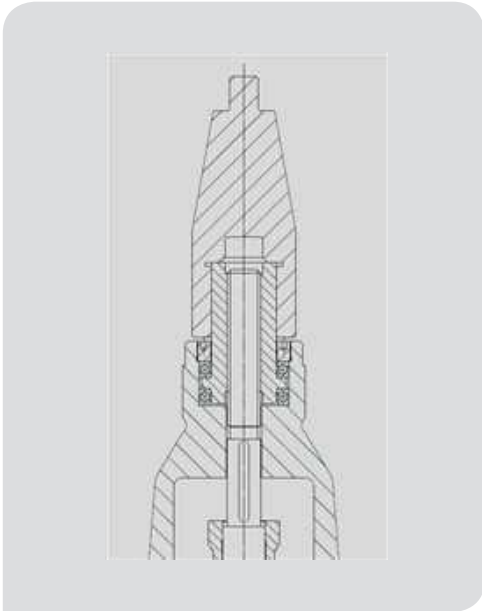


HIGH-PRESSURE SHUT-OFF GLOBE VALVE V58/V43

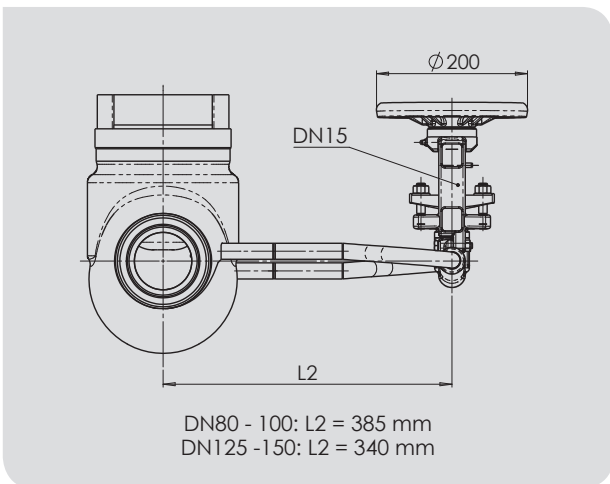
WELDING ENDS



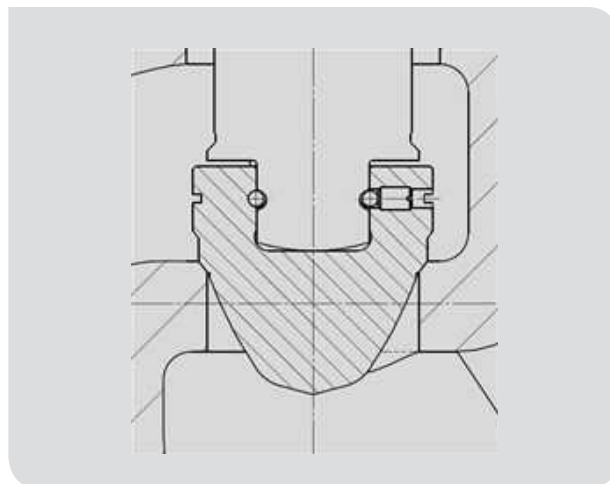
REMOTE CONTROL



BY-PASS



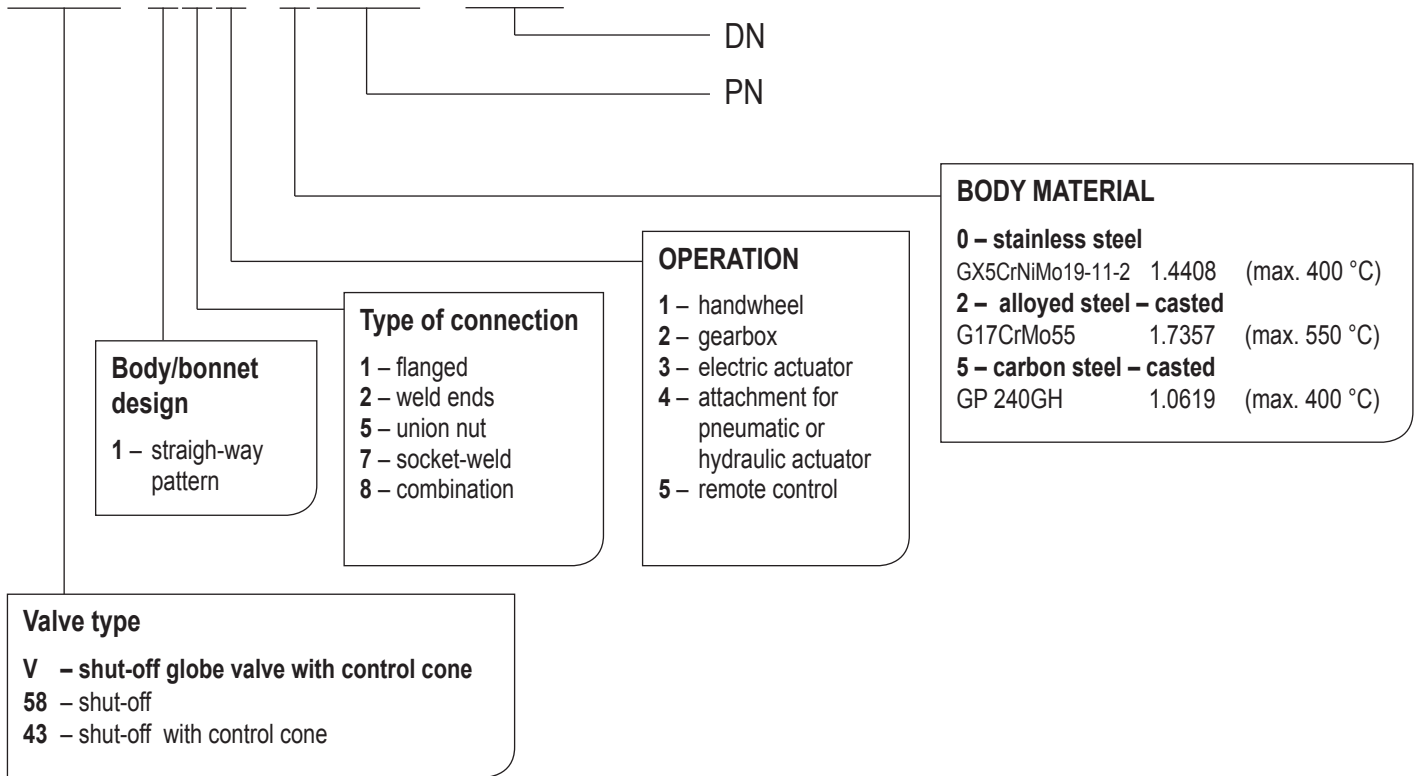
CONTROL CONE



HIGH-PRESSURE SHUT-OFF GLOBE VALVE V58/V43

VALVE DESCRIPTION CODE

V58 111–3250–150



VALVE INSTALLATION

Valve can be installed in any position. Medium must flow in accordance with the direction indicated on the valve body. It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and the flowing medium, therefore it is necessary keep working environment and pipeline clean, for example with using filters
- medium used must be comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V10

PN 100, 160; DN 6–15; T_{MAX}: 450 °C



HIGH-PRESSURE SHUT-OFF GLOBE VALVE V10

APPLICATION

- water, steam, gas, oil, petroleum products, non-aggressive and aggressive substances

CONNECTION

- weld ends, branch, union nut, combination

OPERATION

- handwheel

DESCRIPTION

- high-pressure forged globe valve
- rotating rising stem
- straight or angle pattern body shape (angle body only for PN 160)
- shut-off cone
- conical seat
- sealing surface is welded by hard facing Stellite 6
- complies with the requirements of the directive 2014/68/EU and standard EN 13 709
- testing is carried out according to standard EN 12266-1, part 2

BASIC DESIGN OPTIONS

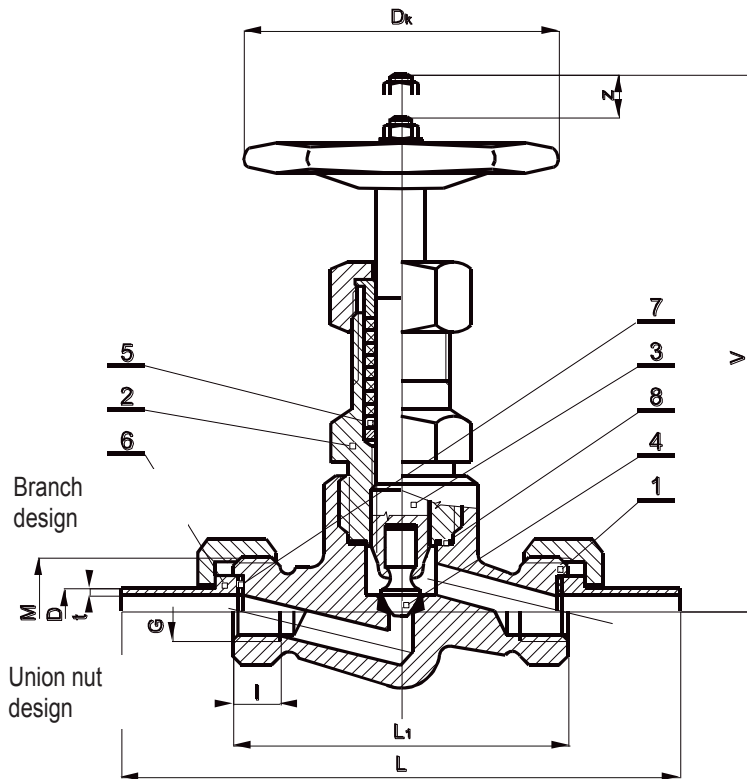
- according to TRD 201
- on request

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V10

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | |
|------------------------------------|-----|---|-----|------|------|------|------|------|-----|------|------|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 |
| P355NH (1.0565) P250GH (1.0460) | 100 | 100 | 100 | 93.3 | 86.7 | 75.6 | 71.1 | 64.4 | 60 | 57.8 | 46.2 |

USED MATERIALS



| Pos. | Part | Material |
|------|--------------------------------|----------------------------------|
| 1 | Body | P355NH (1.0565), P250GH (1.0460) |
| | Hard facing of sealing surface | 18Cr10Ni2Mo |
| 2 | Adapter | St50-2 (1.0050), P250GH (1.0460) |
| 3 | Stem | X20Cr13 (1.4021) |
| 4 | Disc | X22CrMoV12-1 (1.4923) |
| 5 | Packing | Graphite |
| 6 | Branch | 11523 (1.0570) |
| 7 | Gasket (branch) | Graphite |
| 8 | Gasket (adapter) | 17 246 (1.4878) |

VALVE DIMENSIONS

| PN | DN | øD (mm) | t (mm) | L (mm) | M | G | I (mm) | L ₁ (mm) | h (mm) | z (mm) | ØDk (mm) | m [kg] |
|-----|----|---------|--------|--------|---------|------|--------|---------------------|--------|--------|----------|--------|
| 100 | 6 | 10 | 2 | 160 | M27x1,5 | 1/4" | 11 | 90 | 140 | 7 | 125 | 1,1 |
| | 10 | 14 | 2 | 160 | M27x1,5 | 3/8" | 13 | 90 | 140 | 7 | 125 | 1,1 |
| | 15 | 22 | 2,5 | 180 | M33x1,5 | 1/2" | 16 | 100 | 140 | 7 | 125 | 1,5 |

