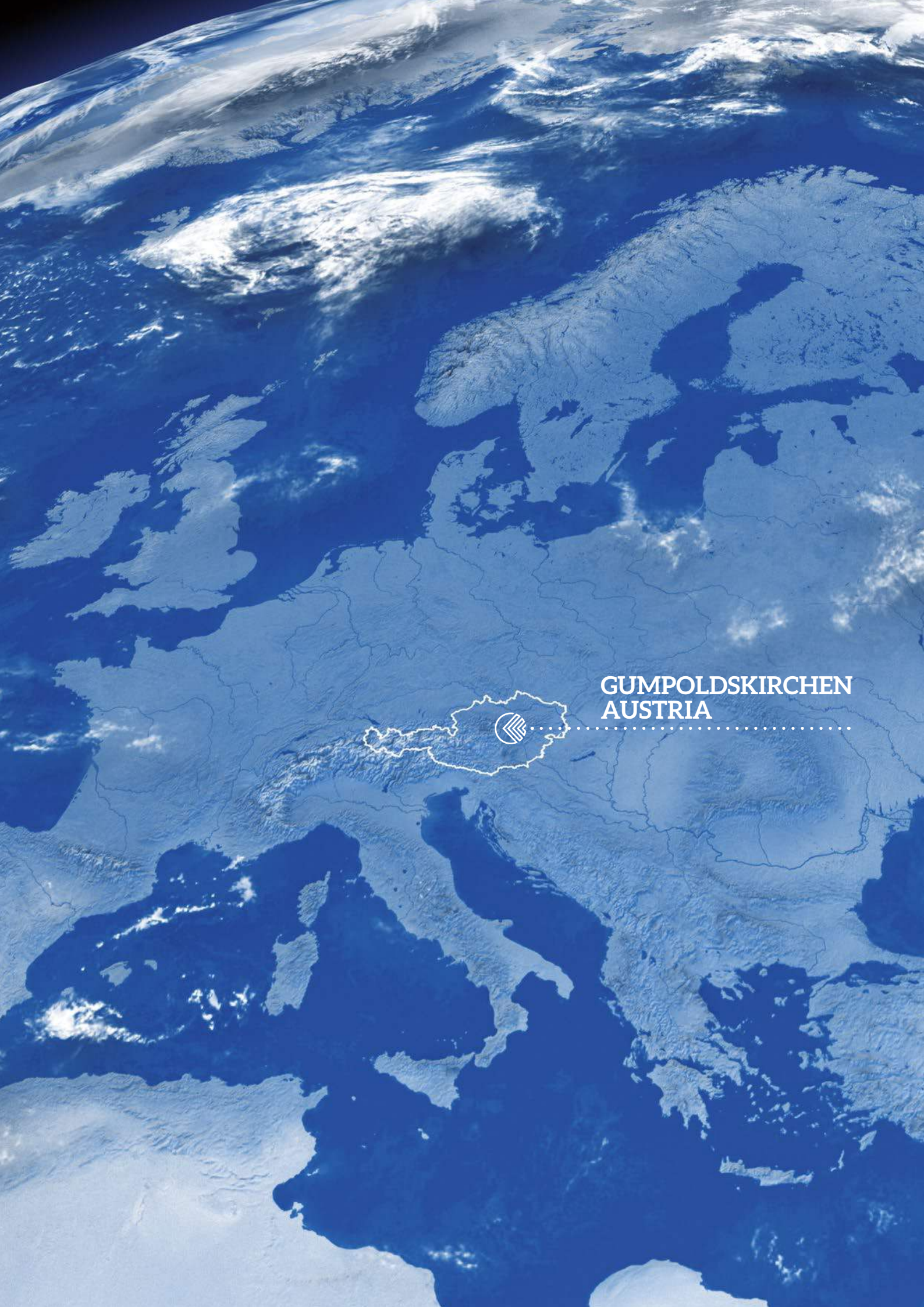
KLINGER Fluid Control

# KLINGER BALLOSTAR® KHI

DN 150 – 1000

www.klinger.kfc.at


GUMPOLDSKIRCHEN
AUSTRIA

# KLINGER FLUID CONTROL

## Today for tomorrow

As a subsidiary of the KLINGER Group, KLINGER Fluid Control has been developing, manufacturing and maintaining high-quality industrial valves at the business location Gumpoldskirchen/Austria for more than 140 years. Via the global distribution and service network, KLINGER Fluid Control offers both standardized and tailored products, services as well as solutions for customers around the globe.

Products from KLINGER Fluid Control are characterized by their high level of reliability as well as by an above average lifecycle at a simultaneously very low total cost of ownership (TCO). As a solutions partner, KLINGER Fluid Control creates customer benefits with added value. In this regard, the focus is on the following core competences:


### ENCOMPASSING SERVICE

» Application expertise
» Product trainings
» Fast quotation and order processing
» Customer-specific special solutions
» Supply of spare parts
» Valve maintenance
» On-site technical support

### INNOVATIVE SOLUTIONS

» State of the art development tools
» Product development for different areas of application
» Automation solutions
» Compilation of customer-specific special solutions
» Product tests in the company-own technical center
» A wide range of certificates and approvals

### OPERATIONAL EXCELLENCE

» Flexible production
» Transparency in the supply chain
» Short delivery times
» ISO 9001 certified quality management system
» ISO 14001 as well as EMAS certified environmental management system

# BALLOSTAR®
# KHI

## Flanged ends





# BALLOSTAR® KHI

## Welded ends





* more dimensions on request

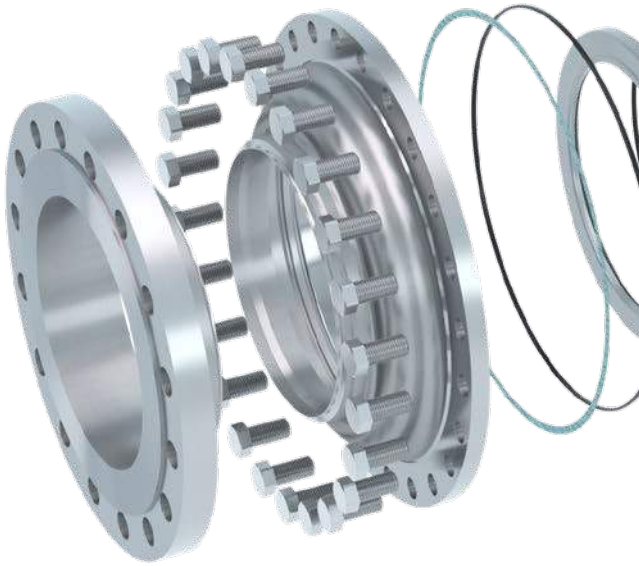
** reducing cones on request possible

# GUARANTEED DURABILITY

## Flanged versions for small nominal diameters DN 150–400

## PRODUCT ADVANTAGES KHI-F

- Maintenance-free
- Bi-directional sealing
- Trunnion mounted ball with cylindrical bore
- Supports pressurization on both sides
- Sealing elements protected against water hammers
- High degree of resilience against pipework forces
- Double block and bleed with optional drain valve
- Subsequent automation possible (top flange in acc. with EN ISO 5211)
- Leakage rate A (EN 12266-1/ISO 5208) soft seated
- Leakage rate Class IV-S1 (EN 60534-4) metal seated
- Metal seat for abrasive media
- Anti blow out stem
- Anti static tested
- Oxygen version
- Fire safe version
- Gas version
- Oil, grease and silicone-free



## PRODUCT DETAILS KHI-F

| | |
|---|---|
| PN | 10/16/25/40, ASME CL 150/300 |
| DN | 150 – 400, 6" – 16" |
| Material | Stainless steel, duplex, carbon steel |
| Temperature | -45°C to +250°C<br>depending on O-ring material |
| Design | Flanges |
| Type | Two-piece ball valve with full bore |
| FTF dimensions | PN 10/16/25 + CL150 → EN 558-1<br>row 12/ANSI B16.10 long pattern<br>PN 40 + CL 300 → EN 558-1<br>row 4/ANSI B16.10 long pattern |

**Ballostar® KHI-F**
Two-piece body
Flanged ends on both sides

**Stainless steel and carbon steel**
available in DN 150–400

# GUARANTEED DURABILITY

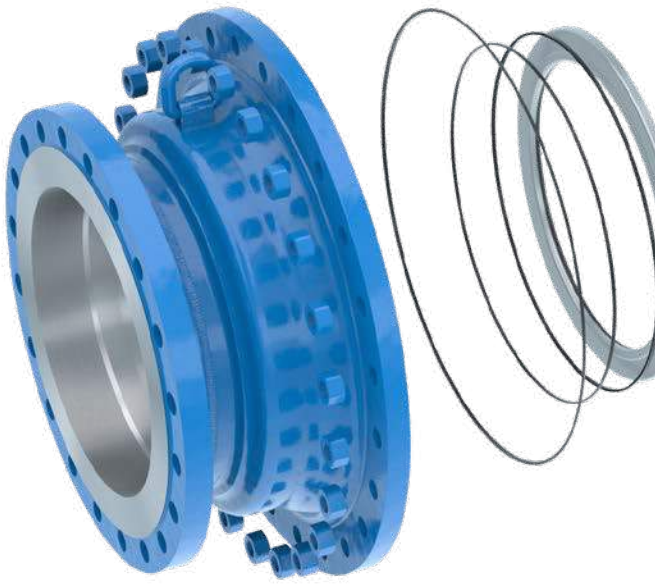
## Flanged versions for large nominal diameters DN 500–1000

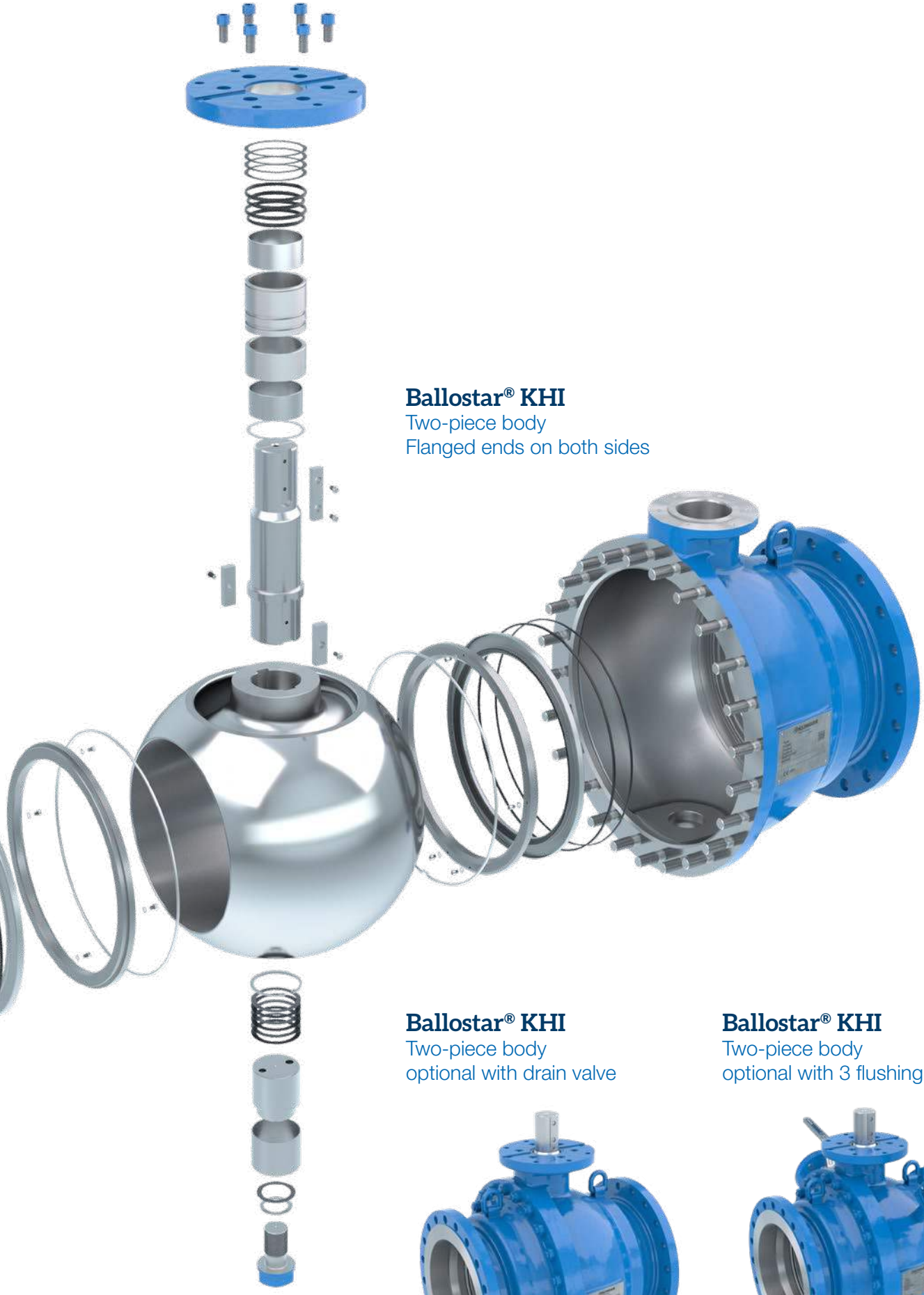
### PRODUCT ADVANTAGES KHI

- Maintenance-free
- Bi-directional sealing
- Trunnion mounted ball with cylindrical bore
- Supports pressurization on both sides
- Sealing elements protected against water hammers
- High degree of resilience against pipework forces
- Double block and bleed with optional drain valve
- Subsequent automation possible (top flange in acc. with EN ISO 5211)
- Leakage rate A (EN 12266-1/ISO 5208) soft seated
- Metal seat for abrasive media
- Anti blow out stem
- Anti static tested
- Oxygen version
- Fire safe version
- Gas version
- Oil, grease and silicone-free

### PRODUCT DETAILS KHI

| | |
|---|---|
| PN | 10/16/25/40 |
| DN | 500 – 1000 |
| Material | Carbon Steel |
| Temperature | -45°C to +200°C |
| Design | Flanges |
| Type | Two-piece ball valve with full bore |





