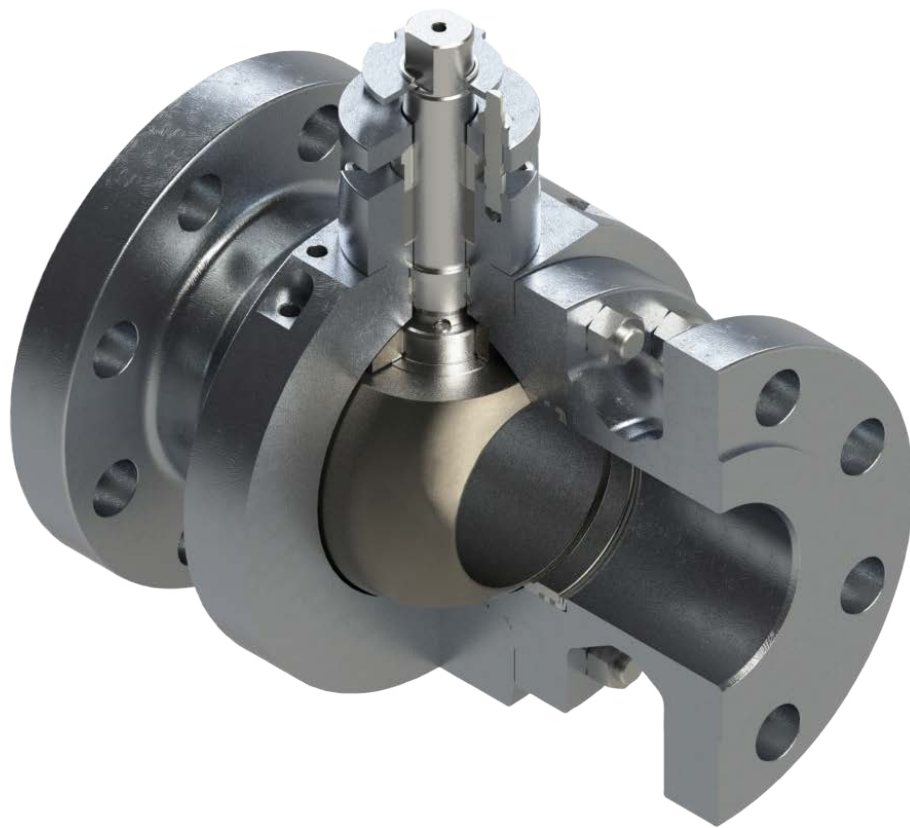


**Argus™ FK76M**  
**Soft- or Metal-Seated Trunnion Mounted**  
**Ball Valve for Critical Services**



## Long-lasting, tight shut-off performance

Argus FK76M ball valves from Flowserve deliver long-lasting, tight shut-off performance in numerous applications within the oil and gas, petrochemical and chemical industries. These engineered valves are available in metal-seated and soft-seated configurations as well as standard and severe service designs. A modular design makes them easy to adapt to various safety, emissions and performance requirements.

### Benefits summary

- Reliable, tight shut-off
- Gas-tight sealing
- Long lasting
- Broad application flexibility



*Argus FK76M two-piece, metal-seated, high-temperature ball valve*

### Engineered to perform

Proven features provide long service life with outstanding fugitive emissions performance and low operating torques in even the toughest applications.

- Trunnion-mounted design
- Robust stem bearing system
- Spring-loaded seats with cavity relief
- Match-lapped balls and seats for bubble-tight performance
- A true full bore
- A fully guided, anti-blow out stem

### Standard and severe service designs

Argus FK76M ball valves are easily adapted to a variety of standard and severe service applications. Configurable elements include:

- Soft or metal seats
- Uni-directional or bi-directional sealing
- Cast or forged construction
- Block and bleed design
- Optional trim materials
- Optional scraper design ball seats

**Note:** For high-speed, high-cycle polymer processing applications, the Argus FK76M PDS ball valve helps to extend maintenance intervals. Refer to brochure ARENBR0016.

## Applications

Argus FK76M ball valves are well-suited for a variety of applications in the **oil and gas, petrochemical and chemical industries** where reliable tight shut-off and uncompromising sealing are required.

Example applications include, but are not limited to:

- Emergency shutdown valves (ESDV)
- High-integrity pressure protection system (HIPPS)
- Coal conversion and gasification
- Polyethylene or polypropylene
- High-pressure oxygen, nitrogen or hydrogen
- High-temperature services
- High-cycle and switching services
- Solids handling (powders, fines, dust and catalysts)
- Thermal fluids
- On/off isolation service
- Oil and gas manifolds
- Separator, filter and drying systems
- Compressor stations

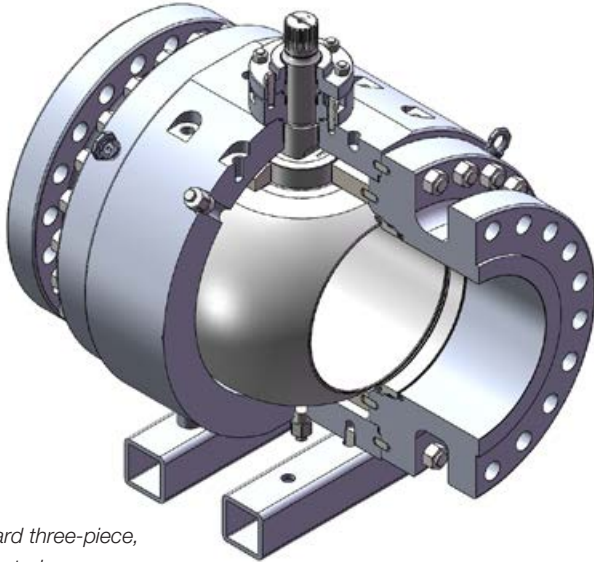


*Argus FK76M two-piece, soft-seated ball valve*

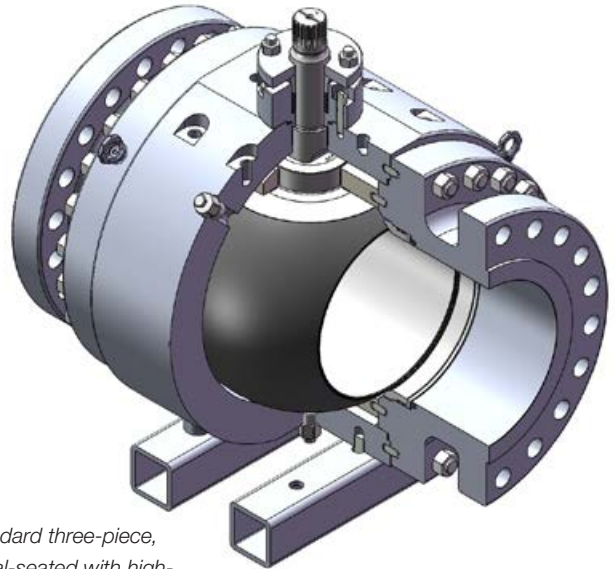
## Design standards

<b>Sizes</b>	3 to 24 in standard; 26 to 36 in available upon request
<b>Pressure rating</b>	PN 10 to 160; Class 150 to 900
<b>Design</b>	API 6D, ASME B16.34 (on request)
<b>Design calculation</b>	DIN EN 12516
<b>Pressure/temperature rating</b>	ASME B16.34 or DIN EN 1092
<b>Shell wall thickness</b>	ASME B16.34 or DIN EN 12516-1
<b>Bore dimensions</b>	API 6D or DIN EN 1983, DIN EN 17292 or DIN EN 13942
<b>Face-to-face dimensions</b>	ASME B16.10 or DIN 558
<b>Flange end dimensions</b>	ASME B16.5 or DIN EN 1092
<b>NACE</b>	MR 0103 or MR 0175 (on request)
<b>Fugitive emissions</b>	ISO 15848 (AH-CO3), VDI 2440
<b>Fire-safe type test</b>	API 607 or ISO 10497-5
<b>Valve material qualification</b>	ASME, PED, material according to AD 2000

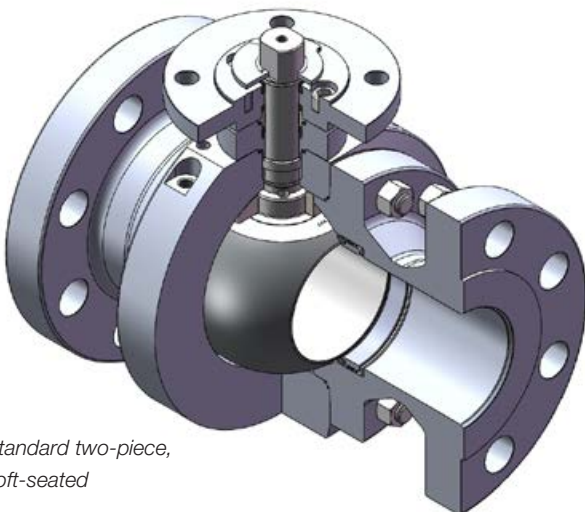
## Configurations



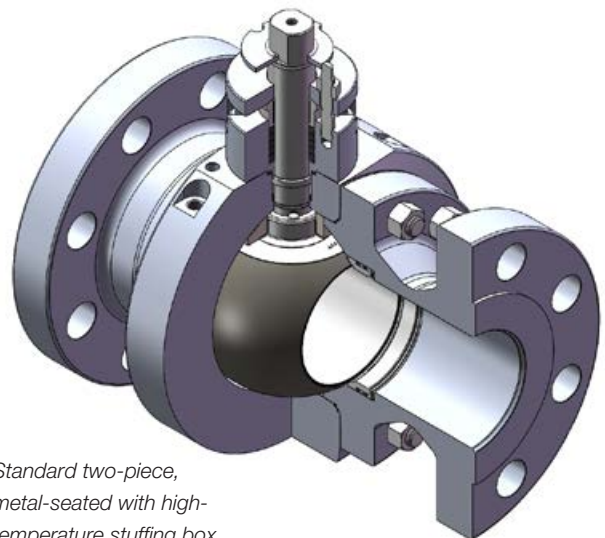
*Standard three-piece,  
soft-seated*



*Standard three-piece,  
metal-seated with high-  
temperature stuffing box*



*Standard two-piece,  
soft-seated*



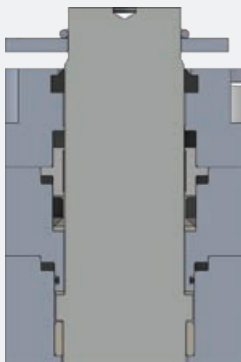
*Standard two-piece,  
metal-seated with high-  
temperature stuffing box*

## Size and pressure range

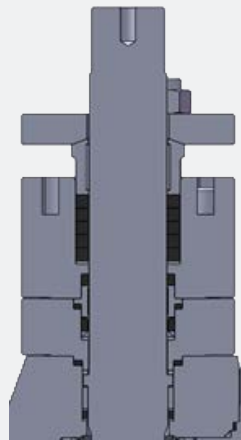
ASME	Size NPS (DIN)								
	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18-36 (450-900)
<b>150</b>	x	x	x	x	x	x	x	x	x
<b>300</b>	x	x	x	x	x	x	x	x	x
<b>600</b>	x	x	x	x	x	x	x	x	x
<b>900</b>	x	x	x	x	x	x	x	x	x

## Stem sealing

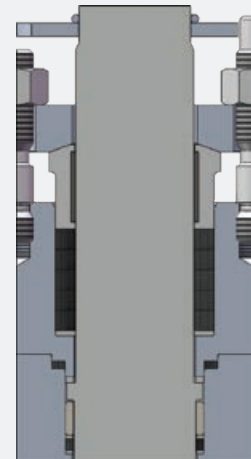
Managing fugitive emissions is a major challenge within the chemical and petrochemical industries. Argus FK76M stem sealing systems are certified per ISO 15848 (AH-CO). Besides reducing fugitive emissions, the upsides are improved plant efficiency and reduced energy costs.



TA-Luft/ISO 15848/EPA



ISB integrated stuffing box; ISO 15848-EPA

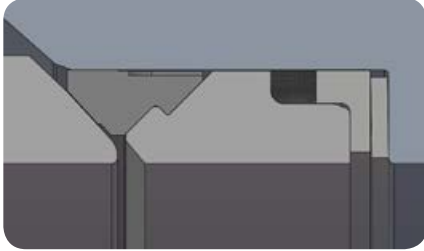


High-temperature stuffing box

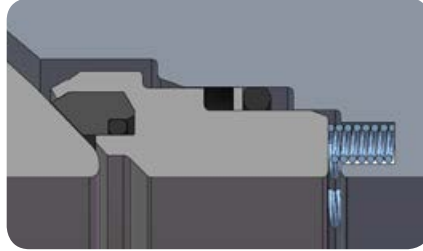
## Ball seat designs

Argus FK76M valves are available with several ball seat designs to best suit the process conditions. A metal-to-metal seat design or a chambered soft seat design with various secondary seals cover the highest standards related to seat tightness in the media flow.

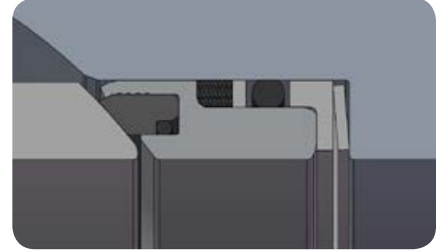
### Soft seats



*PTFE seat with graphite secondary seal and Belleville washer (other materials on request)*



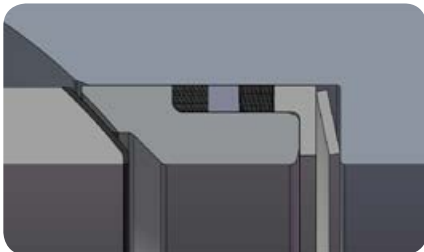
*PEEK<sup>®</sup> O-ring with graphite coil springs, NPS >12 (Belleville washer design on request)*



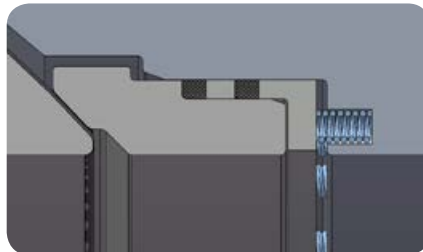
*PEEK O-ring with graphite coil springs and Belleville washer*

### Metal seats

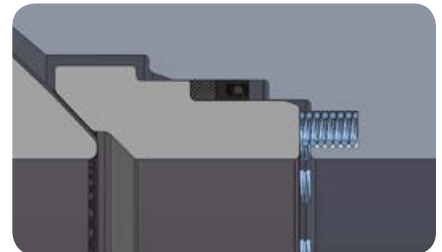
- Coil spring or Belleville washer loaded seats, depending on the size and pressure range, for balanced continuous contact with the ball
- Bi-directional sealing, double-seat design



*Metal seated lip seal with graphite secondary seal and Belleville washer, NPS 3–12 (other designs on request)*



*Metal seated graphite coil springs, NPS >12 (Belleville washer design on request)*



*Metal seated lip seal with graphite coil springs, NPS >12 (Belleville washer design on request)*

### Trunnion mounted

- Ease of actuation and often downsized actuator sizing due to reduced break and operating torque
- Improved valve performance and extended cycle time enabled by low-friction bearings
- Allows bi-directional upstream and downstream sealing also under reverse pressure applications
- API 6D design allows ball valve tightness testing via drain or vent plugs (optional)

### Full bore

- Straight true full bore offers low flow resistance at high  $C_v$  per nominal size.

# Pressure-temperature curve

## Soft versus metal seats

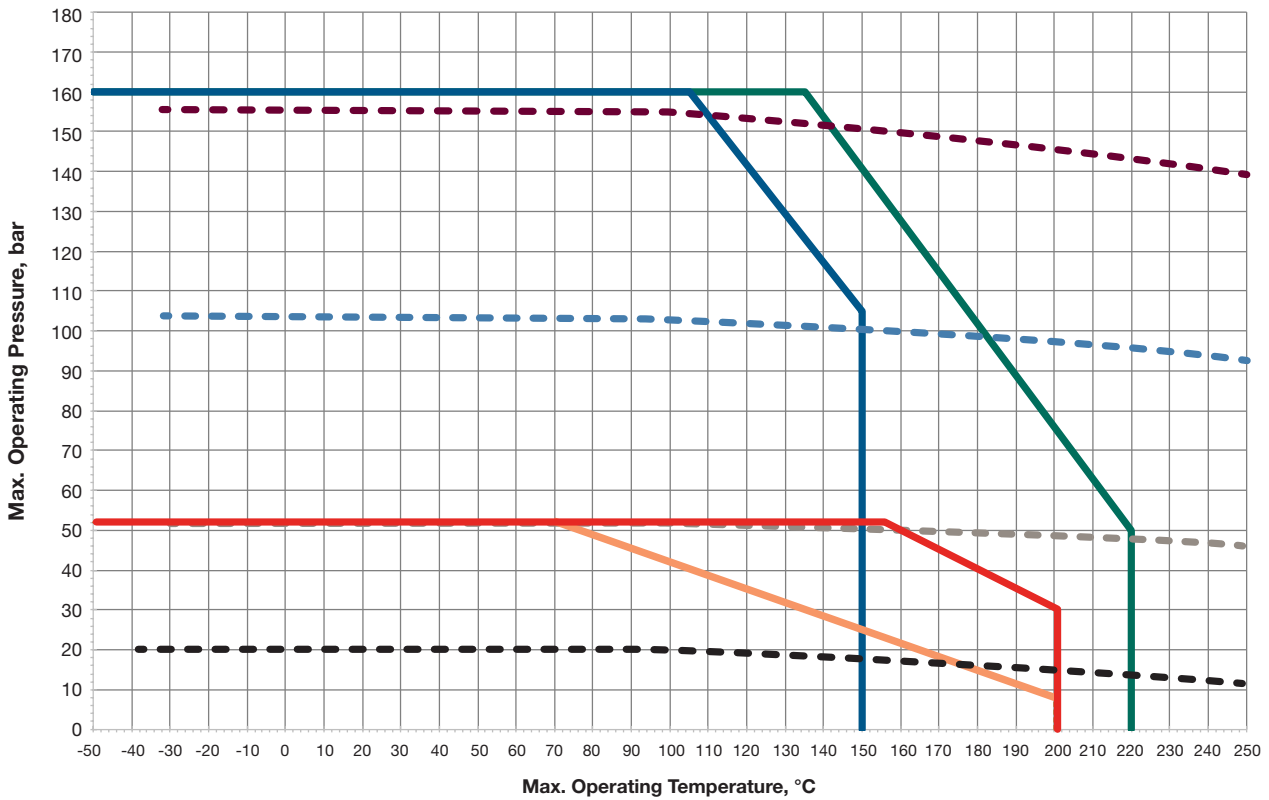
Seat sealing materials for Argus FK76M valves may be PTFE, POM, Devlon, PEEK or steel. The pressure-temperature ratings of soft seated ball valves are determined not only by the valve body materials, but also by the sealing material used for the ball seats. Pressure-temperature seat ratings for metal seated valves are the same as the body ratings.

## About this chart

It is very difficult to determine the exact pressure-temperature ratings for all media under all imaginable conditions. As such, we have prepared a general pressure-temperature chart based upon our experience in both field and laboratory conditions.

Pressure-temperature ratings for soft seated valves (indicated by the solid lines in the chart below) are based on differential pressure with the ball in a fully closed position and refer to the seats only. The dotted lines indicate the maximum working pressure for carbon steel valve bodies, made from TSTE 355 N (equivalent to ASTM A350 Grade LF2).

FK76M P/T – Rating



- · — · Max. GH Rating CL900
 — · — · Max. GH Rating CL300
— PTFE (enclosed sealing) size > 12
— DEVLON V-API (enclosed sealing)
- - - Max. GH Rating CL600
 - - - Max. GH Rating CL150
— PTFE (trapezoidal) size > 12
— PEEK (enclosed sealing)

# Materials of construction

## ASME: NPS 3–5

Design	Valve Design	Valve Calculation	Pressure/ Temperature	Shell Wall Thickness	Bore Dimensions	Face-to-Face Dimensions	Flanged End Dimensions	NACE (optional)	Fugitive Emmision	Fire-Safe Type Test
ASME Specification	API 6D	DIN EN 12516-1 12516-2	ASME B16.34	ASME B16.34	API 6D	ASME B16.10	ASME B16.5	MR0103	ISO15848 VDI 2440	API 607 ISO 10497-5

	Soft Seated						Metal Seated							
<b>Max. Temperature</b>	200°C (392°F)	150°C (302°F)	200°C (392°F)	200°C (392°F)	150°C (302°F)	220°C (428°F)	250°C (482°F)	250°C (482°F)	250°C (482°F)	250°C (482°F)	400°C (752°F)	400°C (752°F)	400°C (752°F)	400°C (752°F)
<b>Min. Temperature</b>	-50°C (-58°F)	-37°C (-35°F)	-37°C (-35°F)	-50°C (-58°F)	-37°C (-35°F)	-37°C (-35°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)
<b>Body Material</b>	A350 Gr. LF2 P355 QH1	A350 Gr. LF2 P355 QH1	A350 Gr. LF2 P355 QH1	1.4571	1.4571	1.4571	A350 Gr. LF2 P355 QH1	A350 Gr. LF2 P355 QH1	1.4571	1.4571	A350 Gr. LF2 P355 QH1	A350 Gr. LF2 P355 QH1	1.4571	1.4571
<b>Stud and Nut</b>	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A193B8MN-CL2 A194 Gr. 8M	A193B8MN-CL2 A194 Gr. 8M	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A193B8MN-CL2 A194 Gr. 8M	A193B8MN-CL2 A194 Gr. 8M	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A193B8MN-CL2 A194 Gr. 8M	A193B8MN-CL2 A194 Gr. 8M
<b>Ball Material</b>	Niro	Duplex	Duplex	Niro	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex
	1.4408 A351 CF8M	A182 F51	A182 F51	1.4408 A351 CF8M	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51
<b>Ball Coating</b>	N/A	N/A	N/A	N/A	N/A	N/A	Crabide	Arguloy 1	Crabide	Arguloy 1	Crabide	Arguloy 1	Crabide	Arguloy 1
<b>Seat Material</b>	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex
	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51
<b>Seat Coating (Metal Seated)</b>	N/A	N/A	N/A	N/A	N/A	N/A	Crabide	Arguloy 2	Crabide	Arguloy 2	Crabide	Arguloy 2	Crabide	Arguloy 2
<b>Sealing Material* (Soft Seated)</b>	PTFE	DEVLON	PEEK	PTFE	DEVLON	PEEK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Bushing Material Ball CL150–CL600/CL900</b>	Norglide L-Bush	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Reinz AFM7 + EBZ/ HT625 Plus + EBZ	Reinz AFM7 + EBZ/ HT625 Plus + EBZ	Reinz AFM7 + EBZ/ HT625 Plus + EBZ	Reinz AFM7 + EBZ/ HT625 Plus + EBZ
<b>Stem Material</b>	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	Nitronic 50 HS	Nitronic 50 HS	Nitronic 50 HS	Nitronic 50 HS
<b>Seat Gasket Material</b>	Graphite	FKM 935 Graphite	FKM 935 Graphite	Graphite	FKM 935 Graphite	FKM 935 Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
<b>Stem Gasket Material</b>	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	Graphite	Graphite	Graphite	Graphite
<b>Body Gasket Material</b>	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	Graphite	Graphite	Graphite	Graphite
<b>Body/Bonnet Gasket Material</b>	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	Graphite	Graphite	Graphite	Graphite

red. = reduced bore



## Materials of construction continued

**DIN: 80–125 mm**

Design	Valve Design	Valve Calculation	Pressure/ Temperature Rating	Shell Wall Thickness	Bore Dimensions	Face-to-Face Dimensions	Flanged End Dimensions	NACE (optional)	Fugitive Emmision	Fire-Safe Type Test
DIN Specification	DIN EN 12516-1	DIN EN 12516-1 12516-2	DIN EN 1092	DIN EN 12516-1	DIN EN 1983 DIN EN 17292 DIN EN 13942	DIN EN 558	DIN EN 1092	MR 0103 (MR0175)	ISO15848 VDI 2440	API 607 ISO 10497-5

	Soft Seated						Metal Seated							
<b>Max. Temperature</b>	200°C (392°F)	150°C (302°F)	200°C (392°F)	200°C (392°F)	150°C (302°F)	220°C (428°F)	250°C (482°F)	250°C (482°F)	250°C (482°F)	250°C (482°F)	400°C (752°F)	400°C (752°F)	400°C (752°F)	400°C (752°F)
<b>Min. Temperature</b>	-50°C (-58°F)	-37°C (-35°F)	-37°C (-35°F)	-50°C (-58°F)	-37°C (-35°F)	-37°C (-35°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)
<b>Body Material</b>	P355 QH1 A350 Gr. LF2	P355 QH1 A350 Gr. LF2	P355 QH1 A350 Gr. LF2	1.4571	1.4571	1.4571	P355 QH1 A350 Gr. LF2	P355 QH1 A350 Gr. LF2	1.4571	1.4571	P355 QH1 A350 Gr. LF2	P355 QH1 A350 Gr. LF2	1.4571	1.4571
<b>Stud and Nut</b>	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A4-70 Mod. A194 Gr. 8M	A4-70 Mod. A194 Gr. 8M	A4-70 Mod. A194 Gr. 8M	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A4-70 Mod. A194 Gr. 8M	A4-70 Mod. A194 Gr. 8M	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A4-70 Mod. A194 Gr. 8M	A4-70 Mod. A194 Gr. 8M
<b>Ball Material</b>	Niro	Duplex	Duplex	Niro	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex
	1.4408 A351 CF8M	A182 F51	A182 F51	1.4408 A351 CF8M	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51
<b>Ball Coating</b>	N/A	N/A	N/A	N/A	N/A	N/A	Crabide	Arguloy 1	Crabide	Arguloy 1	Crabide	Arguloy 1	Crabide	Arguloy 1
<b>Seat Material</b>	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex
	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51
<b>Seat Coating (Metal Seated)</b>	N/A	N/A	N/A	N/A	N/A	N/A	Crabide	Arguloy 2	Crabide	Arguloy 2	Crabide	Arguloy 2	Crabide	Arguloy 2
<b>Sealing Material* (Soft Seated)</b>	PTFE	DEVLON	PEEK	PTFE	DEVLON	PEEK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Bushing Material Ball PN10–PN100/ PN160</b>	Norglide L-Bush	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Reinz AFM7 + EBZ/ HT625 Plus + EBZ	Reinz AFM7 + EBZ/ HT625 Plus + EBZ	Reinz AFM7 + EBZ/ HT625 Plus + EBZ	Reinz AFM7 + EBZ/ HT625 Plus + EBZ
<b>Stem Material</b>	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	Nitronic 50 HS	Nitronic 50 HS	Nitronic 50 HS	Nitronic 50 HS
<b>Seat Gasket Material</b>	Graphite	FKM 935 Graphite	FKM 935 Graphite	Graphite	FKM 935 Graphite	FKM 935 Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
<b>Stem Gasket Material</b>	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	Graphite	Graphite	Graphite	Graphite
<b>Body Gasket Material</b>	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	Graphite	Graphite	Graphite	Graphite
<b>Body/Bonnet Gasket Material</b>	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	Graphite	Graphite	Graphite	Graphite