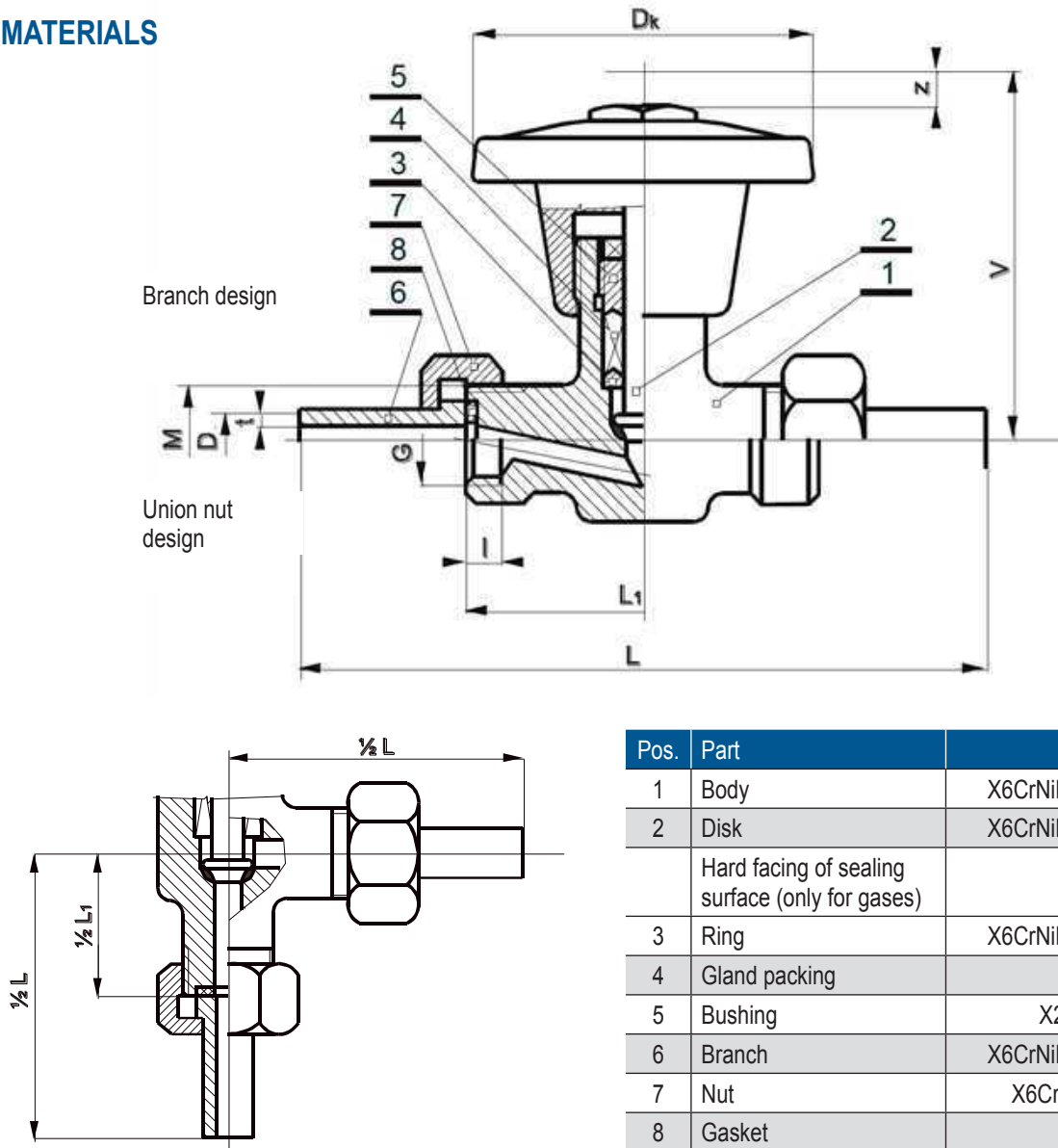
HIGH-PRESSURE SHUT-OFF GLOBE VALVE V10

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | |
|-------------------------------|-----|---|-----|-----|-----|-----|-----|
| | | -196 ¹⁾ | -10 | 50 | 100 | 150 | 200 |
| X6CrNiMoTi17-12-2 (1.4571) | 160 | 160 | 160 | 160 | 146 | 140 | 131 |

1) Application for temperatures from - 196 °C to + 200 °C on request

USED MATERIALS



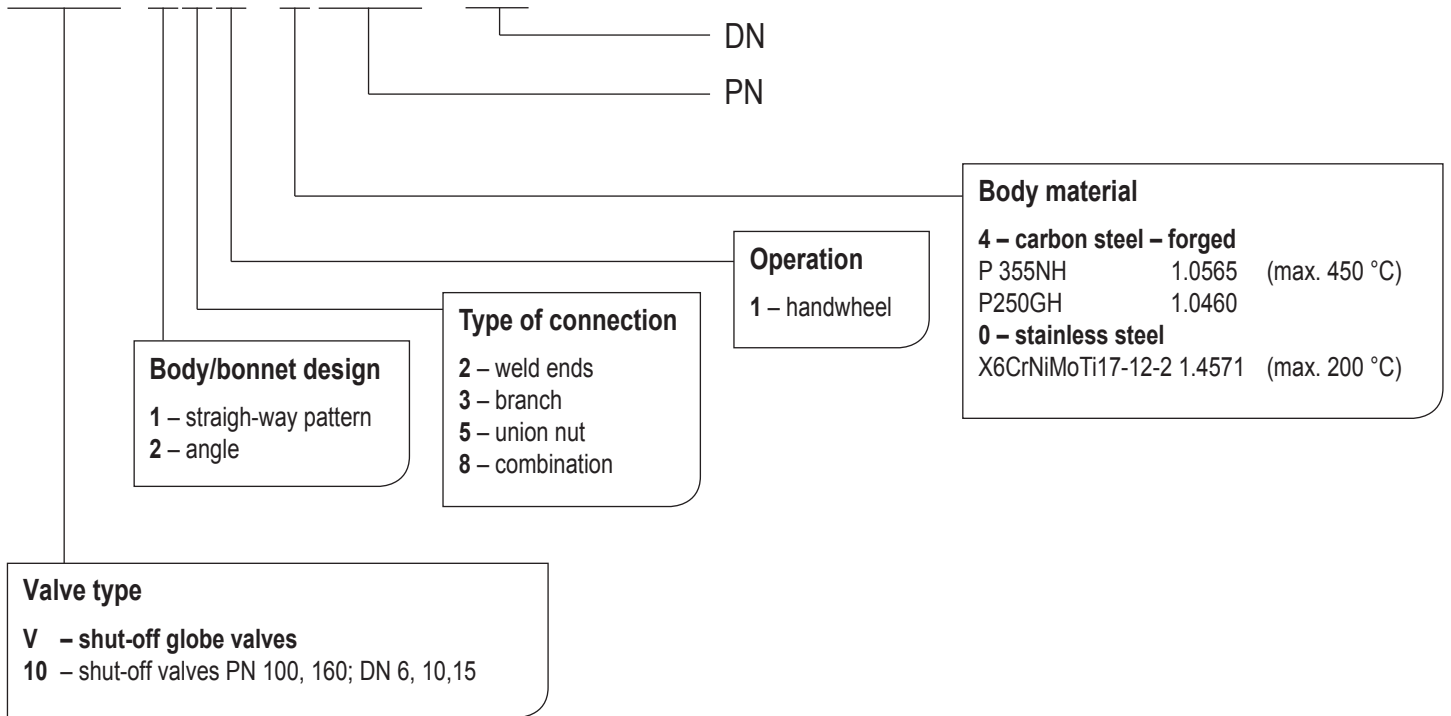
VALVE DIMENSIONS

| PN | DN | ϕD (mm) | t (mm) | L (mm) | M | G | i (mm) | L_1 (mm) | h straight way valve (mm) | h angle type(mm) | z (mm) | ϕD_k (mm) | m straight way valve [kg] | m angle type valve [kg] |
|-----|----|------------------|-----------|-----------|---------|------|-----------|---------------|------------------------------------|------------------------|-----------|--------------------|------------------------------------|----------------------------------|
| 160 | 10 | 14 | 2,5 | 160 | M27x1,5 | 1/2" | 16 | 90 | 75 | 65 | 9 | 80 | 1 | 0,9 |

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V10

VALVE DESCRIPTION CODE

V10 111-4100-10



VALVE INSTALATION

Valve can be installed in any position. Medium must flow under the cone in accordance with the direction indicated on the valve body. It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- medium used must comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V10.1

PN 100–500; DN 6–15; T_{MAX}: 600 °C



HIGH-PRESSURE SHUT-OFF GLOBE VALVE V10.1

APPLICATION

- water, steam, gas, oil, petroleum products, non-aggressive and aggressive substances

CONNECTION

- weld ends

OPERATION

- handwheel

DESCRIPTION

- rotating rising stem
- design of the body is straight
- shut-off cone
- conical seat
- sealing surface is welded by hard facing Stellite 6
- complies with the requirements of the directive 2014/68/EU and standard EN 13709
- testing is carried out according to standard EN 12266-1, part 1

BASIC DESIGN OPTIONS

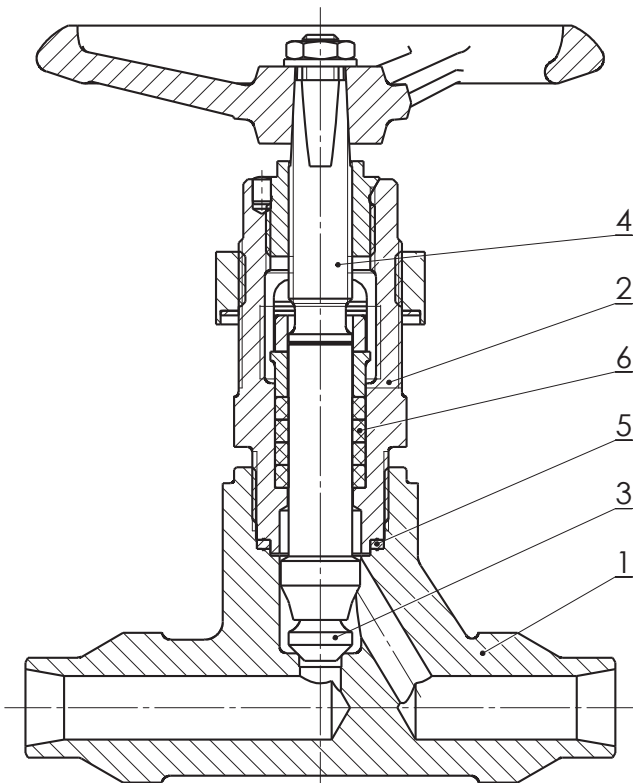
- delivery according to TRD 201 on request

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V10.1

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | | |
|------------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -10 | 50 | 100 | 200 | 250 | 300 | 350 | 400 | 425 | 450 | 475 | 500 | 520 | 540 | 550 | 560 | 570 | 580 | 590 | 600 |
| 14MoV6-3 (1.7715) | 100 | 100 | 100 | 100 | 100 | 99 | 98 | 94 | 88 | 81 | 73 | 65 | 58 | 52 | 48 | 45 | 43 | 41 | 40 | 39 | 38 |
| | 160 | 160 | 160 | 160 | 160 | 159 | 157 | 151 | 140 | 129 | 117 | 104 | 92 | 84 | 76 | 72 | 68 | 66 | 63 | 62 | 61 |
| | 250 | 250 | 250 | 250 | 250 | 248 | 246 | 236 | 219 | 202 | 183 | 162 | 145 | 131 | 119 | 113 | 107 | 103 | 99 | 97 | 96 |
| | 320 | 320 | 320 | 320 | 320 | 317 | 315 | 301 | 280 | 259 | 234 | 207 | 185 | 168 | 152 | 145 | 137 | 132 | 127 | 124 | 123 |
| | 400 | 400 | 400 | 400 | 400 | 397 | 394 | 377 | 350 | 323 | 292 | 259 | 231 | 210 | 190 | 181 | 171 | 165 | 158 | 155 | 153 |
| | 500 | 500 | 500 | 500 | 500 | 496 | 492 | 471 | 438 | 404 | 365 | 324 | 289 | 262 | 238 | 226 | 214 | 206 | 198 | 194 | 191 |
| 11CrMo9-10 (1.7383) | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 93 | 85 | 65 | 49 | 43 | 38 | 32 | 29 | 25 | 22 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 148 | 136 | 104 | 79 | 69 | 60 | 52 | 46 | 40 | 36 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 232 | 213 | 163 | 123 | 108 | 94 | 81 | 72 | 63 | 56 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 296 | 273 | 208 | 157 | 138 | 120 | 103 | 92 | 80 | 72 |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 370 | 341 | 260 | 197 | 172 | 150 | 129 | 114 | 100 | 90 |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 463 | 426 | 325 | 246 | 215 | 188 | 161 | 143 | 125 | 112 |