**Ballostar® KHI**
Two-piece body
Flanged ends on both sides

**Ballostar® KHI**
Two-piece body
optional with drain valve



**Ballostar® KHI**
Two-piece body
optional with 3 flushing valves

# GUARANTEED DURABILITY

## Welded versions in detail
## DN 150–1000

### PRODUCT ADVANTAGES KHI-S | KHSVI | KHSVI VVS

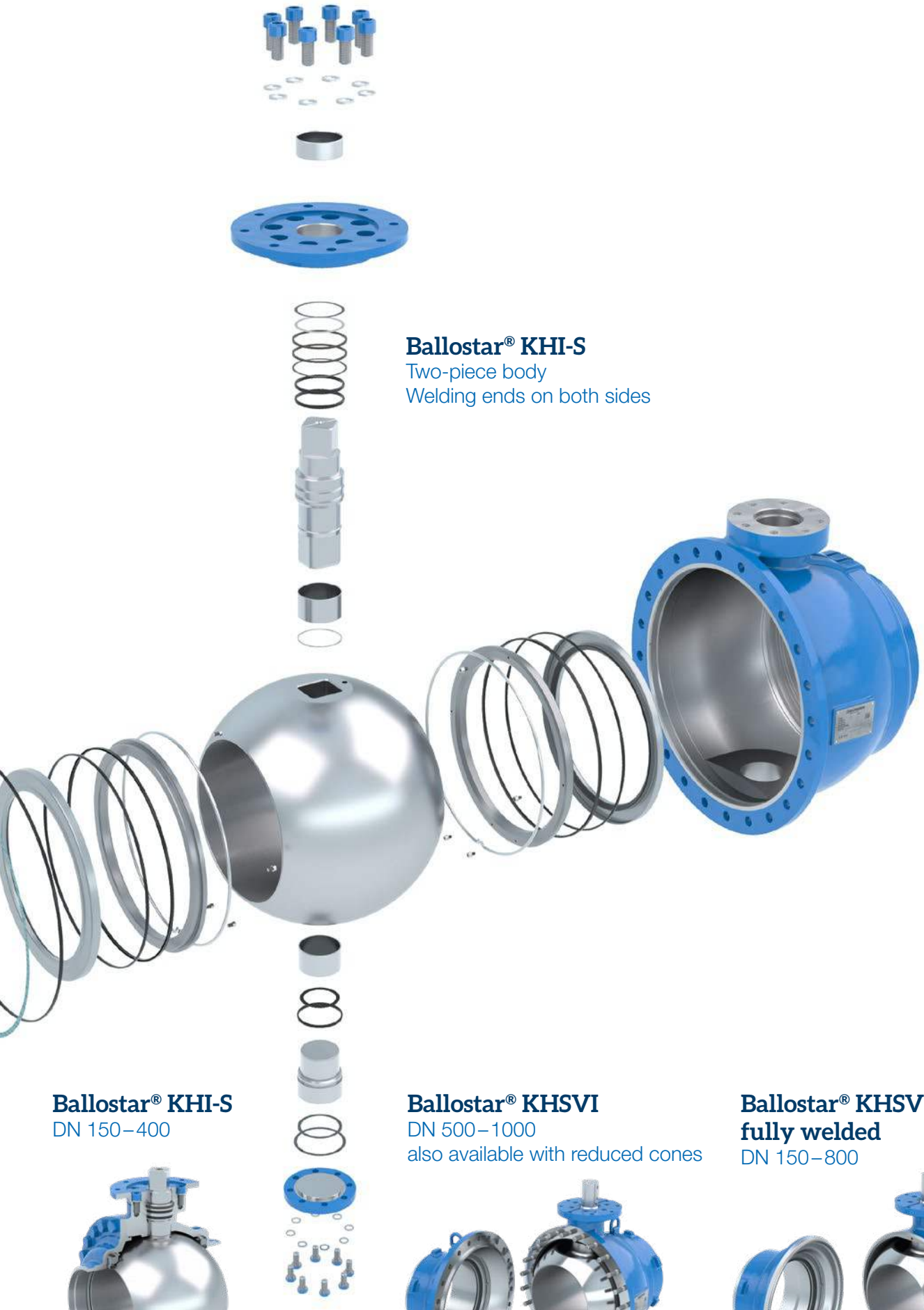
- Maintenance-free
- Bi-directional sealing
- Trunnion mounted ball with cylindrical bore
- Supports pressurization on both sides
- Sealing elements protected against water hammers
- High degree of resilience against pipework forces
- Double block and bleed with optional drain valve
- Subsequent automation possible (top flange in acc. with EN ISO 5211)
- Leakage rate A (EN 12266-1/ISO 5208) soft seated
- Leakage rate Class IV-S1 (EN 60534-4) metal seated (KHI-S)
- Metal seat for abrasive media
- Anti blow out stem
- Anti static tested
- Oxygen version
- Fire safe version
- Gas version
- Oil, grease and silicone-free
- Certified acc. to EHP 003 (EN 488-1) for KHSVI VVS

### PRODUCT DETAILS KHI-S

| | |
|---|---|
| PN | 10/16/25/40, ASME CL 150/300 |
| DN | 150–400 |
| Material | Carbon Steel |
| Temperature | -45°C to +250°C |
| Design | Welding ends |
| Type | Two-piece ball valve with full bore |

### PRODUCT DETAILS KHSVI | KHSVI VVS

| | |
|---|---|
| PN | 10/16/25/40 |
| DN | KHSVI 500–1000 \| KHSVI VVS 150–800 |
| Material | Carbon Steel |
| Temperature | KHSVI -45°C to +200°C<br>KHSVI VVS -45°C to +250°C |
| Design | Welding ends, fully welded (VVS),<br>reducing cones, full bore |
| Type | Two-piece ball valve KHSVI<br>Single-piece ball valve KHSVI VVS |



**Ballostar® KHI-S**
Two-piece body
Welding ends on both sides

**Ballostar® KHI-S**
DN 150–400



**Ballostar® KHSVI**
DN 500–1000
also available with reduced cones



**Ballostar® KHSVI VVS fully welded**
DN 150–800

# GREATEST SAFETY

## Ballostar® KHI sealing system

Leakages represent the worst case for any plant operator. Negative impacts on the environment as well as downtimes,harm to personnel and assets and in some cases heavy financial losses are just a few of the possible outcomes. A seal, which therefore “practices what it preaches”, i.e. a valve capable of reliably fulfilling its shut-off function, is a must. With the KLINGER Ballostar® KHI, this is ensured in multiple ways: By means of the unique ball valve sealing system and the “Double Block and Bleed” function.

## FUNCTION

Thanks to its “elastic sealing system” the ball valve ensures absolute tightness in combination with both high and low pressures. This is achieved by means of two elastic sealing elements working independent of each other. As the differential pressure increases, the additional contact forces also increase – the pre-stressed diaphragm springs, which press the sealing rings against the ball, are relaxed and the operating life thus further extended. (Fig. 1)

## EFFECT

The sealing system at the ball is pre-stressed during assembly. The two pre-stressed elastic sealing elements made of stainless steel and featuring sealing rings and a back seal (consisting of a U-sleeve and an O-ring) form a system upstream and downstream of the valve together with the ball. Furthermore, a support ring protects the elastic sealing element against overloads, for example caused by water hammers. A wire ring safeguards the sealing unit. (Fig. 2)

The ball valve can be pressurized in both flow directions. The elasticity of the sealing elements allows for a compensation of thermal expansion. Thanks to this function, two primary sealed areas are constantly present in the bore.

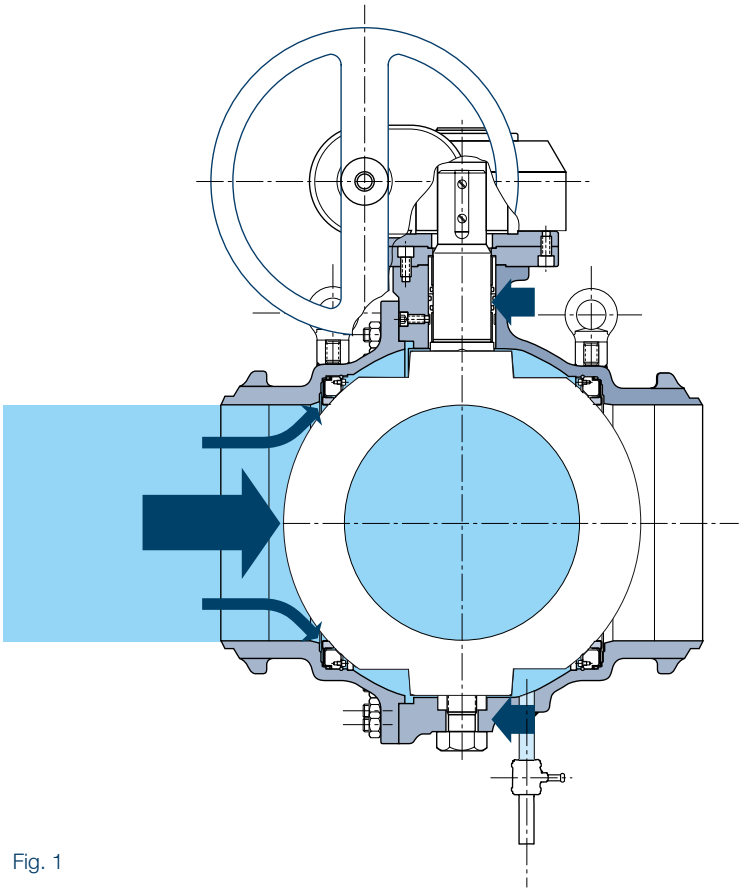
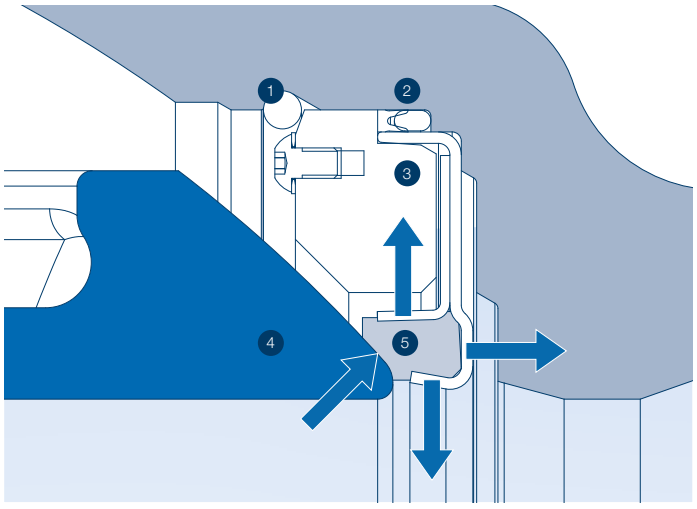


Fig. 1




1. Wire ring
2. U-sleeve, O-ring
3. Support ring
4. Ball
5. Sealing ring

Fig. 2

# DOUBLE BLOCK & BLEED

A “Double Block & Bleed” configuration is usually achieved by means of two separate valves. The same effect, however, can be achieved by utilizing a single KLINGER Ballostar® KHI ball valve. Next to saving time and money, this solution is of enormous importance in tight installation fits. With regard to safety and tightness the KLINGER Ballostar® KHI – in comparison to standard “Double Block & Bleed” solutions – convinces in both flow directions, under a wide range of operating conditions and even in a vacuum. Furthermore, pressurization by the medium is not restricted to the surface of the ball of Ballostar® KHI ball valves, but covers the entire sealing element (ball and surface of the diaphragm spring).

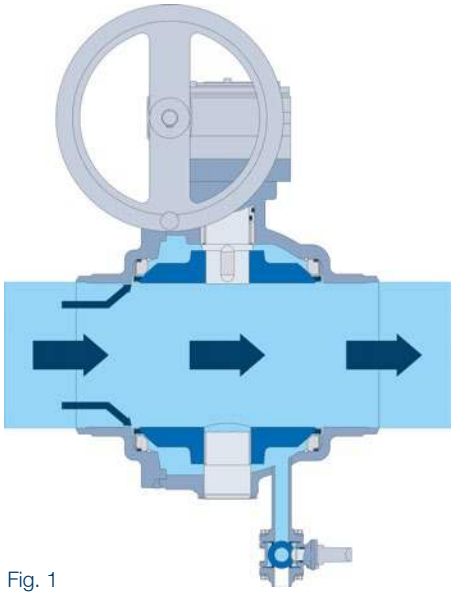


Fig. 1

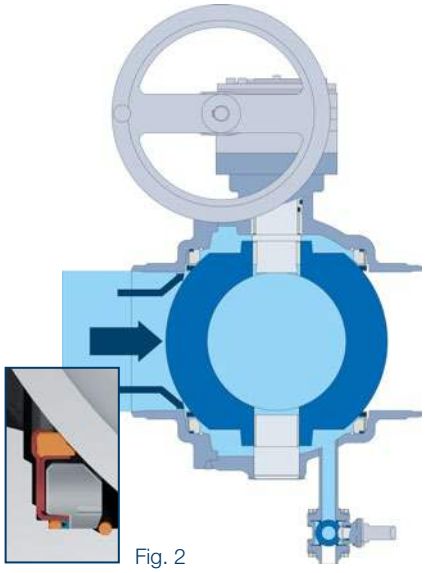


Fig. 2

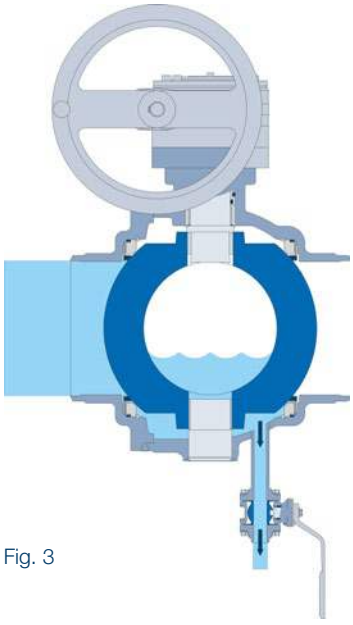


Fig. 3

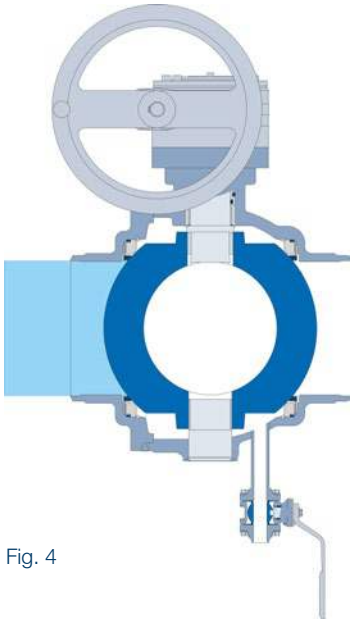


Fig. 4

# FUNCTION

The open valve (Fig. 1) represents the starting point for the explanation of the function of the Ballostar® KHI: The medium flows through the open ball with the test and drain valve closed. Now the ball valve is closed (Fig. 2), the medium collects in the cavity of the ball valve as a result of the closing process. Draining is achieved by means of opening the test and drain valve (Fig. 3). This configuration state also allows for quick and uncomplicated testing of the function of the sealing element: The cavity has been drained, the sealing elements ensure the tightness of the valve – additional leakage of the medium is therefore impossible. If required, and as long as the ball valve remains closed and the test and drain valve open (Fig. 4), the pipe section on the medium-free side can now be opened up and/or worked on without hazard.