S = short pattern; red. = reduced bore

# Materials of construction continued

## ASME: NPS 6–12

Design	Valve Design	Valve Calculation	Pressure/ Temperature Rating	Shell Wall Thickness	Bore Dimensions	Face-to-Face Dimensions	Flanged End Dimensions	NACE (optional)	Fugitive Emmision	Fire-Safe Type Test
ASME Specification	API 6D	DIN EN 12516-1 12516-2	ASME B16.34	ASME B16.34	API 6D	ASME B16.10	ASME B16.5 ASME B16.47	MR0103	ISO15848 VDI 2440	API 607 ISO 10497-5

	Soft Seated							Metal Seated						
<b>Max. Temperature</b>	200°C (392°F)	150°C (302°F)	200°C (392°F)	200°C (392°F)	150°C (302°F)	220°C (428°F)	250°C (482°F)	250°C (482°F)	250°C (482°F)	250°C (482°F)	400°C (752°F)	400°C (752°F)	400°C (752°F)	400°C (752°F)
<b>Min. Temperature</b>	-50°C (-58°F)	-37°C (-35°F)	-37°C (-35°F)	-50°C (-58°F)	-37°C (-35°F)	-37°C (-35°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	
<b>Body Material</b>	A350 Gr. LF2 P355 QH1	A350 Gr. LF2 P355 QH1	A350 Gr. LF2 P355 QH1	1.4571	1.4571	1.4571	A350 Gr. LF2 P355 QH1	A350 Gr. LF2 P355 QH1	1.4571	1.4571	A350 Gr. LF2 P355 QH1	A350 Gr. LF2 P355 QH1	1.4571	1.4571
<b>Screw/Bolt Material</b>	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A193B8MN- CL2 A194 Gr. 8M	A193B8MN- CL2 A194 Gr. 8M	A193B8MN- CL2 A194 Gr. 8M	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A193B8MN- CL2 A194 Gr. 8M	A193B8MN- CL2 A194 Gr. 8M	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A193B8MN- CL2 A194 Gr. 8M	A193B8MN- CL2 A194 Gr. 8M
<b>Ball Material</b>	Niro	Duplex	Duplex	Niro	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex
	1.4408 A351 CF8M	A182 F51	A182 F51	1.4408 A351 CF8M	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51
<b>Ball Coating</b>	N/A	N/A	N/A	N/A	N/A	N/A	Crabide	Arguloy 1	Crabide	Arguloy 1	Crabide	Arguloy 1	Crabide	Arguloy 1
<b>Seat Material</b>	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex
	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51
<b>Seat Coating (Metal Seated)</b>	N/A	N/A	N/A	N/A	N/A	N/A	Crabide	Arguloy 2	Crabide	Arguloy 2	Crabide	Arguloy 2	Crabide	Arguloy 2
<b>Sealing Material* (Soft Seated)</b>	PTFE	DEVLON	PEEK	PTFE	DEVLON	PEEK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Bushing Material Ball CL150-CL600/CL900</b>	Norglide L-Bush	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Norglide L-Bush / Fritex-316 + PEEK	Reinz AFM7 + EBZ/ HT625 Plus + EBZ	Reinz AFM7 + EBZ/ HT625 Plus + EBZ	Reinz AFM7 + EBZ/ HT625 Plus + EBZ	Reinz AFM7 + EBZ / HT625 Plus + EBZ
<b>Stem Material</b>	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	1.4980 A638 Gr. 660	1.4980 A638 Gr. 660	1.4980 A638 Gr. 660	1.4980 A638 Gr. 660
<b>Seat Gasket Material</b>	Graphite	FKM 935 Graphite	FKM 935 Graphite	Graphite	FKM 935 Graphite	FKM 935 Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
<b>Stem Gasket Material</b>	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	Graphite	Graphite	Graphite	Graphite
<b>Body Gasket Material</b>	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	Graphite	Graphite	Graphite	Graphite
<b>Body/Bonnet Gasket Material</b>	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	PTFE Graphite	Graphite	Graphite	Graphite	Graphite

S = short pattern

## Materials of construction continued

**DIN: 150–300 mm**

Design	Valve Design	Valve Calculation	Pressure/ Temperature Rating	Shell Wall Thickness	Bore Dimensions	Face-to-Face Dimensions	Flanged End Dimensions	NACE (optional)	Fugitive Emmision	Fire-Safe Type Test
DIN Specification	DIN EN 12516-1	DIN EN 12516-1 12516-2	DIN EN 1092	DIN EN 12516-1	DIN EN 1983 DIN EN 17292 DIN EN 13942	DIN EN 558	DIN EN 1092	MR 0103 (MR0175)	ISO15848 VDI 2440	API 607 ISO 10497-5

	Soft Seated							Metal Seated						
<b>Max. Temperature</b>	200°C (392°F)	150°C (302°F)	200°C (392°F)	200°C (392°F)	150°C (302°F)	220°C (428°F)	250°C (482°F)	250°C (482°F)	250°C (482°F)	250°C (482°F)	400°C (752°F)	400°C (752°F)	400°C (752°F)	400°C (752°F)
<b>Min. Temperature</b>	-50°C (-58°F)	-37°C (-35°F)	-37°C (-35°F)	-50°C (-58°F)	-37°C (-35°F)	-37°C (-35°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	-50°C (-58°F)	
<b>Body Material</b>	A350 Gr. LF2 P355 QH1	A350 Gr. LF2 P355 QH1	A350 Gr. LF2 P355 QH1	1.4571	1.4571	1.4571	A350 Gr. LF2 P355 QH1	A350 Gr. LF2 P355 QH1	1.4571	1.4571	A350 Gr. LF2 P355 QH1	A350 Gr. LF2 P355 QH1	1.4571	1.4571
<b>Screw/Bolt Material</b>	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A4-70 Mod. A194 Gr. 8M	A4-70 Mod. A194 Gr. 8M	A4-70 Mod. A194 Gr. 8M	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A4-70 Mod. A194 Gr. 8M	A4-70 Mod. A194 Gr. 8M	A193 Gr. B7 A194 Gr. 7	A193 Gr. B7 A194 Gr. 7	A4-70 Mod. A194 Gr. 8M	A4-70 Mod. A194 Gr. 8M
<b>Ball Material</b>	Niro	Duplex	Duplex	Niro	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex
	1.4408 A351 CF8M	A182 F51	A182 F51	1.4408 A351 CF8M	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51	A182 F51
<b>Ball Coating</b>	N/A	N/A	N/A	N/A	N/A	N/A	Crabide	Arguloy 1	Crabide	Arguloy 1	Crabide	Arguloy 1	Crabide	Arguloy 1
<b>Seat Material</b>	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex	Duplex
	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F5*	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51	1.4462 A182 F51
<b>Seat Coating (Metal Seated)</b>	N/A	N/A	N/A	N/A	N/A	N/A	Crabide	Arguloy 2	Crabide	Arguloy 2	Crabide	Arguloy 2	Crabide	Arguloy 2
<b>Sealing Material* (Soft Seated)</b>	PTFE	DEVLON	PEEK	PTFE	DEVLON	PEEK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Bushing Material Ball</b>	Norglide L-Bush	Norglide L-Bush	Norglide L-Bush	Norglide L-Bush	Norglide L-Bush	Norglide L-Bush	Norglide L-Bush	Norglide L-Bush	Norglide L-Bush	Norglide L-Bush	Reinz AFM7 + EBZ	Reinz AFM7 + EBZ	Reinz AFM7 + EBZ	Reinz AFM7 + EBZ
<b>Stem Material</b>	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	1.4980 A638 Gr. 660	1.4980 A638 Gr. 660	1.4980 A638 Gr. 660	1.4980 A638 Gr. 660
<b>Seat Gasket Material</b>	Graphite	FKM 935 Graphite	FKM 935 Graphite	Graphite	FKM 935 Graphite	FKM 935 Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
<b>Stem Gasket Material</b>	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	Graphite	Graphite	Graphite	Graphite
<b>Body Gasket Material</b>	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	Graphite	Graphite	Graphite	Graphite
<b>Body/Bonnet Gasket Material</b>	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	Graphite	Graphite	Graphite	Graphite
	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite

## Materials of construction continued

### ASME: NPS 14–24

Design	Valve Design	Valve Calculation	Pressure/ Temperature Rating	Shell Wall Thickness	Bore Dimensions	Face-to-Face Dimensions	Flanged End Dimensions	NACE (optional)	Fugitive Emmission	Fire-Safe Type Test
ASME Specification	API 6D	DIN EN 12516-1 12516-2	ASME B16.34	ASME B16.34	API 6D	ASME B16.10	ASME B16.5 ASME B16.47	MR0103	ISO15848 VDI 2440	API 607 ISO 10497-5

	Soft Seated			Metal Seated					
<b>Max. Temperature</b>	200°C (392°F)	150°C (302°F)	200°C (392°F)	250°C (482°F)	250°C (482°F)	250°C (482°F)	250°C (482°F)	400°C (752°F)	400°C (752°F)
<b>Min. Temperature</b>	-46°C (-51°F)	-46°C (-51°F)	-46°C (-51°F)	-46°C (-51°F)	-46°C (-51°F)	-46°C (-51°F)	-46°C (-51°F)	-46°C (-51°F)	-46°C (-51°F)
<b>Body Material</b>	A350 Gr. LF2	A350 Gr. LF2	A350 Gr. LF2	A350 Gr. LF2	A350 Gr. LF2	A350 Gr. LF2	A350 Gr. LF2	A350 Gr. LF2	A350 Gr. LF2
<b>Stud and Nut</b>	A193 B7/A194 Gr. 7	A193 B7/A194 Gr. 7	A193 B7/A194 Gr. 7	A193 B7/A194 Gr. 7	A193 B7/A194 Gr. 7	A193 B7/A194 Gr. 7	A193 B7/A194 Gr. 7	A193 B7/A194 Gr. 7	A193 B7/A194 Gr. 7
<b>Ball Material</b>	A350 Gr. LF2	A350 Gr. LF2	A350 Gr. LF2	A182 Type F6A CL2	A182 Type F6A CL2	A182 Type F51	A182 Type F51	A182 Type F6A CL2	A182 Type F51
<b>Ball Coating</b>	ENP	ENP	ENP	Crabide	Crabide	Arguloy 1	Arguloy 1	Crabide	Arguloy 1
<b>Seat Material</b>	Duplex	Duplex	Duplex	Niro	Niro	Duplex	Duplex	Niro	Duplex
	A182 Type F51	A182 Type F51	A182 Type F51	A182 Type F6A CL2	A182 Type F6A CL2	A182 Type F51	A182 Type F51	A182 Type F6A CL2	A182 Type F51
<b>Seat Coating (Metal Seated)</b>	N/A	N/A	N/A	Crabide	Crabide	Arguloy 2	Arguloy 2	Crabide	Arguloy 2
<b>Sealing Material* (Soft Seated)</b>	PTFE	DEVLON	PEEK	N/A	N/A	N/A	N/A	N/A	N/A
<b>Stem Material</b>	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	17-4 PH	1.4980 A638 Gr. 660	1.4980 A638 Gr. 660
<b>Bushing Material</b>	DU	DU	DU	DU	DU	DU	DU	PMT-625 PLUS	PMT-625 PLUS
<b>Seat Gasket Material</b>	VI 840 Graphite	VI 840 Graphite	VI 840 Graphite	Graphite	PTFE-Lip Seal Graphite	Graphite	PTFE-Lip Seal Graphite	Graphite	Graphite
<b>Stem Gasket Material</b>	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	Graphite	Graphite
	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite		
<b>Body Gasket Material</b>	EAGLE BURGMANN 9594 NF	EAGLE BURGMANN 9594 NF	EAGLE BURGMANN 9594 NF	EAGLE BURGMANN 9594 NF	EAGLE BURGMANN 9594 NF	EAGLE BURGMANN 9594 NF	EAGLE BURGMANN 9594 NF	EAGLE BURGMANN 9594 NF	EAGLE BURGMANN 9594 NF

## Properties of seat sealing materials and coatings

### Materials for standard construction

#### PTFE

With few exceptions, PTFE is corrosion-resistant to acids, leaches, solvents, aliphatic and aromatic as well as chlorinated hydrocarbons and many other liquids. It is suitable for a wide range of temperatures: -200°C to 200°C (-328°F to 392°F) as standard; to 250°C (482°F) in special applications.

#### POM

Particularly suitable for high pressures to 800 bar (11,603 psi) at temperatures ranging from -18°C to 100°C (0.4°F to 212°F); -60°C to 121°C (-76°F to 250°F) in special applications.

#### DEVLON

Users of Argus FK76M valves will experience a multitude of benefits. Argus FK76M valves have superior pressure/temperature operating ranges in comparison to PTFE or Nylon 6. The valves have been proven in operation to a pressure of 414 bar (6000 psi), subject to valve and seat design. In addition, they have been proven in operation from -50°C to 176°C (-58°F to 350°F), subject to valve and seat design. Their low moisture absorption level enhances dimensional stability. They have superior dimensional stability over PTFE in high-pressure applications. They have lower frictional losses than PEEK products, possess exceptional resistance to wear and abrasion, and sufficiently conform to seals in low-pressure valve applications. Moreover, they have excellent life performance in soft valve seat applications.

#### PEEK (Lyton)

A linear polymer with lubricant, this material has excellent resistance at high pressures with temperatures to 250°C (482°F). PEEK is resistant to solvents, alcohol, oil, grease, fuels leaches, acids (limited) and water.

### Coatings

#### HVOF

Carbide or WC

Carbide is a hard metal alloy based on chromium carbide and nickel-chromium or tungsten carbide. The coating applied by high-speed flame spraying is characterized by high hardness, density and adhesive strength. The coating is independent of the base material; all metallic materials used in industry can be coated. There is no metallurgical influence on the base material during the coating process. The adhesive strength of the spray coating results from the mechanical bonding with the base material.

#### Spray fusion

The Arguloy hard layer on the ball surface and the seats is a nickel-based alloy which is welded on the base metal and fused by a special heat treatment. They layers are homogeneous, free of cracks, and are corrosion and wear resistant. Hardness of the layers exceeds the hardness of Stellite.

In our innovative coating center, we use the most modern computer-controlled machinery and engineering methods with an extensive quality program. Argus valves are able to produce metal seats and the balls with spherical accuracies and superfine surfaces with a roughness of 1 micron for server gaseous applications.

### Seat sealing systems

Effective sealing of Argus FK76M ball valves depends on several factors:

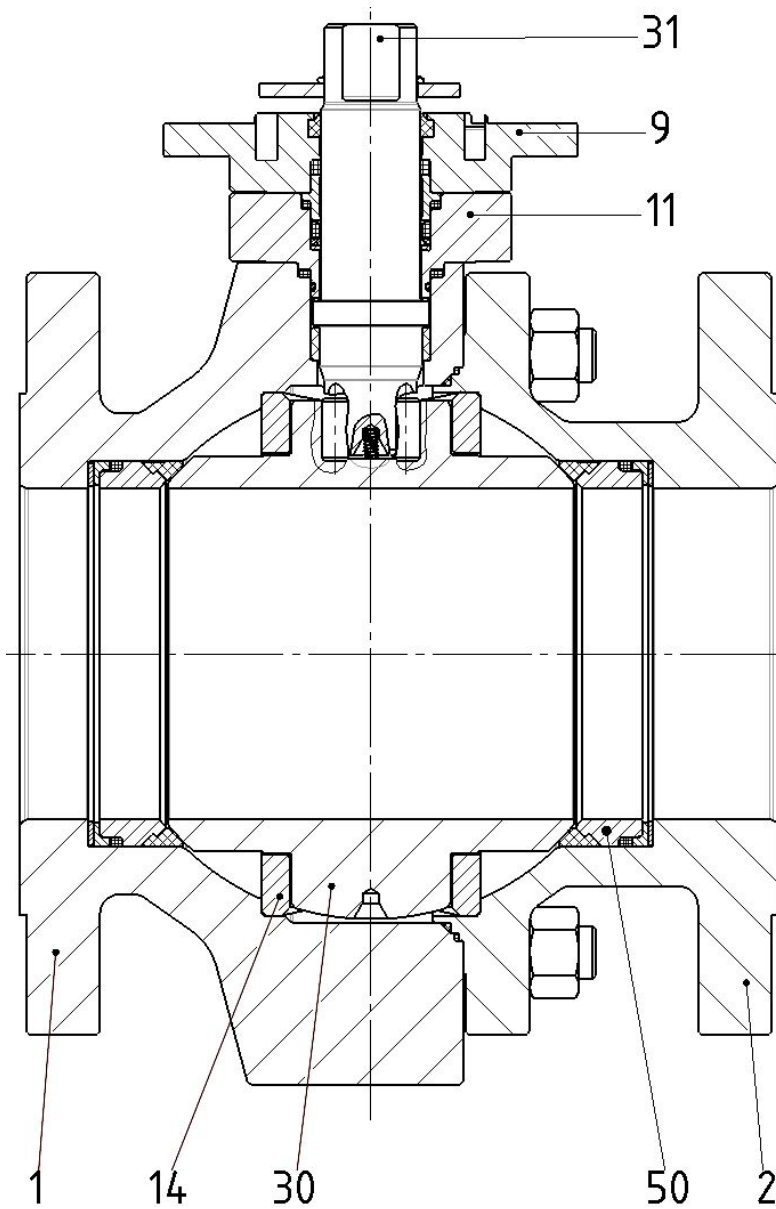
- Contact pressure
- Contact surface of the seat
- Accuracy of surface finish on the ball and on the ball seat
- Sealing design and the sealing material

The contact pressure is built up by the initial stress in the seat (compact or spring supported) and the medium pressure.

The extremely high durability of the Argus sealing system is achieved via close manufacturing tolerances, which are guaranteed by the Flowserve QA system and by rule-based innovative engineering design work.

## Sectional drawing with primary components list

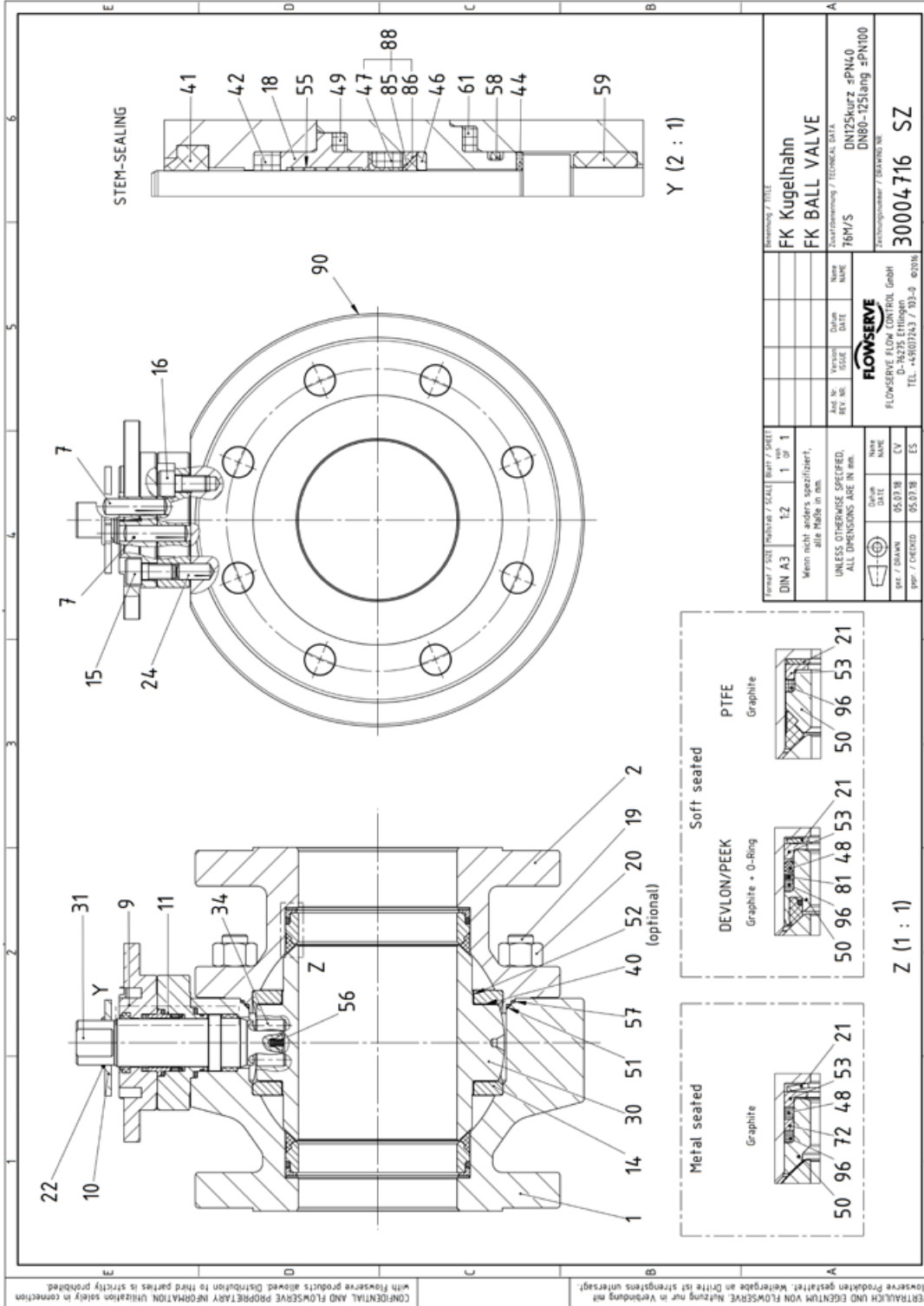
NPS 3–12, ≤250°C (482°F), standard, soft-seated, two-piece valve



No.	Description
1	Body 1
2	Body 2
9	Connection plate
11	Cover plate
14	Counter bearing
30	Ball
31	Stem
50	Ball seat

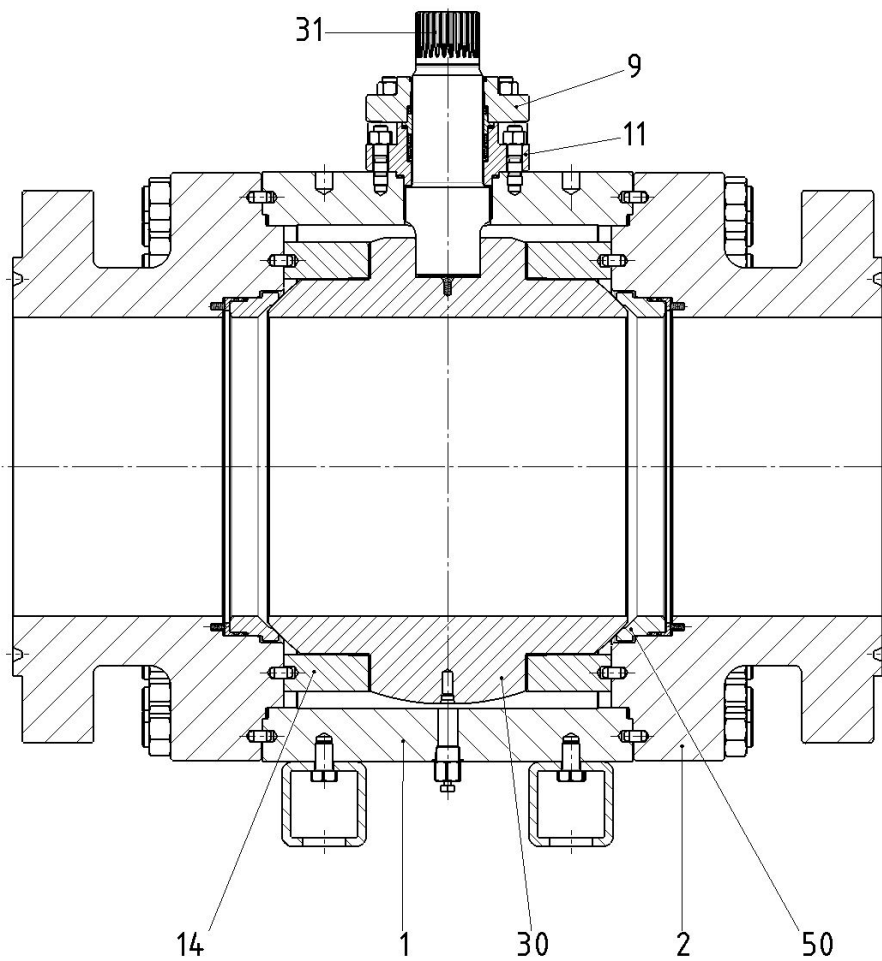
# Sectional drawing

NPS 3–12, ≤250°C (482°F), standard, soft-seated, two-piece valve



## Sectional drawing with primary components list, continued

NPS 14–26,  $\leq 250^{\circ}\text{C}$  (482°F), standard, metal-seated, three-piece valve