USED MATERIALS



| Pos. | Part | Material | |
|------|--|------------------------------|------------------------|
| 1 | Body | 15 128 (14MoV6-3, 1.7715) | 11CrMo9-10 (1.7383) |
| | Hard facing of body sealing surface | Stellite 6 | Stellite 6 |
| 2 | Adapter | 15 128 (14MoV6-3, 1.7715) | 11CrMo9-10 (1.7383) |
| 3 | Disc | X22CrMoV12-1 (1.4923) | |
| 4 | Stem | X22CrMoV12-1 (1.4923) | |
| 5 | Gasket | Graphite | |
| 6 | Gland packing | Graphite | |

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V10.1

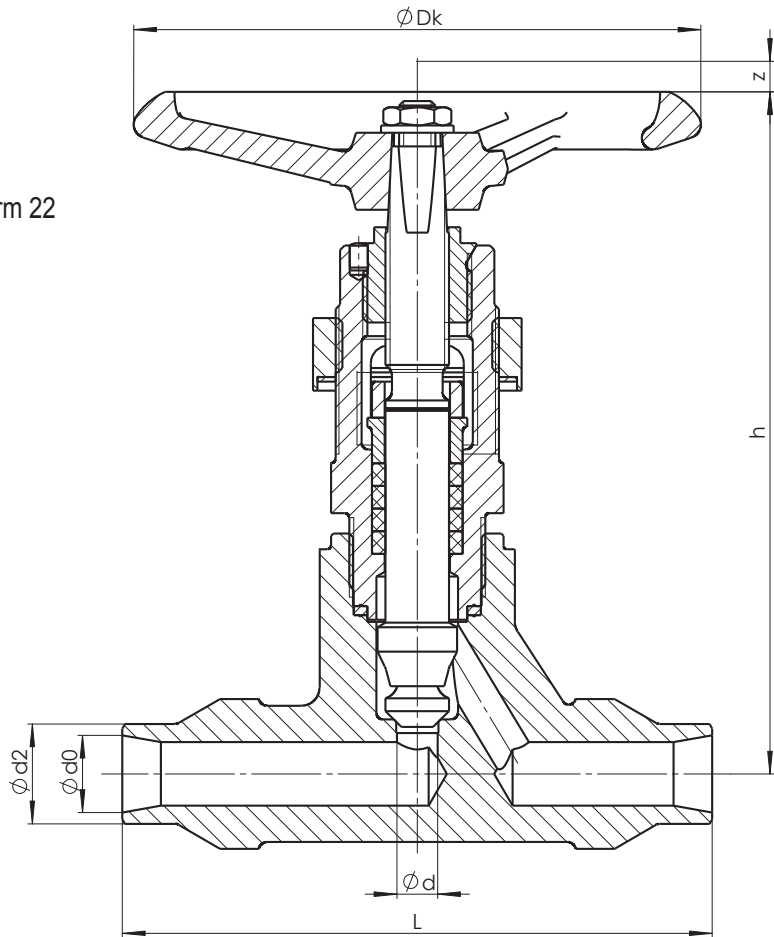
VALVE DIMENSIONS

Weld ends, socket weld

Face-to-face dimensions: as per table

Weld ends: DIN 3239 – part 1

Groove form: DIN 2559 – sheet 1 – form 22



WELD ENDS

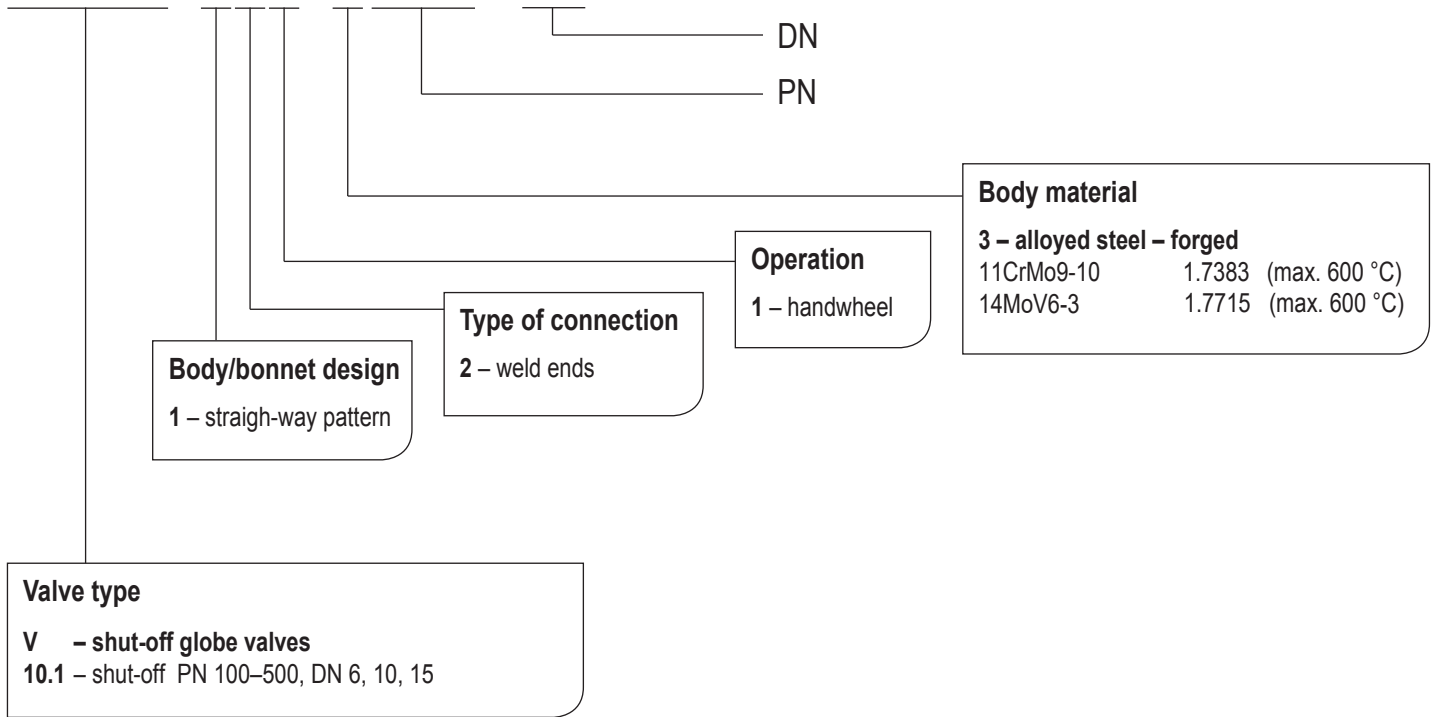
| Nominal pressure | Nominal size | Face-to-face | Centre-to-top | Diameter drilling | Stroke | Handwheel | Weld ends | | Approximate weight | Pipe dimensions |
|------------------|--------------|--------------|---------------|-------------------|----------|----------------|----------------|----------------|--------------------|-----------------|
| PN | DN | L | h | d | z | D _k | d ₂ | d ₀ | m [kg] | |
| 100 | 6 | 130 | 150 | 9 | 9 | 125 | 10 | 7 | 2,0 | 10,0x2,0 |
| | 18 | | | | | | 13 | 1,9 | 17,2x2,0 | |
| | 22 | | | | | | 17 | 1,9 | 21,3x2,0 | |
| 160 | 6 | | | | | | 12 | 7 | 2,0 | 12,0x2,5 |
| | 18 | | | | | | 13 | 1,9 | 17,2x2,0 | |
| | 22 | | | | | | 17 | 1,9 | 21,3x2,0 | |
| 250 | 6 | | | | | | 12 | 7 | 2,0 | 12,0x2,5 |
| | 18 | | | | | | 12 | 1,9 | 17,2x2,6 | |
| | 22 | | | | | | 16 | 1,9 | 21,3x2,6 | |
| 320 | 6 | | | | | | 12 | 7 | 2,0 | 12,0x2,5 |
| | 18 | | | | | | 12 | 1,9 | 17,2x2,6 | |
| | 22 | | | | | | 15 | 1,9 | 21,3x3,2 | |
| 400 | 6 | 14 | 6 | 2,0 | 14,0x4,0 | | | | | |
| | 18 | 10 | 1,9 | 17,2x3,6 | | | | | | |
| | 28 | 17 | 1,9 | 26,9x5,0 | | | | | | |
| 500 | 6 | 14 | 6 | 2,0 | 14,0x4,0 | | | | | |
| | 22 | 11,5 | 1,9 | 21,3x5,0 | | | | | | |
| | 32 | 16,5 | 1,9 | 33,7x8,0 | | | | | | |

Missing data on request

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V10.1

VALVE DESCRIPTION CODE

V10.1 121–3500–10



VALVE INSTALLATION

Valve can be installed in any position. Medium must flow under the cone in accordance with the direction indicated on the valve body. It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- the medium used must be comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

HIGH-PRESSURE GLOBE VALVE V45

PN 100–250; DN 10; T_{MAX} : 550 °C



HIGH-PRESSURE GLOBE VALVE V45

APPLICATION

- water, steam, gas, oil, petroleum products, non-aggressive and aggressive substances

CONNECTION

- weld ends

OPERATION

- handwheel

DESCRIPTION

- rotating rising stem
- shut-off cone
- conical seat
- sealing surfaces is welded by hard facing Stellite 6
- stem gland packing in yoke
- complies with the requirements of the directive 2014/68/EU and standard EN 13709
- testing is carried out according to standard EN 12266-1; part 2

BASIC DESIGN OPTIONS

- PTFE gland packing (max. 200 °C) on request
- delivery according to TRD 201

HIGH-PRESSURE GLOBE VALVE V45

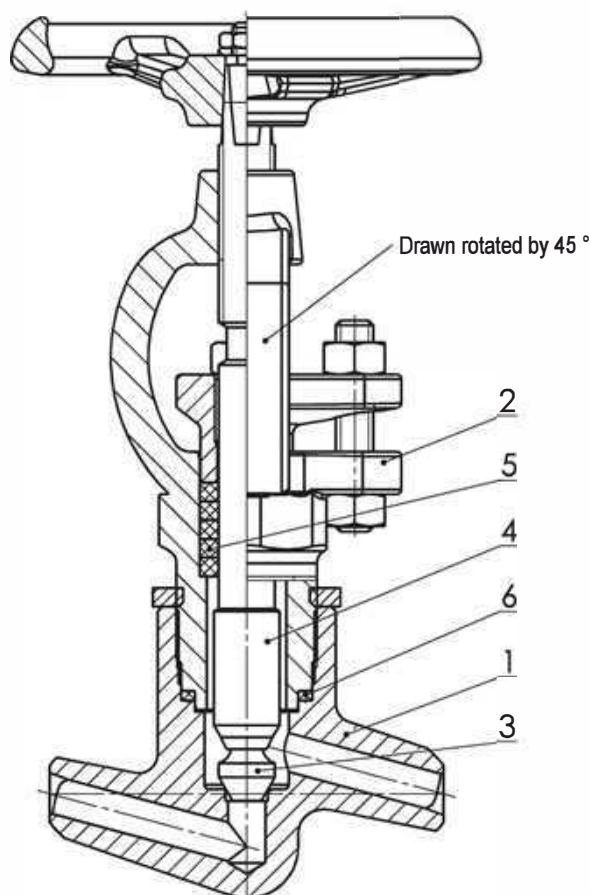
PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | |
|----------------------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 475 | 500 | 510 | 520 | 530 | 540 | 550 |
| P250GH (1.0460) | 100 | 100 | 100 | 88 | 83 | 78 | 69 | 59 | 55 | 49 | 38 | - | - | - | - | - | - | - |
| | 160 | 160 | 160 | 141 | 133 | 125 | 110 | 94 | 87 | 78 | 61 | - | - | - | - | - | - | - |
| | 250 | 250 | 250 | 221 | 208 | 196 | 172 | 147 | 137 | 123 | 95 | - | - | - | - | - | - | - |
| 13CrMo4-5 (1.7335) | 100 | 100 | 100 | 100 | 100 | 100 | 98 | 94 | 93 | 89 | 85 | 81 | 72 | 61 | 49 | 38 | 29 | 21 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 157 | 152 | 150 | 143 | 136 | 129 | 116 | 98 | 77.5 | 61 | 45 | 34 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 245 | 237 | 233 | 223 | 213 | 202 | 180 | 151 | 122 | 95 | 72 | 53 |
| 11CrMo9-10 (1.7383) 15 128 | 100 | 100 | 100 | 100 | 100 | 100 | 98 | 94 | 93 | 89 | 85 | 81 | 72 | 61 | 49 | 43 | 37 | 32 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 157 | 152 | 150 | 143 | 136 | 129 | 116 | 96 | 78 | 68 | 60 | 51 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 245 | 237 | 233 | 223 | 213 | 202 | 180 | 151 | 122 | 107 | 93 | 79 |