# CERTIFIED QUALITY

## The KLINGER Ballostar® KHI keeps its promises

KLINGER Ballostar® ball valves are designed for the toughest and most demanding applications in a wide variety of industries. The various possible applications leave no questions unanswered.This is evidenced by various tests and certifications – for plant operators, this means absolute operational reliability with guaranteed leak tightness.

» **Standard version Fire-Safe für DN 150–400 & VVS**
The ball valve can be used for fire-safe applications and is certified according to API Standard 607 and EN ISO 10497.

» **Double Block & Bleed**
Test certificate for the leak test on the version with a test/ drain cock (‘double block & bleed’) in accordance with ISO 5208 / ISO 14313.

» **Use with gaseous oxygen**
The Ballostar® KHI series are suitable for applications with gaseous oxygen – at operating pressures up to 16 bar for cast steel, up to 40 bar for stainless steel and at operating temperatures up to 60°C (BAM product assessment).

» **Gas approval**
ÖVGW Certificate for authorization to display the ÖVGW quality label "Gas" for the ball valves GKHI, GKHSVI and GKHSVI VVS, DN 150–800, KHI-F and KHI-S.

» **Emission testing in accordance with VDI 2440**
Certified emission testing pursuant to VDI 2440 for Ballostar® KHI/KHSVI ball valves at temperatures <250°C.

» **EN ISO 15848-1**
The KLINGER Ballostar® KHI-F and KHI-S ball valves are significantly below the prescribed emission limits for air pollution control. They have undergone certified emission tests according to ISO 15848-1 (fugitive emissions) and ISO FE CH-C03-SSA0-tRT (120°C) and meet the requirements of the TA-Luft (Technical Instructions on Air Quality Control).

» **Pressure Equipment Directive 2014/68/EU**
The Ballostar® KHI ball valves are developed, produced, tested and delivered in accordance with the valid standards of the Pressure Equipment Directive 2014/68/EU.

» **EN 12266-1, P10, P11 and P12**
The Ballostar® KHI ball valves with KFC sealing elements meet leakage rate A according to EN 12266-1/ISO 5208 in the case of soft sealing design and leakage rate class IV-S1 according to EN 60534-4 in the case of metal sealing design.

» **EHP 003 (EN 488-1) für KHSVI VVS**
KLINGER Ballostar® KHSVI VVS ball valves, DN 150–800, have been successfully tested and certified by the TÜV Austria under inclusion of the extended requirements of the EHP 003 (EN 488-1).

# BALLOSTAR®
# KHI-F

## Flanged ends, stainless steel, DN 150–400

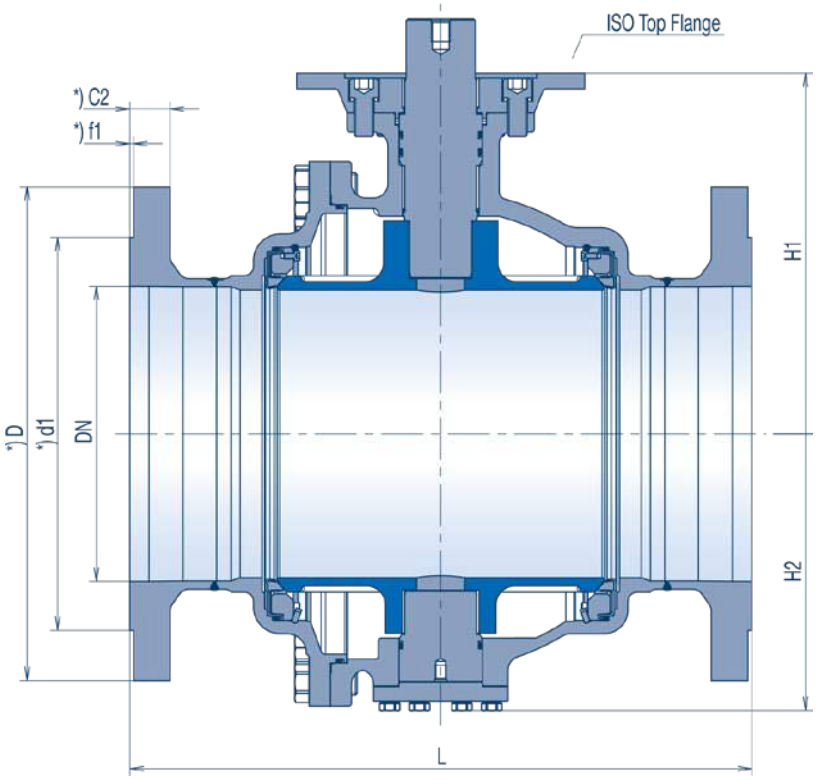
### GENERAL FEATURES
- Two-piece ball valve with full bore
- Trunnion mounted
- Bi-directional sealing
- Top flange acc. ISO 5211
- Leakage rate A (EN 12266-1/ISO 5208) soft seated
- Leakage rate Class IV-S1 (EN 60534-4) metal seated
- Double Block & Bleed with optional drain valve
- Anti blow out stem
- Anti static tested
- Maintenance-free O-ring system

### CONNECTIONS
Flange in acc. with EN 1092-1 or ASME B16.5

### ACCEPTANCE TESTING
- Seat leak tightness: EN 12266-1 P12; leakage rate A
- Tightness to atmosphere: EN 12266-1 P11
- Strength: EN 12266-1 P10

### AUTOMATION
Flange connection in accordance with ISO 5211, allows for direct mounting of an actuator or by means of brackets. Pneumatic and electrical actuators utilizable.

### TEMPERATURE
-45°C to +250°C depending on O-ring material (see pT diagram)




## KHI-F VARIANTS

**FULL BORE DN 150–400** | Material: Stainless steel (M2), Duplex (M3)

| DN (ASME) | DN (mm) | Dimensions | | | | | Top Flange | Weight in kg | Shaft | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | L (mm) | | O | H1 | H2 | ISO 5211 not double drilled | | Square | Diameter | Key |
| | | PN 10-25** CL 150 | PN 40*** CL 300 | | | | | | | | |
| 6" | 150 | 394 | 403 | 320 | 232 | 167 | F14/F16 | 71 | 36 (Standard) | 48 | 14 |
| 8" | 200 | 457 | 502 | 398 | 273 | 209 | F14/F16 | 120 | 36 (Standard) | 48 | 14 |
| 10" | 250 | 533 | 568 | 490 | 349 | 261 | F16/F25 | 200 | 46 (Standard) | 60 | 18 |
| 12" | 300 | 610 | 648 | 568 | 376 | 289 | F25/F30 | 288 | 55 | 72 | 20 (Standard) |
| 14" | 350 | 686 | 762 | 660 | 440 | 346 | F25/F30 | 414 | 55 | 72 | 20 (Standard) |
| 16" | 400 | 762 | 838 | 700 | 442 | 359 | F25/F30 | 534 | 55 | 72 | 20 (Standard) |

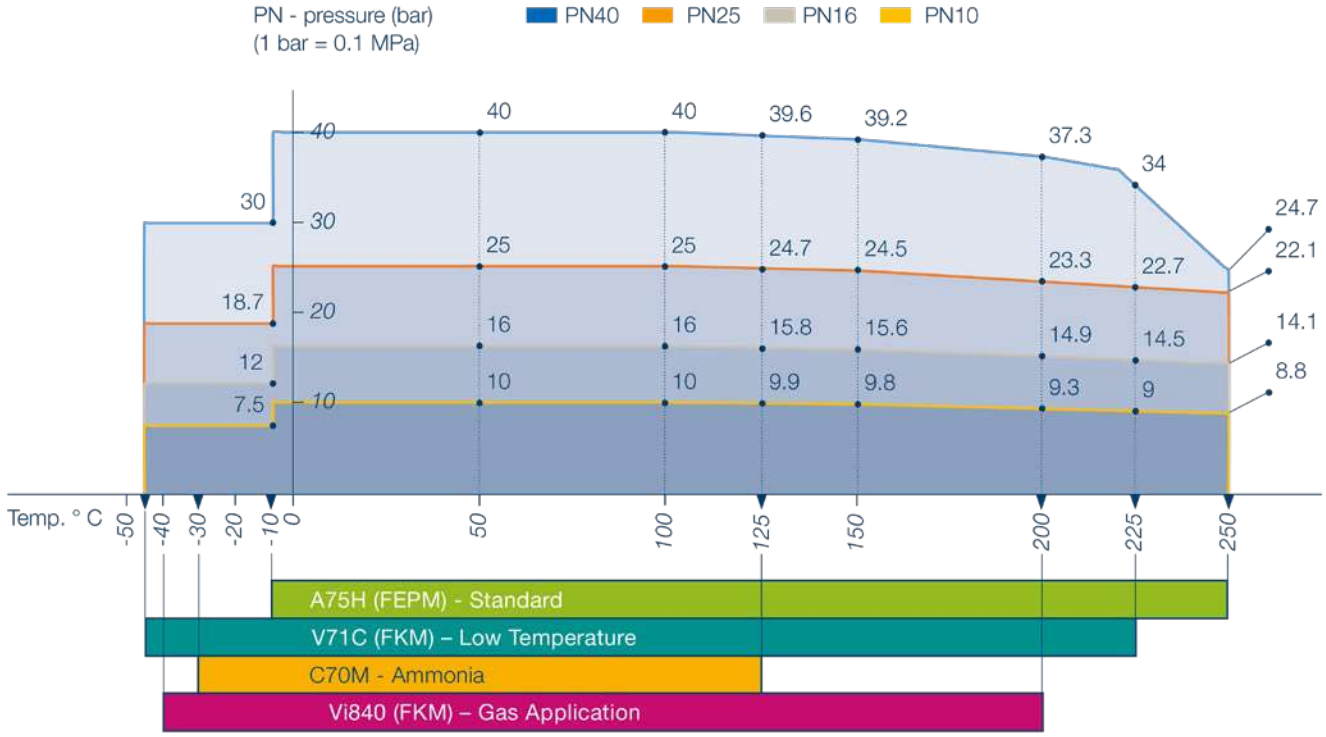
** acc. to EN 558-1 row 12 / ANSI B16.10 long pattern | *** acc. to EN 558-1 row 4 / ANSI B16.10 long pattern

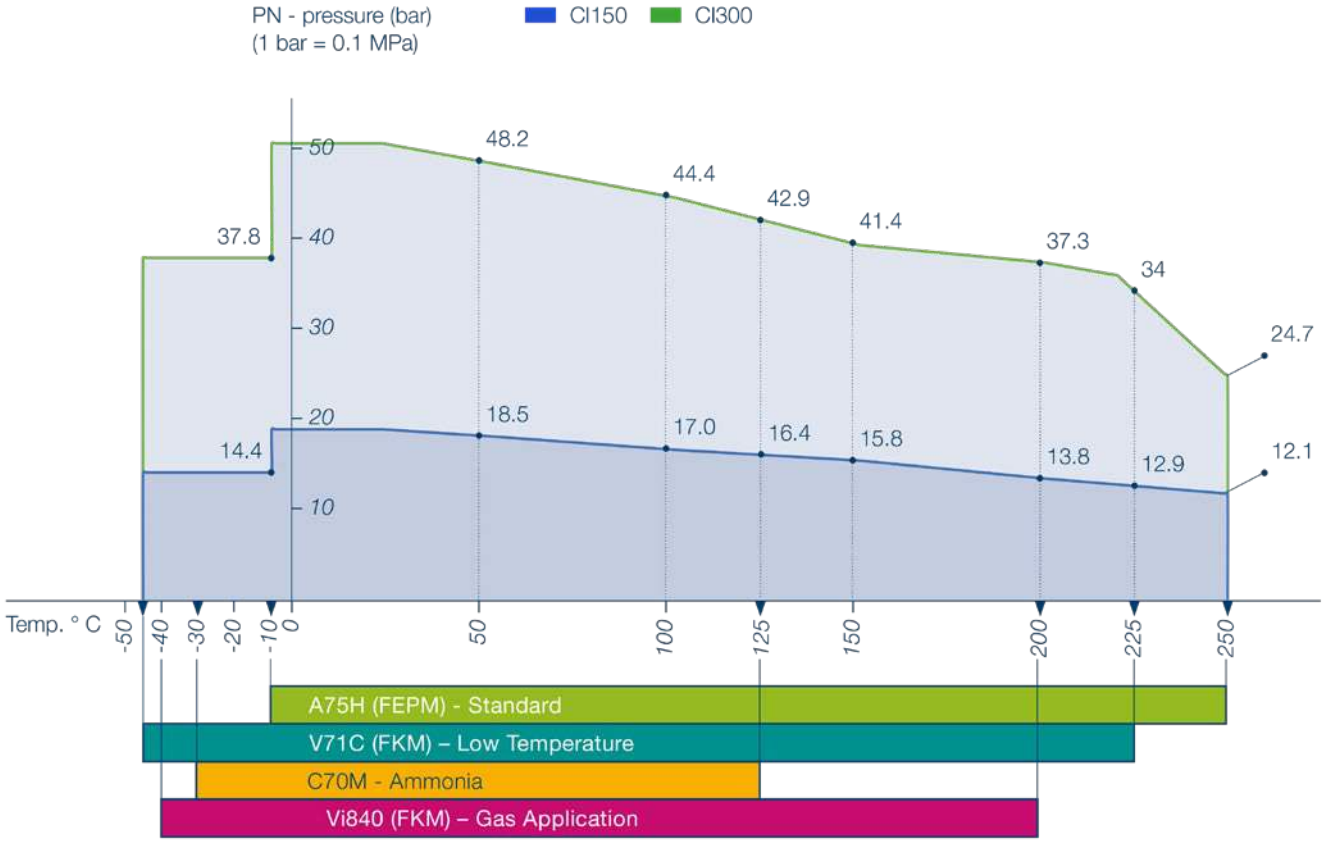
Dimensions in mm. Subject to modification of design and dimensions.