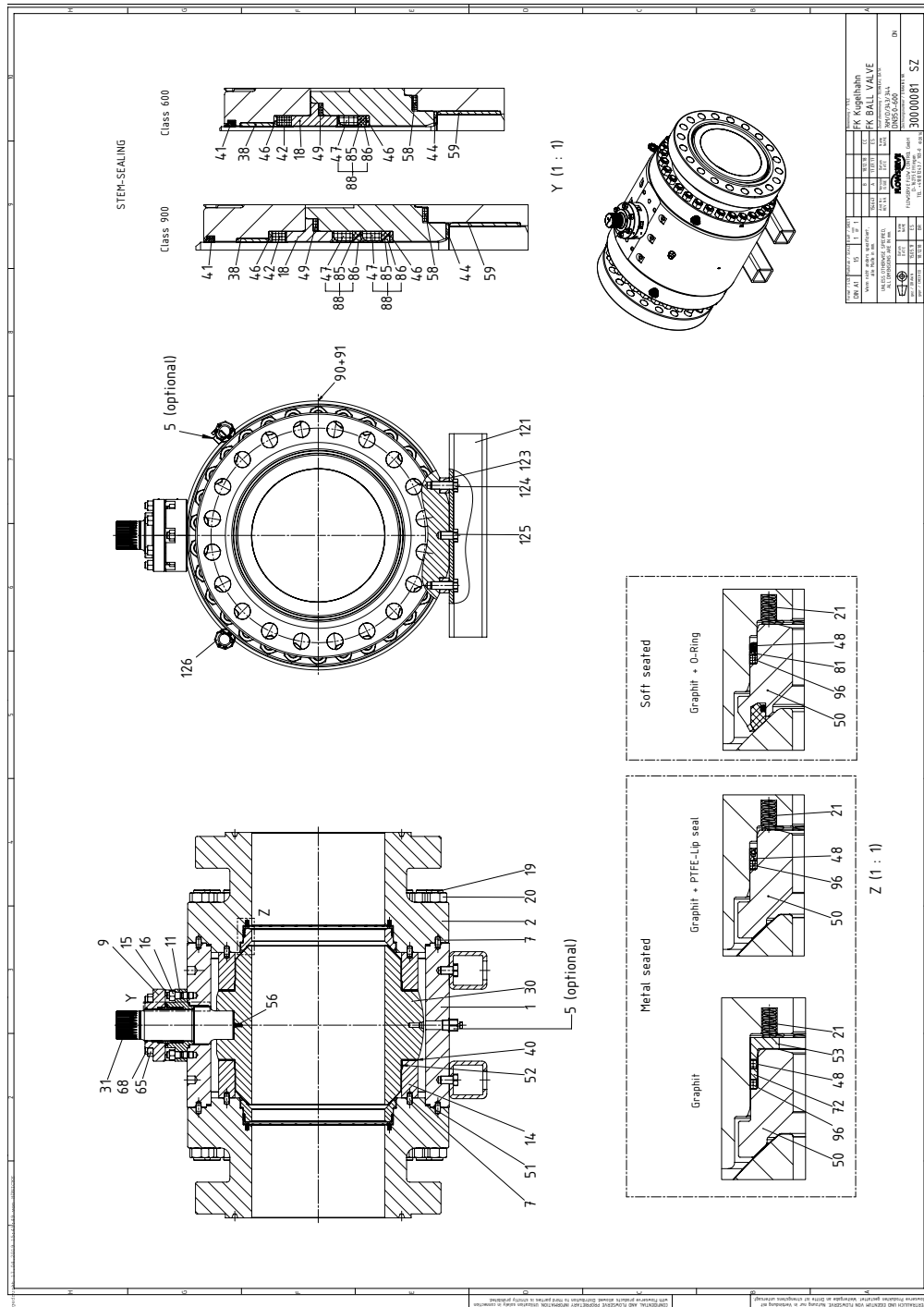


No.	Description
1	Body 1
2	Body 2
9	Gland
11	Gland
14	Trunnion block
30	Ball
31	Stem
50	Sealing ring



# Sectional drawing

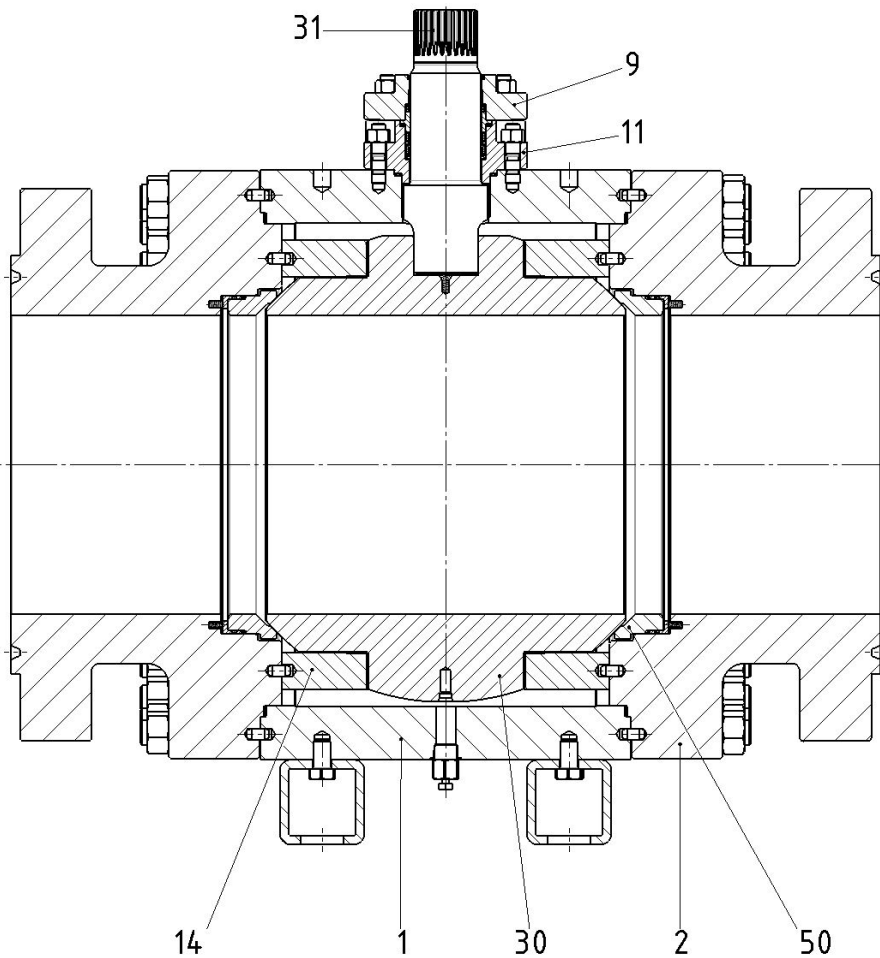
NPS 14–26, ≤250°C (482°F), standard, metal-seated, three-piece valve



No.	Description
1	Body 1
2	Body 2
9	Gland
11	Gland
14	Trunnion block
30	Ball
31	Stem
50	Sealing ring

## Sectional drawing with primary components list, continued

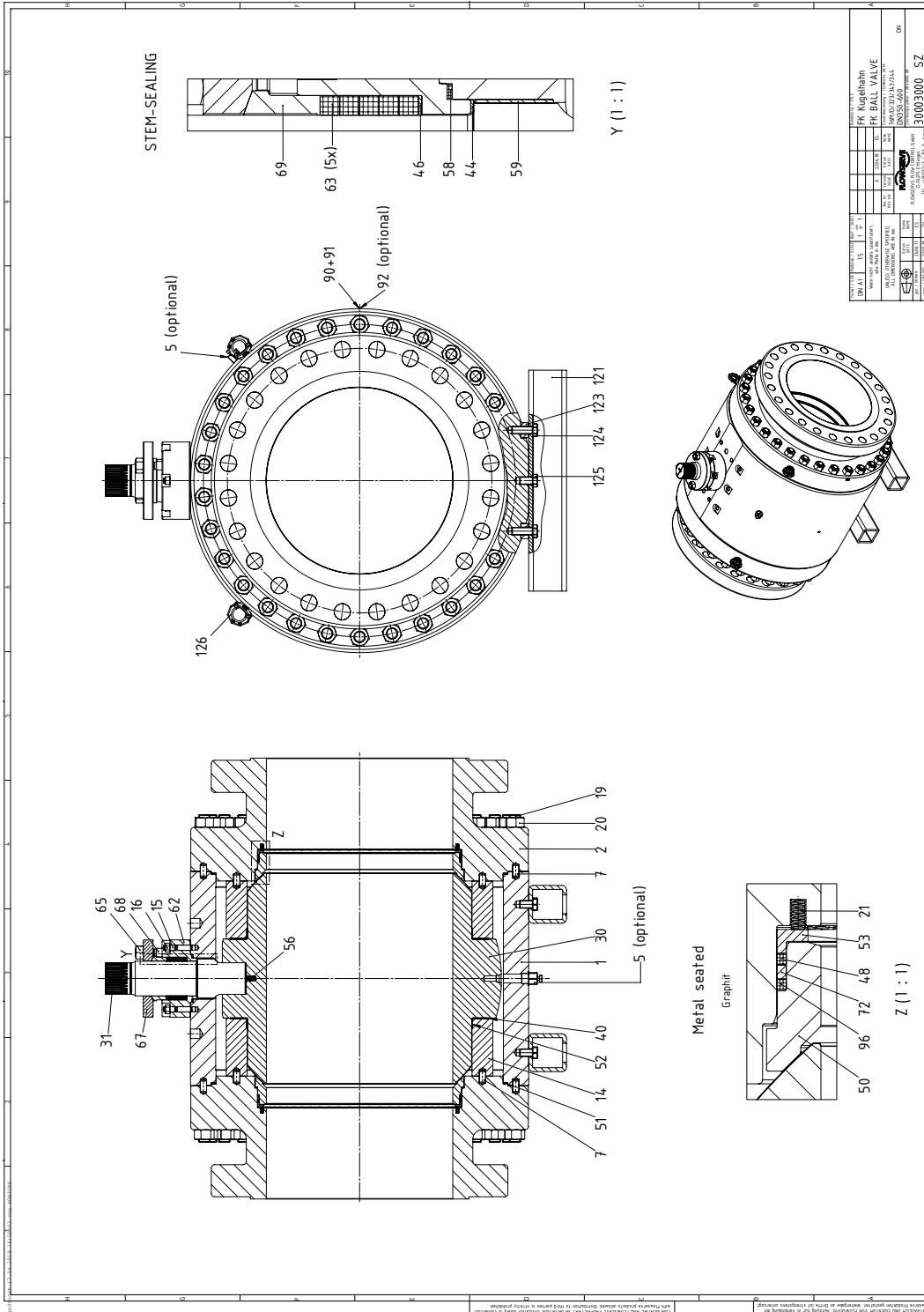
NPS 14–26, >250°C (482°F), high-temperature, metal-seated, three-piece valve



No.	Description
1	Body 1
11	Gland
14	Trunnion block
30	Ball
31	Stem
50	Sealing ring
62	Stuffing box
67	Gland adjustment

# Sectional drawing

NPS 14–26, >250°C (482°F), high-temperature, metal-seated, three-piece valve



## Recommended spare parts list

### NPS 3–12, two-piece valve

Trim Kit Sealing	PTFE	DEVLON	PEEK	DEVLON	PEEK	Metal	Metal	Metal
Seat Gasket	Graphite	O-Ring		O-Ring		Graphite	Graphite	Graphite
		Graphite		Graphite		Graphite	Graphite	Graphite
Temperature	≤200°C (392°F)	≤150°C (302°F)	≤220°C (428°F)	≤150°C (302°F)	≤220°C (428°F)	≤250°C (482°F)	≤250°C (482°F)	>250°C (482°F)
Pressure Class	≤PN 40	≤PN 100		PN 160		≤PN 100	PN 160	≤PN 160
	≤Class 300	≤Class 600		Class 900		≤Class 600	Class 900	≤Class 900
Pos.	Component							
21	Belleville washer	X	X		X	X	X	X
40	Bearing bushing	X	X			X		
	Bushing						X	
	Bearing tape							X
41	Wiper ring	X	X		X	X	X	
42	Sealing ring	X	X		X	X	X	X
44	Thrust washer	X	X		X	X	X	X
47	Seal	X	X		X	X	X	
48	O-ring		X		X			
	Sealing ring					X	X	X
49	Sealing ring	X	X		X	X	X	
50	Ball seat	X	X		X			
51	O-ring	X	X		X	X	X	
	Sealing ring							X
52	Thrust washer				X		X	X
55	Bearing tape	X	X		X	X	X	
56	Compression spring	X	X		X	X	X	X
57	Sealing ring	X	X		X	X	X	X
58	O-ring	X	X		X	X	X	
59	Bushing	X	X		X	X	X	X
61	Sealing ring	X	X		X	X	X	X
63	Sealing ring							X
78	Bearing tape							X
81	Thrust ring		X		X			
85	Sleeve	X	X		X	X	X	
86	Sleeve	X	X		X	X	X	
96	Sealing ring	X	X		X	X	X	X

## Recommended spare parts list continued

### NPS 14–24, three-piece valve

Trim Kit Sealing		PTFE	Devlon	PEEK	Metal	Metal	Metal
Seat Gasket	O-ring			Radial	Graphite	Graphite	Graphite
	Graphite			Graphite	Graphite	Graphite	Graphite
Temperature	≤200°C (392°F)	≤150°C (302°F)	≤250°C	≤250°C (482°F)	≤250°C (482°F)	>250°C (482°F)	
Pressure Class	≤Class 300	≤Class 600		≤Class 900	≤Class 900	≤Class 900	
Pos.	Component						
21	Compression spring		X		X	X	X
38	Du-bushing		X		X	X	
40	Du-bushing		X		X	X	
40	Bushing						X
41	Wiper ring		X		X	X	
42	Sealing ring		X		X	X	
44	Thrust washer		X		X	X	X
47	Seal		X		X	X	
48	O-ring		X				
48	Radial seal				X		
48	Sealing ring					X	X
49	Sealing ring		X		X	X	
50	Ball seat		X				
51	Spiral gasket		X		X	X	X
52	Thrust washer		X		X	X	X
56	Compression spring		X		X	X	X
58	Spiral gasket		X		X	X	X
59	Du-bushing		X		X	X	
59	Bushing						X
63	Sealing ring						X
81	Thrust ring		X				
85	Sleeve		X		X	X	
86	Sleeve		X		X	X	
96	Sealing ring		X		X	X	X

## High-cycle designs

### Standard

- Metallic seat: >15k; max. 200k cycles/year
- Soft seat: >15k; max. 150k cycles/year
- Standard cycle time: >1 sec/in



### Moderate

- Metallic seat: >200k; max. 1000k cycles/year
- Soft seat: >150k; max. 800k cycles/year
- Fast cycle time:  $\leq 1$  sec/in

### Ultimate

- Metallic seat: >1000k; max. 2000k cycles/year
- Soft seat: N/A
- Fast cycle time:  $\leq 1$  sec/in



## Thermal coatings for metal-seated ball valves

### Coatings: HVOF

#### Advantages

- Applicable on any metallic base material
- Highest hardness and wear resistance

#### Disadvantages

- Mechanical bond
- Some porosity
- Cracking and spalling happen very rarely

#### Applications

- General service, moderate operating cycles
- High pressure
- High temperature

#### Materials

- Carbide (Cr<sub>3</sub>C<sub>2</sub>-NiCr): 900–1100 HV 0.3 to 900°C (1652°F)
- WC-Co: 1000–1400 HV 0.3 to 500°C (932°F)
- WC-CoCr: 1000–1400 HV 0.3 to 500°C (932°F)

### Flame spraying and fusing: Arguloy

#### Advantages

- Closed porosity
- Metallurgical bond

#### Disadvantages

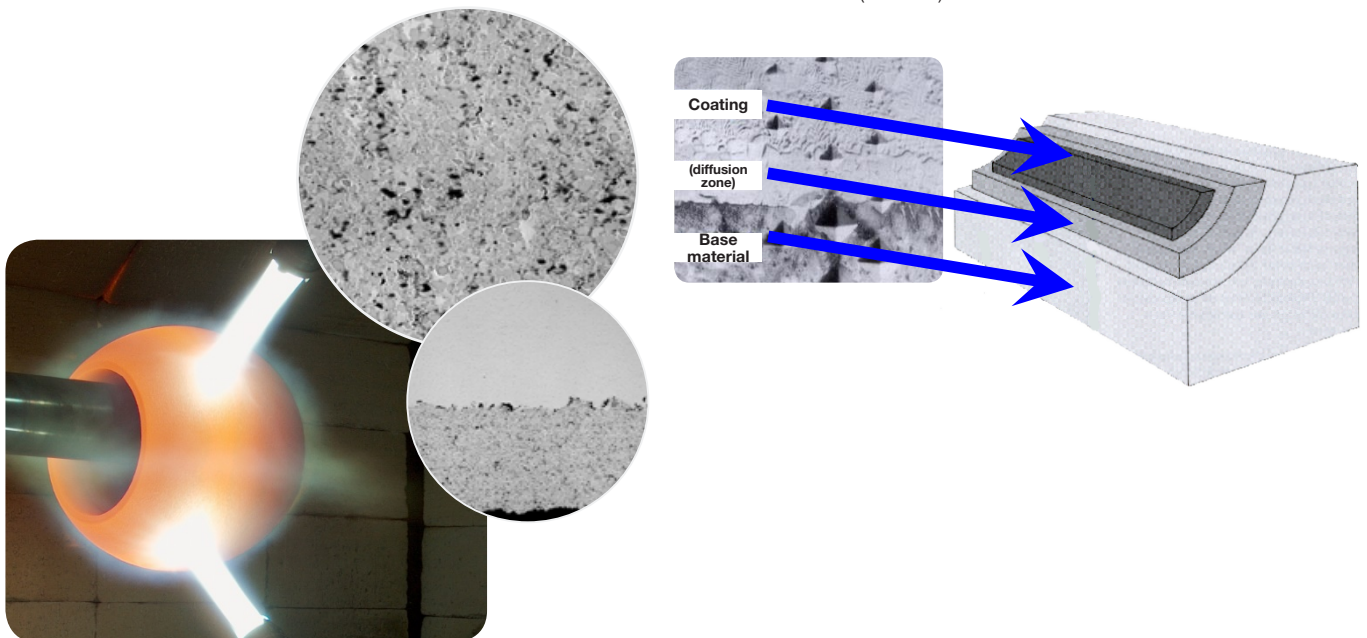
- Restrictions in base materials

#### Applications

- Severe service
- High pressure
- Oxygen
- Low leakage classes
- Thermal cycling or shock
- High and ultimate operating cycles

#### Materials

- Arguloy 1 (NiCrBSi): 50–750 HV 0.3 and 58–62 HRC to 750°C (1382°F)
- Arguloy 2 (NiCrBSi+WC): 750–850 HV 0.3 and 62–65 HRC to 750°C (1382°F)
- Arguloy 3 (Co-Based): 680–750 HV 0.3 and 59–62 HRC to 800°C (1472°F)



## Torques – Class 150

### Class 150 Soft

Size		Differential Pressure [psi/bar]					
		0	58	116	174	232	290
		0	4	8	12	16	20
NPS	DN	Torque BTO [lb-in/Nm]					
3	80	522	584	637	699	761	823
		59	66	72	79	86	93
4	100	646	752	867	982	1097	1213
		73	85	98	111	124	137
6	150	1567	1868	2168	2469	2770	3071
		177	211	245	279	313	347
8	200	1868	2425	2983	3540	4098	4655
		211	274	337	400	463	526
10	250	4425	5381	6337	7293	8249	9205
		500	608	716	824	932	1040
12	300	6196	7399	8603	9807	11,010	12,214
		700	836	972	1108	1244	1380
14	350	9948	11,196	12,435	13,674	14,922	16,161
		1124	1265	1405	1545	1686	1826
16	400	14,860	16,701	18,551	20,392	22,242	24,083
		1679	1887	2096	2304	2513	2721
18	450	17,047	19,525	22,003	24,481	26,959	29,438
		1926	2206	2486	2766	3046	3326
20	500	21,321	24,977	28,632	32,288	35,943	39,598
		2409	2822	3235	3648	4061	4474
24	600	33,181	39,120	45,059	50,998	56,937	62,885
		3749	4420	5091	5762	6433	7105

### Class 150 Metal

Size		Differential Pressure [psi/bar]					
		0	58	116	174	232	290
		0	4	8	12	16	20
NPS	DN	Torque BTO [lb-in/Nm]					
3	80	850	956	1062	1177	1283	1390
		96	108	120	133	145	157
4	100	1071	1275	1478	1682	1885	2089
		121	144	167	190	213	236
6	150	2478	3018	3558	4107	4647	5187
		280	341	402	464	525	586
8	200	3018	4027	5027	6036	7036	8045
		341	455	568	682	795	909
10	250	7258	8984	10,701	12,426	14,143	15,861
		820	1015	1209	1404	1598	1792
12	300	10,444	12,612	14,781	16,949	19,118	21,277
		1180	1425	1670	1915	2160	2404
14	350	13,604	16,055	18,507	20,959	23,410	25,862
		1537	1814	2091	2368	2645	2922
16	400	20,251	23,711	27,172	30,632	34,093	37,554
		2288	2679	3070	3461	3852	4243
18	450	25,402	29,933	34,474	39,005	43,546	48,077
		2870	3382	3895	4407	4920	5432
20	500	32,863	39,651	46,440	53,220	60,008	66,797
		3713	4480	5247	6013	6780	7547
24	600	58,362	68,717	79,064	89,419	99,775	110,130
		6594	7764	8933	10,103	11,273	12,443

#### Assumptions:

Seat sealing:	PTFE
Ball bearing:	PTFE
Operating temperature:	AT
Medium characteristic:	Lubricating
Cycle frequency:	Daily
Stem sealing:	ISO 15848

#### Assumptions:

Seat sealing:	Arguloy
Ball bearing:	PTFE
Operating temperature:	AT
Medium characteristic:	Lubricating
Cycle frequency:	Daily
Stem sealing:	ISO 15848

### Class 150 Operating Torques

NPS	BTO	RTO	ETO	BTC	RTC	ETC
3-6	100%	80%	90%	90%	80%	95%
8	100%	75%	90%	90%	75%	95%
10	100%	70%	90%	90%	70%	95%
12	100%	65%	90%	90%	65%	95%
14-24	100%	60%	90%	90%	60%	95%



# Torques – Class 300

## Class 300 Soft

Size		Differential Pressure [psi/bar]					
		0	145	290	435	580	725
		0	10	20	30	40	50
NPS	DN	Torque BTO [lb-in/Nm]					
3	80	522	673	823	974	1124	1275
		59	76	93	110	127	144
4	100	646	929	1213	1487	1770	2053
		73	105	137	168	200	232
6	150	1567	2319	3071	3824	4576	5328
		177	262	347	432	517	602
8	200	1868	3257	4655	6054	7443	8842
		211	368	526	684	841	999
10	250	4425	6815	9205	11,594	13,984	16,374
		500	770	1040	1310	1580	1850
12	300	6196	9205	12,214	15,223	18,233	21,242
		700	1040	1380	1720	2060	2400
14	350	9948	13,055	16,161	19,268	22,366	25,472
		1124	1475	1826	2177	2527	2878
16	400	14,860	19,472	24,083	28,703	33,314	37,925
		1679	2200	2721	3243	3764	4285
18	450	17,047	23,242	29,438	35,642	41,837	48,033
		1926	2626	3326	4027	4727	5427
20	500	21,321	30,455	39,598	48,732	57,875	67,018
		2409	3441	4474	5506	6539	7572
24	600	33,181	48,033	62,885	77,727	92,579	107,430
		3749	5427	7105	8782	10,460	12,138

## Class 300 Metal

Size		Differential Pressure [psi/bar]					
		0	145	290	435	580	725
		0	10	20	30	40	50
NPS	DN	Torque BTO [lb-in/Nm]					
3	80	850	1124	1390	1664	1938	2204
		96	127	157	188	219	249
4	100	1071	1575	2089	2593	3107	3611
		121	178	236	293	351	408
6	150	2478	3832	5187	6541	7895	9249
		280	433	586	739	892	1045
8	200	3018	5532	8045	10,559	13,073	15,577
		341	625	909	1193	1477	1760
10	250	7258	11,559	15,861	20,162	24,463	28,765
		820	1306	1792	2278	2764	3250
12	300	10,444	15,861	21,277	26,694	32,111	37,527
		1180	1792	2404	3016	3628	4240
14	350	13,604	19,737	25,862	31,987	38,111	44,245
		1537	2230	2922	3614	4306	4999
16	400	20,251	28,898	37,554	46,210	54,857	63,513
		2288	3265	4243	5221	6198	7176
18	450	25,402	36,739	48,077	59,415	70,753	82,100
		2870	4151	5432	6713	7994	9276
20	500	32,863	49,830	66,797	83,755	100,722	117,680
		3713	5630	7547	9463	11,380	13,296
24	600	58,362	84,241	110,130	136,018	161,898	187,786
		6594	9518	12,443	15,368	18,292	21,217

### Assumptions:

Seat sealing:	PTFE
Ball bearing:	PTFE
Operating temperature:	AT
Medium characteristic:	Lubricating
Cycle frequency:	Daily
Stem sealing:	ISO 15848

### Assumptions:

Seat sealing:	Arguloy
Ball bearing:	PTFE
Operating temperature:	AT
Medium characteristic:	Lubricating
Cycle frequency:	Daily
Stem sealing:	ISO 15848

## Class 300 Operating Torques

NPS	BTO	RTO	ETO	BTC	RTC	ETC
3-6	100%	80%	90%	90%	80%	95%
8	100%	75%	90%	90%	75%	95%
10	100%	70%	90%	90%	70%	95%
12	100%	65%	90%	90%	65%	95%
14-24	100%	60%	90%	90%	60%	95%

## Torques – Class 600

### Class 600 Soft

Size		Differential Pressure [psi/bar]					
		0	290	580	870	1160	1450
		0	20	40	60	80	100
NPS	DN	Torque BTO [lb-in/Nm]					
3	80	682	1106	1531	1956	2372	2797
		77	125	173	221	268	316
4	100	859	1646	2443	3231	4018	4815
		97	186	276	365	454	544
6	150	2018	4124	6240	8346	10,453	12,559
		228	466	705	943	1181	1419
8	200	2443	6346	10,258	14,170	18,073	21,985
		276	717	1159	1601	2042	2484
10	250	5841	12,533	19,224	25,915	32,606	39,297
		660	1416	2172	2928	3684	4440
12	300	8320	16,746	25,172	33,597	42,023	50,449
		940	1892	2844	3796	4748	5700
14	350	12,419	20,412	28,406	36,399	44,392	52,385
		1403	2306	3209	4113	5016	5919
16	400	18,513	30,090	41,666	53,243	64,819	76,396
		2092	3400	4708	6016	7324	8632
18	450	22,163	37,555	52,947	68,339	83,731	99,123
		2504	4243	5982	7721	9460	11,199
20	500	28,190	51,130	74,069	97,009	119,949	142,889
		3185	5777	8369	10,961	13,552	16,144
24	600	46,944	83,011	119,069	155,136	191,194	227,261
		5304	9379	13,453	17,528	21,602	25,677

### Class 600 Metal

Size		Differential Pressure [psi/bar]					
		0	290	580	870	1160	1450
		0	20	40	60	80	100
NPS	DN	Torque BTO [lb-in/Nm]					
3	80	850	1390	1938	2478	3018	3567
		96	157	219	280	341	403
4	100	1071	2089	3107	4124	5142	6151
		121	236	351	466	581	695
6	150	2478	5187	7895	10,612	13,320	16,029
		280	586	892	1199	1505	1811
8	200	3018	8045	13,073	18,091	23,118	28,145
		341	909	1477	2044	2612	3180
10	250	7258	15,861	24,463	33,066	41,669	50,272
		820	1792	2764	3736	4708	5680
12	300	10,444	21,277	32,111	42,944	53,777	64,610
		1180	2404	3628	4852	6076	7300
14	350	13,606	25,860	38,114	50,368	62,622	74,876
		1537	2922	4306	5691	7075	8460
16	400	20,246	37,553	54,860	72,167	89,474	106,780
		2288	4243	6198	8154	10,109	12,065
18	450	25,398	48,077	70,756	93,435	116,113	138,792
		2870	5432	7994	10,557	13,119	15,681
20	500	32,866	66,793	100,720	134,647	168,573	202,500
		3713	7547	11,380	15,213	19,046	22,879
24	600	58,360	110,130	161,900	213,670	265,440	317,210
		6594	12,443	18,292	24,141	29,991	35,840