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | |
|-------------------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -196 *) | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 |
| X6CrNiTi 18-10 (1.4541) | 100 | 100 | 100 | 100 | 88 | 82 | 76 | 73 | 69 | 65 | 62 | 60 | 57 | 55 |
| | 160 | 160 | 160 | 160 | 141 | 131 | 122 | 116 | 110 | 104 | 99 | 95 | 92 | 88 |
| | 250 | 250 | 250 | 250 | 220 | 205 | 190 | 181 | 172 | 163 | 155 | 149 | 143 | 137 |

*) Use for temperatures up to -196 ° C on request

USED MATERIALS



HIGH-PRESSURE GLOBE VALVE V45

| Pos. | Part | Material | | | |
|------|--------------------------------|---------------------------------|-------------------------------|-------------------------------|---|
| 1 | Body | P250GH (1.0460), 11 416 | 13CrMo4-5 (1.7335) | 11CrMo9-10 (1.7383) | X6CrNiTi18-10 (1.4541) |
| | Hard facing of sealing surface | X20CrMo17-1 (1.4115) | Stellite 6 | Stellite 6 | - |
| 2 | Adapter | G17CrMo5-5 (1.7357, 42 2744) | | | GX5CrNiNb19-11, GX5CrNiMoNb19-11-2 (1.4552, 1.4581) |
| 3 | Disc | X20Cr13 (1.4021) | X6CrNiMoTi17-12-2 (1.4571) | X6CrNiMoTi17-12-2 (1.4571) | X6CrNiMoTi17-12-2 (1.4571) |
| | Hard facing of sealing surface | - | Stellite 6 | | |
| 4 | Stem | X20Cr13 (1.4021) | X22CrMoV12-1 (1.4923) | X22CrMoV12-1 (1.4923) | X22CrMoV12-1 (1.4923) |
| 5 | Packing | Graphite | | | |
| 6 | Gasket | Graphite | | | |

VALVE DIMENSIONS

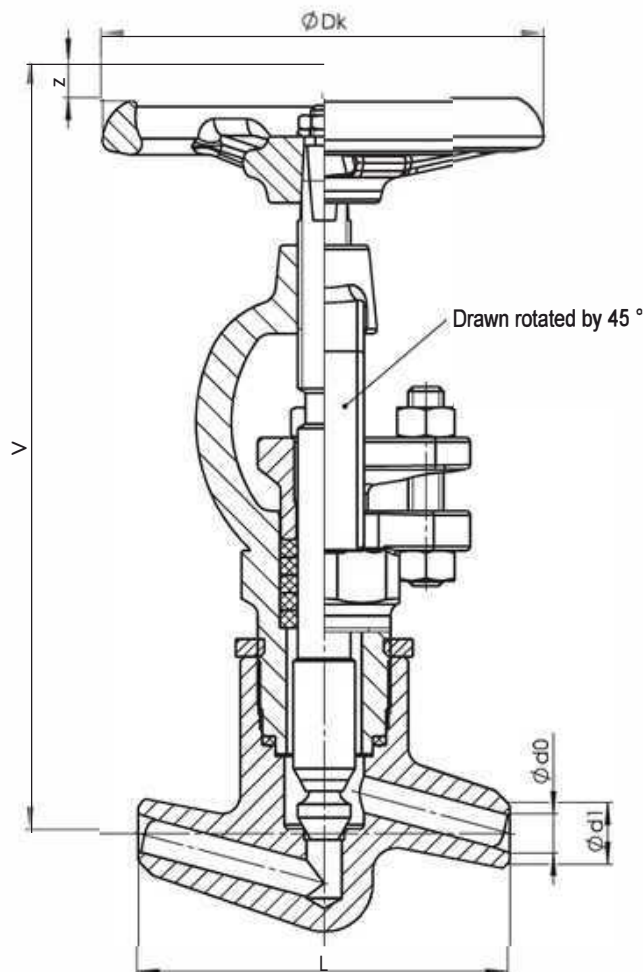
Weld ends

Face-to-face dimensions:

as per table

Dimensions of welding ends:

as per table (ČSN 13 1075)

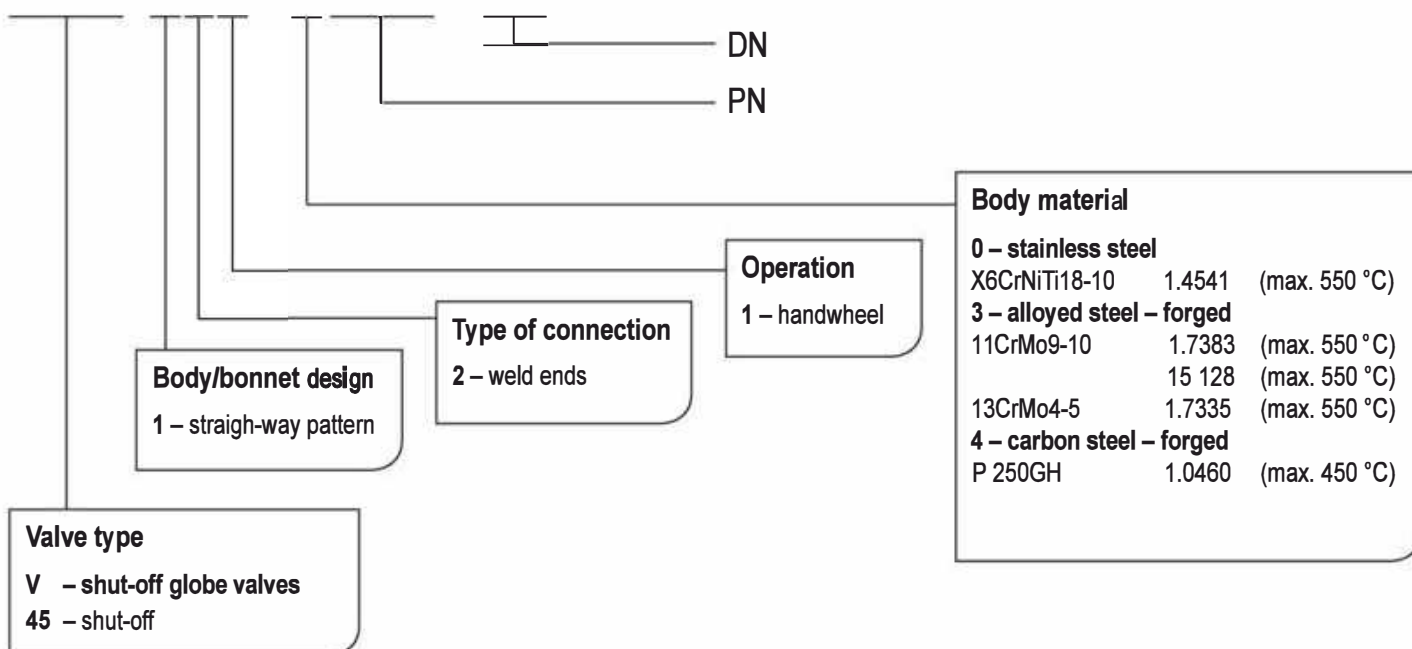


HIGH-PRESSURE GLOBE VALVE V45

| Nominal pressure | Nominal size | Face-to-face | Centre-to-top | Stroke | Handwheel | Weld ends | | Pipe dimension | Approximate weight |
|------------------|--------------|--------------|---------------|--------|-------------------|-------------------|-------------------|----------------|--------------------|
| PN | DN | L | V | z | $\varnothing D_k$ | $\varnothing d_1$ | $\varnothing d_0$ | TR KR x s | m [kg] |
| 100 | 10 | 85 | 175 | 6 | 125 | 14 | 10 | 14 x 2 | 1,3 |
| 160 | | 85 | 175 | 6 | 125 | 14 | 10 | 14 x 2,5 | 1,3 |
| 250 | | 85 | 175 | 6 | 125 | 14 | 9 | 14 x 3 | 1,3 |

VALVE DESCRIPTION CODE

V45 121-3160-10



VALVE INSTALLATION

Valve can be installed in any position. Medium must flow under the cone in accordance with the direction indicated on the valve body. It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- the medium used must be comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.3/V40.3

PN 63–250 ONLY FOR DN 65; PN 320–630; DN 10–50; T_{MAX} : 600 °C



HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.3/V40.3

APPLICATION

- water, steam, gas, oil, petroleum products, non-aggressive and aggressive substances

CONNECTION

- flanged, weld ends, threaded ends, combination

OPERATION

- handwheel, electric actuator, gearbox, attachment for pneumatic or hydraulic actuator, remote control

DESCRIPTION

- high-pressure shut-off valve V46.3 and high-pressure shut-off valve with control cone V40.3
- forged material
- non-rotating rising stem
- one-piece body without cover
- stem gland packing in body
- sealing surface is welded by hard facing (13Cr) or Stellite 6
- position indicator
- complies with the requirements of the directive 2014/68/EU and standard EN 13709
- testing is carried out according to standard EN 12266-1, part 2

BASIC DESIGN OPTIONS

- control cone (for rough control) – type V40.3
- according to TRD 201
- limit switches
- gland with scraper ring