# BALLOSTAR® KHI-F

## Flanged ends, stainless steel, DN 150–400

### Material index M2

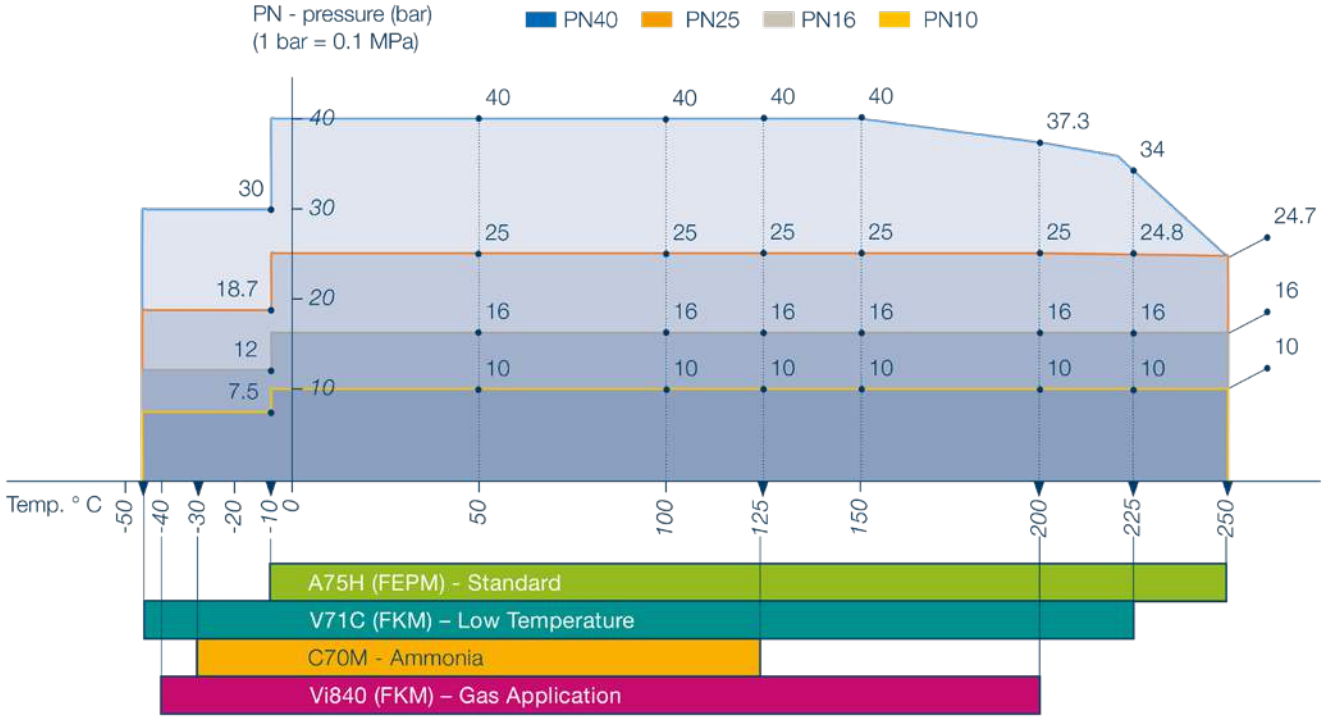


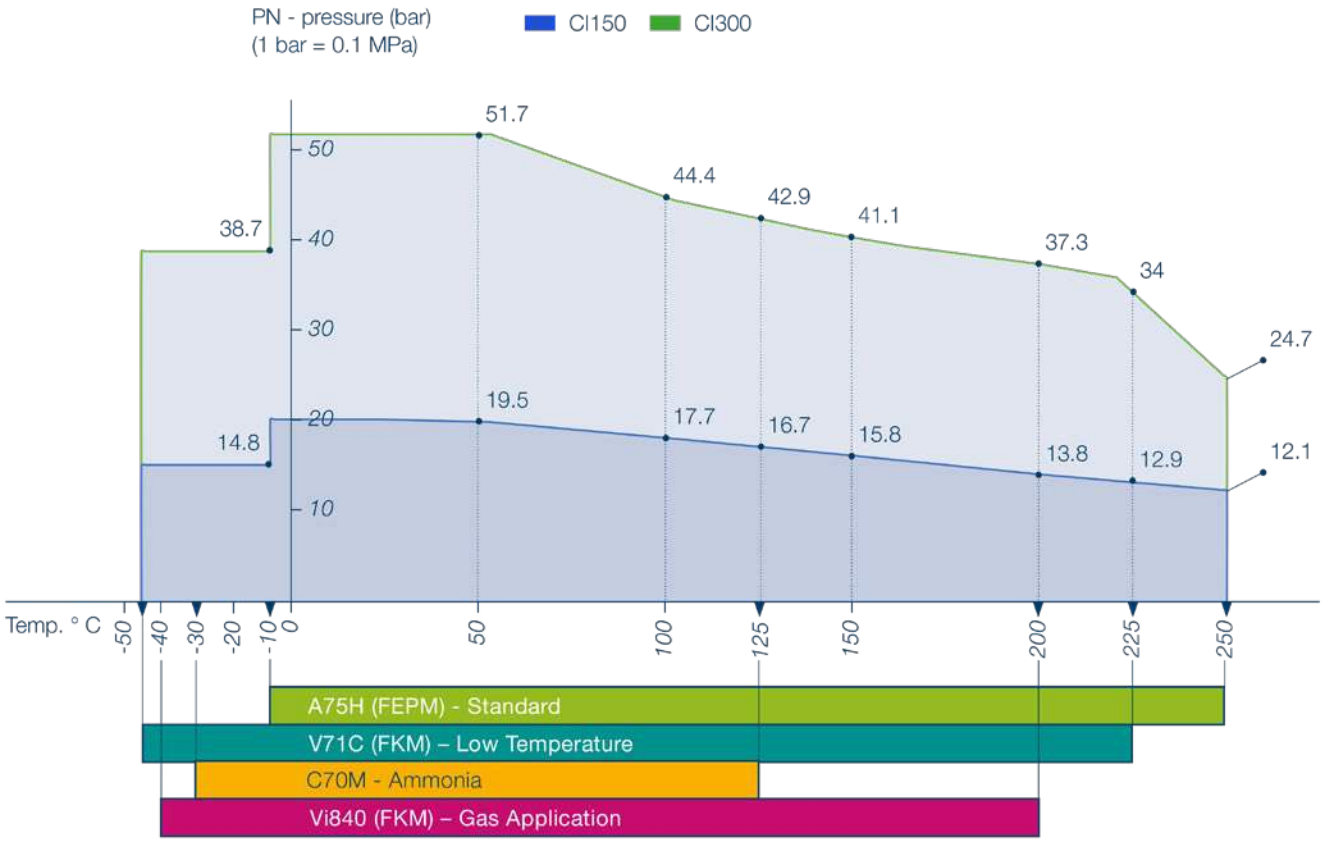



# BALLOSTAR® KHI-F

## Flanged ends, duplex, DN 150–400

### Material index M3



# BALLOSTAR®
# KHI-F

## Flanged ends, carbon steel, DN 150–400

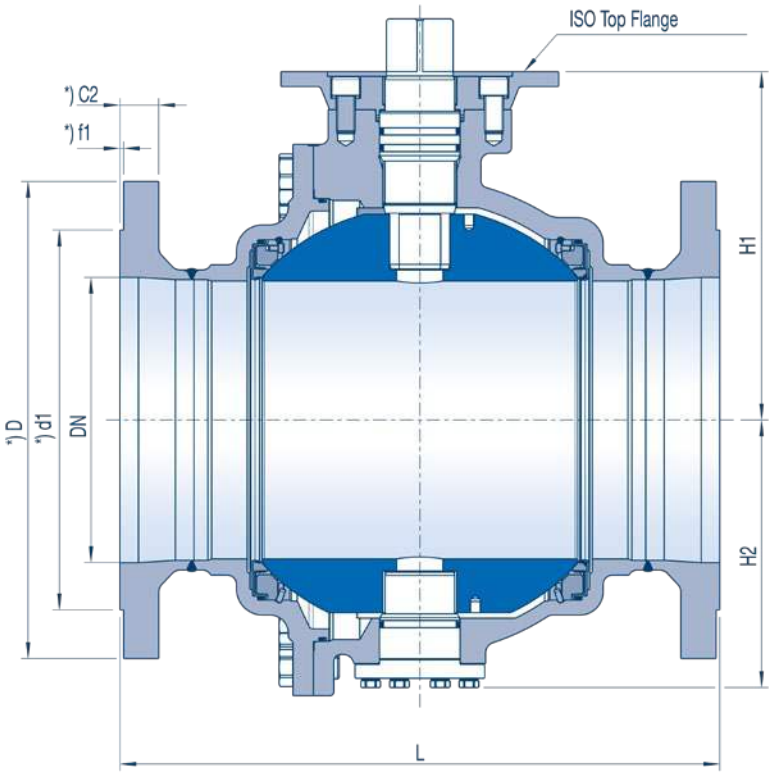
### GENERAL FEATURES
- Two-piece ball valve with full bore
- Trunnion mounted
- Bi-directional sealing
- Top flange acc. ISO 5211
- Leakage rate A (EN 12266-1/ISO 5208) soft seated
- Leakage rate Class IV-S1 (EN 60534-4) metal seated
- Double Block & Bleed with optional drain valve
- Anti blow out stem
- Anti static tested
- Maintenance-free O-ring system

### CONNECTIONS
Flange in acc. with EN 1092-1 or ASME B16.5

### ACCEPTANCE TESTING
- Seat leak tightness: EN 12266-1 P12; leakage rate A
- Tightness to atmosphere: EN 12266-1 P11
- Strength: EN 12266-1 P10

### AUTOMATION
Flange connection in accordance with ISO 5211, allows for direct mounting of an actuator or by means of brackets. Pneumatic and electrical actuators utilizable.

### TEMPERATURE
-45°C to +250°C depending on O-ring material (see pT diagram)




## KHI-F VARIANTS

**FULL BORE DN 150–400** | Material: Carbon steel 1.0619 (M1)

| DN (ASME) | DN (mm) | Dimensions | | | | | Top Flange | Weight in kg | Shaft | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | L (mm) | | O | H1 | H2 | ISO 5211 not double drilled | | Square | Diameter | Key |
| | | PN 10-25** CL 150 | PN 40*** CL 300 | | | | | | | | |
| 6" | 150 | 394 | 403 | 326 | 232 | 167 | F14/F16 | 90 | 36 (Standard) | 48 | 14 |
| 8" | 200 | 457 | 502 | 404 | 273 | 209 | F14/F16 | 155 | 36 (Standard) | 48 | 14 |
| 10" | 250 | 533 | 568 | 500 | 349 | 261 | F16/F25 | 270 | 46 (Standard) | 60 | 18 |
| 12" | 300 | 610 | 648 | 595 | 376 | 289 | F25/F30 | 444 | 55 | 72 | 20 (Standard) |
| 14" | 350 | 686 | 762 | 670 | 440 | 346 | F25/F30 | 632 | 55 | 72 | 20 (Standard) |
| 16" | 400 | 762 | 838 | 720 | 442 | 359 | F25/F30 | 800 | 55 | 72 | 20 (Standard) |

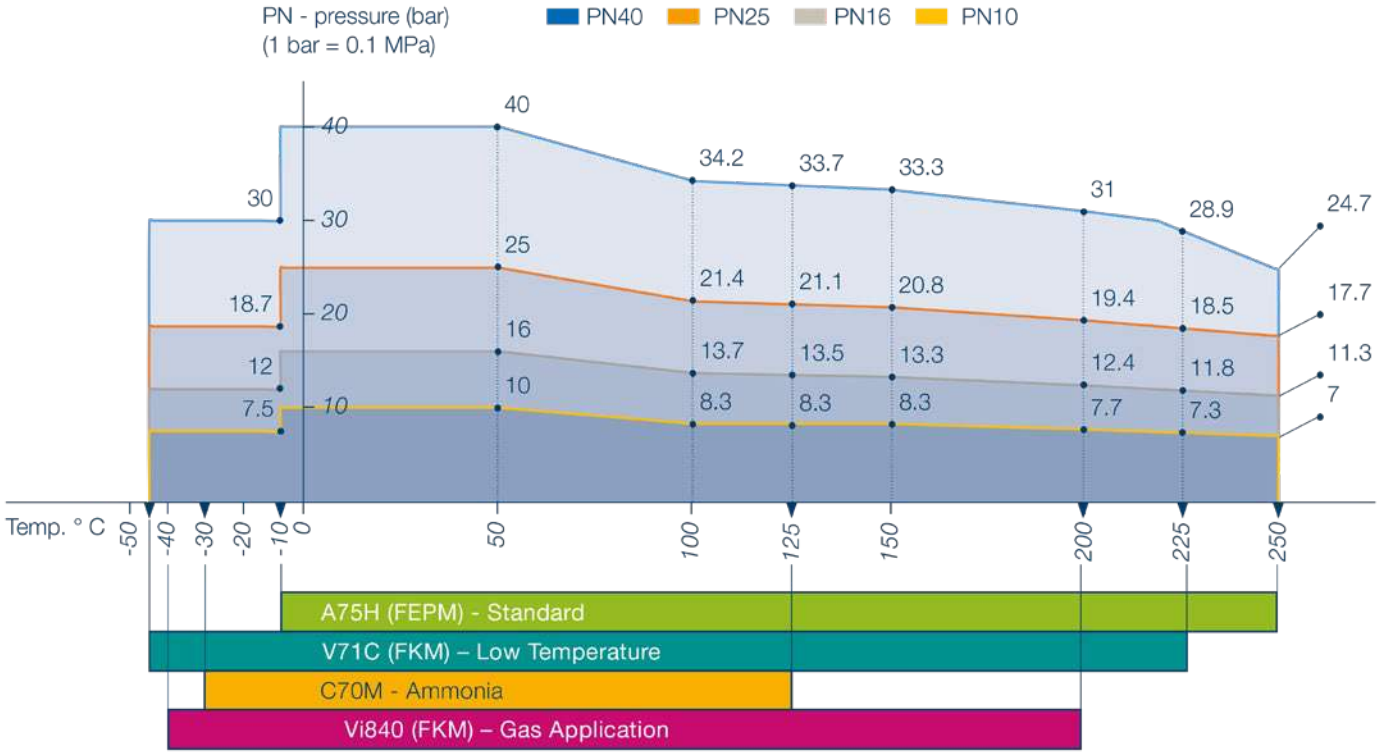
** acc. to EN 558-1 row 12 / ANSI B16.10 long pattern | *** acc. to EN 558-1 row 4 / ANSI B16.10 long pattern