#### Assumptions:

Seat sealing:	PEEK
Ball bearing:	PTFE
Operating temperature:	AT
Medium characteristic:	Lubricating
Cycle frequency:	Daily
Stem sealing:	ISO 15848

#### Assumptions:

Seat sealing:	Arguloy
Ball bearing:	PTFE
Operating temperature:	AT
Medium characteristic:	Lubricating
Cycle frequency:	Daily
Stem sealing:	ISO 15848

### Class 600 Operating Torques

NPS	BTO	RTO	ETO	BTC	RTC	ETC
3-6	100%	80%	90%	90%	80%	95%
8	100%	75%	90%	90%	75%	95%
10	100%	70%	90%	90%	70%	95%
12	100%	65%	90%	90%	65%	95%
14-24	100%	60%	90%	90%	60%	95%

## Torques – Class 900

### Class 900 Soft

Size		Differential Pressure [psi/bar]					
		0	435	870	1305	1740	2176
		0	30	60	90	120	150
NPS	DN	Torque BTO [lb-in/Nm]					
3	80	1151	2461	3779	5098	6408	7727
		130	278	427	576	724	873
4	100	1283	3204	5125	7036	8957	10,878
		145	362	579	795	1012	1229
6	150	3531	9444	15,365	21,277	27,198	33,111
		399	1067	1736	2404	3073	3741
8	200	4248	13,878	23,508	33,137	42,767	52,396
		480	1568	2656	3744	4832	5920
10	250	7744	24,844	41,953	59,052	76,161	93,260
		875	2807	4740	6672	8605	10,537
12	300	9435	34,960	60,495	86,029	111,564	137,098
		1066	3950	6835	9720	12,605	15,490
14	350	18,135	31,626	45,116	58,607	72,097	85,587
		2049	3573	5097	6622	8146	9670
16	400	25,704	45,266	64,828	84,390	103,952	123,514
		2904	5114	7325	9535	11,745	13,955
18	450	29,396	53,430	77,464	101,498	125,532	149,566
		3321	6037	8752	11,468	14,183	16,899
20	500	36,126	73,116	110,106	147,096	184,085	221,075
		4082	8261	12,440	16,620	20,799	24,978
24	600	58,158	118,042	177,926	237,809	297,693	357,577
		6571	13,337	20,103	26,869	33,635	40,401

### Class 900 Metal

Size		Differential Pressure [psi/bar]					
		0	435	870	1305	1740	2176
		0	30	60	90	120	150
NPS	DN	Torque BTO [lb-in/Nm]					
3	80	1266	2956	4655	6346	8036	9727
		143	334	526	717	908	1099
4	100	1443	3912	6381	8842	11,311	13,772
		163	442	721	999	1278	1556
6	150	3894	11,497	19,109	26,712	34,323	41,926
		440	1299	2159	3018	3878	4737
8	200	4815	17,197	29,579	41,961	54,344	66,726
		544	1943	3342	4741	6140	7539
10	250	8922	30,907	52,901	74,886	96,880	118,874
		1008	3492	5977	8461	10,946	13,431
12	300	11,090	43,917	76,745	109,572	142,400	175,227
		1253	4962	8671	12,380	16,089	19,798
14	350	18,098	38,187	58,276	78,366	98,455	118,544
		2045	4315	6584	8854	11,124	13,394
16	400	25,896	54,308	82,719	111,131	139,542	167,954
		2926	6136	9346	12,556	15,766	18,976
18	450	31,107	64,835	98,562	132,289	166,017	199,744
		3515	7325	11,136	14,947	18,757	22,568
20	500	39,106	91,261	143,416	195,570	247,725	299,880
		4418	10,311	16,204	22,096	27,989	33,882
24	600	67,203	149,116	231,029	312,942	394,855	476,768
		7593	16,848	26,103	35,358	44,613	53,868

#### Assumptions:

Seat sealing:	PEEK
Ball bearing:	PTFE
Operating temperature:	AT
Medium characteristic:	Lubricating
Cycle frequency:	Daily
Stem sealing:	ISO 15848

#### Assumptions:

Seat sealing:	Arguloy
Ball bearing:	PTFE
Operating temperature:	AT
Medium characteristic:	Lubricating
Cycle frequency:	Daily
Stem sealing:	ISO 15848

### Class 900 Operating Torques

NPS	BTO	RTO	ETO	BTC	RTC	ETC
3-6	100%	80%	90%	90%	80%	95%
8	100%	75%	90%	90%	75%	95%
10	100%	70%	90%	90%	70%	95%
12	100%	65%	90%	90%	65%	95%
14-24	100%	60%	90%	90%	60%	95%

## Torques – MAST

### MAST at AT 250°C (482°F) Version

NPS	Class	Material	MAST [lb-in]	MAST [Nm]
3	150	17-4 PH	15,816	1787
	300-600	17-4 PH	27,614	3120
	900	17-4 PH	49,502	5593
4	150	17-4 PH	15,816	1787
	300-600	17-4 PH	27,614	3120
	900	17-4 PH	49,502	5593
6	150-600	17-4 PH	57,379	6483
	900	17-4 PH	CF	CF
8	150-600	17-4 PH	113,245	12,795
	900	17-4 PH	CF	CF
10	150-600	17-4 PH	191,990	21,692
	900	17-4 PH	CF	CF
12	150-600	17-4 PH	309,936	35,018
	900	17-4 PH	CF	CF
14	150-600	17-4 PH	267,337	30,205
	900	17-4 PH	409,675	46,287
16	150-600	17-4 PH	611,525	69,093
	900	17-4 PH	863,152	97,523
18	150-600	17-4 PH	611,525	69,093
	900	17-4 PH	863,152	97,523
20	150-600	17-4 PH	863,152	97,523
	900	17-4 PH	1,184,018	133,776
24	150-600	17-4 PH	1,184,018	133,776
	900	17-4 PH	2,045,992	231,166

## Leakage rates

Pressure Class	Size		ANSI/FCI 70-2					ISO 5208			API 598		
	NPS	DIN	LF2 (bar)	Leakage rate V(B) (ml/min)	Leakage rate V(B1) (ml/min)	Leakage rate VI (ml/min)	Testing Time (s)	Rate D Water (ml/min)	Rate D Gas (ml/min)	Testing Time (s)	Test Water (ml/min)	Test Gas (ml/min)	Testing Time (s)
Class 150	3	80	19.6	0.47	14.8	0.9	60	0.48	144	60	0.375	0.12	60
Class 300	3	80	51.1	1.226	14.8	0.9	60	0.48	144	60	0.375	0.12	60
Class 600	3	80	102.1	2.45	14.8	0.9	60	0.48	144	60	0.375	0.12	60
Class 900	3	80	153.2	3.677	14.8	0.9	60	0.48	144	60	0.375	0.12	60
Class 150	4	100	19.6	0.588	18.5	1.7	60	0.6	180	60	0.5	0.16	60
Class 300	4	100	51.1	1.533	18.5	1.7	60	0.6	180	60	0.5	0.16	60
Class 600	4	100	102.1	3.063	18.5	1.7	60	0.6	180	60	0.5	0.16	60
Class 900	4	100	153.2	4.596	18.5	1.7	60	0.6	180	60	0.5	0.16	60
Class 150	6	150	19.6	0.882	27.75	4	60	0.9	270	60	0.75	0.24	60
Class 300	6	150	51.1	2.3	27.75	4	60	0.9	270	60	0.75	0.24	60
Class 600	6	150	102.1	4.595	27.75	4	60	0.9	270	60	0.75	0.24	60
Class 900	6	150	153.2	6.894	27.75	4	60	0.9	270	60	0.75	0.24	60
Class 150	8	200	19.6	1.176	37	6.75	60	1.2	360	120	1	0.32	120
Class 300	8	200	51.1	3.066	37	6.75	60	1.2	360	120	1	0.32	120
Class 600	8	200	102.1	6.126	37	6.75	60	1.2	360	120	1	0.32	120
Class 900	8	200	153.2	9.192	37	6.75	60	1.2	360	120	1	0.32	120
Class 150	10	250	19.6	1.47	46.25	11.1	60	1.5	450	120	1.25	0.4	120
Class 300	10	250	51.1	3.833	46.25	11.1	60	1.5	450	120	1.25	0.4	120
Class 600	10	250	102.1	7.658	46.25	11.1	60	1.5	450	120	1.25	0.4	120
Class 900	10	250	153.2	11.49	46.25	11.1	60	1.5	450	120	1.25	0.4	120
Class 150	12	300	19.6	1.764	55.5	16	60	1.8	540	120	1.5	0.48	120
Class 300	12	300	51.1	4.599	55.5	16	60	1.8	540	120	1.5	0.48	120
Class 600	12	300	102.1	9.189	55.5	16	60	1.8	540	120	1.5	0.48	120
Class 900	12	300	153.2	13.788	55.5	16	60	1.8	540	120	1.5	0.48	120
Class 150	14	350	19.6	2.058	64.75	21.6	60	2.1	630	120	1.75	0.56	120
Class 300	14	350	51.1	5.366	64.75	21.6	60	2.1	630	120	1.75	0.56	120
Class 600	14	350	102.1	10.721	64.75	21.6	60	2.1	630	120	1.75	0.56	120
Class 900	14	350	153.2	16.086	64.75	21.6	60	2.1	630	120	1.75	0.56	120
Class 150	16	400	19.6	2.352	74	28.4	60	2.4	720	120	2	0.64	120
Class 300	16	400	51.1	6.132	74	28.4	60	2.4	720	120	2	0.64	120
Class 600	16	400	102.1	12.252	74	28.4	60	2.4	720	120	2	0.64	120
Class 900	16	400	153.2	18.384	74	28.4	60	2.4	720	120	2	0.64	120

### Test procedures

ANSI/FCI 70-2	Rate V	Type B	Water	1.0 PN	Pathway	
ANSI/FCI 70-2	Rate V	Type B1	Air—N2	3.5 bar	Pathway	
ANSI/FCI 70-2	Rate VI	Type C	Air—N2	3.5 bar	Pathway	
ISO 5208	Rate D water		Water	1.1 PN	Pathway	(DBB Caverne)
ISO 5208	Rate D gas		Air—N2	1.1 PN or 6 bar	Pathway	(DBB Caverne)
API 598	Test water		Water	1.1 PN	Pathway	(DBB Caverne)
API 598	Test gas		Air—N2	1.1 PN or 5.5 bar	Pathway	(DBB Caverne)

### In-house testing procedures

Each valve is tested for body integrity and seat tightness at a body test pressure of 1.5xPN. The test pressure for metal-seated valves is 1.1xPN versus 6 bar for soft-seated designs. Standard test medium is water; air may be used on request.

### Test standards

Standard testing is per FCI 70-2 Class V or VI for soft and metal-seated valves. Testing per API 598 also available.

## Flow rates ( $C_v$ and $K_v$ ) — full bore

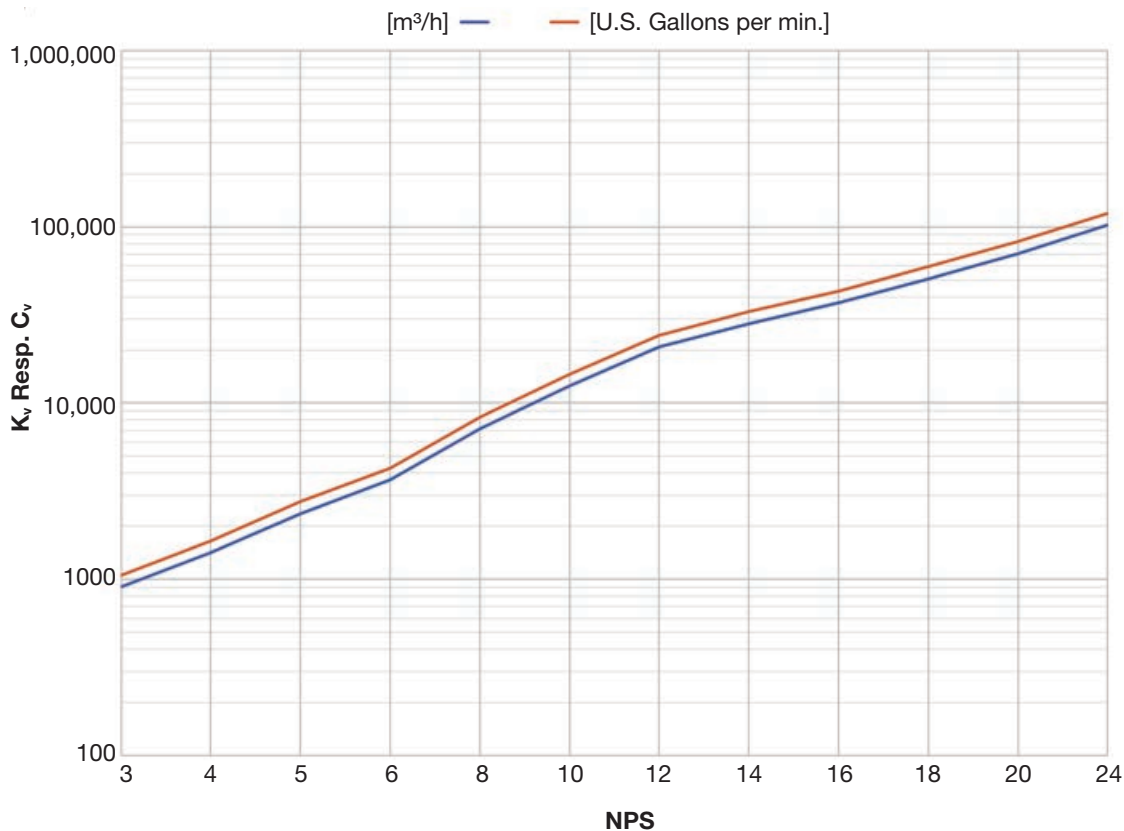
### Flow Rate per NAN7154 (2014) — Full Bore

DN (mm)	NPS (in)	Clear Width (mm)	$K_v^{*1}$ (m <sup>3</sup> /h)	$C_v^{*2}$ (U.S. gpm)
80	3	78	905	1056
100	4	100	1414	1650
125	5	125	2362	2758
150	6	150	3674	4288
200	8	200	7155	8350
250	10	250	12,500	14,590
300	12	300	20,780	24,250
350	14	350	28,290	33,014
400	16	400	37,000	43,100
450	18	450	50,800	59,283
500	20	500	70,700	82,500
600	24	600	10,200	119,000

\*1  $K_v$  value is the full capacity flow rate through the ball valve in cubic meters per hour of water at 5°C to 30°C (41°F to 86°F) with a pressure drop of 1 bar.

\*2  $C_v$  value is the full capacity flow rate through the ball valve in U.S. gallons per minute of water at 5°C to 30°C (41°F to 86°F) with a pressure drop of 1 psi.

### Flow Rate per NAN7154 (2014) — Full Bore



## Flow rates ( $C_v$ and $K_v$ ) — reduced bore

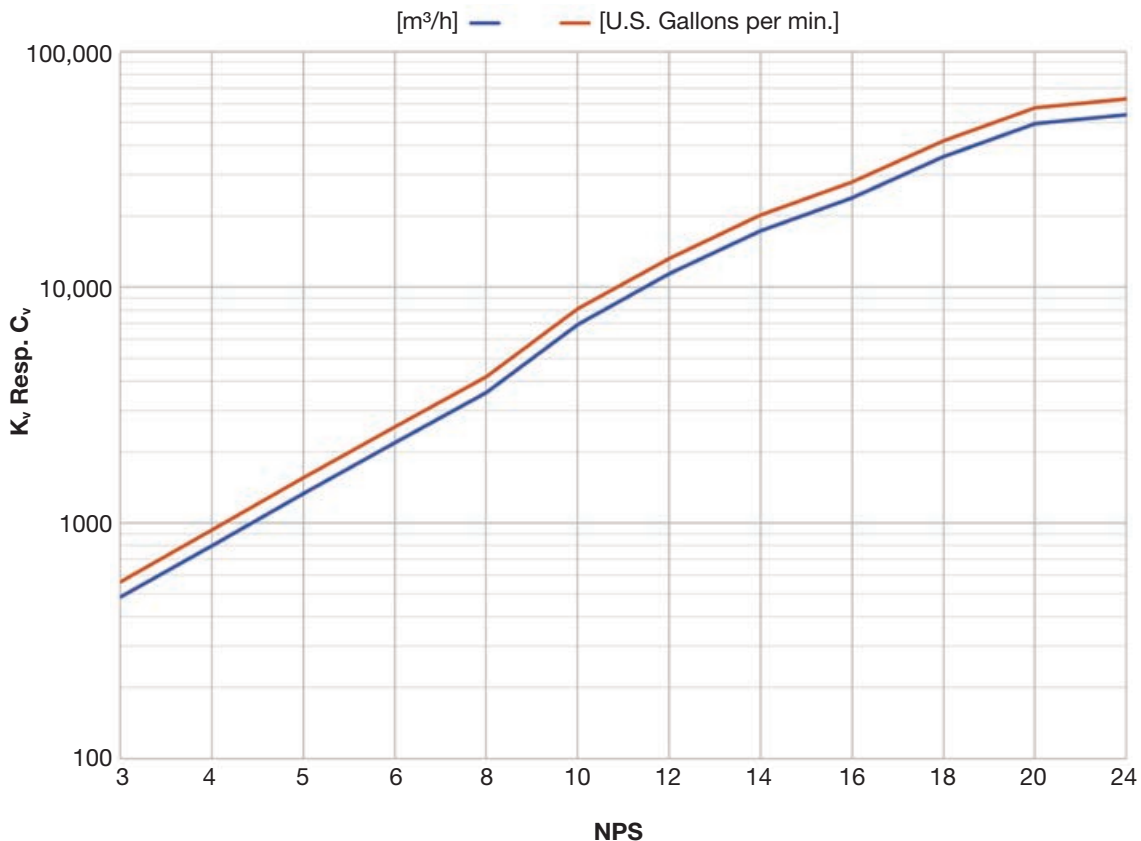
Flow Rate per NAN7154 (2014) — Reduced Bore

DN (mm)	NPS (in)	Clear Width (mm)	$K_v^{*1}$ (m <sup>3</sup> /h)	$C_v^{*2}$ (U.S. gpm)
80	3	65	484	564
100	4	78	800	934
125	5	100	1332	1555
150	6	125	2183	2547
200	8	150	3577	4175
250	10	200	6933	8090
300	12	250	11,392	13,294
350	14	300	17,324	20,217
400	16	350	23,970	27,872
450	18	400	35,900	41,895
500	20	450	49,560	57,836
600	24	500	53,950	62,960

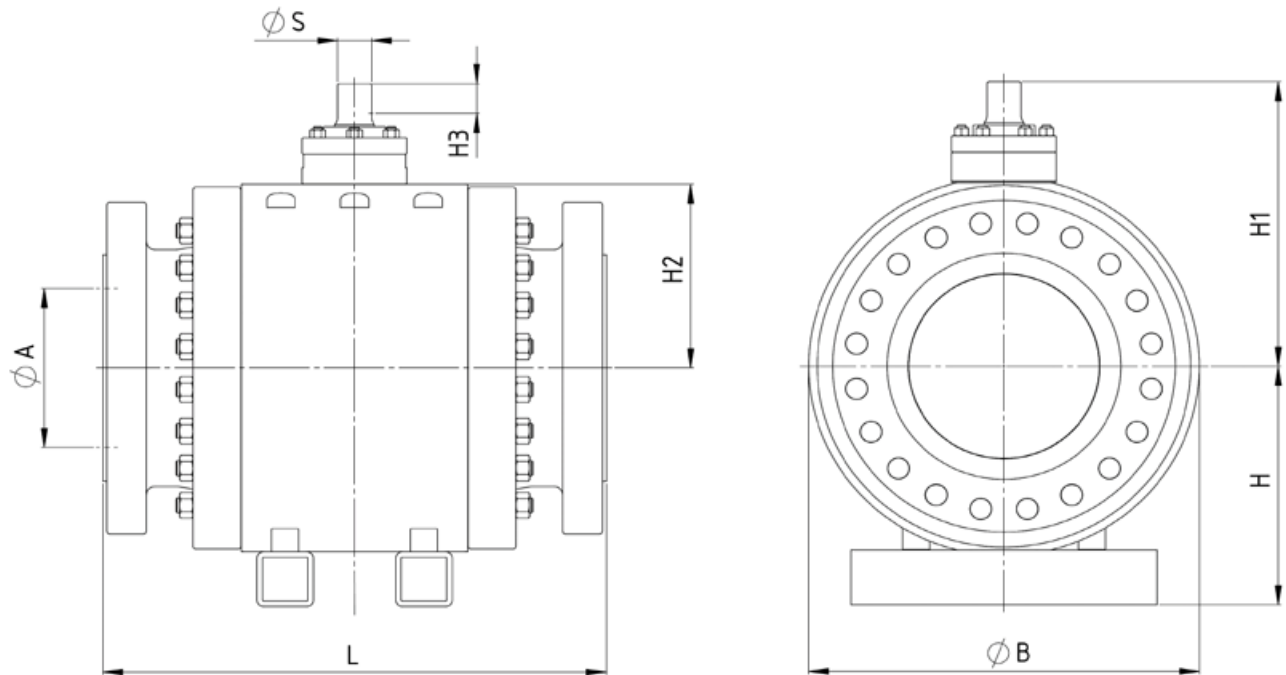
\*1  $K_v$  value is the full capacity flow rate through the ball valve in cubic meters per hour of water at 5°C to 30°C (41°F to 86°F) with a pressure drop of 1 bar.

\*2  $C_v$  value is the full capacity flow rate through the ball valve in U.S. gallons per minute of water at 5°C to 30°C (41°F to 86°F) with a pressure drop of 1 psi.

Flow Rate per NAN7154 (2014) — Reduced Bore



## Dimensions — 3- to 5-in valves

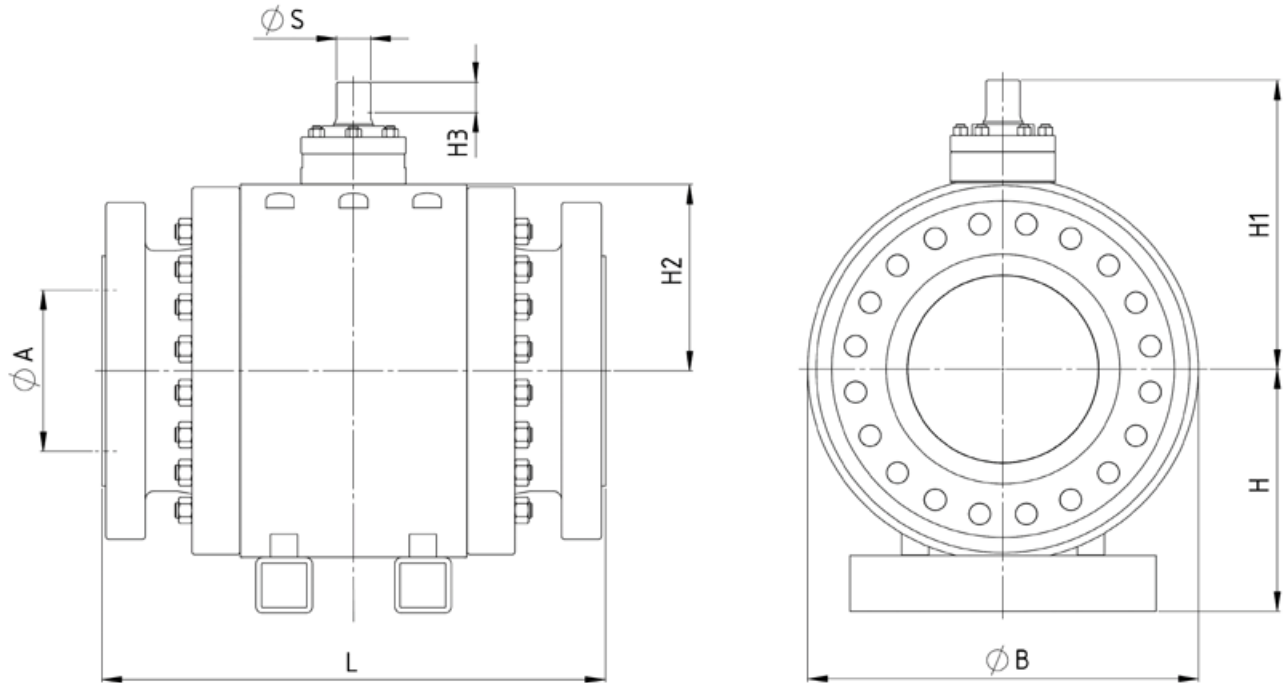


### ASME Valves

Valve Design	Size (NPS)	Long or Short Pattern	Pressure Class	Valve Design	Dimensional Drawing No.	Operating Head Drawing No.	Weight (kg)	L (mm) (D3)		$\phi A$ (mm)	$\phi B$ (mm)	H (D4) (mm)	H1 (mm)	H2 (D19) (mm)	H3 (mm)	$\phi S$ (mm)
								RF	RTJ							
API 6D	3	-	Class 150	Standard	30004783	30004318	37	203	-	76	232	116	174	144	22	28
API 6D	3	-	Class 150	Std.-High temp.	30004889	30004832	38	203	-	76	232	116	213	102	22	28
API 6D	3	-	Class 300	Standard	30004793	30004732	55	282	-	76	235	118	189	154	27	33
API 6D	3	-	Class 300	Std.-High temp.	30004878	30004828	56	282	-	76	235	118	223	102	27	33
API 6D	3	-	Class 600	Standard	30004799	30004732	61	356	-	76	235	118	189	154	27	33
API 6D	3	-	Class 600	Std.-High temp.	30004869	30004828	62	356	-	76	235	118	223	102	27	33
API 6D	3	-	Class 900	Standard	30004760	30004565	105	381	-	76	255	128	224	109	20	W35x2x16x8f
API 6D	3	-	Class 900	Std.-High temp.	30004417	30004418	106	381	-	76	255	128	229	109	20	W35x2x16x8f
API 6D	3	-	Class 600	Standard	30004812	30004732	61	-	359	76	235	118	189	154	27	33
API 6D	3	-	Class 600	Std.-High temp.	30004876	30004828	62	-	359	76	235	118	223	102	28	33
API 6D	3	-	Class 900	Standard	30004755	30004565	105	-	384	76	255	128	224	109	20	W35x2x16x8f
API 6D	3	-	Class 900	Std.-High temp.	30004863	30004418	106	-	384	76	255	128	229	109	20	W35x2x16x8f
API 6D	4	-	Class 150	Standard	30004715	30004318	51	229	-	100	260	130	190	160	22	28
API 6D	4	-	Class 150	Std.-High temp.	30004901	30004575	52	229	-	100	260	130	229	118	23	28
API 6D	4	-	Class 300	Standard	30004728	30004732	75	305	-	100	265	133	205	170	27	33
API 6D	4	-	Class 300	Std.-High temp.	30004914	30004835	77	305	-	100	265	133	239	118	28	33
API 6D	4	-	Class 600	Standard	30004757	30004758	96	432	-	100	265	133	205	170	27	33
API 6D	4	-	Class 600	Std.-High temp.	30004923	30004835	94	432	-	100	265	133	239	118	27	33