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.3/V40.3

PRESSURE-TEMPERATURE-RATINGS

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | |
|------------------------|-----|---|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 | 580 |
| P250GH (1.0460) | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 44.8 | 40.6 | 37.8 | 36.4 | 21 | - | - | - | - | - | - | - | - |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 71.1 | 64.4 | 60 | 57.8 | 33 | - | - | - | - | - | - | - | - |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 110 | 94.1 | 88.3 | 78.5 | 45 | - | - | - | - | - | - | - | - |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 172 | 147 | 137 | 123 | 70 | - | - | - | - | - | - | - | - |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 273 | 233 | 182 | 103 | - | - | - | - | - | - | - | - |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 342 | 290 | 227 | 129 | - | - | - | - | - | - | - | - |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 490 | 427 | 364 | 284 | 162 | - | - | - | - | - | - | - | - |
| 16Mo3 (1.5415) | 63 | 63 | 63 | 63 | 63 | 60,2 | 56 | 47,6 | 44,8 | 42 | 40,6 | 28,3 | 21,5 | 17 | 13,6 | - | - | - | - | - |
| | 100 | 100 | 100 | 100 | 100 | 95,6 | 88,9 | 75,6 | 71,1 | 66,7 | 64,4 | 44,9 | 34,1 | 26,9 | 21,6 | - | - | - | - | - |
| | 160 | 160 | 160 | 160 | 160 | 157 | 147 | 136 | 123 | 116 | 110 | 79,9 | 60,7 | 47,9 | 38,4 | - | - | - | - | - |
| | 250 | 250 | 250 | 250 | 250 | 245 | 229 | 213 | 191 | 181 | 171 | 124 | 94,2 | 74,4 | 59,5 | - | - | - | - | - |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 318 | 298 | 288 | 179 | 136 | 107 | 86 | - | - | - | - | - |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 398 | 373 | 360 | 224 | 170 | 134 | 108 | - | - | - | - | - |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 484 | 422 | 398 | 361 | 321 | 184 | 145 | 116 | - | - | - | - |
| 13CrMo4-5 (1.7335) | 63 | 63 | 63 | 63 | 63 | 63 | 61.6 | 57.4 | 53.2 | 50.4 | 47.6 | 38.4 | 32.5 | 26.3 | 21.8 | 17.6 | 13.7 | - | - | - |
| | 100 | 100 | 100 | 100 | 100 | 100 | 97.8 | 91.1 | 84.4 | 80 | 75.6 | 60.9 | 51.6 | 41.8 | 34.7 | 28 | 21.8 | - | - | - |
| | 160 | 160 | 160 | 160 | 160 | 160 | 157 | 152 | 150 | 143 | 136 | 116 | 98.1 | 77.5 | 60.8 | 45.1 | 34.3 | - | - | - |
| | 250 | 250 | 250 | 250 | 250 | 250 | 245 | 237 | 233 | 223 | 213 | 180 | 151 | 122 | 95.1 | 71.6 | 53 | - | - | - |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 314 | 298 | 286 | 273 | 232 | 196 | 155 | 122 | 91.2 | 67.7 | - | - | - |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 392 | 373 | 357 | 341 | 289 | 245 | 194 | 152 | 114 | 85.3 | - | - | - |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 489 | 433 | 363 | 287 | 234 | 189 | 148 | - | - |
| 11CrMo9-10 (1.7383) | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 61.8 | 59.8 | 56.9 | 54.9 | 46.1 | 38,7 | 31,4 | 27,4 | 23,5 | 20 | 17,3 | 14,8 | 12,8 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 98.1 | 93.2 | 89.2 | 85.3 | 72.6 | 60,3 | 48.1 | 42 | 35.9 | 30.7 | 26.4 | 22.7 | 19.6 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 152 | 150 | 143 | 136 | 116 | 96,7 | 77.5 | 68,6 | 59.8 | 51 | 44 | 37.8 | 32.5 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 237 | 233 | 223 | 213 | 180 | 151 | 122 | 107 | 93.2 | 79.4 | 68.4 | 58.9 | 50.7 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 314 | 298 | 286 | 273 | 232 | 193 | 155 | 137 | 119 | 102 | 87.9 | 75.6 | 65.1 |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 392 | 373 | 357 | 341 | 289 | 241 | 194 | 171 | 148 | 127 | 109 | 94.2 | 81 |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 426 | 375 | 325 | 285 | 246 | 215 | 188 | 161 | 143 |
| | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 490 | 426 | 369 | 320 | 276 | 235 | 202 | 174 | 149 |

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.3/V40.3

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | |
|-----------------------------------|-----|---|-----|-----|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -196 ¹⁾ | -10 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 |
| X6CrNiMoTi 17-12-2 (1.4571) | 63 | 63 | 63 | 63 | 61.6 | 57.4 | 53.8 | 51.2 | 49 | 47.3 | 45.9 | - | - | - | - | - | - | - | - | - |
| | 100 | 100 | 100 | 100 | 97.8 | 91.1 | 85.3 | 81.3 | 77.8 | 75.1 | 72.9 | - | - | - | - | - | - | - | - | - |
| | 160 | 160 | 160 | 160 | 146 | 140 | 131 | 125 | 119 | 115 | 112 | - | - | - | - | - | - | - | - | - |
| | 250 | 250 | 250 | 250 | 229 | 218 | 204 | 195 | 186 | 180 | 174 | - | - | - | - | - | - | - | - | - |
| | 320 | 320 | 320 | 320 | 293 | 279 | 261 | 249 | 238 | 230 | 223 | - | - | - | - | - | - | - | - | - |
| | 400 | 400 | 400 | 400 | 366 | 349 | 327 | 311 | 298 | 288 | 279 | - | - | - | - | - | - | - | - | - |

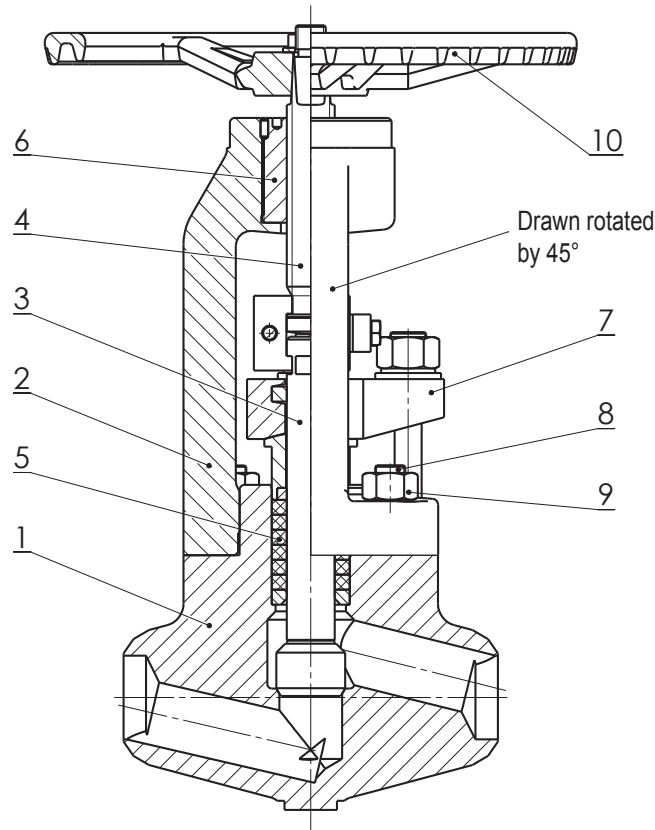
1) Application for temperatures - 196 °C to + 400 °C on request

| Material | PN | Admissible operating pressure PS [bar] at operating temperature TS [°C] | | | | | | | | | | | | | | | | | | | |
|--|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | -10 | 200 | 250 | 300 | 350 | 400 | 450 | 480 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 | 600 |
| X10CrMo VNb9-1 (P91) (1.4903) ²⁾ | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 |
| | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 |
| | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 |
| | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 |

2) Application for temperatures up to + 650 °C on request

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.3/V40.3

USED MATERIALS



| Pos. | Part | Material | | | | | |
|------|--------------------------------------|---|-----------------------------------|--------------------------------|--------------------------|-------------------------------|-----------------------------------|
| 1 | Body | P250GH (1.0460) (11 416) | 16Mo3 (1.5415) | 13CrMo4-5 (1.7335) | 11CrMo9-10 (1.7383) | X6CrNiMoTi17-12-2 (1.4571) | X10CrMoVNb9-1, (P91), (1.4903) |
| | Hard facing of sealing surface | 13Cr | Stellite 6 | | | | |
| 2 | Yoke | 11CrMo9-10 (1.0460, 1.7380, 1.7383) | 11CrMo9-10 (1.7335, 1.7383) | 11CrMo9-10 (1.7335, 1.7383) | 11CrMo9-10 (1.7383) | X6CrNiMoTi17-12-2 (1.4571) | 11CrMo9-10 (1.7383) |
| 3 | Disc | X20Cr13 (1.4021) | X22CrMoV12-1 (1.4923) | X22CrMoV12-1 (1.4923) | X22CrMoV12-1 (1.4923) | X6CrNiMoTi17-12-2 (1.4571) | X20CrMoV11-1 (1.4922) |
| | Hard facing of sealing surface | Hardened | Stellite 6 | | | | |
| 4 | Stem | X20Cr13 (1.4021) | X22CrMoV12-1 (1.4923) | X22CrMoV12-1 (1.4923) | X22CrMoV12-1 (1.4923) | X39CrMo17-1 (1.4122) | X20CrMoV11-1 (1.4922) |
| 5 | Packing | Graphite | | | | | |
| 6 | Stem nut | 11 110 (10S20) (1.0721) | | | | | |
| 7 | Flange | P250GH (C 22.8) (1.0425, 1.0460) | 11CrMo9-10 (1.7383) | 16Mo 3 (1.5415) | 13CrMo4-5 (1.7335) | 11CrMo9-10 (1.7383) | 11CrMo9-10 (1.7383) |
| 8 | Bolt | 21CrMoV5-7 (1.7709) | 21CrMoV5-7 (1.7709) | 21CrMoV5-7 (1.7709) | 21CrMoV5-7 (1.7709) | X22CrMoV12-1 (1.4923) | X22CrMoV12-1 (1.4923) |
| 9 | Nut | 25CrMo4 (1.7218) | 25CrMo4 (1.7218) | 25CrMo4 (1.7218) | 25CrMo4 (1.7218) | X22CrMoV12-1 (1.4923) | X22CrMoV12-1 (1.4923) |
| 10 | Handwheel | EN-GJL-300 (GG – 30) | | | | | |

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.3/V40.3

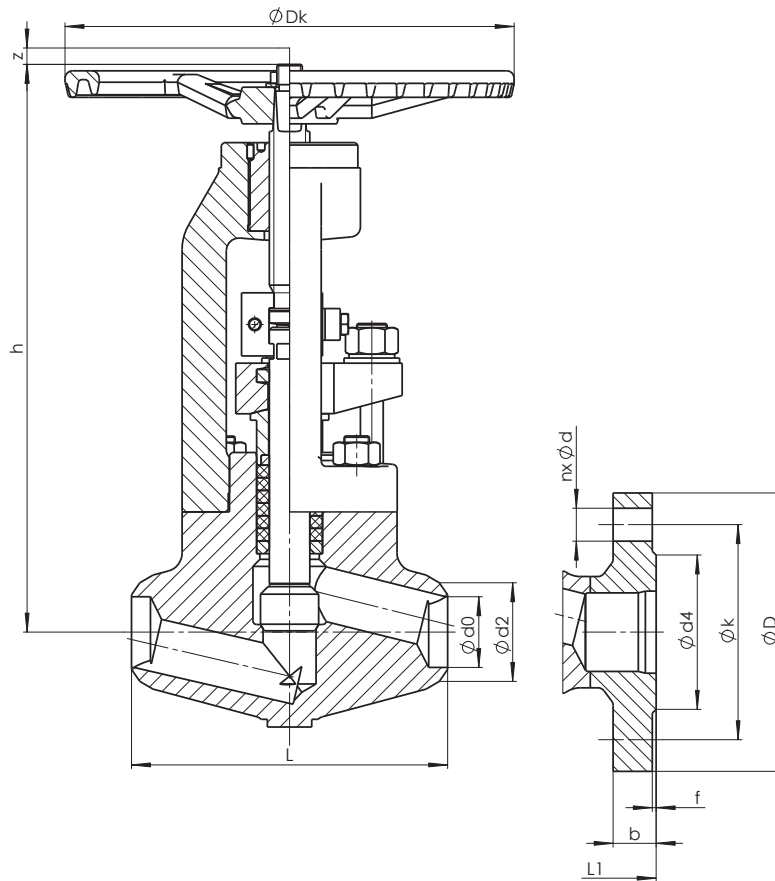
VALVE DIMENSIONS

1. Flanged

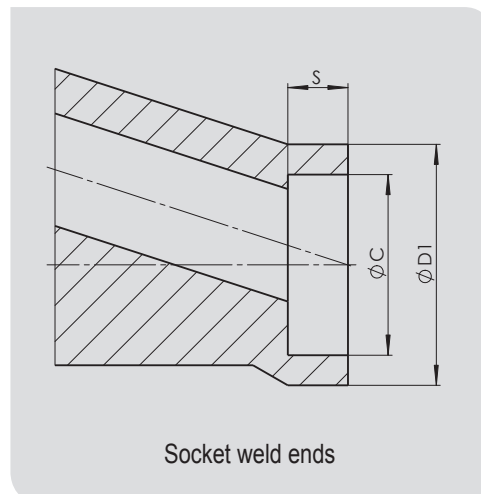
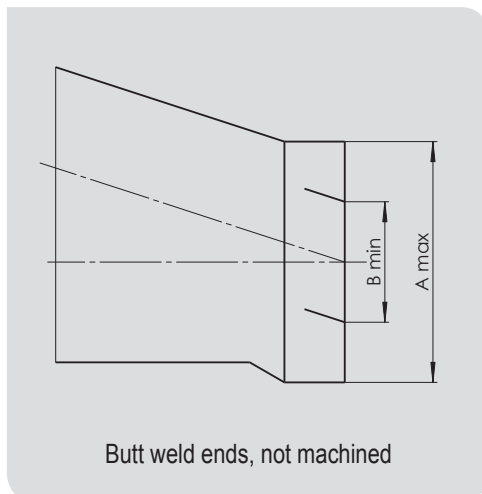
Face-to-face dimensions: according to the manufacturer's standard
Flanges: EN 1092-1, (DIN 2501/1972)