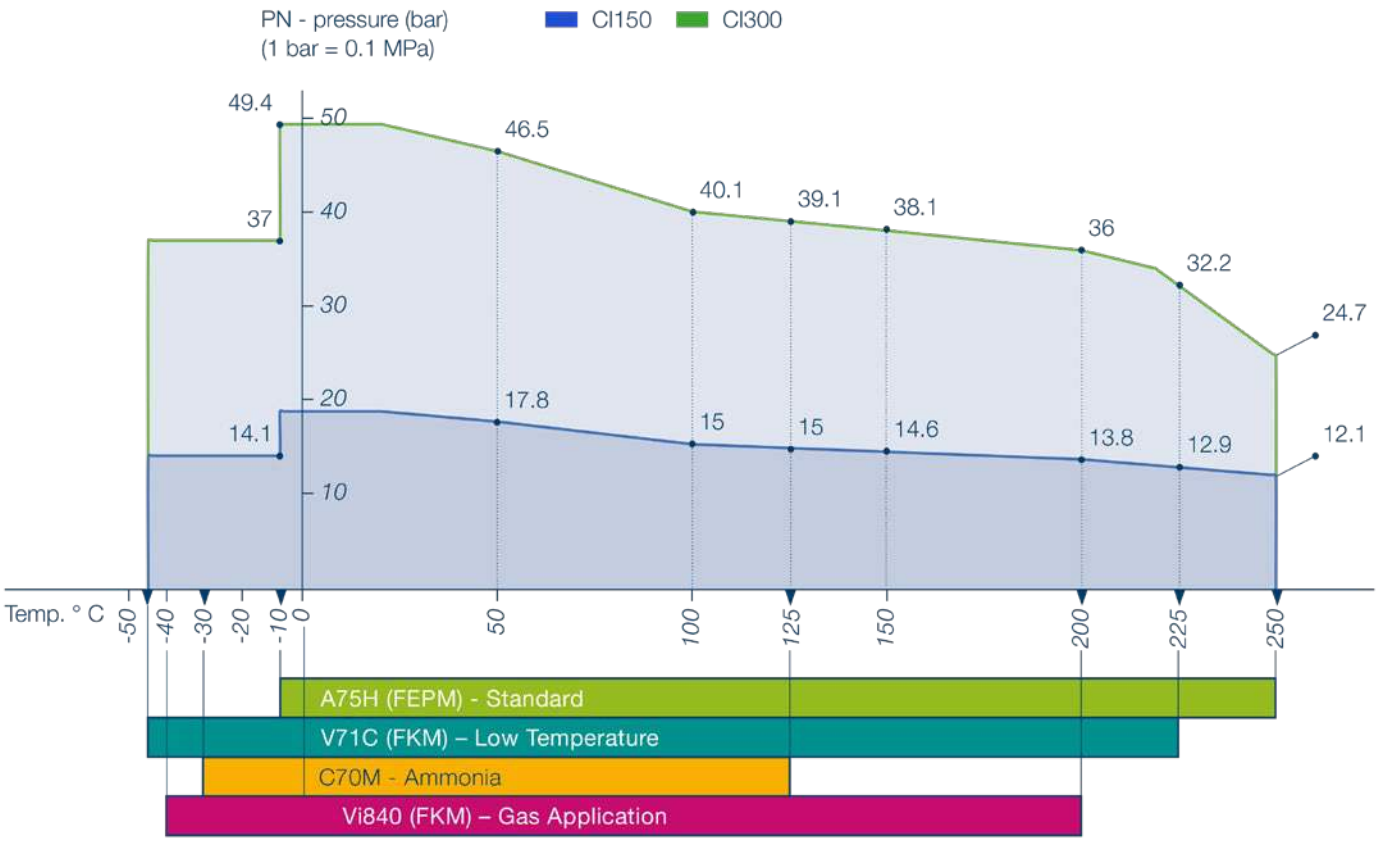
Dimensions in mm. Subject to modification of design and dimensions.

# BALLOSTAR® KHI-F

## Flanged ends, carbon steel, DN 150–400

### Material index M1



# BALLOSTAR® KHI

## Flanged ends, carbon steel, DN 500–1000

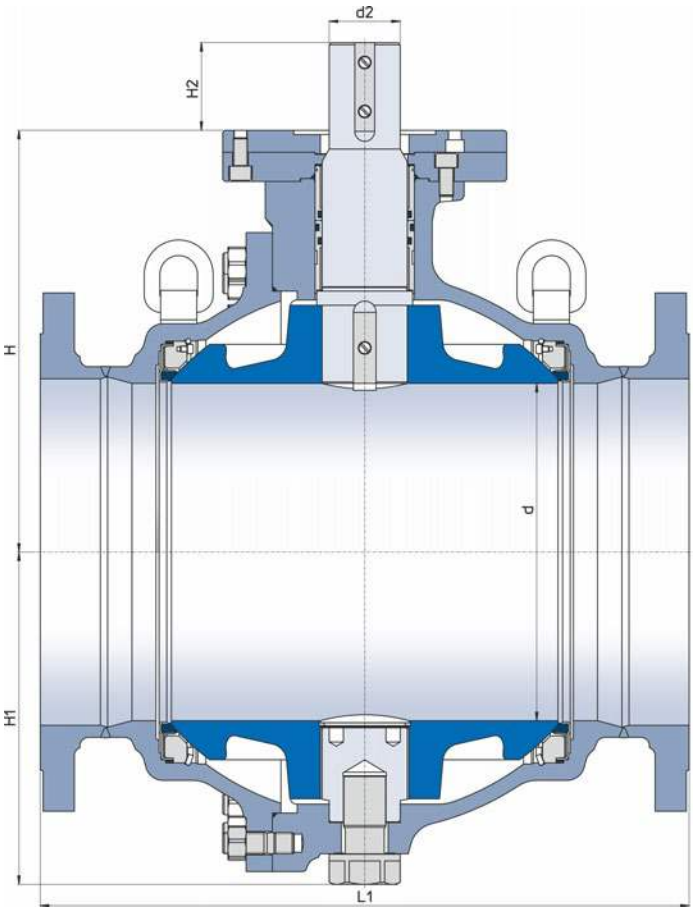
### GENERAL FEATURES
» Two-piece ball valve with full bore
» Trunnion mounted
» Bi-directional sealing
» Top flange acc. ISO 5211
» Leakage rate A (EN 12266-1/ISO 5208) soft seated
» Double Block & Bleed with optional drain valve
» Anti blow out stem
» Anti static tested
» Maintenance-free O-ring system

### CONNECTIONS
Flange in acc. with EN 1092-1

### ACCEPTANCE TESTING
» Seat leak tightness: EN 12266-1 P12; leakage rate A
» Tightness to atmosphere: EN 12266-1 P11
» Strength: EN 12266-1 P10

### AUTOMATION
Flange connection in accordance with ISO 5211, allows for direct mounting of an actuator or by means of brackets. Pneumatic and electrical actuators utilizable.

### TEMPERATURE
-45°C to +200°C depending on O-ring material (see pT diagram)




## KHI VARIANTS

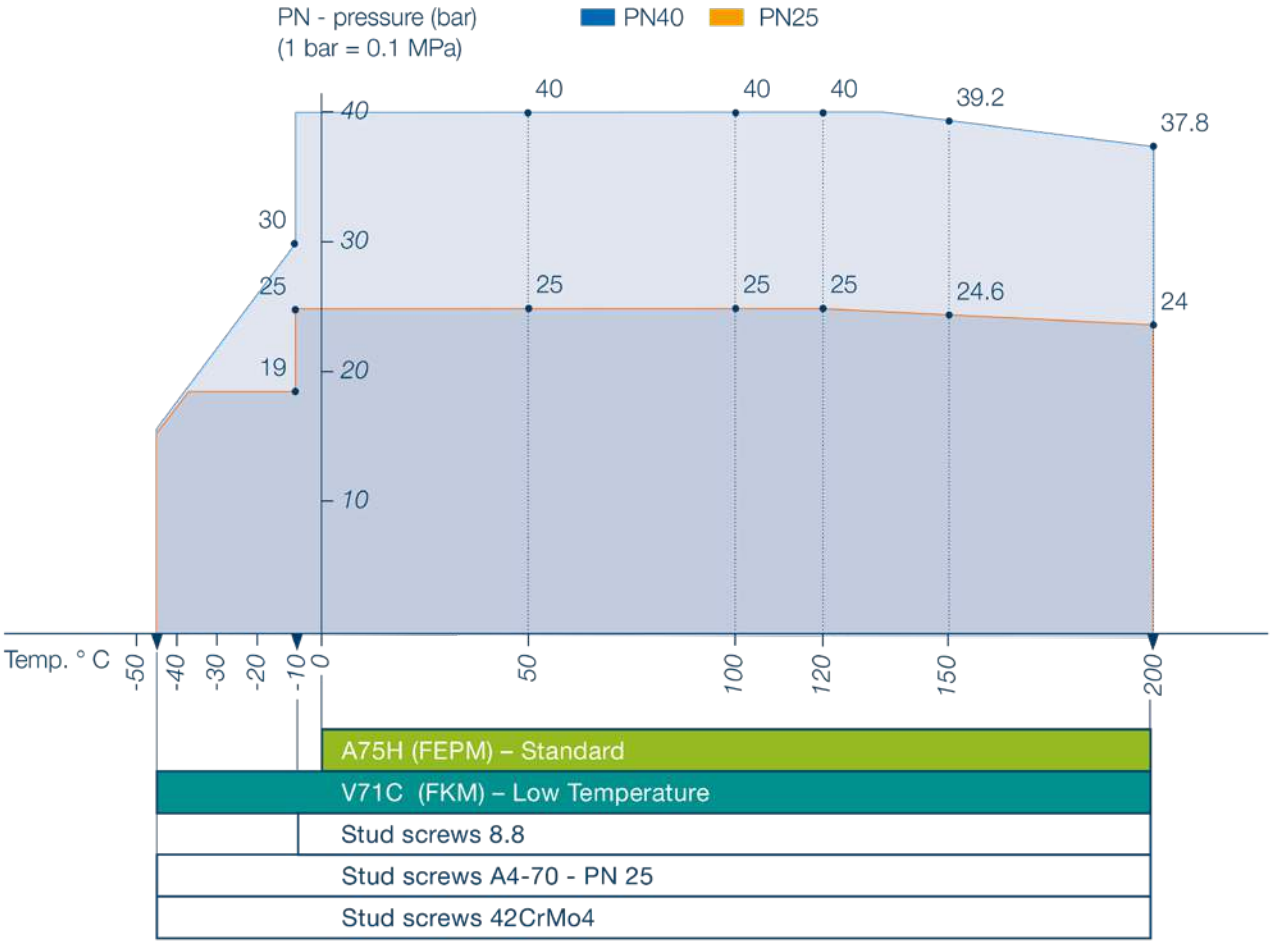
| FULL BORE DN 500–1000 \| Material: Carbon steel 1.0619 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DN | Dimensions | | | | Connection dimensions | | Top Flange | PN | | Weight in kg | |
| | L1 | H | H1 | H2 | d | d2 | ISO 5211 | | | at PN 25 | at PN 40 |
| 500 | 914 | 594 | 468 | 124 | 475 | 100 | F25/30 | 25 | 40 | 1200 | 1330 |
| 600 | 1067 | 698 | 533 | 125 | 585 | 100 | F25/30 | 25 | 40 | 1750 | 1863 |
| 700 | 1245 | 834 | 640 | 149 | 686 | 140 | F35 | 25 | * | 3100 | * |
| 800 | 1372 | 931 | 710 | 148 | 782 | 140 | F35 | 25 | * | 4850 | * |
| 1000 | 2305 | 1091 | 865 | 180 | 980 | 180 | F35/40/48 | 25 | * | 8160 | * |

* on demand

Dimensions in mm. Subject to modification of design and dimensions.