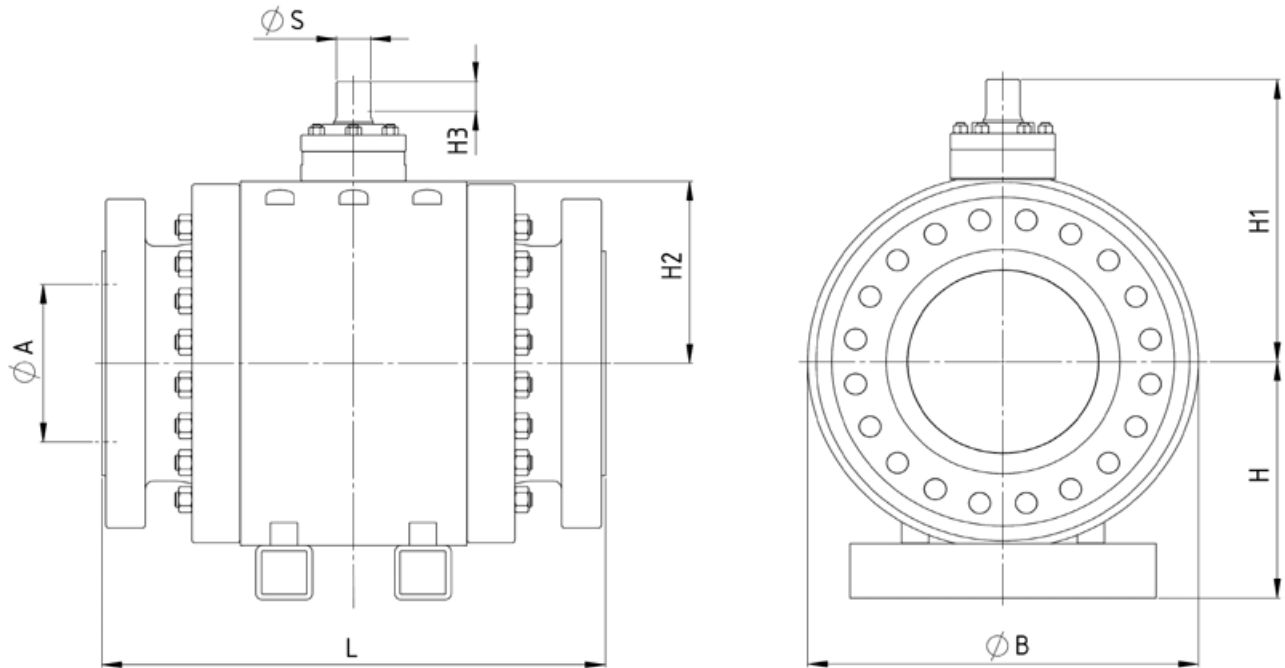
Dimensions — 3- to 5-in valves continued



ASME Valves continued

Valve Design	Size (NPS)	Long or Short Pattern	Pressure Class	Valve Design	Dimensional Drawing No.	Operating Head Drawing No.	Weight (kg)	L (mm) (D3)		ØA (mm)	ØB (mm)	H (D4) (mm)	H1 (mm)	H2 (D19) (mm)	H3 (mm)	ØS (mm)
								RF	RTJ							
API 6D	4	-	Class 900	Standard	30004750	30004565	144	457	-	100	280	140	239	124	20	W35x2x16x8f
API 6D	4	-	Class 900	Std.-high temp.	30004930	30004418	146	457	-	100	280	140	244	124	20	W35x2x16x8f
API 6D	4	-	Class 600	Standard	30004771	30004758	96	-	435	100	265	133	205	170	27	33
API 6D	4	-	Class 600	Std.-high temp.	30004926	30004835	94	-	435	100	265	133	239	118	27	33
API 6D	4	-	Class 900	Standard	30004462	30004565	145	-	460	100	280	140	239	124	20	W35x2x16x8f
API 6D	4	-	Class 900	Std.-high temp.	30004945	30004418	147	-	460	100	280	140	244	124	20	W35x2x16x8f
API 6D	5	-	Class 150	Standard	30004818	30004318	64	356	-	128	260	130	190	160	22	28
API 6D	5	-	Class 150	Std.-high temp.	30004947	30004575	65	356	-	128	260	130	229	118	23	28
API 6D	5	-	Class 300	Standard	30004840	30004732	91	381	-	128	265	133	205	170	27	33
API 6D	5	-	Class 300	Std.-high temp.	30004949	30004835	92	381	-	128	265	133	239	118	28	33
API 6D	5	-	Class 600	Standard	30004847	30004758	129	508	-	125	265	133	205	170	27	33
API 6D	5	-	Class 600	Std.-high temp.	30004955	30004835	130	508	-	125	265	133	239	118	28	33
API 6D	5	-	Class 900	Standard	30004849	30004565	184	559	-	120	280	140	239	124	20	W35x2x16x8f
API 6D	5	-	Class 900	Std.-high temp.	30004959	30004418	186	559	-	120	280	140	244	124	20	W35x2x16x8f
API 6D	5	-	Class 600	Standard	30004856	30004758	130	-	511	125	265	133	205	170	27	33
API 6D	5	-	Class 600	Std.-high temp.	30004974	30004835	131	-	511	125	265	133	239	118	31	33
API 6D	5	-	Class 900	Standard	30004842	30004565	184	-	562	120	280	140	239	124	20	W35x2x16x8f
API 6D	5	-	Class 900	Std.-high temp.	30004976	30004418	187	-	562	120	280	140	244	124	20	W35x2x16x8f

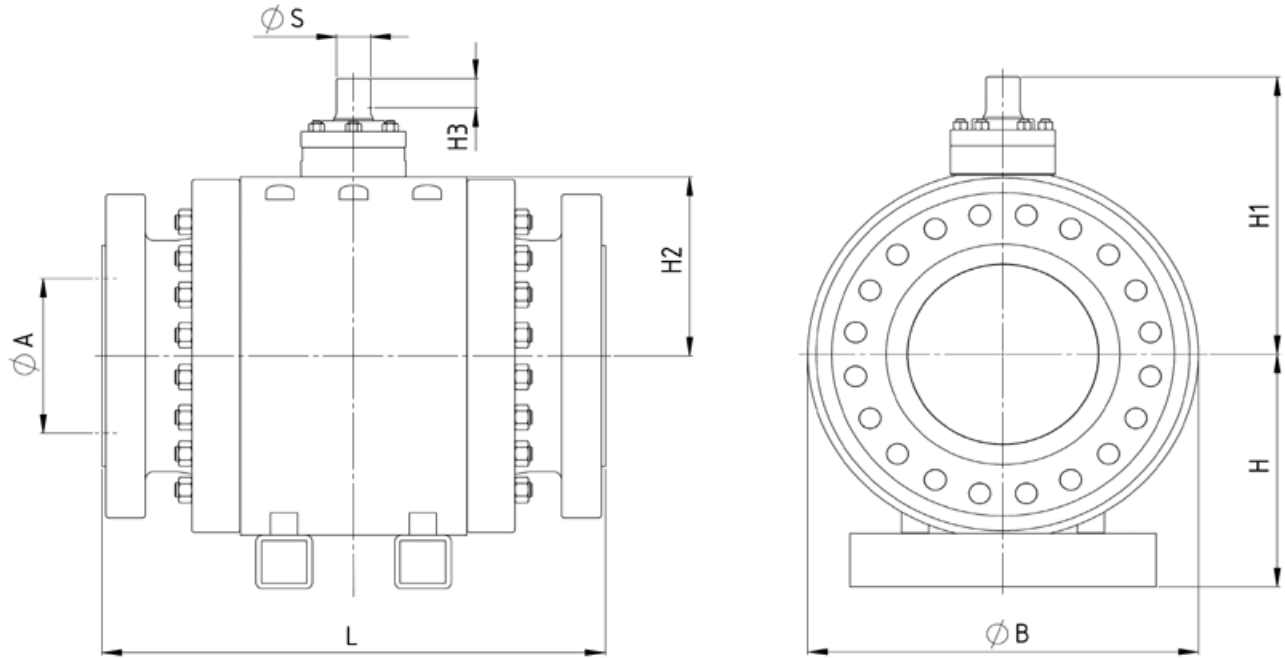
## Dimensions – 3- to 5-in valves continued



### DIN-EN Valves

Valve Design	Size (NPS)	Long or Short Pattern	Pressure Class	Valve Design	Dimensional Drawing No.	Operating Head Drawing No.	Weight (kg)	L (mm) (D3)		ØA (mm)	ØB (mm)	H (D4) (mm)	H1 (mm)	H2 (D19) (mm)	H3 (mm)	ØS (mm)
								RF	RTJ							
API 6D	80	S	PN 16	Standard	30004779	30004318	36	182	-	76	232	116	174	144	22	28
API 6D	80	S	PN 16	Std.-high temp.	30004985	30004832	37	182	-	76	232	116	213	102	22	28
API 6D	80	S	PN 40	Standard	30004788	30004318	37	182	-	76	232	116	174	144	22	28
API 6D	80	S	PN 40	Std.-high temp.	30004981	30004832	38	182	-	76	232	116	213	102	22	28
API 6D	80	L	PN 16	Standard	30004805	30004318	43	310	-	76	232	116	174	144	22	28
API 6D	80	L	PN 16	Std.-high temp.	30004978	30004832	44	310	-	76	232	116	213	102	22	28
API 6D	80	L	PN 40	Standard	30004809	30004318	44	310	-	76	232	116	174	144	22	28
API 6D	80	L	PN 40	Std.-high temp.	30004831	30004832	46	310	-	76	232	116	213	102	22	28
API 6D	80	L	PN 63	Standard	30004814	30004732	56	310	-	76	235	118	189	154	27	33
API 6D	80	L	PN 63	Std.-high temp.	30004989	30004828	57	310	-	76	235	118	223	102	27	33
API 6D	80	L	PN 100	Standard	30004820	30004732	63	310	-	76	235	118	189	154	27	33
API 6D	80	L	PN 100	Std.-high temp.	30004827	30004828	64	310	-	76	235	118	223	102	27	33
API 6D	80	L	PN 160	Standard	30004564	30004565	100	380	-	76	255	128	224	109	20	W35x2x16x8f
API 6D	80	L	PN 160	Std.-high temp.	30004483	30004418	101	380	-	76	255	128	229	109	20	W35x2x16x8f
API 6D	100	S	PN 16	Standard	30004725	30004318	44	192	-	100	260	130	190	160	22	28
API 6D	100	S	PN 16	Std.-high temp.	30004993	30004575	45	192	-	100	260	130	229	118	22	28
API 6D	100	S	PN 40	Standard	30004314	30004318	46	192	-	100	260	130	190	160	22	28
API 6D	100	S	PN 40	Std.-high temp.	30004574	30004575	47	192	-	100	260	130	229	118	22	28
API 6D	100	L	PN 16	Standard	30004774	30004318	57	350	-	100	260	130	190	160	22	28
API 6D	100	L	PN 16	Std.-high temp.	30005001	30004575	56	350	-	100	260	130	229	118	22	28
API 6D	100	L	PN 40	Standard	30004777	30004318	59	350	-	100	260	130	190	160	22	28

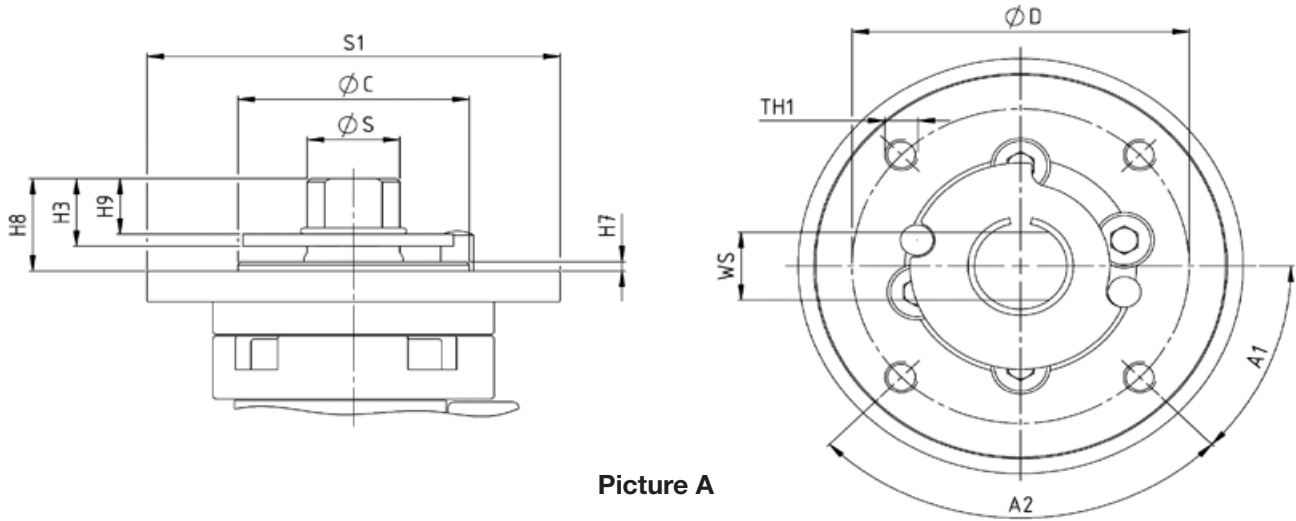
Dimensions – 3- to 5-in valves continued



DIN-EN Valves continued

Valve Design	Size (NPS)	Long or Short Pattern	Pressure Class	Valve Design	Dimensional Drawing No.	Operating Head Drawing No.	Weight (kg)	L (mm) (D3)		$\phi A$ (mm)	$\phi B$ (mm)	H (D4) (mm)	H1 (mm)	H2 (D19) (mm)	H3 (mm)	$\phi S$ (mm)
								RF	RTJ							
API 6D	100	L	PN 40	Std.-high temp.	30005003	30004575	61	350	-	100	260	130	229	118	22	28
API 6D	100	L	PN 63	Standard	30004790	30004732	75	350	-	100	265	133	205	170	27	33
API 6D	100	L	PN 63	Std.-high temp.	30004995	30004835	77	350	-	100	265	133	239	118	27	33
API 6D	100	L	PN 100	Standard	30004795	30004758	86	350	-	100	265	133	205	170	27	33
API 6D	100	L	PN 100	Std.-high temp.	30004834	30004835	87	350	-	100	265	133	239	118	27	33
API 6D	100	L	PN 160	Standard	30004762	30004565	130	430	-	100	280	140	239	124	20	W35x2x16x8f
API 6D	100	L	PN 160	Std.-high temp.	30004854	30004418	132	430	-	100	280	140	244	124	20	W35x2x16x8f
API 6D	125	S	PN 16	Standard	30004871	30004318	62	325	-	132	260	130	190	160	22	28
API 6D	125	S	PN 16	Std.-high temp.	30005005	30004575	63	325	-	132	260	130	229	118	22	28
API 6D	125	S	PN 40	Standard	30004883	30004318	66	325	-	132	260	130	190	160	22	28
API 6D	125	S	PN 40	Std.-high temp.	30005009	30004575	67	325	-	132	260	130	229	118	22	28
API 6D	125	L	PN 16	Standard	30004886	30004318	65	400	-	132	260	130	190	160	22	28
API 6D	125	L	PN 16	Std.-high temp.	30005014	30004575	66	400	-	132	260	130	229	118	22	28
API 6D	125	L	PN 40	Standard	30004891	30004318	69	400	-	132	260	130	190	160	22	28
API 6D	125	L	PN 40	Std.-high temp.	30005017	30004575	70	400	-	132	260	130	229	118	22	28
API 6D	125	L	PN 63	Standard	30004919	30004732	93	400	-	131	265	133	205	170	27	33
API 6D	125	L	PN 63	Std.-high temp.	30005021	30004835	95	400	-	131	265	133	239	118	27	33
API 6D	125	L	PN 100	Standard	30004941	30004758	107	400	-	127	265	133	205	170	27	33
API 6D	125	L	PN 100	Std.-high temp.	30005026	30004835	108	400	-	127	265	133	239	118	27	33
API 6D	125	L	PN 160	Standard	30004838	30004565	155	500	-	120	280	140	239	124	20	W35x2x16x8f
API 6D	125	L	PN 160	Std.-high temp.	30005032	30004418	157	500	-	120	280	140	244	124	20	W35x2x16x8f

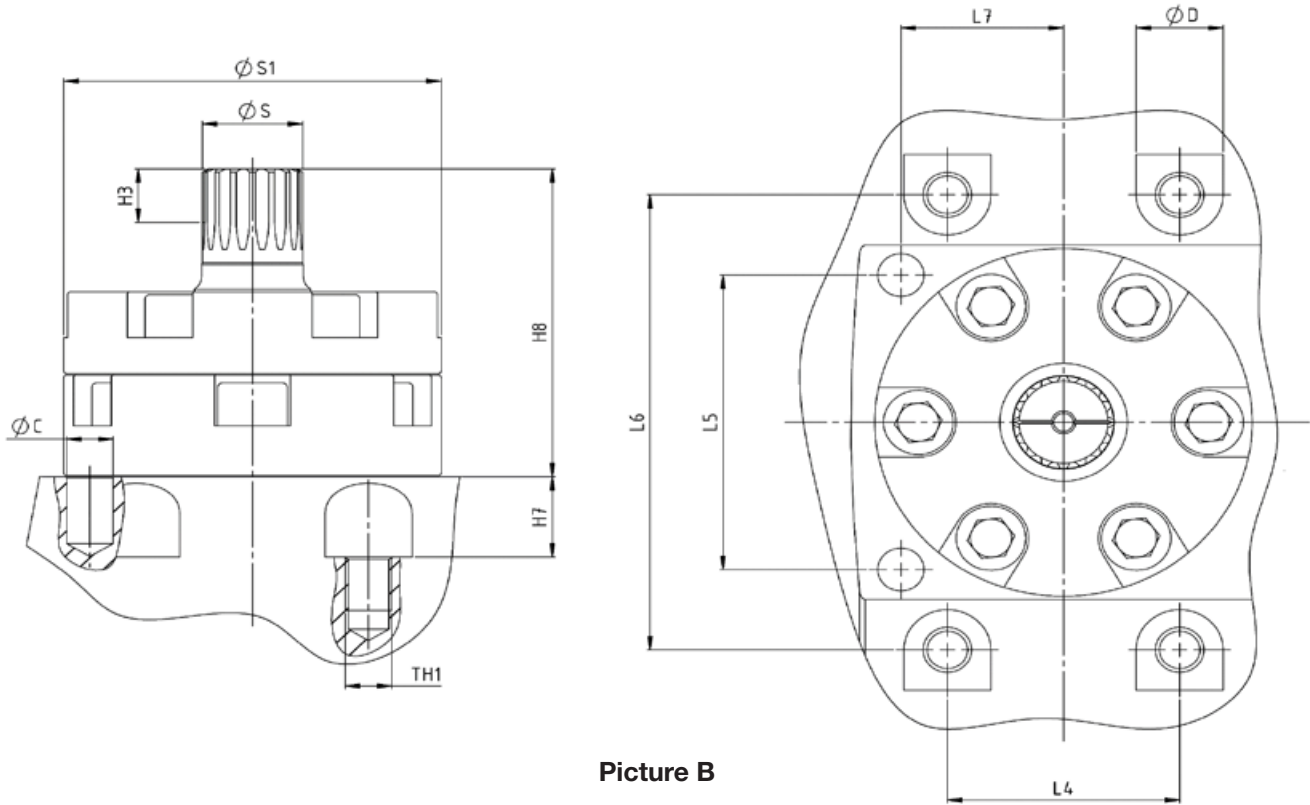
## Dimensions — 3- to 5-in valves — bare stem



Picture A

Operating Head Drawing No.	Picture	ØC [ØH8 - deep] (mm)	ØD (mm)	ØS (mm)	ØS1 (mm)	TH1 [Ø/M - deep] (mm)	L4 [±0.2] (mm)	L5 [±0.02] (mm)	L6 [±0.2] (mm)	L7 [±0.02] (mm)	H3 (mm)	H7 [±0.1] (mm)	H8 (mm)	H9 (mm)	WS (mm)	A1	A2
30004318	A	70	102	28	125	M10-10	-	-	-	-	22	3	30	18	22	45°	4x90°
30004732	A	85	125	33	150	Ø13.5	-	-	-	-	27	3	35	23	27		4x90°
30004758	A	100	140	33	175	Ø17.5	-	-	-	-	27	3	35	23	27	45°	4x90°

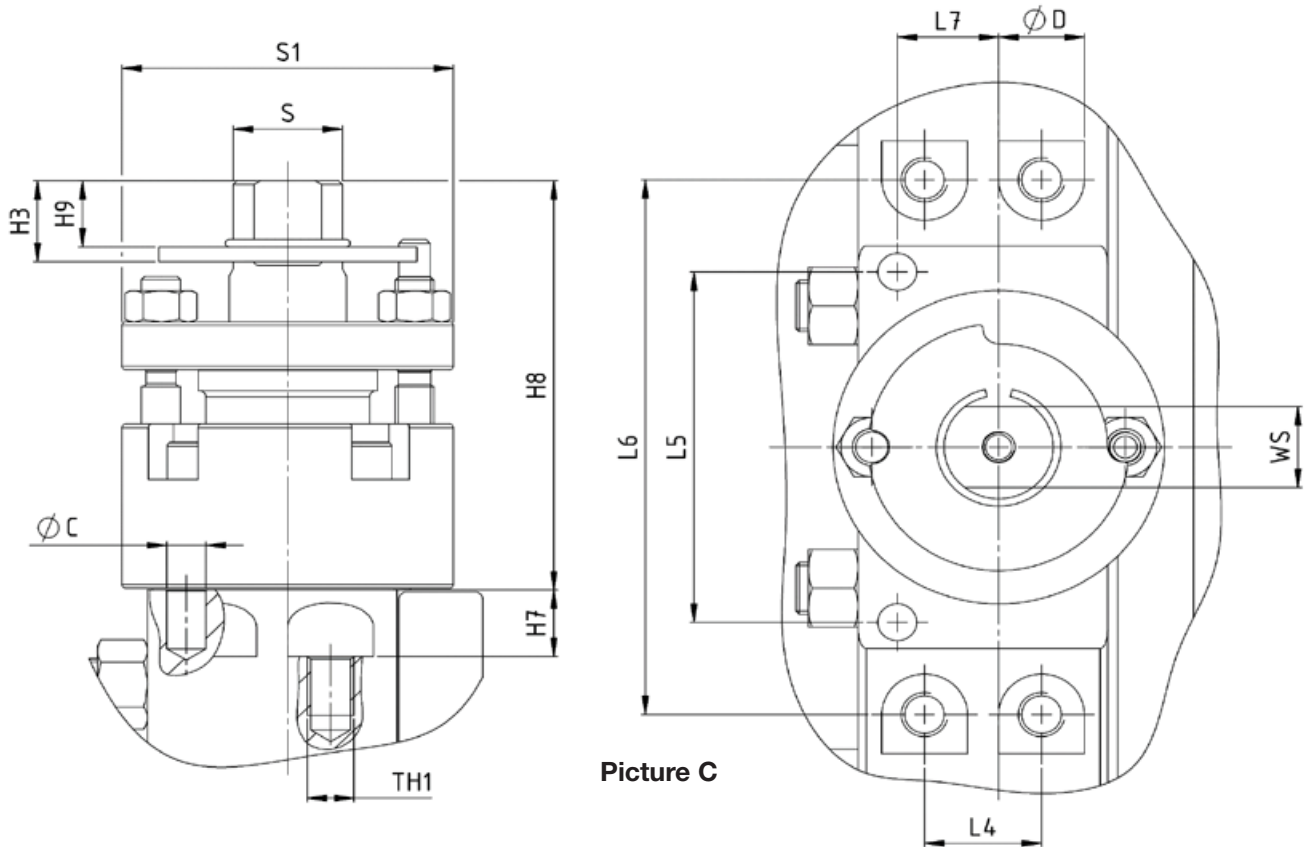
Dimensions — 3- to 5-in valves — bare stem continued



Picture B

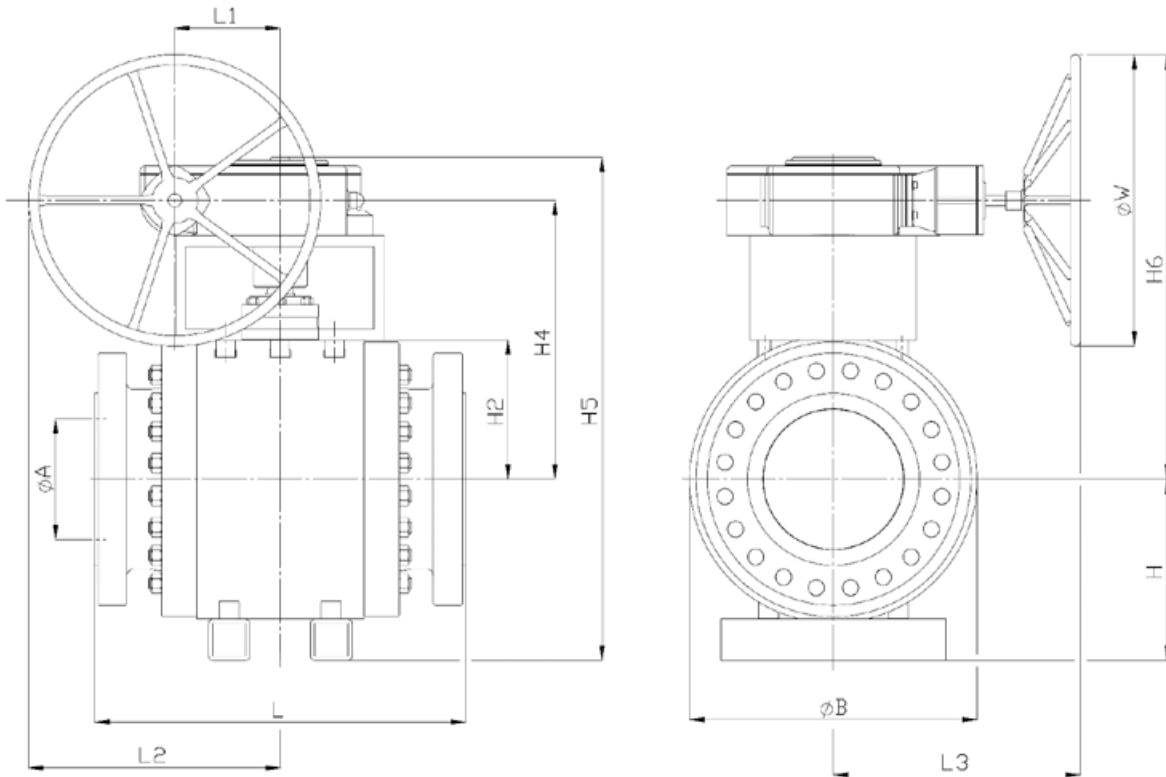
Operating Head Drawing No.	Picture	$\varnothing C$ [ $\varnothing H8$ - deep] (mm)	$\varnothing D$ (mm)	$\varnothing S$ (mm)	$\varnothing S1$ (mm)	TH1 [ $\varnothing/M$ - deep] (mm)	L4 [ $\pm 0.2$ ] (mm)	L5 [ $\pm 0.02$ ] (mm)	L6 [ $\pm 0.2$ ] (mm)	L7 [ $\pm 0.02$ ] (mm)	H3 (mm)	H7 [ $\pm 0.1$ ] (mm)	H8 (mm)	H9	WS	A1	A2
30004418	B	16-25	30	W35x2x16x8f	130	M16-20	80	110	170	56	20	30	120	-	-	-	-
30004565	B	16-25	30	W35x2x16x8f	130	M16-20	80	110	170	56	20	30	115	-	-	-	-