2. Weld ends

Face-to-face dimensions: according to the manufacturer's standard
Dimensions of welding ends: DIN 3239 – part 1
Groove form: DIN 2559 – sheet 1 – form 22



WELDING ENDS



HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.3/V40.3

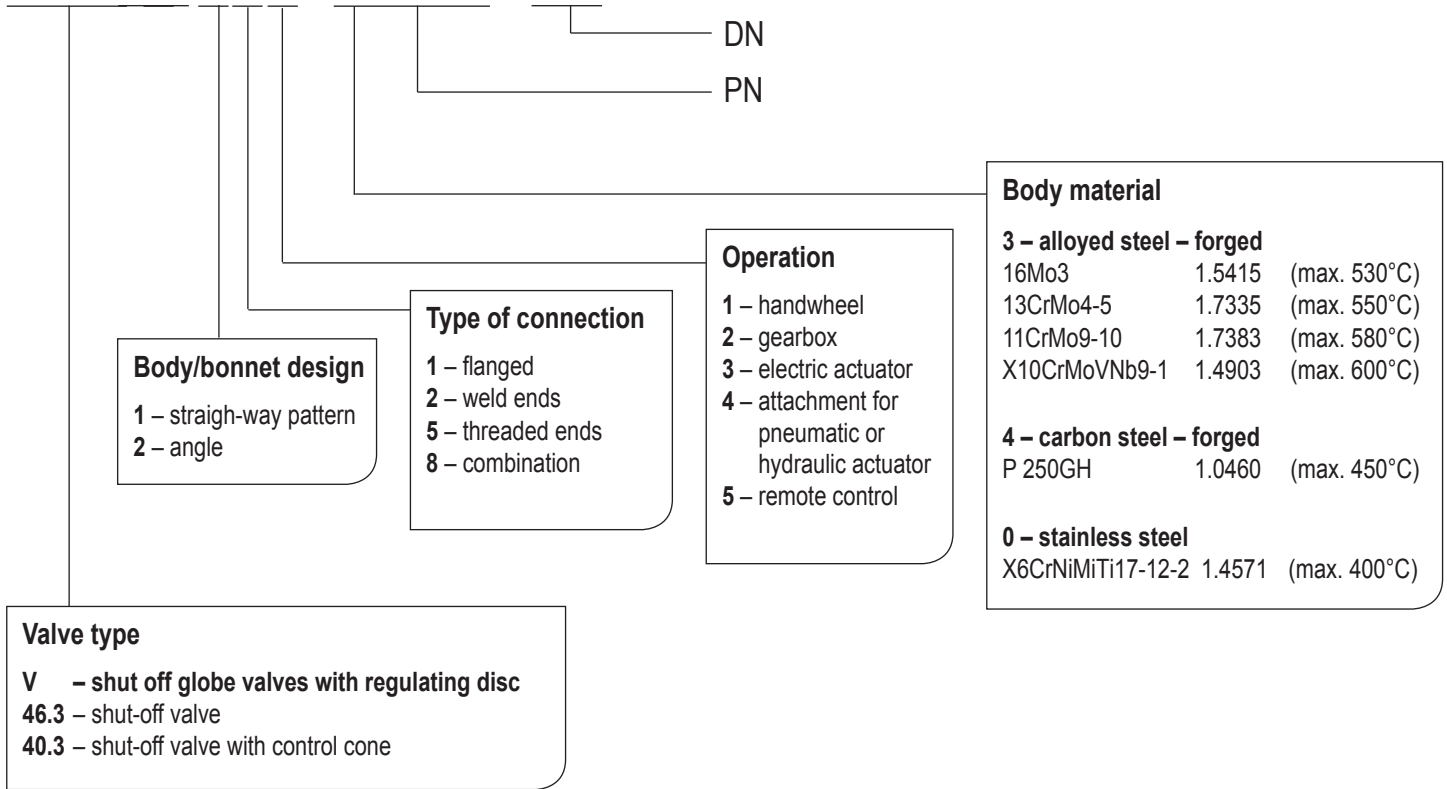
| Nominal pressure | Nominal size | Centre-to-top-height | Stroke | E-actuator connection EN ISO 5210 | Handwheel | Weld ends | | | | | | | | | | | | | | | | |
|------------------|--------------|----------------------|-----------|--------------------------------------|------------|---------------|---|-----------|-----------|-----------|-----------|--------------|---|------------|------------|--|---------------------------|--------------------------|--------------------------|--------------------------|-----------|----------------|
| | | | | | | Flange design | | | | | | | Socket weld acc. to ASME B16.11 or DIN 3239-2 PN320 | | | Dimension of not machined butt weld ends | | Approximate weight | Pipe dimension | | | |
| PN | DN | h [mm] | z [mm] | - | Dk [mm] | L1 [mm] | n | d [mm] | k [mm] | D [mm] | b [mm] | d4xf [mm] | L [mm] | d2 [mm] | d0 [mm] | D1 _{-0,5} [mm] | C ^{+0,2} [mm] | s _{min} [mm] | A _{max} [mm] | B _{min} [mm] | m [kg] | Pipe dimension |
| 320 | 10 | 230 | 13 | F10C | 200 | 260 | 4 | 18 | 85 | 125 | 24 | 40x2 | 150 | 18 | 12 | 27 | 17,6 | 9,5 | 32 | 9 | 8,8 | 17,2x2,6 |
| | 15 | 230 | 13 | F10C | 200 | 260 | 4 | 18 | 90 | 130 | 26 | 45x2 | 150 | 22 | 15 | 32,5 | 21,7 | 9,5 | 32 | 14 | 8,5 | 21,3x3,2 |
| | 20 | 270 | 18 | F10C | 250 | - | - | - | - | - | - | - | 160 | 28 | 20 | 39,5 | 27,1 | 12,7 | 50 | 19 | 14,5 | 26,9x4,0 |
| | 25 | 270 | 18 | F10C | 250 | 300 | 4 | 22 | 115 | 160 | 34 | 68x2 | 160 | 34 | 24 | 48 | 33,8 | 12,7 | 50 | 22 | 14 | 33,7x5,0 |
| | 40 | 450 | 30 | F14C | 355 | 400 | 4 | 26 | 145 | 195 | 38 | 88x3 | 250 | 49 | 35 | 64,5 | 48,7 | 12,7 | 88 | 32 | 55 | 48,3x7,1 |
| | 50 | 450 | 30 | F14C | 355 | 400 | 8 | 26 | 160 | 210 | 42 | 102x3 | 250 | 67 | 47 | 73,5 | 61,1 | 15,9 | 88 | 40 | 54 | 63,5x8,8 |
| 400 | 10 | 230 | 13 | F10C | 200 | 260 | 4 | 18 | 85 | 125 | 28 | 40x2 | 150 | 18 | 10 | - | - | - | 32 | 9 | 8,8 | 17,2x3,6 |
| | 15 | 230 | 13 | F10C | 200 | 260 | 4 | 22 | 100 | 145 | 30 | 45x2 | 150 | 28 | 17 | - | - | - | 32 | 14 | 8,5 | 26,9x5,0 |
| | 20 | 270 | 18 | F10C | 250 | - | - | - | - | - | - | - | 160 | 34 | 20 | - | - | - | 50 | 19 | 14,5 | 32x6,3 |
| | 25 | 270 | 18 | F10C | 250 | 300 | 4 | 26 | 130 | 180 | 38 | 68x2 | 160 | 44 | 28 | - | - | - | 50 | 22 | 14 | 42,4x8 |
| | 40 | 450 | 30 | F14C | 355 | 400 | 4 | 30 | 165 | 220 | 48 | 88x3 | 250 | 61 | 40 | - | - | - | 88 | 32 | 55 | 60,3x11 |
| | 50 | 450 | 30 | F14C | 355 | 400 | 8 | 30 | 180 | 235 | 52 | 102x3 | 250 | 77 | 49 | - | - | - | 88 | 40 | 54 | 76,1x14,2 |
| 500 | 10 | 230 | 13 | F10C | 200 | - | - | - | - | - | - | - | 150 | 22 | 11,5 | - | - | - | 32 | 9 | 8,8 | 21,3x5,0 |
| | 15 | 230 | 13 | F10C | 200 | - | - | - | - | - | - | - | 150 | 32 | 16,5 | - | - | - | 32 | 14 | 8,5 | 32x8,0 |
| | 20 | 270 | 18 | F10C | 250 | - | - | - | - | - | - | - | 160 | 38 | 20 | - | - | - | 50 | 19 | 14,5 | 38x10,0 |
| | 25 | 270 | 18 | F10C | 250 | - | - | - | - | - | - | - | 160 | 49 | 23,5 | - | - | - | 50 | 22 | 14 | 48,3x12,5 |
| | 40 | 450 | 30 | F14C | 355 | - | - | - | - | - | - | - | 250 | 77 | 42 | - | - | - | 88 | 32 | 55 | 76,1x17,5 |
| | 50 | 450 | 30 | F14C | 355 | - | - | - | - | - | - | - | 250 | 86 | 45 | - | - | - | 88 | 40 | 54 | 82,5x20,0 |
| 630 | 10 | 230 | 13 | F10C | 200 | - | - | - | - | - | - | - | 150 | 22 | 11,5 | - | - | - | 32 | 9 | 8,8 | 21,3x5,0 |
| | 15 | 230 | 13 | F10C | 200 | - | - | - | - | - | - | - | 150 | 32 | 16,5 | - | - | - | 32 | 14 | 8,5 | 32x8,0 |
| | 20 | 270 | 18 | F10C | 250 | - | - | - | - | - | - | - | 160 | 38 | 20 | - | - | - | 50 | 19 | 14,5 | 38x10,0 |
| | 25 | 270 | 18 | F10C | 250 | - | - | - | - | - | - | - | 160 | 49 | 23,5 | - | - | - | 50 | 22 | 14 | 48,3x12,5 |
| | 40 | 450 | 30 | F14C | 355 | - | - | - | - | - | - | - | 250 | 77 | 42 | - | - | - | 88 | 32 | 55 | 76,1x17,5 |
| | 50 | 450 | 30 | F14C | 355 | - | - | - | - | - | - | - | 250 | 86 | 45 | - | - | - | 88 | 40 | 54 | 82,5x20,0 |
| 63 | 65 | 450 | 30 | F10C | 355 | 340 | 8 | 22 | 160 | 205 | 26 | 122x3 | 250 | 78 | 69 | 80,5 | 61,1 | 15,9 | 88 | 50 | 53 | 76,1x3,6 |
| 100 | | 450 | 30 | F10C | 355 | 340 | 8 | 26 | 170 | 220 | 30 | 122x3 | 250 | 78 | 69 | 80,5 | 61,1 | 15,9 | 88 | 50 | 53 | 76,1x3,6 |
| 160 | | 450 | 30 | F14C | 355 | 340 | 8 | 26 | 170 | 220 | 34 | 122x3 | 250 | 78 | 65 | 80,5 | 61,1 | 15,9 | 88 | 50 | 53 | 76,1x5,6 |
| 250 | | 450 | 30 | F14C | 355 | 340 | 8 | 26 | 180 | 230 | 42 | 122x3 | 250 | 78 | 59,5 | 80,5 | 61,1 | 15,9 | 88 | 50 | 53 | 76,1x8,8 |

Flange DN 20 and DN 32 - on customer request

HIGH-PRESSURE SHUT-OFF GLOBE VALVE V46.3/V40.3

VALVE DESCRIPTION CODE

V46.3 111-3 320-25



VALVE INSTALLATION

Valve can be installed in any position. Medium must flow under the cone in accordance with the direction indicated on the valve body. It is necessary to consider the following points during assembly and operation:

- operating conditions must comply with operating parameters of the valve
- proper function of the valve is affected by the presence of impurities in the pipeline and flowing medium, therefore it is necessary keep working environment a pipeline clean, for example with using filters
- the medium used must be comply with the corrosion resistance of the valve material
- use of mechanically damaged valves during the operation is prohibited

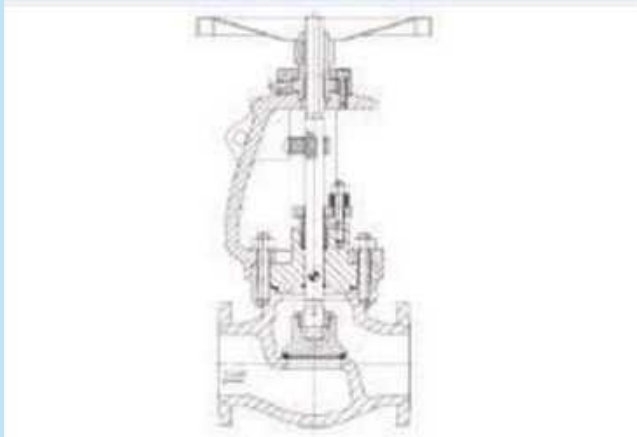
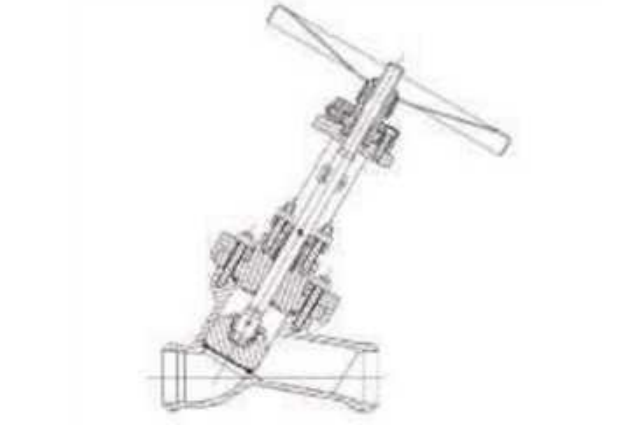
The service life of valves significantly extends regular maintenance and minor repairs carried out by trained personnel.

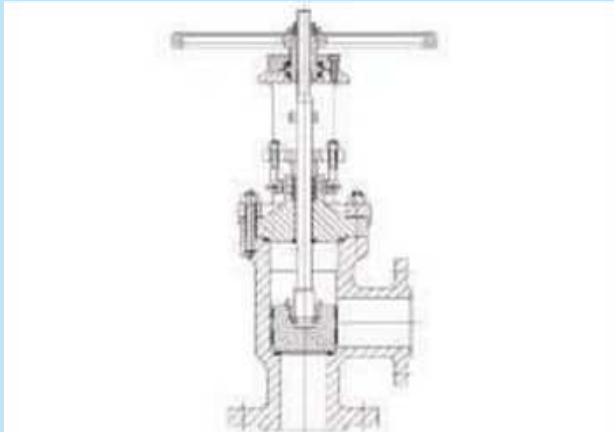
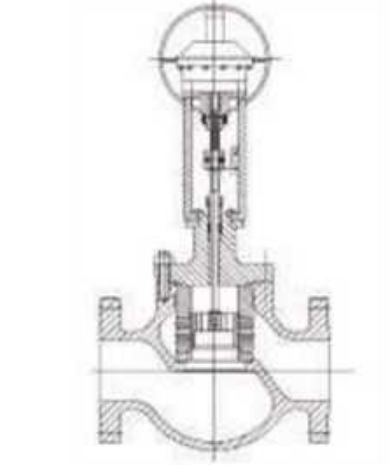
Globe Valves

ENEQ globe valves are offered in straight-pattern (T-pattern), Y-pattern, angle (90°) pattern and a variety of special designs. All can be supplied for on/off service, throttling or control applications, with bolted bonnet or pressure-seal construction, in cast or forged materials to meet ANSI-, API- and BS-based specifications.


Globe valves are designed to meet requirements of ANSI B16.34, BS-1873, ANSI B16.5, ANSI B16.10 and API 602.

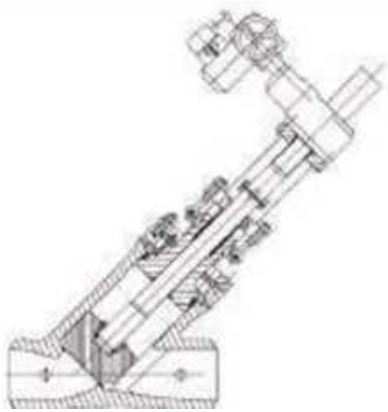

Configurations

| Configuration | Description | Illustration (insert from p. 8) |
|-----------------------------|---|--|
| Straight (T-Pattern) | Most commonly used. Fluid flows across the plug and seat, producing a large pressure drop. |  |
| Y-Pattern | Body is angled so plug and seat are nearly in line with flow. Lower pressure drop than T-pattern. |  |

| | | |
|-------------------------------------|--|---|
| <p>Angle (90°)</p> | <p>Flow path is turned through 90° within the valve—ideal where piping direction changes are required.</p> |  |
| <p>Cage-Guided (Control)</p> | <p>Used for throttling/service. Cage around the plug guides movement and defines flow characteristic. Multiple trim options yield different Cv and pressure-drop profiles.</p> |  |

Special Globe Valves

| Type | Key Features | Illustration (insert from p. 9) |
|----------------------------|---|--|
| <p>Choke Valves</p> | <p>For API 6A applications choke valves, both positive and adjustable are available. Choke valves are specifically design for service conditions providing different types of beans for positive chokes (including ceramic materials, tungsten carbide and hardened mar-tensitic steels) as well as different configurations of seats, cages and discs for adjustable chokes.</p> |  |

| | | |
|---|--|---|
| <p>Stop-Check</p> | <p>This design is a combination between globe valve and check valve. When valve is open, the stem is in open position the valve operates like a piston check valve, disc is moved by the fluid-media. However when valve has to be closed the stem goes down against the disc ensuring dhut-off of the valve..</p> |  |
| <p>Bellows-Sealed Valves (Zero Stem Leakage)</p> | <p>For those applications when emissions to the atmosphere are strictly forbidden, valve is provided with metallic bellows which ensures no leakage through the stem packing to the atmosphere.</p> |  |
| <p>Control Valves</p> | <p>Cage-guided globe designs with specialized trim (multi-stage, V-notch, sliding stem) for severe-service control applications.</p> | |

Materials

Body/Bonnet Materials

| Material Family | Designations |
|---------------------------------------|--|
| Carbon Steel (General Use) | WCB; WCC; WCA; A 105N |
| Carbon Steel (Low Temperature) | LCB; LCC; LCA; LC3; LF2; LF3; LF6 |
| Alloy Steel (High Temperature) | WC1; WC6; WC9; C5; C12; C12A; F1; F11; F22; F5; F9; F91 |
| Martensitic Steel | CA15; CA6NM; F6 |
| Stainless Steel (Corrosion Resistant) | CF8; CF8M; CF3; CF3M; CF8C; F304; F316; F304L; F316L; F321; F347 |

| | |
|---|--|
| Duplex & Superduplex Stainless Steel | CD4MCu; CD4MCuN; CK3MCuN; F51; F44; F52; F53 |
| Nickel Base Alloys | Inconel 625; Hastelloy (CW-12MW); Incoloy 825; Monel |

*) Table based on ASTM materials. Equivalent DIN materials are also available upon request.

Trim Materials

Different combinations of trim material consistent with body / bonnet material according API 600 are available.

Different hard facings for sealing areas can be used being the most common ones: stellite-6 & 12, 13% Cr, Bohler skwan,

Cobalt free alloys, and Tungsten Carbide for API 6A applications.

Different hardened martensitic steels upto 48 HRC are also available for globe valves wearing resistant trims.

| Trim # | Nominal Trim | Cast Spec | Forged Spec | Welded Spec | Material Type |
|------------|----------------|------------------|---------------------------|---|---------------|
| 1 | F6 | ASTM A217 (CA15) | ASTM A105 (F6A) | AWS A5.9 ER410 | 13 Cr |
| 2 | 304 | ASTM A351 (CF8) | ASTM A182 (F304) | AWS A5.9 ER308 | 18 Cr-8 Ni |
| 3 | F310 | – | ASTM A182 (F310) | AWS A5.9 ER410 | 25 Cr-20 Ni |
| 4 | Hard F6 | – | Note h | – | 13 Cr |
| 5 | Hardfaced | – | – | AWS A5.13 ER/R CoCr-a | 13 Cr |
| 5 A | Hardfaced | – | – | Note h | 13 Cr |
| 6 | F6 & Cu-Ni | ASTM A217 (CA15) | ASTM A182 (F6A) Note h | AWS A5.9 ER410 | 13 Cr |
| 7 | F6 & Hardfaced | ASTM A217 (CA15) | Note h | AWS A5.9 ER410 | 13 Cr |
| 8 | F6 & Hardfaced | ASTM A217 (CA15) | – | AWS A5.9 ER410 | – |
| 8 A | F6 & Hardfaced | ASTM A217 (CA15) | – | AWS A5.9 ER410; AWS A5.13 E/R CoCr-a | 13 Cr |
| 9 | Monel | – | MFG Standard | – | Ni-Cu Alloy |

| | | | | | |
|----|----------------------|------------------|------------------|----------------------|----------------|
| 10 | 316 | ASTM A351 (CF8M) | ASTM A182 (F316) | AWS A5.9 ER410 | 18 Cr-8 Ni-Mo |
| 11 | Monel & Hardfaced | – | MFG Standard | See Trim 5/5 A | Ni-Cu Alloy |
| 12 | 316 & Hardfaced | ASTM A351 (CF8M) | ASTM A182 (F316) | AWS A5.9 ER316 | 18 Cr-8 Ni-Mo |
| 13 | Alloy 20 | ASTM A351 (CN7M) | ASTM B473 | AWS A5.9 ER320 | 19 Cr-29 Ni |
| 14 | Alloy 20 & Hardfaced | ASTM A351 (CN7M) | – | AWS A5.9 ER320 | 19 Cr-29 Ni |
| 15 | Hardfaced | – | – | AWS A5.13 E/R CoCr-a | 18 Cr-8 Ni |
| 16 | Hardfaced | – | – | AWS A5.13 E/R CoCr-a | 18 Cr-8 Ni-Mo |
| 17 | Hardfaced | – | – | AWS A5.13 E/R CoCr-a | 18 Cr-10 Ni-Cb |
| 18 | Hardfaced | – | – | AWS A5.13 E/R CoCr-a | 19 Cr-29 Ni |

Note h: forged or welded specifications are not applicable for trims 4 and 5 A; consult the manufacturer for special processing.

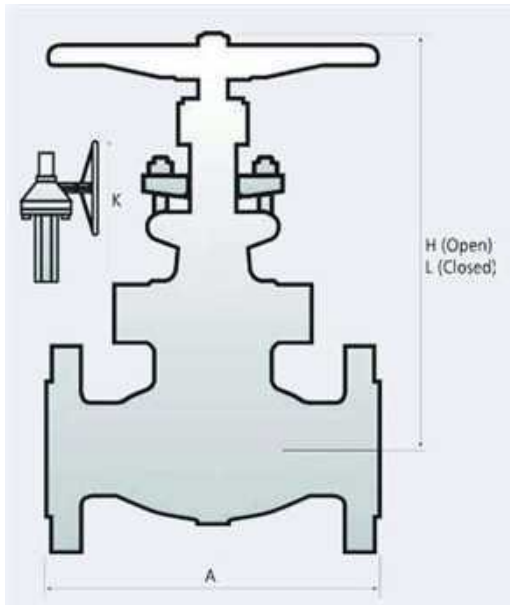
Soft Seated Valves

For cryogenic or other special applications soft seated valves are also available.