# BALLOSTAR®
# KHI

## Flanged ends, carbon steel, DN 500–1000



# BALLOSTAR®
# KHI-S

## Welding ends, DN 150–400

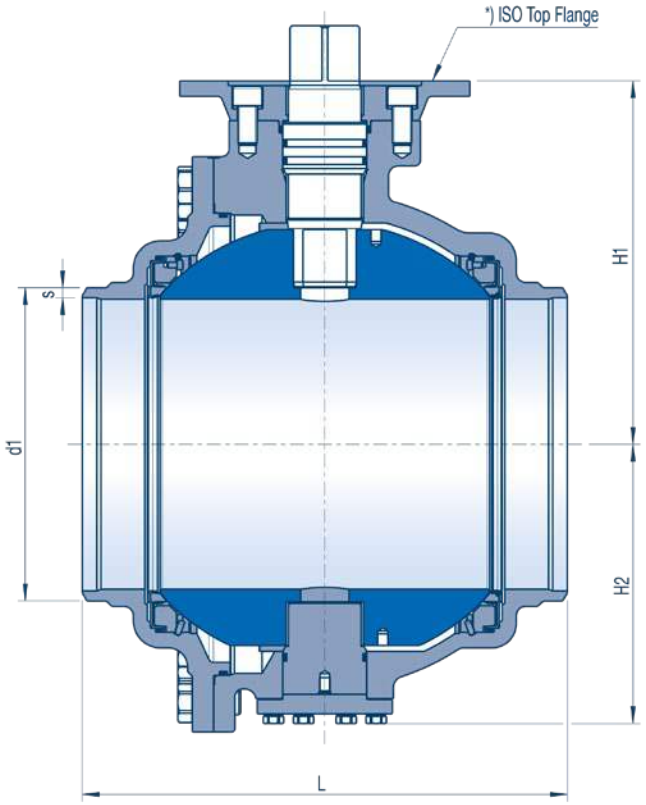
### GENERAL FEATURES
- Two-piece ball valve with full bore
- Trunnion mounted
- Bi-directional sealing
- Top flange acc. ISO 5211
- Leakage rate A (EN 12266-1/ISO 5208) soft seated
- Leakage rate Class IV-S1 (EN 60534-4) metal seated
- Double Block & Bleed with optional drain valve
- Anti blow out stem
- Anti static tested
- Maintenance-free O-ring system

### CONNECTIONS
Welding ends in acc. with customer requirements

### ACCEPTANCE TESTING
- Seat leak tightness: EN 12266-1 P12; leakage rate A
- Tightness to atmosphere: EN 12266-1 P11
- Strength: EN 12266-1 P10

### AUTOMATION
Flange connection in accordance with ISO 5211, allows for direct mounting of an actuator or by means of brackets. Pneumatic and electrical actuators utilizable.

### TEMPERATURE
-45°C to +250°C depending on O-ring material (see pT diagram)




## KHI-S VARIANTS

**FULL BORE DN 150–400** | Material: Carbon steel 1.0619

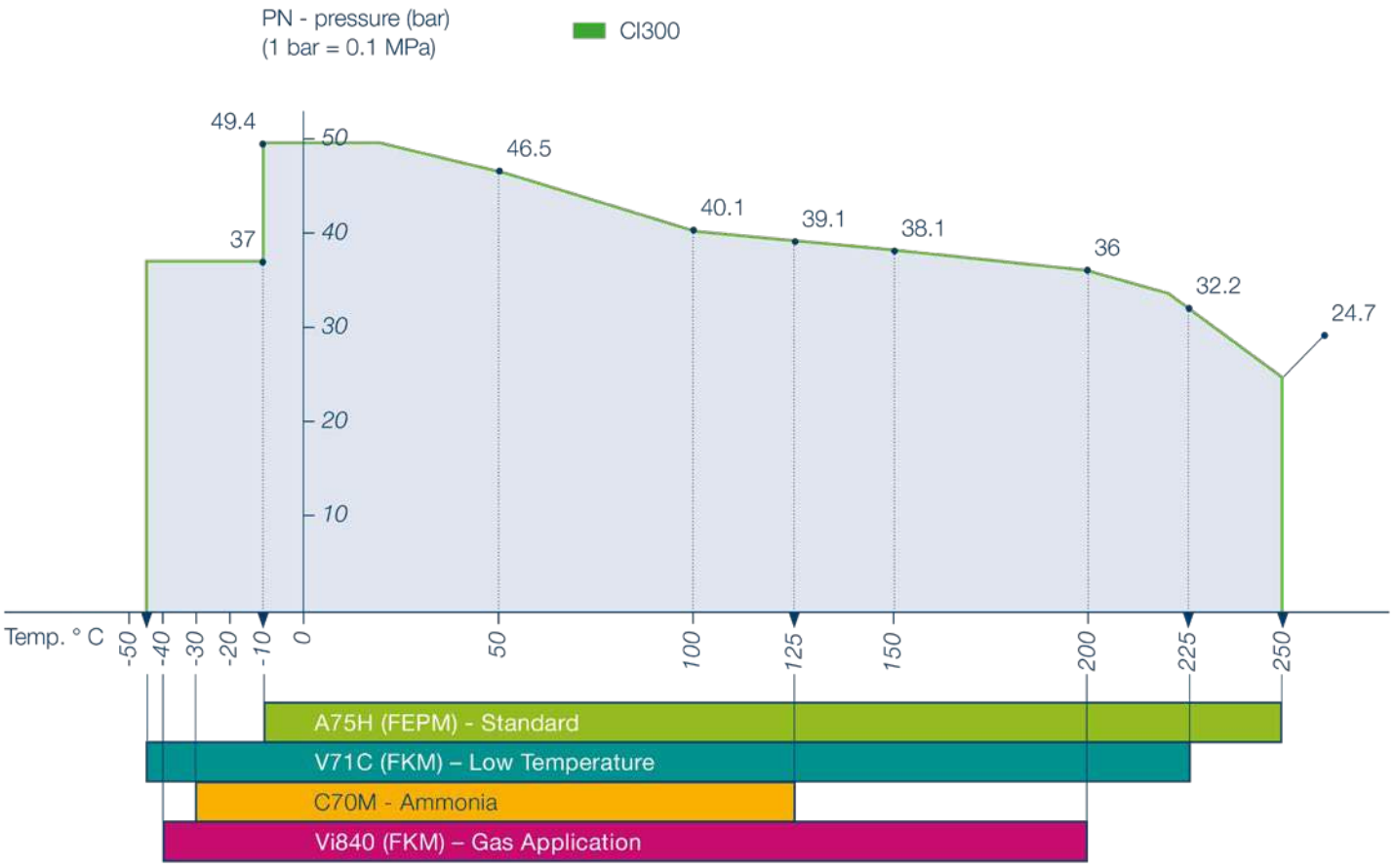
| DN (ASME) | DN (mm) | Dimensions | | | | Connection dimensions | | Top Flange | Weight in kg | Shaft | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | L (mm)* | O | H1 | H2 | d1 (mm) | s (max. mm) | ISO 5211 not double drilled | | Square | Diameter | Key |
| 6" | 150 | 403 | 326 | 232 | 167 | 168.3 | 7.15 | F14/F16 | 90 | 36 (Standard) | 48 | 14 |
| 8" | 200 | 419 | 404 | 273 | 209 | 219.1 | 8.05 | F14/F16 | 155 | 36 (Standard) | 48 | 14 |
| 10" | 250 | 457 | 500 | 349 | 261 | 273 | 10 | F16/F25 | 270 | 46 (Standard) | 60 | 18 |
| 12" | 300 | 502 | 595 | 376 | 289 | 323.9 | 10.45 | F25/F30 | 444 | 55 | 72 | 20 (Standard) |
| 14" | 350 | 572 | 670 | 440 | 346 | 355.6 | 11.05 | F25/F30 | 632 | 55 | 72 | 20 (Standard) |
| 16" | 400 | 610 | 720 | 442 | 359 | 406.4 | 12.7 | F25/F30 | 800 | 55 | 72 | 20 (Standard) |

* acc. to EN 12982 row 61 / ANSI B16.10 short pattern

Dimensions in mm. Subject to modification of design and dimensions.

# BALLOSTAR® KHI-S

## Welding ends, DN 150–400



# BALLOSTAR® KHSVI

## Welding ends, DN 500–1000

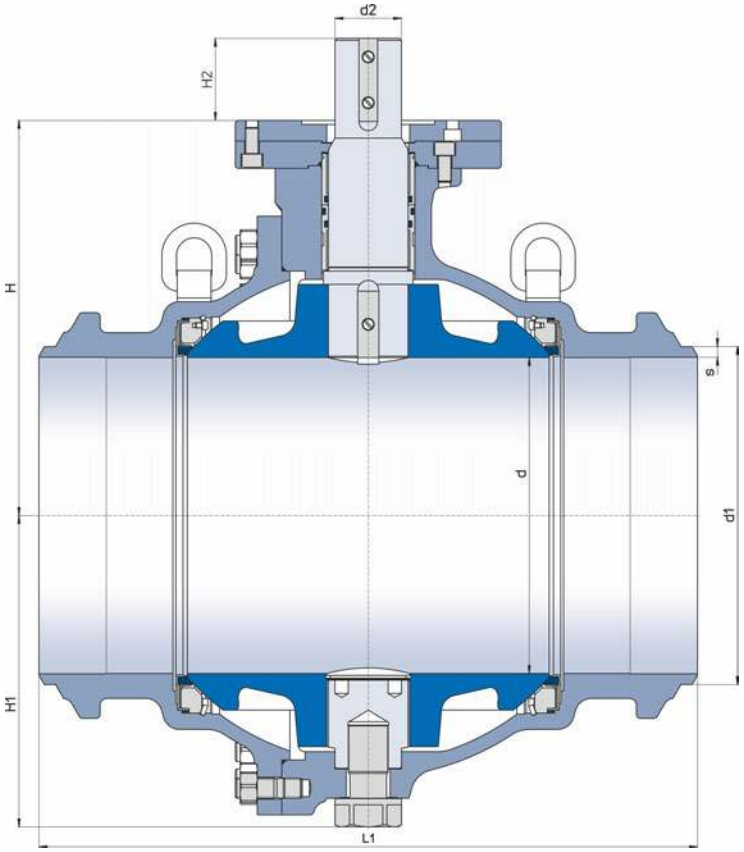
### GENERAL FEATURES
» Two-piece ball valve with full bore
» Trunnion mounted
» Bi-directional sealing
» Top flange acc. ISO 5211
» Leakage rate A (EN 12266-1/ISO 5208) soft seated
» Double Block & Bleed with optional drain valve
» Anti blow out stem
» Anti static tested
» Maintenance-free O-ring system

### CONNECTIONS
Welding ends in acc. with customer requirements

### ACCEPTANCE TESTING
» Seat leak tightness: EN 12266-1 P12; leakage rate A
» Tightness to atmosphere: EN 12266-1 P11
» Strength: EN 12266-1 P10

### AUTOMATION
Flange connection in accordance with ISO 5211, allows for direct mounting of an actuator or by means of brackets. Pneumatic and electrical actuators utilizable.

### TEMPERATURE
-45°C to +200°C depending on O-ring material (see pT diagram)




## KHSVI VARIANTS

**FULL BORE DN 500–1000** | Material: Carbon steel 1.0619

| DN | Dimensions | | | | Connection dimensions | | | | Top Flange | PN | | Weight in kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | H | H1 | H2 | d | d1 | d2 | s* | ISO 5211 | | | |
| 500 | 991 | 594 | 468 | 124 | 475 | 508 | 100 | 16 | F25/30 | 25 | 40 | 1150 |
| 600 | 1143 | 698 | 533 | 125 | 585 | 610 | 100 | 17.5 | F25/30 | 25 | 40 | 1700 |
| 700 | 1346 | 834 | 640 | 149 | 686 | 711 | 140 | 17.5 | F35 | 25 | 40 | 3000 |
| 800 | 1524 | 931 | 710 | 148 | 782 | 813 | 140 | 19 | F35 | 25 | 40 | 4700 |
| 1000 | 1981 | 1091 | 865 | 180 | 980 | 1016 | 180 | 10 | F35/40/48 | 25 | 40 | 7480 |

* Standard dimensions, also configurable in accordance with customer requirements

Dimensions in mm. Subject to modification of design and dimensions.

# BALLOSTAR® KHSVI

## Welding ends with reducing cones

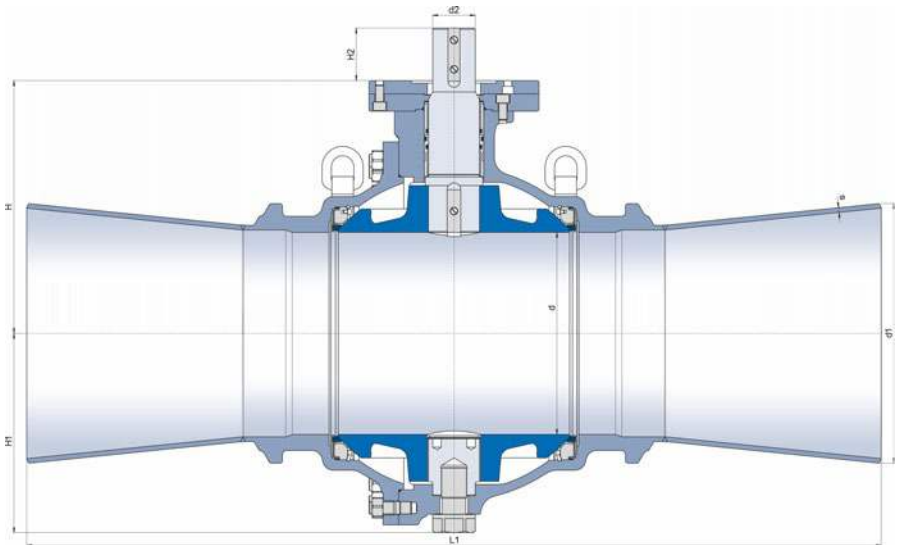
### GENERAL FEATURES
» Two-piece ball valve with full bore
» Trunnion mounted
» Bi-directional sealing
» Top flange acc. ISO 5211
» Leakage rate A (EN 12266-1/ISO 5208) soft seated
» Double Block & Bleed with optional drain valve
» Anti blow out stem
» Anti static tested
» Maintenance-free O-ring system

### CONNECTIONS
Welding ends in acc. with customer requirements

### ACCEPTANCE TESTING
» Seat leak tightness: EN 12266-1 P12; leakage rate A
» Tightness to atmosphere: EN 12266-1 P11
» Strength: EN 12266-1 P10

### AUTOMATION
Flange connection in accordance with ISO 5211, allows for direct mounting of an actuator or by means of brackets. Pneumatic and electrical actuators utilizable.