Dimensions — 3- to 5-in valves — bare stem continued



Operating Head Drawing No.	Picture	ØC [ØH8 - deep] (mm)	ØD (mm)	ØS (mm)	ØS1 (mm)	TH1 [Ø/M - deep] (mm)	L4 [±0.2] (mm)	L5 [±0.02] (mm)	L6 [±0.2] (mm)	L7 [±0.02] (mm)	H3 (mm)	H7 [±0.1] (mm)	H8 (mm)	H9 (mm)	WS (mm)	A1	A2
30004575	C	10-16	22	28	85	M12-16	30	95	145	26	22	18	111	18	22	-	-
30004828	C	10-16	22	33	96	M12-16	50	100	150	32	27	22	121	23	27	-	-
30004832	C	10-16	22	28	85	M12-16	30	95	145	26	22	22	111	18	22	-	-
30004835	C	10-16	22	33	96	M12-16	50	100	150	32	27	18	121	23	27	-	-

## Dimensions — 3- to 5-in valves — valve and gear



### ASME Valves to 250°C (482°F)

Valve Design	Size (NPS)	Pressure Class	Long or Short Pattern	Flange	L (mm)	ØA (mm)	ØB (mm)	H (mm)	H2 (mm)	Weight – Valve Only (kg)*
API 6D	3	Class 150	L	RF	203	76	232	116	144	37
API 6D	3	Class 300	L	RF	282	76	235	118	154	55
API 6D	3	Class 600	L	RF	356	76	235	118	154	61
API 6D	3	Class 900	L	RF	381	76	255	128	109	105
API 6D	3	Class 600	L	RTJ	359	76	235	118	154	61
API 6D	3	Class 900	L	RTJ	384	76	255	128	109	105

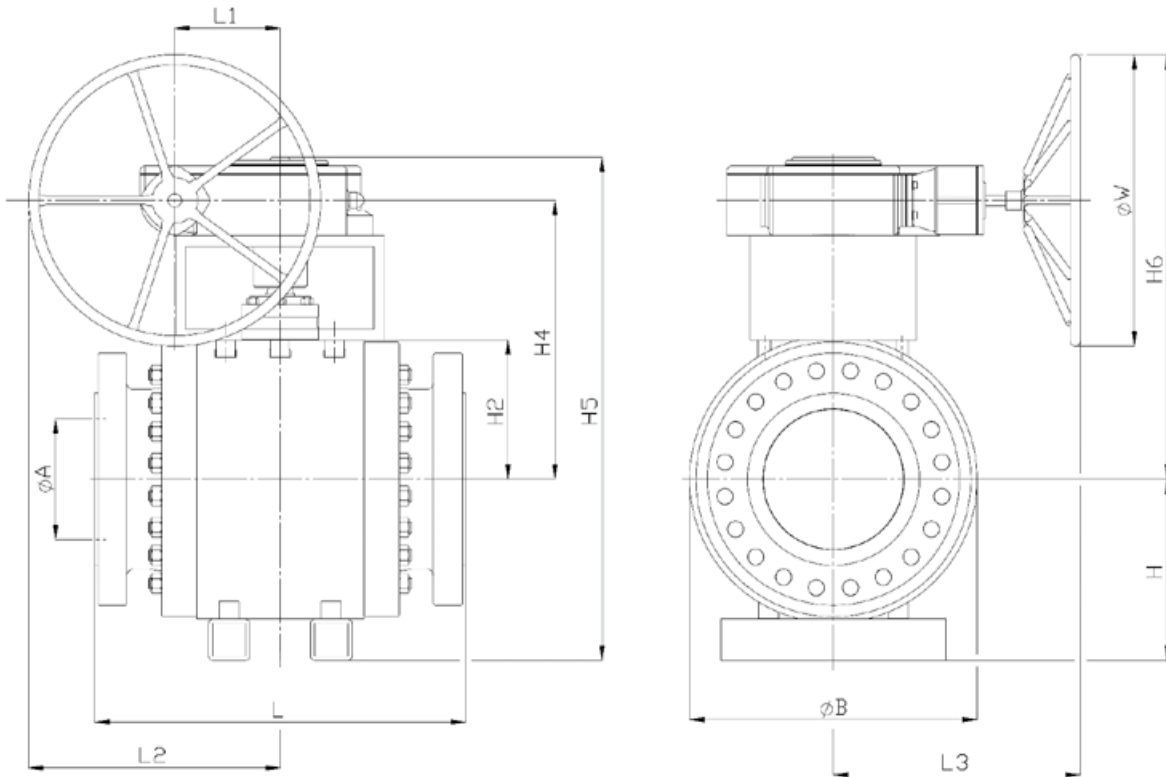
\* "weight valve" = weight valve only (without gear)

Size (NPS)	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight – Gear (kg)**	Total Weight (kg)***
3	Class 150	M50	283	449	433	97	247	326	300	23	60
3	Class 300	M50	293	461	443	97	247	326	300	23	78
3	Class 600	M50	293	461	443	97	247	326	300	23	84
3	Class 900	M100	419	597	619	97	297	326	400	40	145
3	Class 600	M50	293	461	443	97	247	362	300	23	84
3	Class 900	M100	419	597	619	97	297	362	400	40	145

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.

## Dimensions — 3- to 5-in valves — valve and gear continued



### ASME Valves to 250°C (482°F) *continued*

Valve Design	Size (NPS)	Pressure Class	Long or Short Pattern	Flange	L (mm)	ØA (mm)	ØB (mm)	H (mm)	H2 (mm)	Weight – Valve Only (kg)*
API 6D	4	Class 150	L	RF	229	100	260	130	160	51
API 6D	4	Class 300	L	RF	305	100	265	133	170	75
API 6D	4	Class 600	L	RF	432	100	265	133	170	96
API 6D	4	Class 900	L	RF	457	100	280	140	124	144
API 6D	4	Class 600	L	RTJ	435	100	265	133	170	96
API 6D	4	Class 900	L	RTJ	460	100	280	140	124	145

\* "weight valve" = weight valve only (without gear)

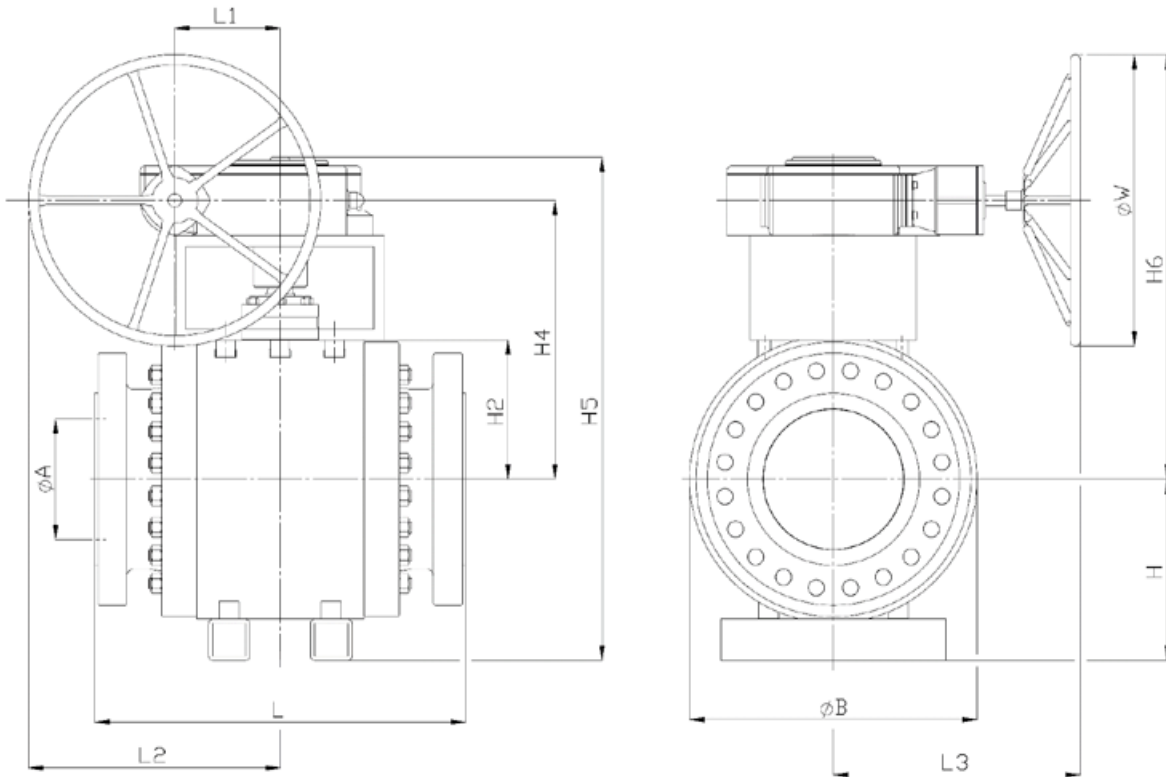
Size (NPS)	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight – Gear (kg)**	Total Weight (kg)***
4	Class 150	M50	299	479	449	97	247	326	300	23	74
4	Class 300	M50	309	492	459	97	247	326	300	23	98
4	Class 600	M50	339	522	489	97	247	326	300	23	119
4	Class 900	M100	434	624	634	97	297	326	400	40	184
4	Class 600	M50	339	522	489	97	247	362	300	23	119
4	Class 900	M100	434	624	634	97	297	362	400	40	185

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.



## Dimensions — 3- to 5-in valves — valve and gear continued



### ASME Valves to 250°C (482°F) continued

Valve Design	Size (NPS)	Pressure Class	Long or Short Pattern	Flange	L (mm)	ØA (mm)	ØB (mm)	H (mm)	H2 (mm)	Weight – Valve Only (kg)*
API 6D	5	Class 150	L	RF	356	128	260	130	160	64
API 6D	5	Class 300	L	RF	381	128	265	133	170	91
API 6D	5	Class 600	L	RF	508	125	265	133	170	129
API 6D	5	Class 900	L	RF	559	120	280	140	124	184
API 6D	5	Class 600	L	RTJ	511	125	265	133	170	130
API 6D	5	Class 900	L	RTJ	562	120	280	140	124	184

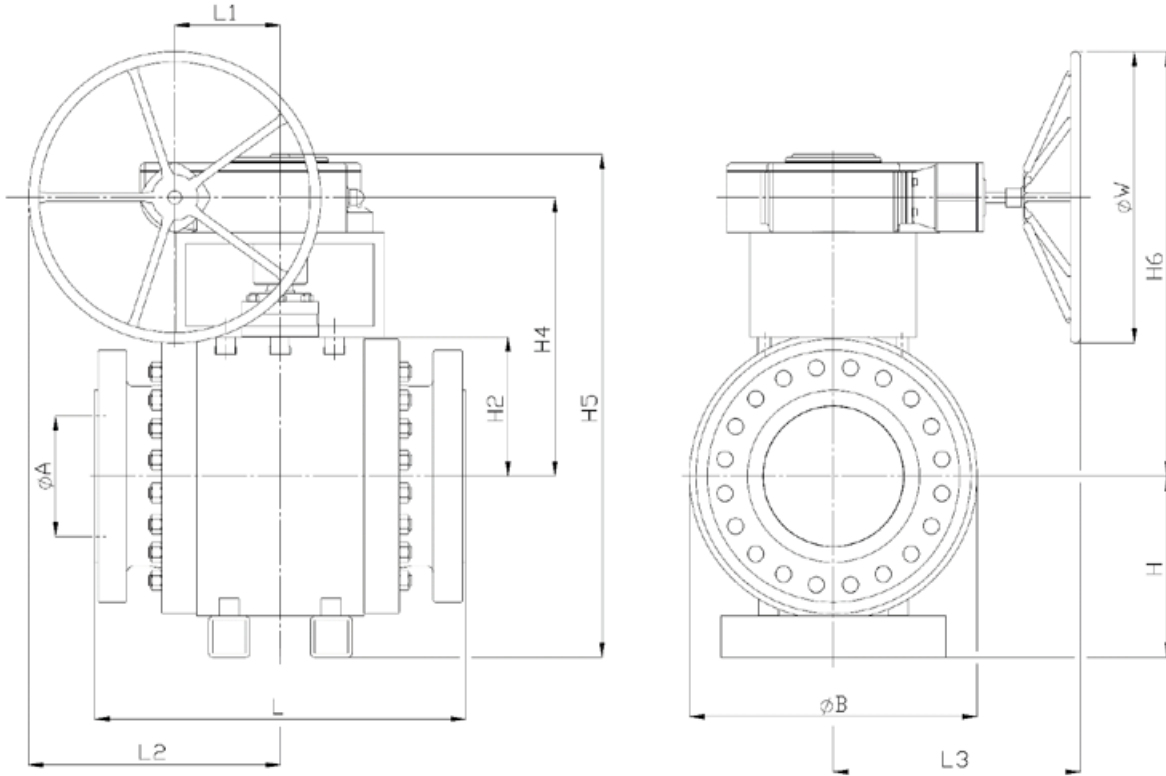
\* "weight valve" = weight valve only (without gear)

Size (NPS)	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight – Gear (kg)**	Total Weight (kg)***
5	Class 150	M50	299	429	449	97	247	326	300	23	87
5	Class 300	M50	309	492	459	97	247	326	300	23	114
5	Class 600	M50	339	522	489	97	247	326	300	23	152
5	Class 900	M100	434	624	634	97	297	326	400	40	224
5	Class 600	M50	339	522	489	97	247	362	300	23	153
5	Class 900	M100	434	624	634	97	297	362	400	40	224

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.

## Dimensions – 3- to 5-in valves – valve and gear continued



### ASME Valves >250°C (482°F)

Valve Design	Size (NPS)	Pressure Class	Long or Short Pattern	Flange	L (mm)	ØA (mm)	ØB (mm)	H (mm)	H2 (mm)	Weight – Valve Only (kg)*
API 6D	3	Class 150	L	RF	203	76	232	116	102	38
API 6D	3	Class 300	L	RF	282	76	235	118	102	56
API 6D	3	Class 600	L	RF	356	76	235	118	102	62
API 6D	3	Class 900	L	RF	381	76	255	128	109	106
API 6D	3	Class 600	L	RTJ	359	76	235	118	102	62
API 6D	3	Class 900	L	RTJ	384	76	255	128	109	106

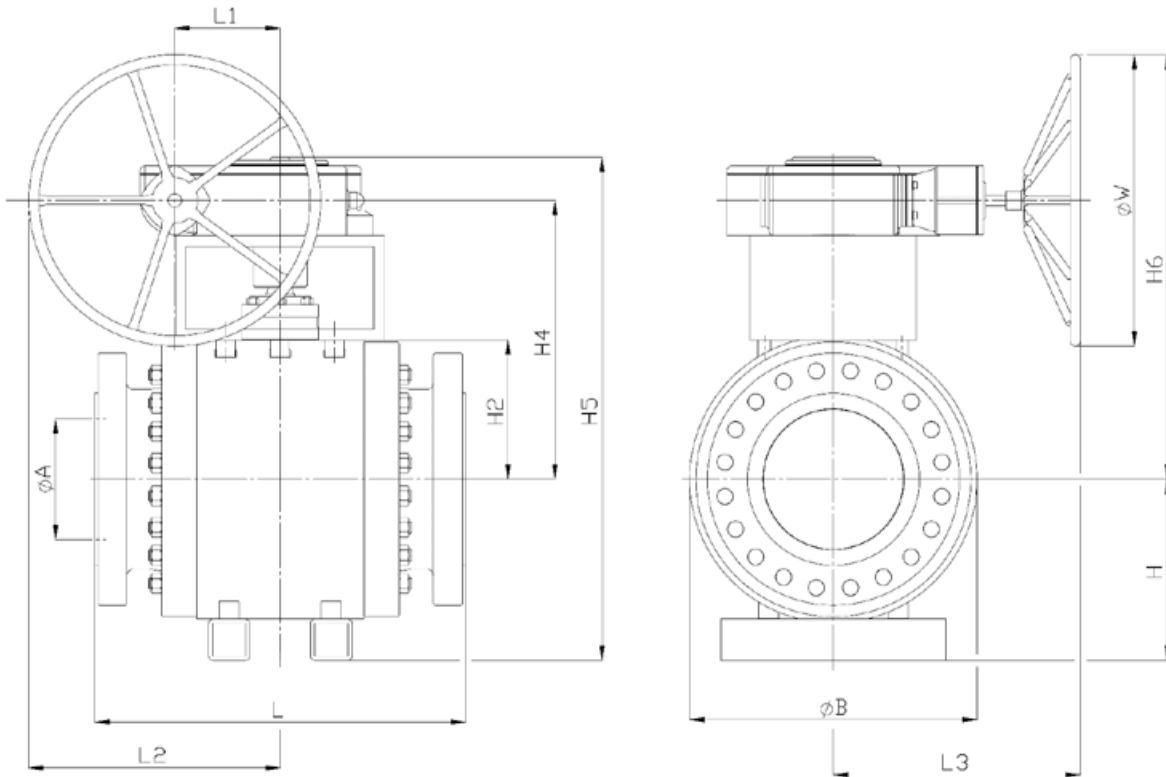
\* "weight valve" = weight valve only (without gear)

Size (NPS)	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight – Gear (kg)**	Total Weight (kg)***
3	Class 150	M50	372	538	522	97	247	326	300	23	61
3	Class 300	M50	412	580	562	97	247	326	300	23	79
3	Class 600	M50	412	580	562	97	247	326	300	23	85
3	Class 900	M100	419	597	619	97	297	326	400	40	146
3	Class 600	M50	412	580	562	97	247	457	300	23	85
3	Class 900	M100	419	597	619	97	297	362	400	40	146

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.

## Dimensions – 3- to 5-in valves – valve and gear continued



### ASME Valves >250°C (482°F) continued

Valve Design	Size (NPS)	Pressure Class	Long or Short Pattern	Flange	L (mm)	ØA (mm)	ØB (mm)	H (mm)	H2 (mm)	Weight – Valve Only (kg)*
API 6D	4	Class 150	L	RF	229	100	260	130	118	52
API 6D	4	Class 300	L	RF	305	100	265	133	118	77
API 6D	4	Class 600	L	RF	432	100	265	133	118	94
API 6D	4	Class 900	L	RF	457	100	280	140	124	146
API 6D	4	Class 600	L	RTJ	435	100	265	133	118	94
API 6D	4	Class 900	L	RTJ	460	100	280	140	124	147

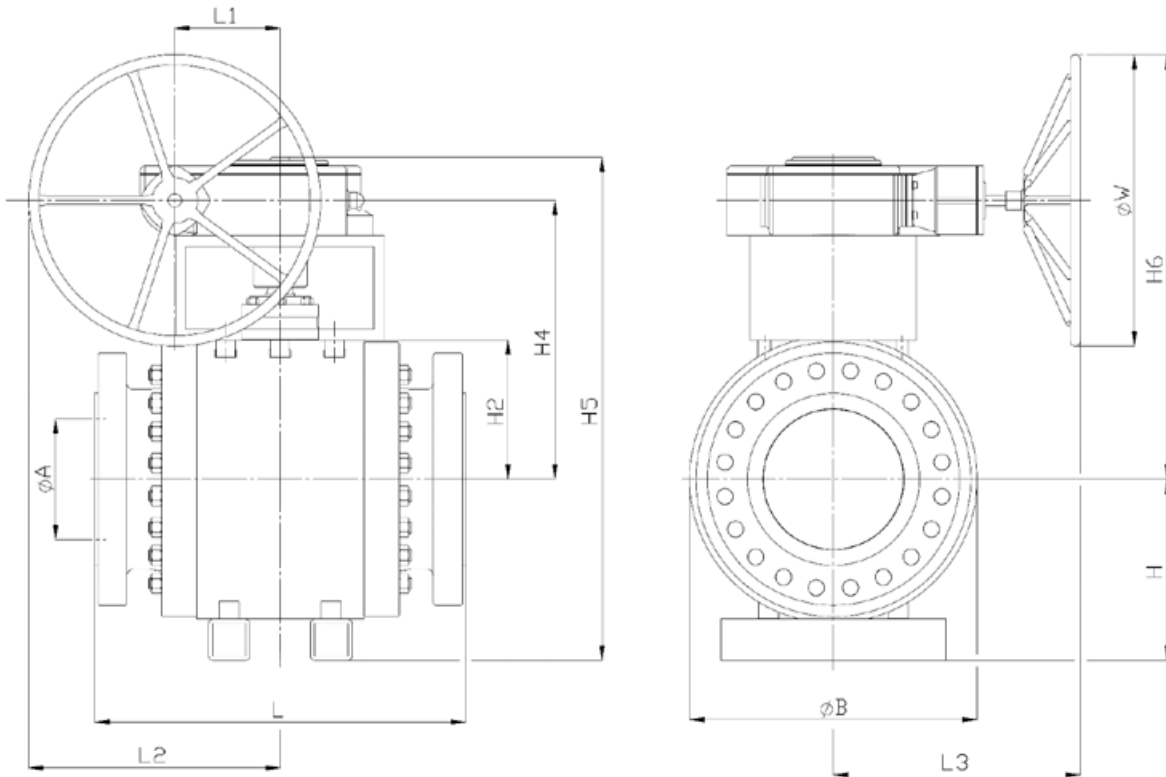
\* "weight valve" = weight valve only (without gear)

Size (NPS)	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight – Gear (kg)**	Total Weight (kg)***
4	Class 150	M50	388	568	538	97	247	326	300	23	75
4	Class 300	M50	428	611	578	97	247	326	300	23	100
4	Class 600	M50	428	611	578	97	247	326	300	23	117
4	Class 900	M200	439	652	739	138	438	326	600	55	201
4	Class 600	M50	428	611	578	97	247	457	300	23	117
4	Class 900	M200	439	652	739	0	300	362	600	55	202

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.

## Dimensions — 3- to 5-in valves — valve and gear continued



### ASME Valves >250°C (482°F) continued

Valve Design	Size (NPS)	Pressure Class	Long or Short Pattern	Flange	L (mm)	ØA (mm)	ØB (mm)	H (mm)	H2 (mm)	Weight – Valve Only (kg)*
API 6D	5	Class 150	L	RF	356	128	260	130	118	65
API 6D	5	Class 300	L	RF	381	128	265	133	118	92
API 6D	5	Class 600	L	RF	508	125	265	133	118	130
API 6D	5	Class 900	L	RF	559	120	280	140	124	186
API 6D	5	Class 600	L	RTJ	511	125	265	133	118	131
API 6D	5	Class 900	L	RTJ	562	120	280	140	124	187

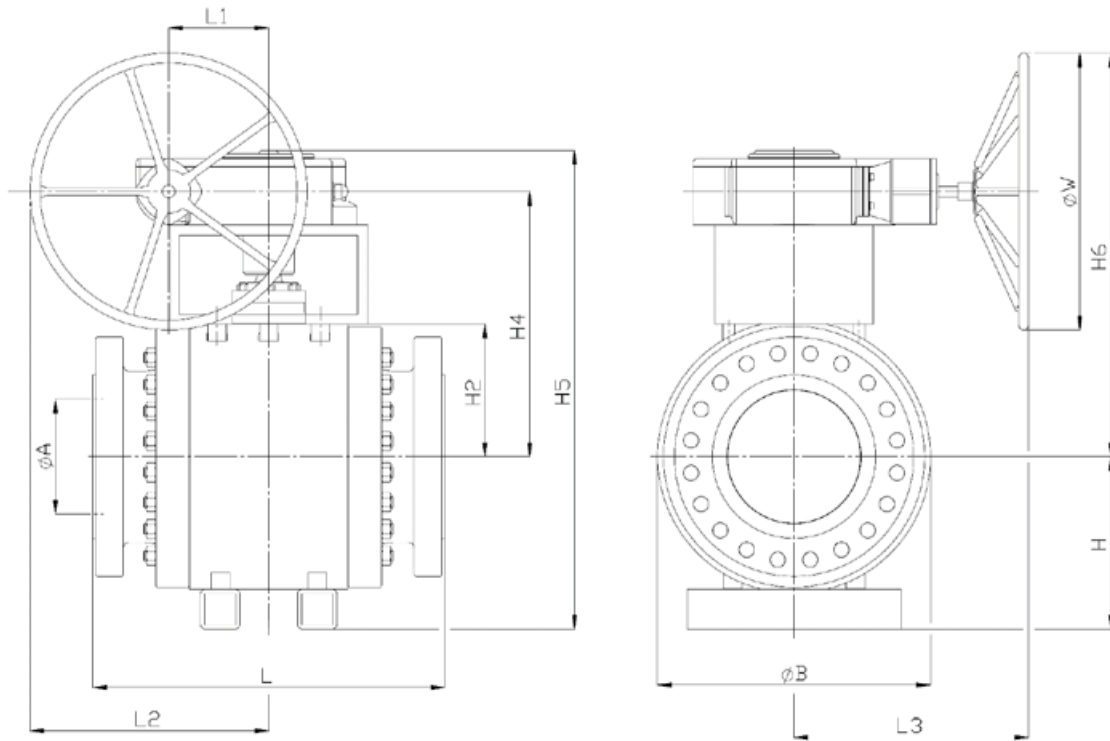
\* "weight valve" = weight valve only (without gear)

Size (NPS)	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight – Gear (kg)**	Total Weight (kg)***
5	Class 150	M50	388	568	538	97	247	326	300	23	88
5	Class 300	M50	388	571	538	97	247	326	300	23	115
5	Class 600	M50	428	611	578	97	247	326	300	23	153
5	Class 900	M200	439	652	739	138	438	326	600	55	241
5	Class 600	M50	428	611	578	97	247	457	300	23	154
5	Class 900	M200	439	652	739	138	438	362	600	55	242

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.