General Valve Features

- Bolted bonnet, pressure-seal or welded bonnet construction
- Graphite or PTFE packing, with leak-off/packing-expulsor options
- Backseat on gate and globe valves for live packing replacement
- Outside-screw-and-yoke (OS&Y) design on manual gate/globe valves
- Handwheel, gearbox or electric/pneumatic/hydraulic actuation
- Full material traceability and certifications (ISO 9001, PED, ATEX, SIL, EN ISO 3834-2, AD2000, etc.)

Globe Valve Dimensions



Class 150

| SIZE | FACE TO FACE (A) RF | FACE TO FACE (A) RTJ | FACE TO FACE (A) BW | H | L | K | CV | Approx. Weight RF (Kg.) |
|------|---------------------|----------------------|---------------------|------|------|------|-------|-------------------------|
| 2" | 203 | 216 | 203 | 320 | 285 | - | 38.3 | 18 |
| 3" | 241 | 254 | 241 | 400 | 355 | - | 100 | 36 |
| 4" | 292 | 305 | 292 | 457 | 406 | - | 185 | 55 |
| 6" | 406 | 419 | 406 | 609 | 546 | - | 440 | 104 |
| 8" | 495 | 508 | 495 | 698 | 622 | - | 810 | 200 |
| 10" | 622 | 635 | 622 | 762 | 685 | - | 1260 | 300 |
| 12" | 698 | 711 | 698 | 876 | 774 | - | 1890 | 390 |
| 14" | 787 | 800 | 787 | 990 | 889 | - | 2441 | 610 |
| 16" | 914 | 927 | 914 | 1104 | 977 | - | 3234 | 880 |
| 18" | 978 | 991 | 978 | 1206 | 1066 | - | 4308 | 1150 |
| 20" | 978 | 991 | 978 | 1270 | 1117 | - | 5364 | 1650 |
| 24" | 1295 | 1308 | 1295 | 1498 | 1295 | - | 7825 | 2200 |
| 26" | 1295 | - | 1295 | - | - | 1560 | 9857 | 2545 |
| 28" | 1448 | - | 1448 | - | - | 1680 | 11480 | 2887 |
| 30" | 1524 | - | 1524 | - | - | 1800 | 13228 | 3712 |
| 32" | 1626 | - | 1626 | - | - | 1920 | 15098 | 4262 |

| | | | | | | | | |
|------------|------|---|------|---|---|------|-------|------|
| 36" | 1956 | - | 1956 | - | - | 2160 | 19211 | 5431 |
|------------|------|---|------|---|---|------|-------|------|

Class 300

| SIZE | FACE TO FACE (A) RF | FACE TO FACE (A) RTJ | FACE TO FACE (A) BW | H | L | K | CV | Approx. Weight RF (Kg.) |
|------------|---------------------|----------------------|---------------------|------|------|------|-------|-------------------------|
| 2" | 267 | 283 | 267 | 350 | 315 | - | 38.3 | 26 |
| 3" | 318 | 333 | 318 | 450 | 406 | - | 100 | 52 |
| 4" | 356 | 371 | 356 | 584 | 533 | - | 185 | 88 |
| 6" | 444 | 460 | 444 | 660 | 584 | - | 440 | 160 |
| 8" | 559 | 574 | 559 | 762 | 673 | - | 810 | 259 |
| 10" | 622 | 638 | 622 | 850 | 762 | - | 1260 | 420 |
| 12" | 711 | 727 | 711 | 1187 | 1092 | - | 1890 | 595 |
| 14" | 838 | 854 | 838 | 1085 | 990 | - | 2441 | 876 |
| 16" | 863 | 879 | 863 | - | - | 1371 | 3234 | 1200 |
| 18" | 977 | 994 | 977 | - | - | 1473 | 4183 | 1600 |
| 20" | 1016 | 1035 | 1016 | - | - | 1574 | 5226 | 2100 |
| 24" | 1346 | 1368 | 1346 | - | - | 1803 | 7657 | 3150 |
| 26" | 1397 | 1422 | 1397 | - | - | 1950 | 9663 | 3720 |
| 28" | 1524 | 1549 | 1524 | - | - | 2048 | 11271 | 4320 |
| 30" | 1626 | 1651 | 1626 | - | - | 2140 | 13002 | 5040 |
| 32" | 1727 | 1755 | 1727 | - | - | 2240 | 14853 | - |

Class 600

| SIZE | FACE TO FACE (A) RF | FACE TO FACE (A) RTJ | FACE TO FACE (A) BW | H | L | K | CV | Approx. Weight RF (Kg.) |
|-----------|---------------------|----------------------|---------------------|------|-----|---|------|-------------------------|
| 2" | 368 | 371 | 368 | 468 | 433 | - | 155 | 70 |
| 3" | 381 | 384 | 381 | 685 | 609 | - | 650 | 105 |
| 4" | 457 | 460 | 457 | 774 | 673 | - | 1200 | 140 |
| 6" | 610 | 612 | 610 | 1016 | 863 | - | 2850 | 300 |

| | | | | | | | | |
|-----|------|------|------|------|------|------|--------|-------|
| 8" | 737 | 739 | 737 | 1282 | 1079 | - | 5025 | 530 |
| 10" | 838 | 841 | 838 | 1485 | 1231 | - | 7850 | 950 |
| 12" | 965 | 968 | 965 | 1682 | 1384 | - | 11500 | 1400 |
| 14" | 1029 | 1038 | 1029 | 1924 | 1574 | - | 13900 | 1800 |
| 16" | 1130 | 1140 | 1130 | - | - | 2159 | 18150 | 2400 |
| 18" | 1219 | 1232 | 1219 | - | - | 2362 | 23910 | 3000 |
| 20" | 1321 | 1333 | 1321 | - | - | 2463 | 29550 | 3800 |
| 24" | 1549 | 1568 | 1549 | - | - | 3048 | 42570 | 4900 |
| 26" | 1574 | - | 1574 | - | - | 3436 | 52167 | 6160 |
| 28" | 1663 | - | 1663 | - | - | 3787 | 60500 | 7728 |
| 30" | 1778 | - | 1778 | - | - | 4100 | 69452 | 10080 |
| 32" | 1854 | - | 1854 | - | - | 4270 | 79092 | 12320 |
| 36" | 2032 | - | 2032 | - | - | 4712 | 103212 | 15120 |

Class 900

| SIZE | FACE TO FACE (A) RF | FACE TO FACE (A) RTJ | FACE TO FACE (A) BW | H | L | K | CV | Approx. Weight RF (Kg.) |
|------|---------------------|----------------------|---------------------|------|------|------|-------|-------------------------|
| 2" | 368 | 371 | 368 | 468 | 433 | - | 200 | 70 |
| 3" | 470 | 472 | 470 | 781 | 711 | - | 600 | 130 |
| 4" | 546 | 549 | 546 | 876 | 774 | - | 1070 | 200 |
| 6" | 705 | 711 | 705 | 1104 | 965 | - | 2500 | 410 |
| 8" | 832 | 841 | 832 | 1422 | 1244 | - | 4370 | 720 |
| 10" | 991 | 1000 | 991 | 1784 | 1562 | - | 6850 | 1400 |
| 12" | 1130 | 1146 | 1130 | - | - | 1955 | 9980 | 2500 |
| 14" | 1257 | 1276 | 1257 | - | - | 2057 | 12000 | 3200 |
| 16" | 1384 | 1406 | 1384 | - | - | 2311 | 15675 | 3800 |
| 18" | 1537 | 1559 | 1537 | - | - | 2438 | 20640 | 4400 |
| 20" | 1664 | 1686 | 1664 | - | - | 2590 | 25880 | 5200 |
| 24" | 1943 | 1971 | 1943 | - | - | 2946 | 31175 | 9500 |
| 26" | 3032 | - | 3032 | - | - | 3253 | 45514 | 10235 |

| | | | | | | | | |
|------------|------|---|------|---|---|------|-------|-------|
| 28" | 2209 | - | 2209 | - | - | 3573 | 53320 | 11500 |
| 30" | 2286 | - | 2286 | - | - | 3933 | 61095 | 15525 |
| 32" | 2413 | - | 2413 | - | - | 4313 | 73478 | 18400 |
| 36" | 2565 | - | 2565 | - | - | 4705 | 96862 | 21735 |

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Class 1500

| SIZE | FACE TO FACE (A) RF | FACE TO FACE (A) RTJ | FACE TO FACE (A) BW | H | L | K | CV | Approx. Weight RF (Kg.) |
|-------------|------------------------------------|-------------------------------------|------------------------------------|----------|----------|----------|-----------|--|
| 2" | 451 | 454 | 451 | 460 | 425 | - | 164 | 80 |
| 3" | 578 | 584 | 578 | 696 | 625 | - | 275 | 275 |
| 4" | 673 | 683 | 673 | 819 | 733 | - | 460 | 460 |
| 6" | 914 | 927 | 914 | 1000 | 877 | - | 1100 | 1100 |
| 8" | 1022 | 1038 | 1022 | - | - | 1567 | 1970 | 1970 |
| 10" | 1270 | 1292 | 1270 | - | - | 1680 | 3130 | 3130 |
| 12" | 1422 | 1444 | 1422 | - | - | 1840 | 4535 | 4535 |
| 14" | 1526 | - | 1526 | - | - | 1974 | 8368 | 5500 |
| 16" | 1699 | - | 1699 | - | - | 2080 | 10955 | 7210 |
| 18" | 1908 | - | 1908 | - | - | 2214 | 14481 | 9415 |
| 20" | 2012 | - | 2012 | - | - | 2427 | 17587 | 11450 |
| 24" | 2220 | - | 2220 | - | - | 2672 | 21338 | 16575 |

Class 2500

| SIZE | FACE TO FACE (A) RF | FACE TO FACE (A) RTJ | FACE TO FACE (A) BW | H | L | K | CV | Approx. Weight RF (Kg.) |
|-------------|------------------------------------|-------------------------------------|------------------------------------|----------|----------|----------|-----------|--|
| 2" | 368 | 371 | 368 | 468 | 433 | - | 200 | 70 |
| 3" | 470 | 472 | 470 | 781 | 711 | - | 600 | 130 |
| 4" | 546 | 549 | 546 | 876 | 774 | - | 1070 | 200 |
| 6" | 705 | 711 | 705 | 1104 | 965 | - | 2500 | 410 |

| | | | | | | | | |
|------------|------|------|------|------|------|------|-------|-------|
| 8" | 832 | 841 | 832 | 1422 | 1244 | - | 4370 | 720 |
| 10" | 991 | 1000 | 991 | 1784 | 1562 | - | 6850 | 1400 |
| 12" | 1130 | 1146 | 1130 | - | - | 1955 | 9980 | 2500 |
| 14" | 1257 | 1276 | 1257 | - | - | 2057 | 12000 | 3200 |
| 16" | 1384 | 1406 | 1384 | - | - | 2311 | 15675 | 3800 |
| 18" | 1537 | 1559 | 1537 | - | - | 2438 | 20640 | 4400 |
| 20" | 1664 | 1686 | 1664 | - | - | 2590 | 25880 | 5200 |
| 24" | 1943 | 1971 | 1943 | - | - | 2946 | 31175 | 9500 |
| 26" | 3032 | - | 3032 | - | - | 3253 | 45514 | 10235 |
| 28" | 2209 | - | 2209 | - | - | 3573 | 53320 | 11500 |
| 30" | 2286 | - | 2286 | - | - | 3933 | 61095 | 15525 |
| 32" | 2413 | - | 2413 | - | - | 4313 | 73478 | 18400 |
| 36" | 2565 | - | 2565 | - | - | 4705 | 96862 | 21735 |

Manufacturing Range (Globe Valves)

| Standards | Sizes | Features / Design |
|---|--|---|
| ANSI B16.34, BS 1873, ANSI B16.5, ANSI B16.10, API 602 | 48" (ANSI 150/300), 36" (ANSI 600/900), 24" (ANSI 1500/2500), 12" (ANSI 4500) | Bolted bonnet or pressure-seal Cast and forged bodies Zero-stem-leakage bellows seal Non-return globe "Y" pattern Stop-check design Angle globe |