### TEMPERATURE
-45°C to +200°C depending on O-ring material (see pT diagram)




## KHSVI CONES VARIANTS

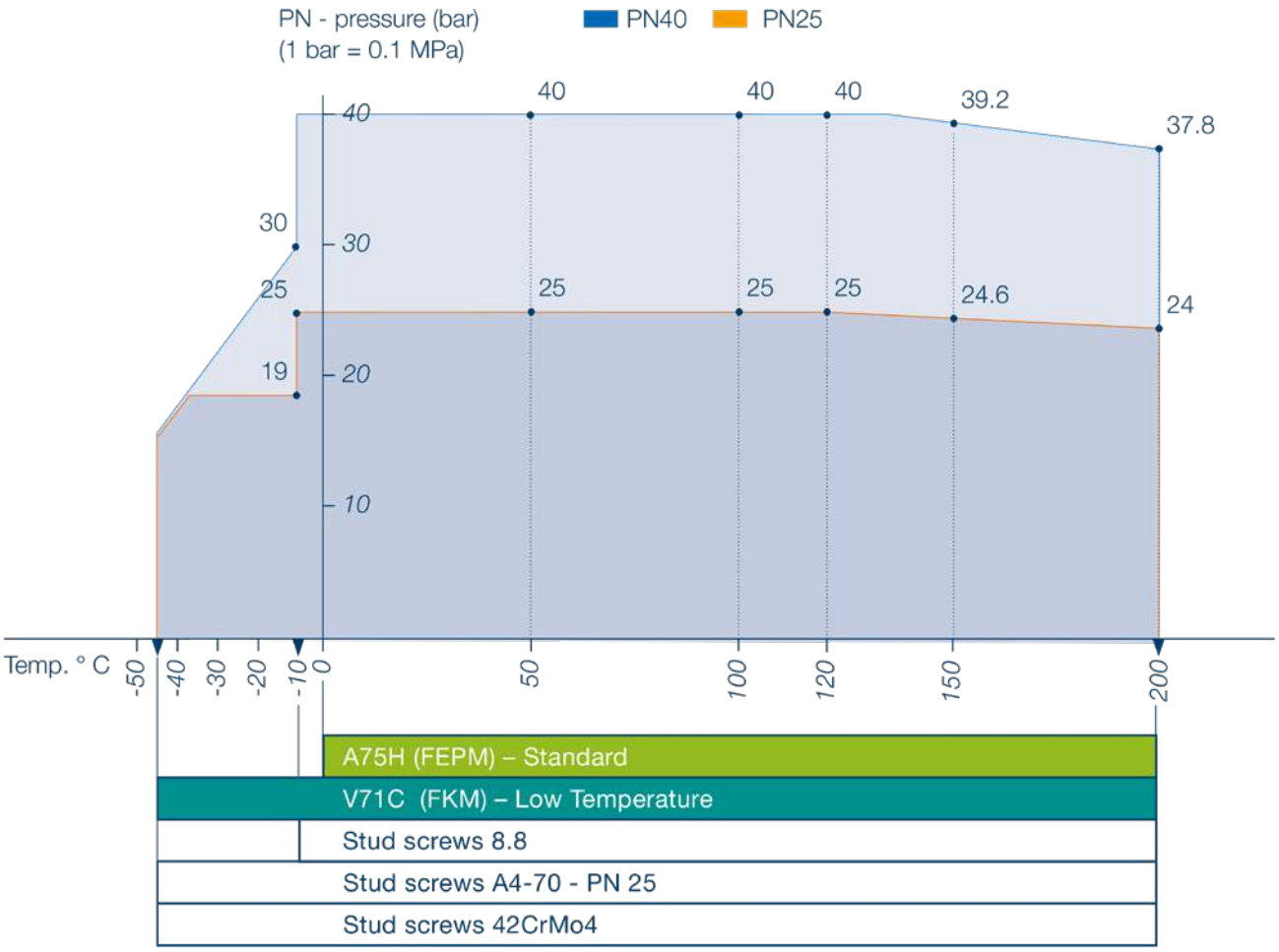
**REDUCING CONES DN 600/500 – 1200/1000** | Material: Carbon steel 1.0619

| DN | Dimensions | | | | Connection dimensions | | | | Top Flange | PN | | Weight in kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1* | H | H1 | H2 | d | d1 | d2 | s* | ISO 5211 | | | |
| 600/500 | 2011 | 594 | 468 | 124 | 475 | 610 | 100 | 7 | F25/30 | 25 | 40 | 1264 |
| 700/600 | 2367 | 698 | 533 | 125 | 585 | 711 | 100 | 8 | F25/30 | 25 | 40 | 1860 |
| 800/700 | 2570 | 834 | 640 | 149 | 686 | 813 | 140 | 8 | F35 | 25 | 40 | 3184 |
| 900/800 | 2748 | 931 | 710 | 148 | 782 | 914 | 140 | 10 | F35 | 25 | 40 | 4960 |
| 1000/800 | 2748 | 931 | 710 | 148 | 782 | 1016 | 140 | 10 | F35 | 25 | 40 | 4980 |
| 1200/800 | 2950 | 931 | 710 | 148 | 782 | 1220 | 140 | 12 | F35 | 25 | 40 | 5070 |
| 1200/1000 | 3407 | 1091 | 865 | 180 | 980 | 1220 | 180 | 12 | F35/40/48 | 25 | 40 | 7950 |

* Standard dimensions, also configurable in accordance with customer requirements

# BALLOSTAR® KHSVI

## Welding ends, DN 500–1000 with reducing cones



# BALLOSTAR®
# KHSVI VVS

## Fully-welded, DN 150–250

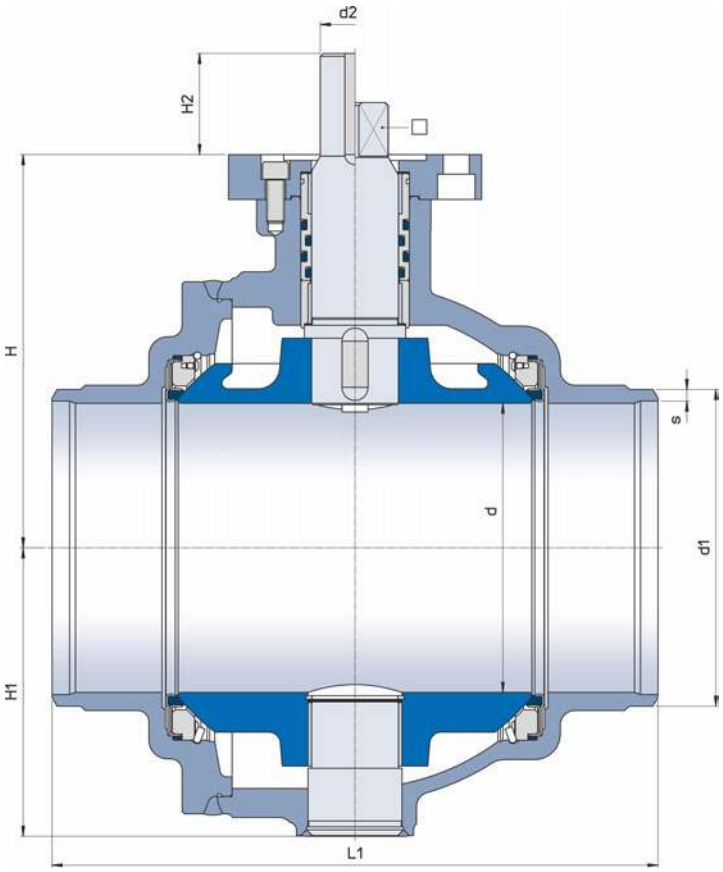
### GENERAL FEATURES
» Single-piece ball valve with full bore
» Trunnion mounted
» Bi-directional sealing
» High degree of resilience against pipework forces
» Double Block & Bleed with optional drain valve
» Anti blow out stem
» Anti static tested
» Maintenance-free
» Certified acc. to EHP 003 (EN 488-1)

### CONNECTIONS
Welding ends in acc. with customer requirements

### ACCEPTANCE TESTING
» Seat leak tightness: EN 12266-1 P12; leakage rate A
» Tightness to atmosphere: EN 12266-1 P11
» Strength: EN 12266-1 P10

### AUTOMATION
Flange connection in accordance with ISO 5211, allows for direct mounting of an actuator or by means of brackets. Pneumatic and electrical actuators utilizable.

### TEMPERATURE
-45°C to +250°C depending on O-ring material (see pT diagram)




## KHSVI VVS VARIANTS

**FULL BORE DN 150–250** | Material: Carbon steel 1.0619

| DN | Dimensions | | | | Connection dimensions | | | | | Top Flange | PN | | Weight in kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | H | H1 | H2 | d | d1 | d2 | □ SW | s* | ISO 5211 | | | |
| 150 | 403 | 383 | 149 | 77 | 150 | 168.3 | 36 | 27/36 | 6.65 | F12/14 | 25 | 40 | 55 |
| 200 | 419 | 474 | 200 | 98 | 200 | 219.1 | 48 | 36 | 8.05 | F12/14/16 | 25 | 40 | 106 |
| 250 | 457 | 493 | 250 | 95 | 250 | 273 | 50/60 | 46/55 | 8.50 | F16/25 | 25 | 40 | 170 |

* Standard dimensions, also configurable in accordance with customer requirements

DN 150: connection flange F12 or F14 optional with ø 36 mm, □ 27 or □ 36
DN 200: connection flange F14 or F16 optionall with ø 48 mm or □ 36
DN 250: connection flange F16 or F25 optional with ø 50 mm or ø 60 mm, □ 46 or □ 55

Dimensions in mm. Subject to modification of design and dimensions.

# BALLOSTAR®
# KHSVI VVS

## Fully-welded, DN 300–800

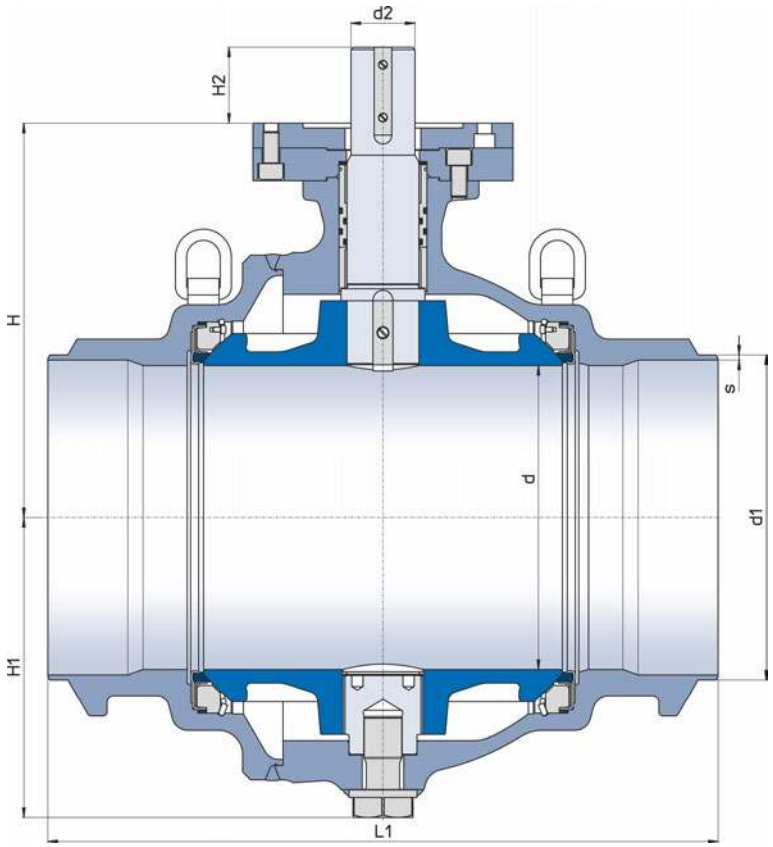
### GENERAL FEATURES
» Single-piece ball valve with full bore
» Trunnion mounted
» Bi-directional sealing
» High degree of resilience against pipework forces
» Double Block & Bleed with optional drain valve
» Anti blow out stem
» Anti static tested
» Maintenance-free
» Certified acc. to EHP 003 (EN 488-1)

### CONNECTIONS
Welding ends in acc. with customer requirements

### ACCEPTANCE TESTING
» Seat leak tightness: EN 12266-1 P12; leakage rate A
» Tightness to atmosphere: EN 12266-1 P11
» Strength: EN 12266-1 P10

### AUTOMATION
Flange connection in accordance with ISO 5211, allows for direct mounting of an actuator or by means of brackets. Pneumatic and electrical actuators utilizable.