## Dimensions — 3- to 5-in valves — valve and gear continued



### DIN Valves to 250°C (482°F)

Valve Design	Size (NPS)	Pressure Class	Long or Short Pattern	Flange	L (mm)	ØA (mm)	ØB (mm)	H (mm)	H2 (mm)	Weight – Valve Only (kg)*
API 6D	80	PN 16	S	RF	182	76	232	116	144	36
API 6D	80	PN 16	L	RF	310	76	232	116	144	43
API 6D	80	PN 40	S	RF	182	76	232	116	144	37
API 6D	80	PN 40	L	RF	310	76	232	116	144	44
API 6D	80	PN 63	L	RF	310	76	235	118	154	56
API 6D	80	PN 100	L	RF	310	76	235	118	154	63
API 6D	80	PN 160	L	RF	380	76	255	128	109	100

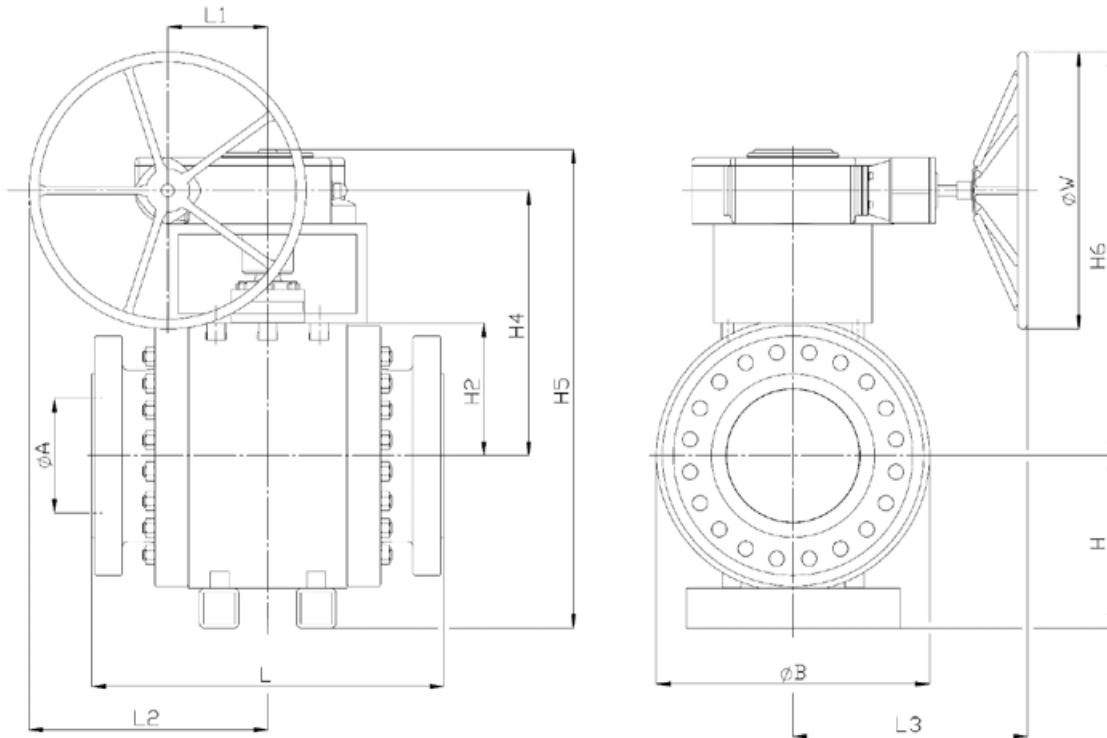
\* "weight valve" = weight valve only (without gear)

Size (NPS)	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight – Gear (kg)**	Total Weight (kg)***
80	PN 16	M50	283	449	433	97	247	326	300	23	59
80	PN 16	M50	283	449	433	97	247	326	300	23	66
80	PN 40	M50	283	449	433	97	247	326	300	23	60
80	PN 40	M50	283	449	433	97	247	326	300	23	67
80	PN 63	M50	293	461	443	97	247	326	300	23	79
80	PN 100	M50	293	461	443	97	247	326	300	23	86
80	PN 160	M100	419	597	619	97	297	362	400	40	140

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.

## Dimensions — 3- to 5-in valves — valve and gear continued


**DIN Valves to 250°C (482°F) continued**

Valve Design	Size (NPS)	Pressure Class	Long or Short Pattern	Flange	L (mm)	ØA (mm)	ØB (mm)	H (mm)	H2 (mm)	Weight – Valve Only (kg)*
API 6D	100	PN 16	S	RF	192	100	260	130	160	44
API 6D	100	PN 16	L	RF	350	100	260	130	160	57
API 6D	100	PN 40	S	RF	192	100	260	130	160	46
API 6D	100	PN 40	L	RF	350	100	260	130	160	57
API 6D	100	PN 63	L	RF	350	100	265	133	170	75
API 6D	100	PN 100	L	RF	350	100	265	133	170	86
API 6D	100	PN 160	L	RF	430	100	280	140	124	130

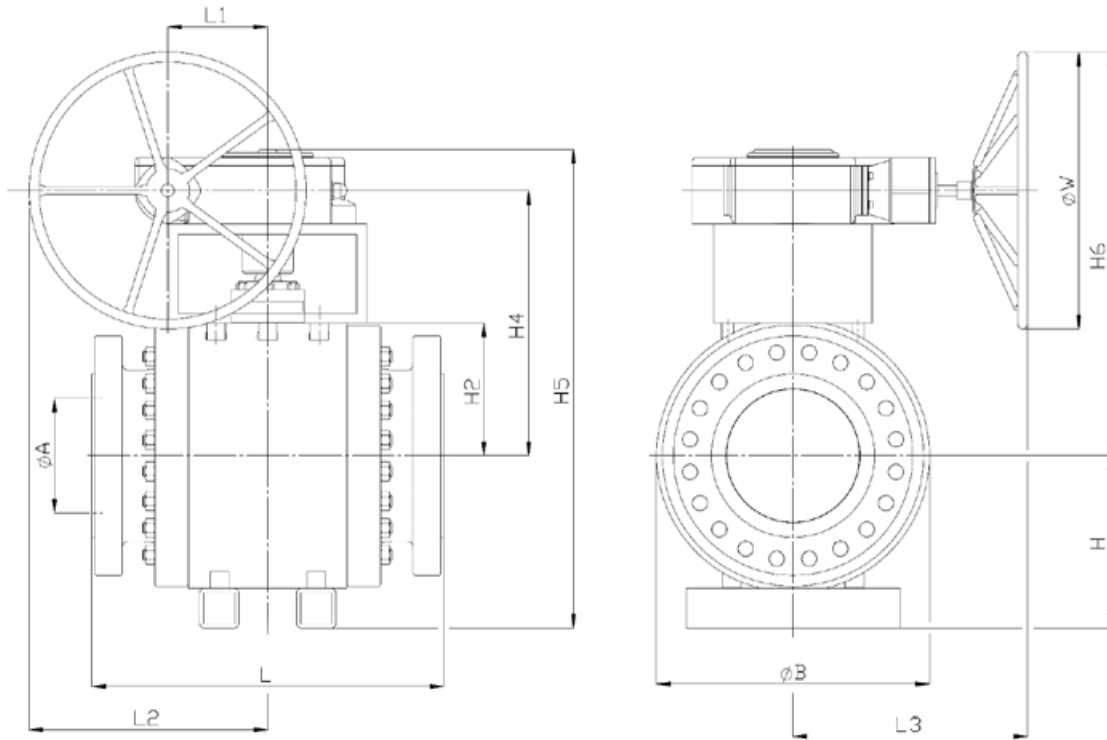
\* "weight valve" = weight valve only (without gear)

Size (NPS)	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight – Gear (kg)**	Total Weight (kg)***
100	PN 16	M50	299	479	449	97	247	326	300	23	67
100	PN 16	M50	299	479	449	97	247	326	300	23	80
100	PN 40	M50	299	479	449	97	247	326	300	23	69
100	PN 40	M50	299	479	449	97	247	326	300	23	80
100	PN 63	M50	309	492	459	97	247	326	300	23	98
100	PN 100	M50	339	522	489	97	247	326	300	23	109
100	PN 160	M100	434	624	634	97	297	362	400	40	170

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.

## Dimensions — 3- to 5-in valves — valve and gear continued


**DIN Valves to 250°C (482°F)** *continued*

Valve Design	Size (NPS)	Pressure Class	Long or Short Pattern	Flange	L (mm)	ØA (mm)	ØB (mm)	H (mm)	H2 (mm)	Weight – Valve Only (kg)*
API 6D	125	PN 16	S	RF	325	132	260	130	160	62
API 6D	125	PN 16	L	RF	400	132	260	130	160	65
API 6D	125	PN 40	S	RF	325	132	260	130	160	66
API 6D	125	PN 40	L	RF	400	132	260	130	160	69
API 6D	125	PN 63	L	RF	400	131	265	133	170	93
API 6D	125	PN 100	L	RF	400	127	265	133	170	107
API 6D	125	PN 160	L	RF	500	120	280	140	124	155

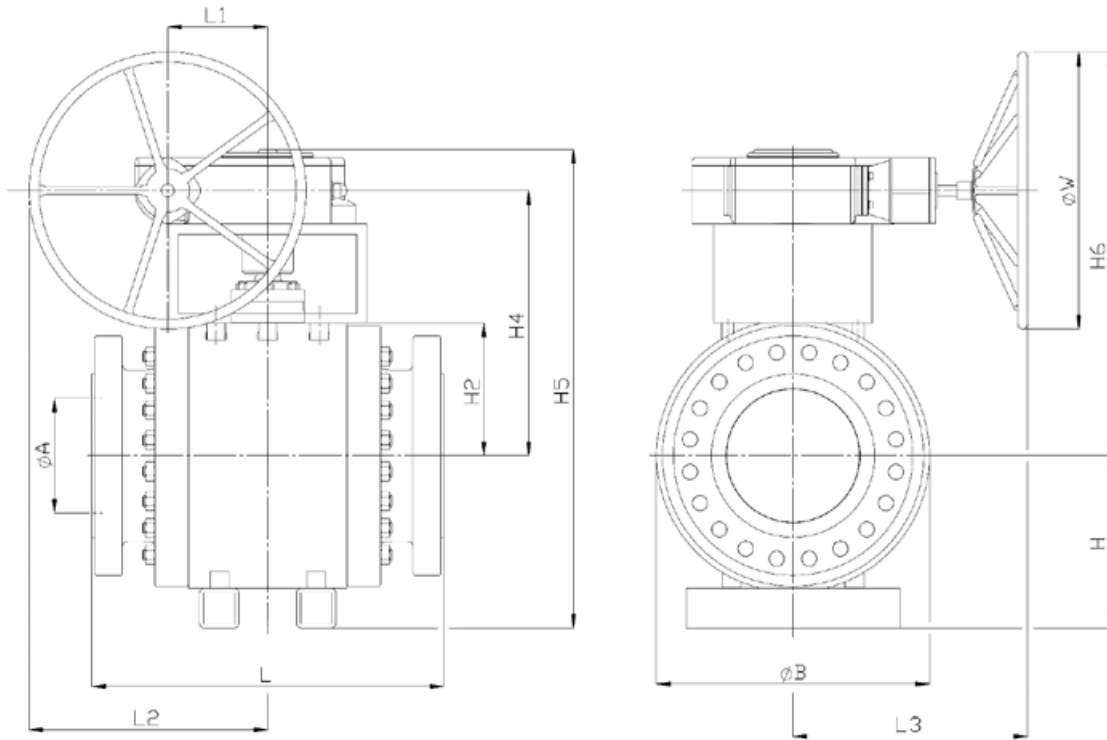
\* "weight valve" = weight valve only (without gear)

Size (NPS)	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight – Gear (kg)**	Total Weight (kg)***
125	PN 16	M50	299	479	449	97	247	326	300	23	85
125	PN 16	M50	299	479	449	97	247	326	300	23	88
125	PN 40	M50	299	479	449	97	247	326	300	23	89
125	PN 40	M50	299	479	449	97	247	326	300	23	92
125	PN 63	M50	309	492	459	97	247	326	300	23	116
125	PN 100	M50	339	522	489	97	247	326	300	23	130
125	PN 160	M100	434	624	634	97	297	362	400	40	195

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.

## Dimensions — 3- to 5-in valves — valve and gear continued



### DIN Valves >250°C (482°F)

Valve Design	Size (NPS)	Pressure Class	Long or Short Pattern	Flange	L (mm)	ØA (mm)	ØB (mm)	H (mm)	H2 (mm)	Weight – Valve Only (kg)*
API 6D	80	PN 16	S	RF	182	76	232	116	102	37
API 6D	80	PN 16	L	RF	310	76	232	116	102	44
API 6D	80	PN 40	S	RF	182	76	232	116	102	38
API 6D	80	PN 40	L	RF	310	76	232	116	102	46
API 6D	80	PN 63	L	RF	310	76	235	118	102	57
API 6D	80	PN 100	L	RF	310	76	235	118	102	64
API 6D	80	PN 160	L	RF	380	76	255	128	109	101

\* "weight valve" = weight valve only (without gear)

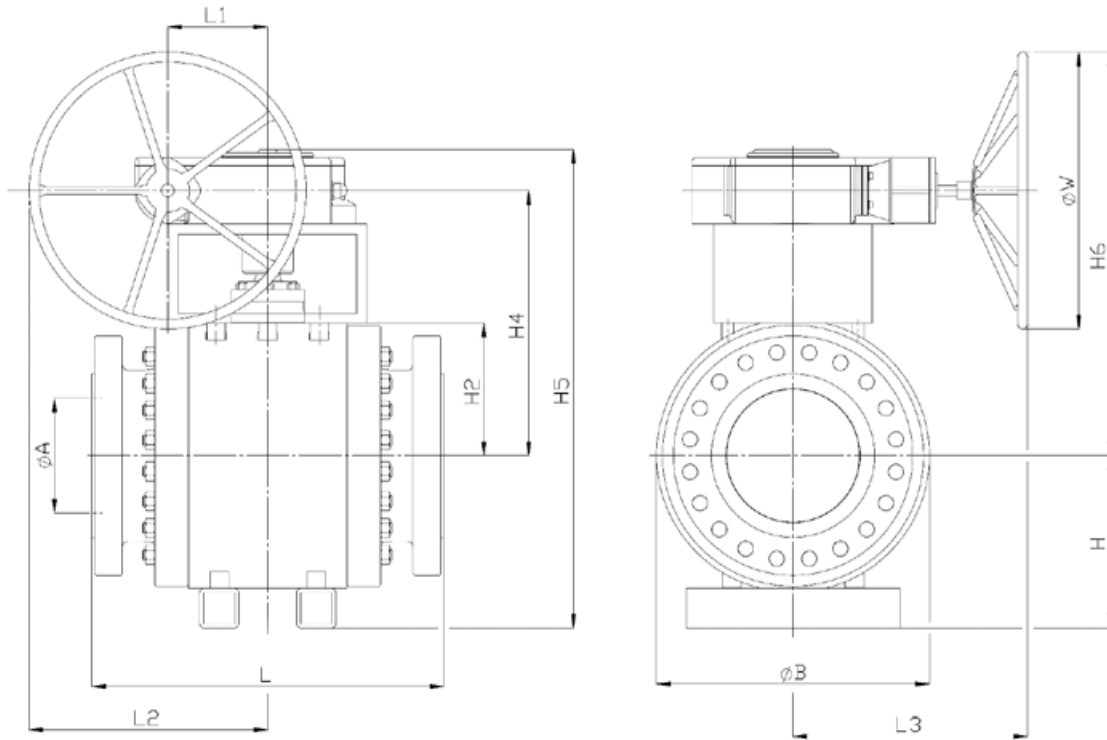
Size (NPS)	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight – Gear (kg)**	Total Weight (kg)***
80	PN 16	M50	372	538	522	97	247	326	300	23	60
80	PN 16	M50	372	538	522	97	247	326	300	23	67
80	PN 40	M50	372	538	522	97	247	326	300	23	61
80	PN 40	M50	372	538	522	97	247	326	300	23	69
80	PN 63	M50	412	580	562	97	247	326	300	23	80
80	PN 100	M50	412	580	562	97	247	326	300	23	87
80	PN 160	M200	424	625	724	138	438	457	600	55	156

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.



## Dimensions — 3- to 5-in valves — valve and gear continued


**DIN Valves >250°C (482°F) continued**

Valve Design	Size (NPS)	Pressure Class	Long or Short Pattern	Flange	L (mm)	ØA (mm)	ØB (mm)	H (mm)	H2 (mm)	Weight – Valve Only (kg)*
API 6D	100	PN 16	S	RF	192	100	260	130	118	45
API 6D	100	PN 16	L	RF	350	100	260	130	118	56
API 6D	100	PN 40	S	RF	192	100	260	130	118	47
API 6D	100	PN 40	L	RF	350	100	260	130	118	61
API 6D	100	PN 63	L	RF	350	100	265	133	118	77
API 6D	100	PN 100	L	RF	350	100	265	133	118	87
API 6D	100	PN 160	L	RF	430	100	280	140	124	132

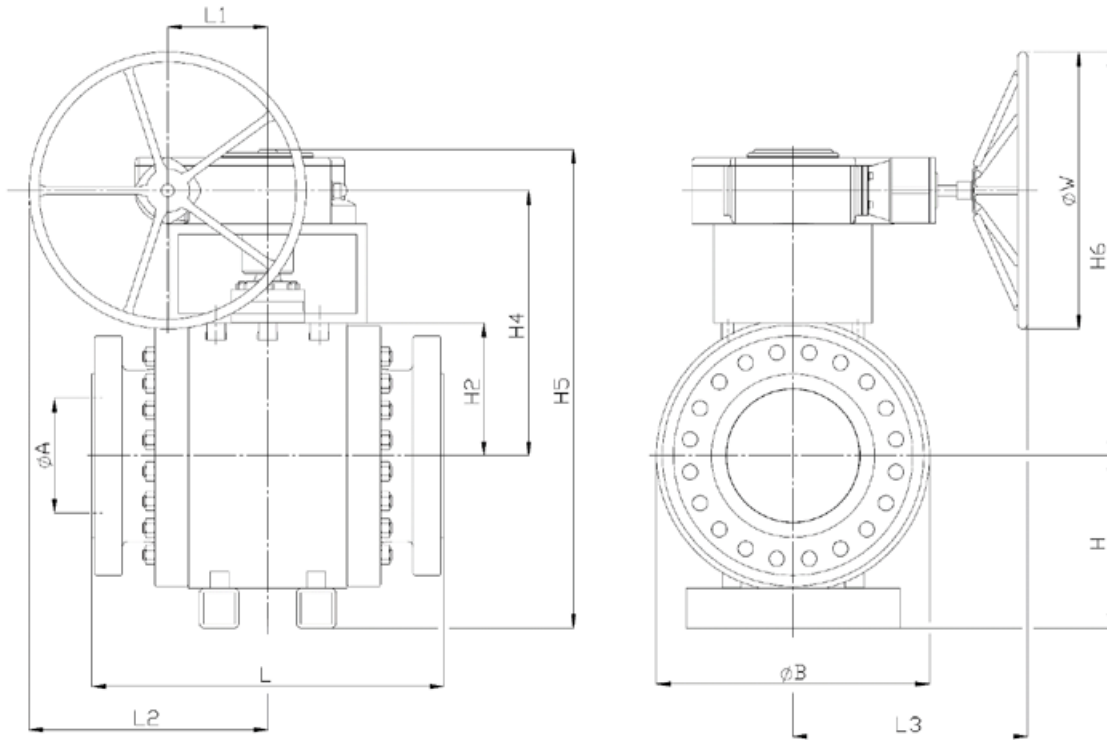
\* "weight valve" = weight valve only (without gear)

Size (NPS)	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight – Gear (kg)**	Total Weight (kg)***
100	PN 16	M50	388	568	538	97	247	326	300	23	68
100	PN 16	M50	388	568	538	97	247	326	300	23	79
100	PN 40	M50	388	568	538	97	247	326	300	23	70
100	PN 40	M50	388	568	538	97	247	326	300	23	84
100	PN 63	M50	428	611	578	97	247	326	300	23	100
100	PN 100	M100	428	611	628	97	297	326	400	23	110
100	PN 160	M200	439	652	739	138	438	457	600	55	187

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.

## Dimensions — 3- to 5-in valves — valve and gear continued



### DIN Valves >250°C (482°F) continued

Valve Design	Size (NPS)	Pressure Class	Long or Short Pattern	Flange	L (mm)	ØA (mm)	ØB (mm)	H (mm)	H2 (mm)	Weight – Valve Only (kg)*
API 6D	125	PN 16	S	RF	325	132	260	130	118	63
API 6D	125	PN 16	L	RF	400	132	260	130	118	66
API 6D	125	PN 40	S	RF	325	132	260	130	118	67
API 6D	125	PN 40	L	RF	400	132	260	130	118	70
API 6D	125	PN 63	L	RF	400	131	265	133	118	95
API 6D	125	PN 100	L	RF	400	127	265	133	118	108
API 6D	125	PN 160	L	RF	500	120	280	140	124	157

\* "weight valve" = weight valve only (without gear)

Size (NPS)	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight – Gear (kg)**	Total Weight (kg)***
125	PN 16	M50	388	568	538	97	247	326	300	23	86
125	PN 16	M50	388	568	538	97	247	326	300	23	89
125	PN 40	M50	388	568	538	97	247	326	300	23	90
125	PN 40	M50	388	568	538	97	247	326	300	23	93
125	PN 63	M50	428	611	578	97	247	326	300	23	118
125	PN 100	M100	428	611	628	97	297	326	400	23	131
125	PN 160	M200	439	652	739	138	438	457	600	55	212

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.

## Dimensions — 3- to 5-in valves — mounting brackets

### ASME Valves to 250°C (482°F)

Valve Design	Max. Torque (Nm)	Type of Gear*	Connection Gear	Height of Gear (mm)
API 6D	1000	M50 (Q2000)	F14	100
API 6D	2000	M100 (Q2000)	F14	100
API 6D	4000	M200 (Q4000)	F16	128

Type of Gear*	Height of Mounting Bracket (mm)											
	NPS 3				NPS 4				NPS 5 [4]			
	Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900
M50 (Q2000)	89	89	89	-	89	89	119	-	89	89	119	-
M100 (Q2000)	-	-	-	260	-	-	-	260	-	-	-	260
M200 (Q4000)	-	-	-	-	-	-	-	-	-	-	-	-

### ASME Valves — 251°C to 400°C (484°F to 752°F)

Valve Design	Max. Torque (Nm)	Type of Gear*	Connection Gear	Height of Gear (mm)
API 6D	1000	M50 (Q2000)	F14	100
API 6D	2000	M100 (Q2000)	F14	100
API 6D	4000	M200 (Q4000)	F16	128

Type of Gear*	Height of Mounting Bracket (mm)											
	NPS 3				NPS 4				NPS 5 [4]			
	Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900
M50 (Q2000)	220	260	260	-	220	260	260	-	220	220	260	-
M100 (Q2000)	-	-	-	260	-	-	-	-	-	-	-	-
M200 (Q4000)	-	-	-	-	-	-	-	260	-	-	-	260

\*Manufacturer: Pro-Gear

## Dimensions – 3- to 5-in valves – mounting brackets continued

### DIN Valves to 250°C (482°F)

Valve Design	Max. Torque (Nm)	Type of Gear*	Connection Gear	Height of Gear (mm)
API 6D	1000	M50 (Q2000)	F14	100
API 6D	2000	M100 (Q2000)	F14	100
API 6D	4000	M200 (Q4000)	F16	128

Type of Gear*	Height of Mounting Bracket (mm)											
	DN 80				DN 100				DN 125 [100]			
	PN 16 + PN 40	PN 63	PN 100	PN 160	PN 16 + PN 40	PN 63	PN 100	PN 160	PN 16 + PN 40	PN 63	PN 100	PN 160
M50 (Q2000)	89	89	89	-	89	89	119	-	89	89	119	-
M100 (Q2000)	-	-	-	260	-	-	-	260	-	-	-	260
M200 (Q4000)	-	-	-	-	-	-	-	-	-	-	-	-

### DIN Valves – 251°C to 400°C (484°F to 752°F)

Valve Design	Max. Torque (Nm)	Type of Gear*	Connection Gear	Height of Gear (mm)
API 6D	1000	M50 (Q2000)	F14	100
API 6D	2000	M100 (Q2000)	F14	100
API 6D	4000	M200 (Q4000)	F16	128

Type of Gear*	Height of Mounting Bracket (mm)											
	DN 80				DN 100				DN 125 [100]			
	PN 16 + PN 40	PN 63	PN 100	PN 160	PN 16 + PN 40	PN 63	PN 100	PN 160	PN 16 + PN 40	PN 63	PN 100	PN 160
M50 (Q2000)	220	260	260	-	220	260	-	-	220	260	-	-
M100 (Q2000)	-	-	-	-	-	-	260	-	-	-	260	-
M200 (Q4000)	-	-	-	260	-	-	-	260	-	-	-	260

\*Manufacturer: Pro-Gear

## Dimensions – 3- to 5-in valves – mounting brackets continued

### ASME Valves to 250°C (482°F)

Type of Gear*	Weight of Mounting Bracket + Coupling (kg)											
	NPS 3				NPS 4				NPS 5 [4]			
	Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900
M50 (Q2000)	6.2	6.2	6.2	-	6.2	6.2	15.5	-	6.2	6.2	15.5	-
M100 (Q2000)				23				19.3				19.3
M200 (Q4000)												

### ASME Valves – 251°C to 400°C (484°F to 752°F)

Type of Gear*	Weight of Mounting Bracket + Coupling (kg)											
	NPS 3				NPS 4				NPS 5 [4]			
	Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900
M50 (Q2000)	9.8	19.3	19.3		9.8	19.3	19.3		9.8	19.3	19.3	
M100 (Q2000)												
M200 (Q4000)				23				23				23