### TEMPERATURE
-45°C to +250°C depending on O-ring material (see pT diagram)




## KHSVI VVS VARIANTS

**FULL BORE DN 300–800** | Material: Carbon steel 1.0619

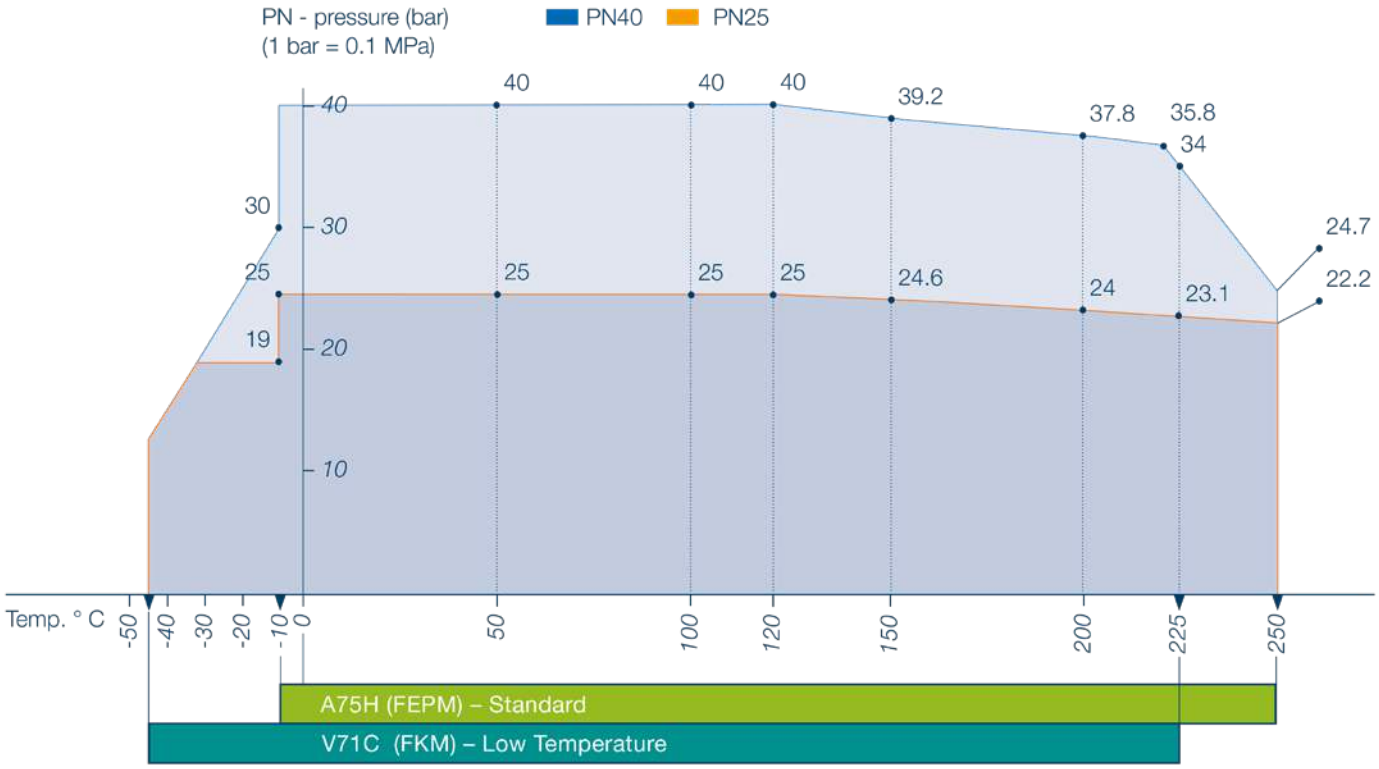
| DN | Dimensions | | | | Connection dimensions | | | | Top Flange | PN | | Weight in kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | H | H1 | H2 | d | d1 | d2 | s* | ISO 5211 | | | |
| 300 | 635 | 383 | 294 | 77 | 300 | 323.9 | 60 | 9.45 | F16/25 | 25 | 40 | 288 |
| 350 | 762 | 474 | 356 | 98 | 350 | 355.6 | 80 | 10.8 | F25 | 25 | 40 | 465 |
| 400 | 838 | 493 | 376 | 95 | 380 | 406.4 | 80 | 10.2 | F25 | 25 | 40 | 605 |
| 500 | 991 | 594 | 468 | 124 | 475 | 508 | 100 | 16 | F25/30 | 25 | 40 | 1015 |
| 600 | 1143 | 698 | 533 | 125 | 585 | 610 | 100 | 17.5 | F25/30 | 25 | 40 | 1650 |
| 700 | 1346 | 834 | 640 | 149 | 686 | 711 | 140 | 17.5 | F35 | 25 | 40 | 2690 |
| 800 | 1524 | 931 | 710 | 148 | 782 | 813 | 140 | 19 | F35 | 25 | 40 | 3810 |

* Standard dimensions, also configurable in accordance with customer requirements

Dimensions in mm. Subject to modification of design and dimensions.

# BALLOSTAR®
# KHSVI VVS

## Fully-welded, DN 150–250 and 300–800



# DRAIN VALVE

## For the entire Ballostar® portfolio

### Test & Drain valve

Test and drain valves are available for all KHI, KHSVI, KHS-VI-VVS, KHI-F and KHI-S ball valve models. These are weld-ed onto the ball valve body in a 45° position as standard. The three-piece KHA ball valve model with short weld ends is used for this purpose (see image).

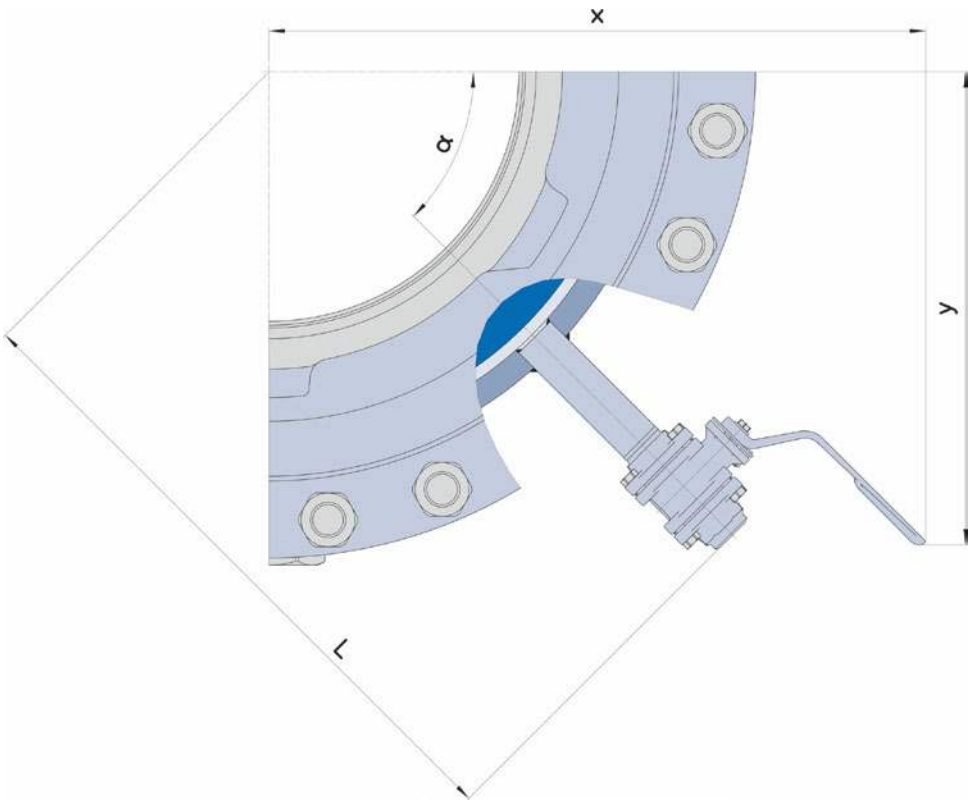
The process connection can be designed as either a short or long welded end, a flanged end or a threaded connection. The position of the test or drain cock on the ball valve body is also variable.

The following advantages result from the use of a test or drain cock:

1. Draining of the ball valve cavity in closed position
2. Checking the tightness of the inlet-side sealing element in the closed position (Double Block & Bleed)
3. Ensuring tightness in the closed state whilst the test or drain valve is open

| DN | Dimensions | L | α | x | y |
|---|---|---|---|---|---|
| 150 | KHA-S DN 20 | 287 | 45° | 353 | 218 |
| 200 | | 322 | | 377 | 243 |
| 250 | KHA-S DN 25 | 399 | | 429 | 289 |
| 300 | | 434 | | 453 | 314 |
| 350 | | 464 | | 475 | 335 |
| 400 | | 499 | | 499 | 360 |
| 500 | KHA-S DN 50 | 621 | | 702 | 514 |
| 600 | | 706 | | 762 | 574 |
| 700 | | 786 | | 819 | 631 |
| 800 | | 816 | | 843 | 655 |
| 1000 | KHA-S DN 65 | 1030 | | 984 | 782 |

All parameters and dimensions can be individually modified upon request



# STEM EXTENSIONS

## For Ballostar® KHI-F & KHI-S in carbon steel, DN 150–400

### Option with extended operating stem

Certain processes and operating conditions require an extension of the ball valve's operating shaft. Such conditions may arise, for example, when mobile insulation is fitted to the valve to minimize heat loss, when the installation situation requires it for reasons of space (e.g. in shaft installations), or when a greater operating height for the ball valve is desired.

To ensure a high degree of flexibility regarding specific structural operating conditions and the operation of the ball valve, the KHI-F and KHI-S ball valve models are available with bolted-on operating stem extensions at a standard height of 300 mm.

The stainless-steel operating shaft is housed within a protective carbon steel sleeve. The end of the extension is designed as an ISO-TOP flange, which facilitates the installation of a gearbox or actuator.

# TECHNICAL DETAILS

## Flow characteristics for the determination of the nominal diameter for the entire Ballostar® KHI portfolio

### Torques*

#### KFC SEAT RING

| DN (mm) | Differential pressure (bar) | |
|---|---|---|
| | 25 | 40/50 |
| | Torque (Nm)* | |
| 150 | 465 | 900 |
| 200 | 763 | 1,255 |
| 250 | 1,488 | 2,075 |
| 300 | 2,650 | 4,095 |
| 350 | 3,620 | 5,045 |
| 400 | 4,465 | 5,705 |
| 500 | 6,215 | 8,325 |
| 600 | 9,300 | 11,100 |
| 700 | 13,800 | 19,650 |
| 800 | 22,425 | 26,400 |
| 1000 | 32,100 | 42,800 |

#### METAL SEAT

| DN (mm) | Differential pressure (bar) | | |
|---|---|---|---|
| | 16 | 25 | 40 |
| | Torque (Nm)* | | |
| 150 | 630 | 840 | 1,090 |
| 200 | 980 | 1,260 | 1,640 |
| 250 | 1,890 | 2,520 | 3,280 |
| 300 | 3,570 | 4,480 | 5,820 |
| 350 | 4,970 | 6,160 | 8,000 |
| 400 | 6,090 | 7,280 | 9,470 |
| 500 | 7,620 | 10,045 | 13,060 |

*Values without safety.
KLINGER recommends safety factor 1.4.

### Flow values

#### FULL BORE

| DN (mm) | ζ | $K_{vs}$-value |
|---|---|---|
| 150 | 0.042 | 3,840 |
| 200 | 0.037 | 7,280 |
| 250 | 0.039 | 11,120 |
| 300 | 0.036 | 16,700 |
| 350 | 0.042 | 20,900 |
| 400 | 0.043 | 27,100 |
| 500 | 0.041 | 43,300 |
| 600 | 0.037 | 65,600 |
| 700 | 0.047 | 79,100 |
| 800 | 0.043 | 107,800 |
| 1000 | 0.044 | 166,600 |

#### REDUCING CONES

| DN (mm) | ζ | $K_{vs}$-value |
|---|---|---|
| 500/400 | 0.060 | 39,837 |
| 600/500 | 0.055 | 60,565 |
| 700/600 | 0.052 | 84,698 |
| 800/700 | 0.048 | 115,932 |
| 900/800 | 0.045 | 150,652 |
| 1000/800 | 0.224 | 83,886 |
| 1200/1000 | 0.127 | 161,700 |

### MAST values for KHI-F & KHI-S

#### (NOMINAL DIAMETERS DN 150 – 400, 20° C, Nm)

| DN (mm) | M2 (Xc) | M3 (Xd) |
|---|---|---|
| 150 | 2,134 | 4,268 |
| 200 | 2,754 | 5,508 |
| 250 | 5,095 | 10,190 |
| 300 | 10,672 | 21,344 |
| 350 | 13,729 | 27,458 |
| 400 | 14,596 | 29,193 |

# TECHNISCHE DETAILS

## Auslegungsberechnungen

| | | |
|---|---|---|
| Flow rate | $Q$ | in m³/h |
| Pressure loss | $\Delta p$ | in bar |
| Density | $\rho$ | in kg/m³ |
| Velocity | $w$ | in m/s |
| Flow coefficient | $K_v$ | in m³/h |
| Pressure loss coefficient | $\zeta$ | |

The valve is to be selected in a manner that the $K_v$-value is greater, or the $\zeta$-value less than the computed value.

Allows for the calculation of:

$$K_v = Q * \sqrt{\frac{\rho}{1000 * \Delta p}}$$

or

$$\zeta = \frac{2 * \Delta p * 10^5}{\rho * w^2}$$

In metric measurement systems the characteristic unit utilized for shut-off andcontrol valves is the $K_V$-value. The values provided in the table apply to a $H_2O$ flow medium with a temperature of 5–30°C, a density of 1000 kg/m³ and a pressure loss of p = 1 bar at the valve.

In countries using inches, the characteristic unit is the $C_V$-value. It provides how many US gal/min of $H_2O$, at a temperature of 60°F and with a pressure loss of 1 psi, flow through the valve.

$$\Delta p = \zeta * \frac{\rho}{2} * w^2 * 10^{-5}$$

or

$$\Delta p = \left(\frac{Q}{K_v}\right)^2 * \frac{\rho}{1000}$$

# HIGHEST REQUIREMENTS

## Certification in accordance with EHP 003 (EN 488-1) for the fully-welded model KHSVI VVS

In order to increase operational safety, the requirements regarding buried shut-off valves are constantly increased. Meeting these requirements is achieved through the utilization of special valves with particularly rigid and deformation-free bodies. The corresponding technical requirements and test methods for shut-off valves directly buried within district heating networks are defined in the EHP 003 (EN 488-1).

Increased compressive forces as well as new bending moments for valves were already defined in the 2011 predecessorversion of the standard. The tensile forces, however, remained unchanged.

Compared to 2011, some requirements have now again been made stricter. The number of operations during the type approval test, for example, has been increased and all tests must be carried out on the same valve. Furthermore, the end of the last 100 mm of the spindle/shaft construction must feature corrosion protection.

KLINGER Ballostar® KHSVI VVS ball valves are successfully tested and certified by the TÜV Austria on the company-own multi-function test stand under inclusion of the expanded requirements of EHP 003 (EN 488-1).

In-house test laboratory

## DEMANDING REQUIREMENTS ARE OUR STANDARD

We not only offer standard products, but also master individual requirements. This means we act as problem solvers even for the most challenging applications. Our products are tested for quality, safety and reliability in our in-house test laboratory.

## HIGHEST QUALITY IS OUR MISSION

Therefore, design and production always remain our responsibility. International applications for our products made in Austria.

# FOCUS INDUSTRIES

## Your challenges – our competences

### DISTRICT HEATING

Excellent thermal resistance, long service life and high performance efficiency are reflected in all our products and solutions for district heating applications.

### PULP & PAPER

Our valves stand for optimized processes and increased production efficiency. We make a significant contribution to reducing downtime, saving energy and avoiding emissions.

### GEOTHERMAL

Especially for the geothermal sector, KLINGER offers innovative valve solutions for the ecological and economical extraction and use of “green” energy.

### STEEL

KLINGER offers unique solutions to complex issues facing the metalworking industry today, such as high pressure and high temperature environments.


### HYDROGEN

The use of hydrogen plays an essential role in achieving climate goals. KLINGER masters even complex challenges in this segment with efficient solutions.

**Our products are problem solver for many areas of applications.**

KLINGER Fluid Control

Your KLINGER distribution partner

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