### DIN Valves to 250°C (482°F)

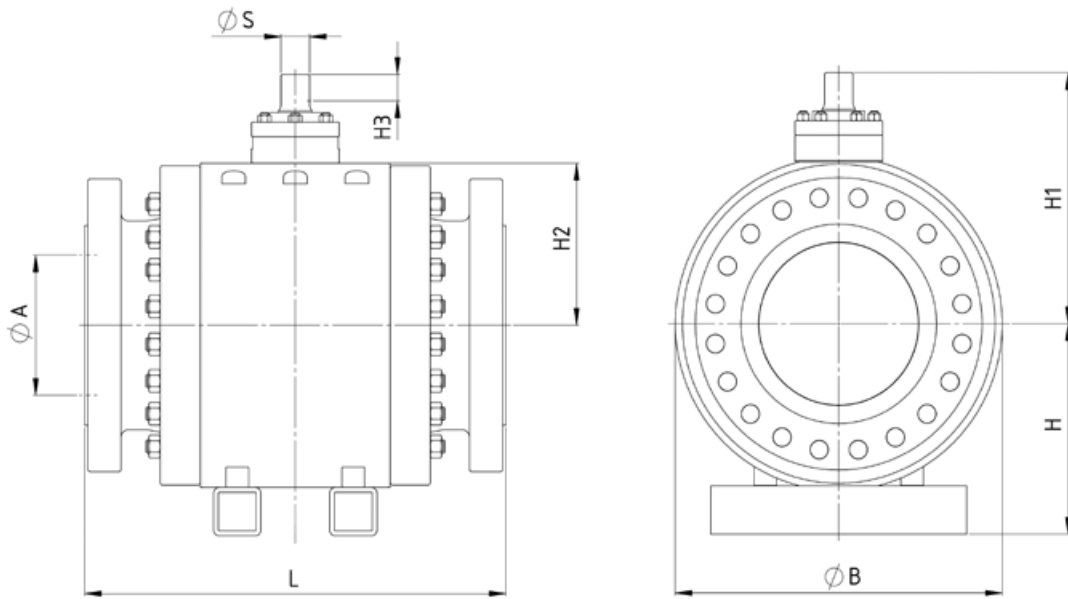
Type of Gear*	Height of Mounting Bracket (mm)											
	DN 80				DN 100				DN 125 [100]			
	PN 16 + PN 40	PN 63	PN 100	PN 160	PN 16 + PN 40	PN 63	PN 100	PN 160	PN 16 + PN 40	PN 63	PN 100	PN 160
M50 (Q2000)	6.2	6.2	6.2	-	6.2	6.2	15.5	-	6.2	6.2	15.5	-
M100 (Q2000)				23				19.3				19.3
M200 (Q4000)												

### DIN Valves – 251°C to 400°C (484°F to 752°F)

Type of Gear*	Height of Mounting Bracket (mm)											
	DN 80				DN 100				DN 125 [100]			
	PN 16 + PN 40	PN 63	PN 100	PN 160	PN 16 + PN 40	PN 63	PN 100	PN 160	PN 16 + PN 40	PN 63	PN 100	PN 160
M50 (Q2000)	9.8	19.3	19.3		9.8	19.3	19.3	-	9.8	19.3	19.3	
M100 (Q2000)												
M200 (Q4000)				23				19.3				19.3

\*Manufacturer: Pro-Gear

## Dimensions – 6- to 12-in valves

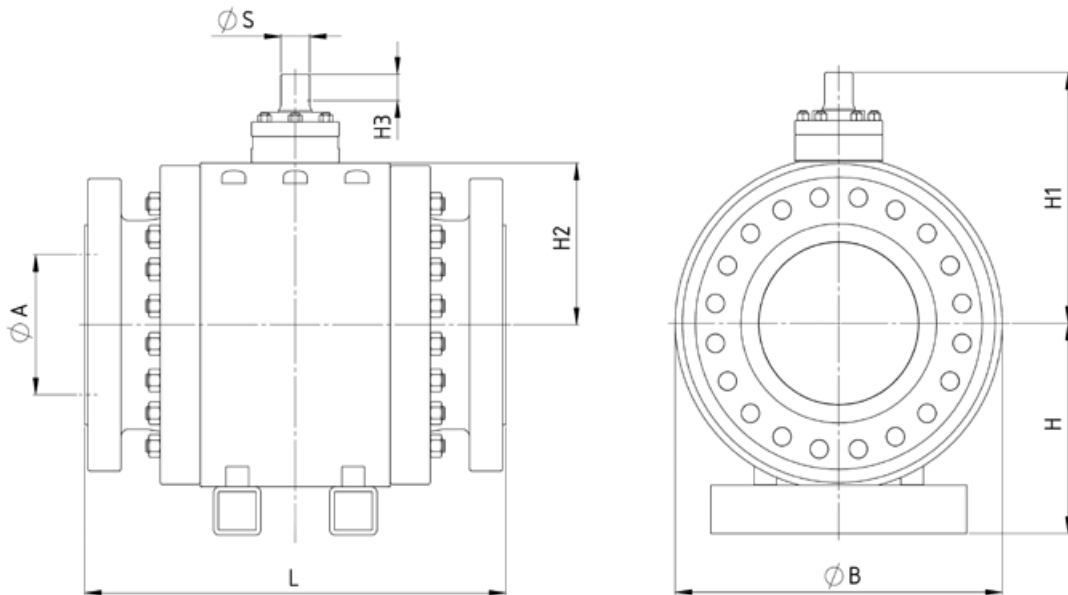


### ASME Valves

Valve Design	NPS	Long or Short Pattern	Pressure Class	Valve Number	Valve Code	Dimensional Drawing No.	Operating Head Drawing No.	Weight (kg)	L (mm) (D3)		ØA (mm)	ØB (mm)	H (D4) (mm)	H1 (mm)	H2 (D19) (mm)	H3 (mm)	ØS (mm)
									RF	RTJ							
API 6D	6	-	Class 150	767354	1405D2C552	30006048	30005944	167	394	-	150	380	190	269	225	34	43
API 6D	6	-	Class 150	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	6	-	Class 300	767364	1405D2C552	30006033	30005944	184	403	-	150	380	190	269	225	34	43
API 6D	6	-	Class 300	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	6	-	Class 600	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	6	-	Class 600	767374	1D0VD4C552	30005943	30005944	236	559	-	150	380	190	269	225	34	43
API 6D	6	-	Class 900	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	6	-	Class 900	767386	1D0VD4C552	CF	CF	342	610	-	150	385	192.5	CF	180	CF	CF
API 6D	6	-	Class 600	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	6	-	Class 600	767398	1D0VD4C552	30006195	30005944	236	-	562	150	380	190	269	225	34	43
API 6D	6	-	Class 900	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	6	-	Class 900	767410	1D0VD4C552	CF	CF	342	-	613	150	385	192.5	CF	180	CF	CF
API 6D	8	-	Class 150	767422	1405D2C552	30005959	30005737	268	457	-	202	450	225	322	272	40	53
API 6D	8	-	Class 150	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	8	-	Class 300	767432	1405D2C552	30005957	30005737	304	502	-	202	450	225	322	272	40	53
API 6D	8	-	Class 300	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	8	-	Class 600	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	8	-	Class 600	767442	1D0VD4C552	30005736	30005737	377	660	-	202	450	225	322	205	40	53
API 6D	8	-	Class 900	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	8	-	Class 900	767454	1D0VD4C552	CF	CF	542	737	-	202	470	235	CF	235	CF	CF
API 6D	8	-	Class 600	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	8	-	Class 600	767466	1D0VD4C552	30005974	30005737	378	-	663	202	450	225	322	272	40	53
API 6D	8	-	Class 900	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	8	-	Class 900	767478	1D0VD4C552	CF	CF	543	-	740	202	470	235	CF	215.5	CF	CF

CF = consult factory

## Dimensions – 6- to 12-in valves continued

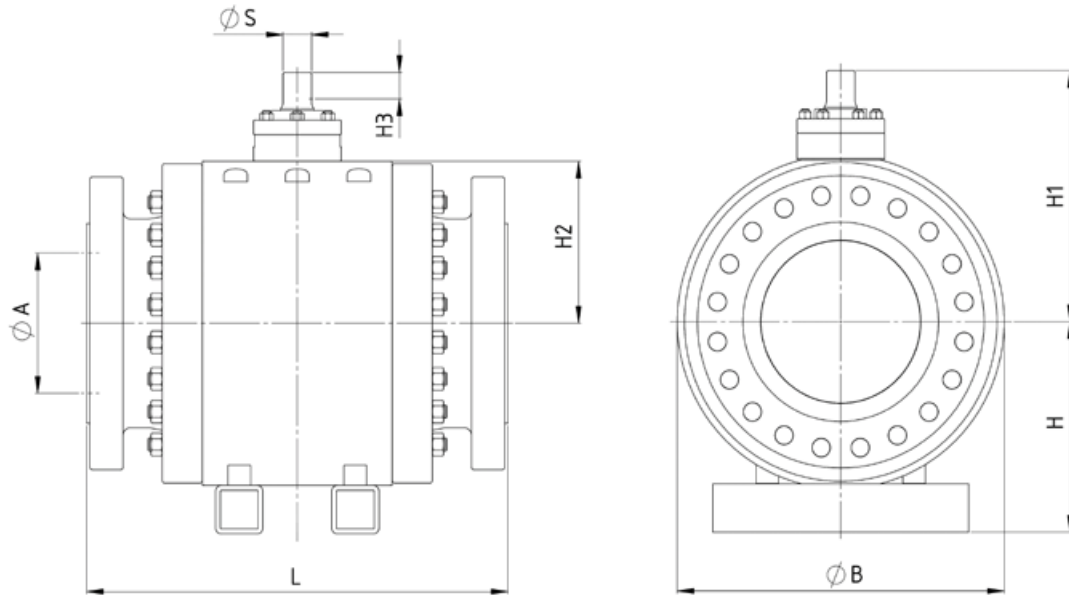


### ASME Valves continued

Valve Design	NPS	Long or Short Pattern	Pressure Class	Valve Number	Valve Code	Dimensional Drawing No.	Operating Head Drawing No.	Weight (kg)	L (mm) (D3)		ØA (mm)	ØB (mm)	H (D4) (mm)	H1 (mm)	H2 (D19) (mm)	H3 (mm)	ØS (mm)
									RF	RTJ							
API 6D	10	-	Class 150	767490	1405D2C552	30006083	30006026	497	533	-	254	565	283	402	270	45	63
API 6D	10	-	Class 150	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	10	-	Class 300	767500	1405D2C552	30006077	30006026	566	568	-	254	565	283	402	270	45	63
API 6D	10	-	Class 300	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	10	-	Class 600	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	10	-	Class 600	767510	1D0VD4C552	30006024	30006026	722	787	-	254	565	283	402	270	45	63
API 6D	10	-	Class 900	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	10	-	Class 900	767522	1D0VD4C552	CF	CF	957	838	-	254	565	282.5	CF	270	CF	CF
API 6D	10	-	Class 600	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	10	-	Class 600	767534	1D0VD4C552	30006187	30006026	724	-	790	254	565	283	402	270	45	63
API 6D	10	-	Class 900	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	10	-	Class 900	767546	1D0VD4C552	CF	CF	959	-	841	254	565	282.5	CF	270	CF	CF
API 6D	12	-	Class 150	767558	1405D2C552	30006155	30006093	703	610	-	305	640	320	444	307	50	73
API 6D	12	-	Class 150	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	12	-	Class 300	767567	1405D2C552	30006150	30006093	792	648	-	305	640	320	444	307	50	73
API 6D	12	-	Class 300	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	12	-	Class 600	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	12	-	Class 600	767578	1D0VD4C552	30006091	30006093	973	838	-	305	640	320	444	307	50	73
API 6D	12	-	Class 900	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	12	-	Class 900	767590	1D0VD4C552	CF	CF	1395	965	-	305	650	325	CF	312.5	CF	CF
API 6D	12	-	Class 600	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	12	-	Class 600	767602	1D0VD4C552	30006157	30006093	976	-	841	305	640	320	444	307	50	73
API 6D	12	-	Class 900	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	12	-	Class 900	767614	1D0VD4C552	CF	CF	1398	-	968	305	650	325	CF	312.5	CF	CF

CF = consult factory

## Dimensions — 6- to 12-in valves continued



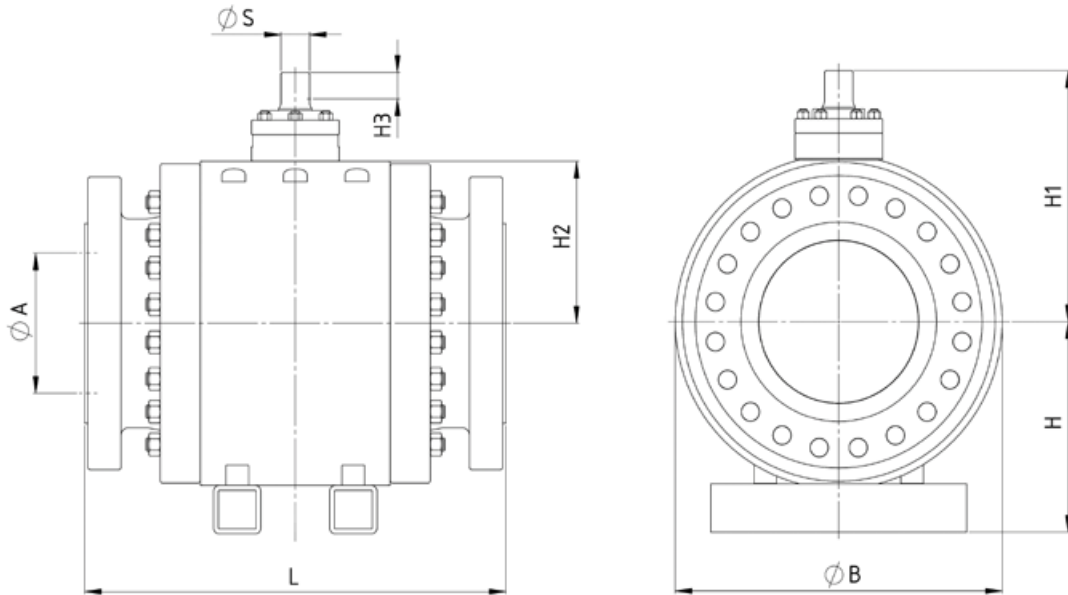
### DIN-EN Valves

Valve Design	NPS	Long or Short Pattern	Pressure Class	Valve Number	Valve Code	Dimensional Drawing No.	Operating Head Drawing No.	Weight (kg)	L (mm) (D3)		ØA (mm)	ØB (mm)	H (D4) (mm)	H1 (mm)	H2 (D19) (mm)	H3 (mm)	ØS (mm)
									RF	RTJ							
API 6D	150	S	PN16	76717	1405D2C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	150	S	PN16	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	150	S	PN40	707127	1405D2C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	150	S	PN40	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	150	L	PN63	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	150	L	PN63	767138	1D0VD4C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	150	L	PN100	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	150	L	PN100	767150	1D0VD4C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	200	S	PN10	767162	1405D2C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	200	S	PN10	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	200	S	PN16	767172	1405D2C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	200	S	PN16	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	200	S	PN25	767182	1405D2C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	200	S	PN25	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	200	S	PN40	767192	1405D2C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	200	S	PN40	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	200	L	PN63	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	200	L	PN63	767202	1D0VD4C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	200	L	PN100	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	200	L	PN100	767214	1D0VD4C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	250	L	PN10	767226	1405D2C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	250	L	PN10	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-

CF = consult factory



## Dimensions — 6- to 12-in valves continued

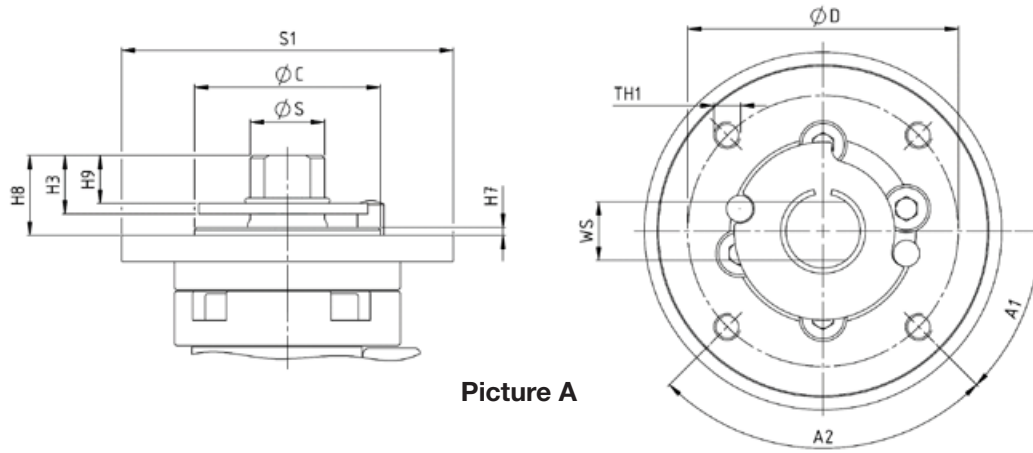


### DIN-EN Valves *continued*

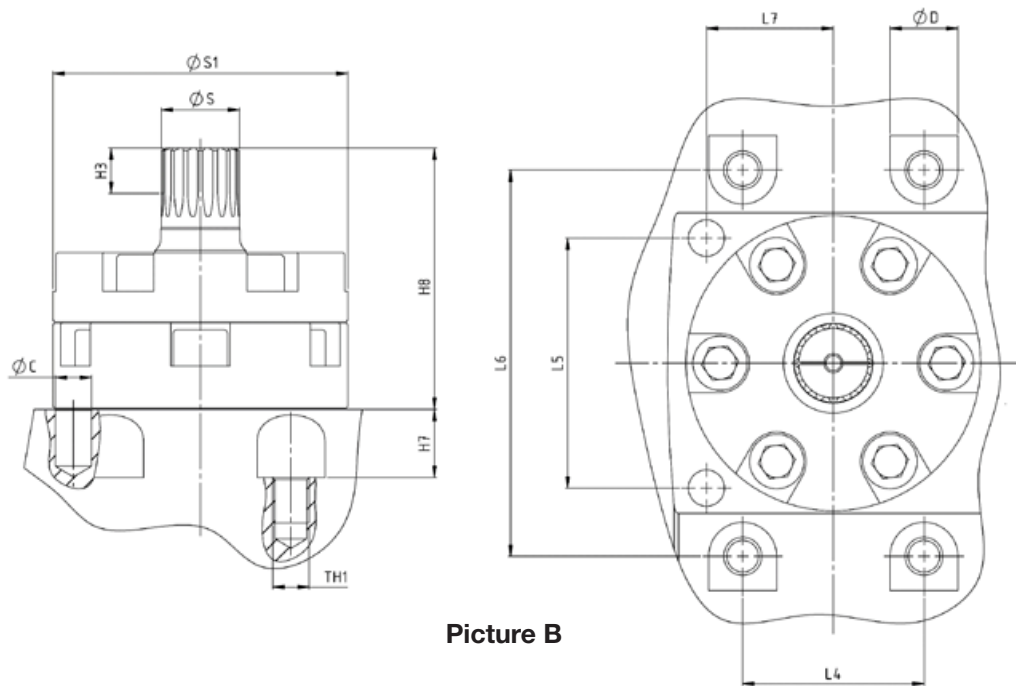
Valve Design	NPS	Long or Short Pattern	Pressure Class	Valve Number	Valve Code	Dimensional Drawing No.	Operating Head Drawing No.	Weight (kg)	L (mm) (D3)		ØA (mm)	ØB (mm)	H (D4) (mm)	H1 (mm)	H2 (D19) (mm)	H3 (mm)	ØS (mm)
									RF	RTJ							
API 6D	250	L	PN16	767236	1405D2C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	250	L	PN16	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	250	L	PN25	767246	1405D2C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	250	L	PN25	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	250	L	PN40	767256	1405D2C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	250	L	PN40	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	250	L	PN63	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	250	L	PN63	767266	1D0VD4C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	250	L	PN100	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	250	L	PN100	767278	1D0VD4C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	300	L	PN10	767290	1405D2C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	300	L	PN10	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	300	L	PN16	767300	1405D2C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	300	L	PN16	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	300	L	PN25	767310	1405D2C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	300	L	PN25	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	300	L	PN40	767320	1405D2C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	300	L	PN40	-	1D0VD4C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	300	L	PN63	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	300	L	PN63	767330	1D0VD4C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
API 6D	300	L	PN100	-	1405D2C552	-	-	-	-	-	-	-	-	-	-	-	-
API 6D	300	L	PN100	767342	1D0VD4C552	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF

CF = consult factory

## Dimensions – 6- to 12-in valves – bare stem



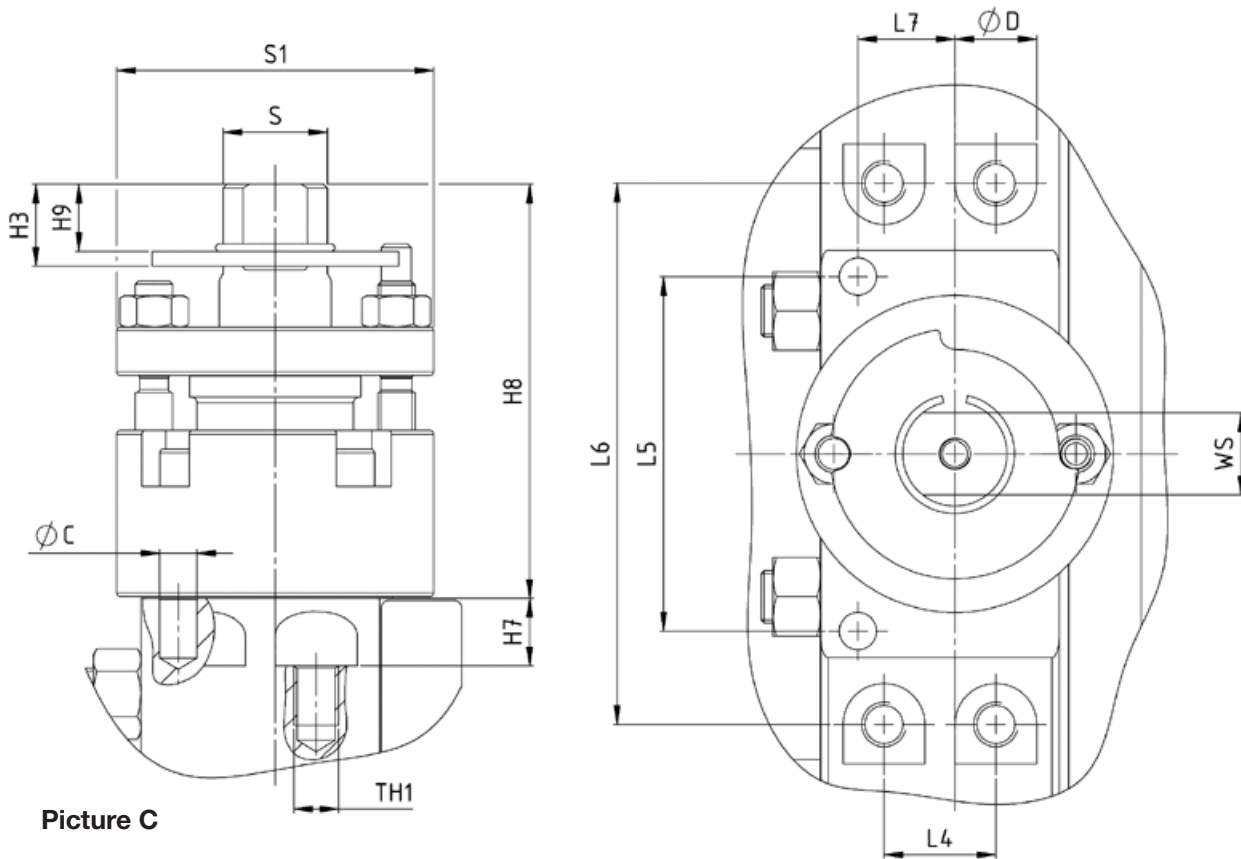
Picture A



Picture B

Operating Head Drawing No.	Picture	ØC [ØH8 - deep] (mm)	ØD (mm)	ØS (mm)	ØS1 (mm)	TH1 [Ø/M - deep] (mm)	L4 [±0.2] (mm)	L5 [±0.02] (mm)	L6 [±0.2] (mm)	L7 [±0.02] (mm)	H3 (mm)	H7 [±0.1] (mm)	H8 (mm)	H9 (mm)	WS (mm)	A1	A2
30005737	A	200	254	53	300	Ø17.5	-	-	-	-	40	5	50	6	46	22.5°	8x45°
30005944	A	130	165	43	210	Ø22	-	-	-	-	34	5	44	28	34	45°	4x90°
30006026	B	20-22	-	63	160	M20-25	120	130	240	75	45	25	132	-	55	-	-
30006093	B	25-28	40	73	170	M20-25	140	145	280	80	50	30	137	-	65	-	-

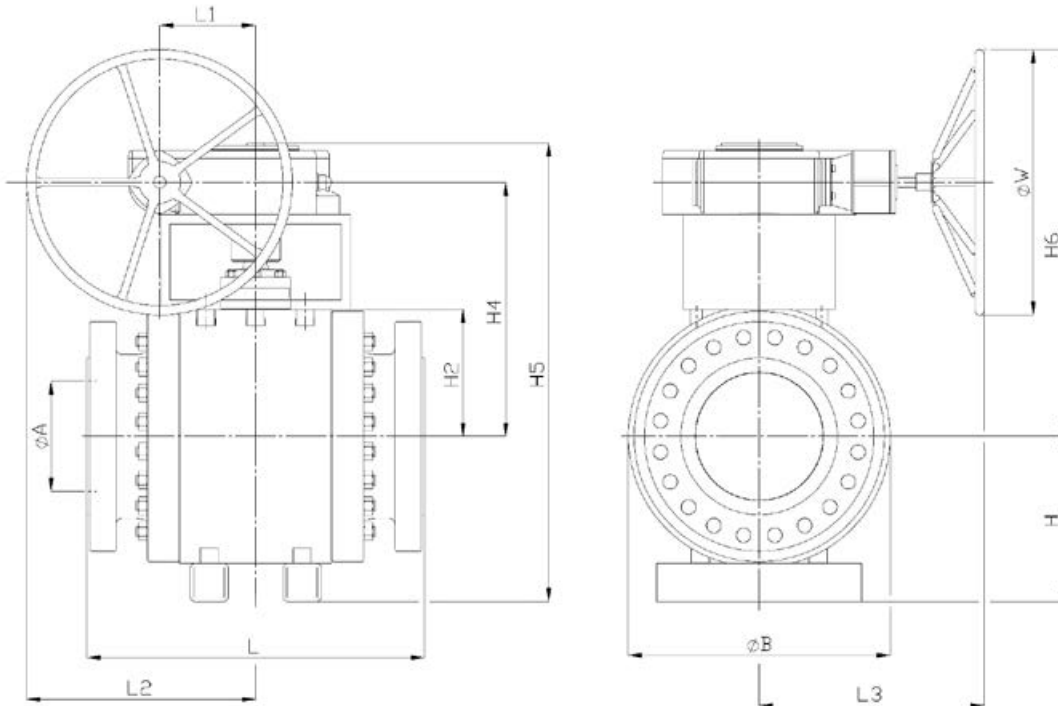
Dimensions — 6- to 12-in valves — bare stem continued



Picture C

Operating Head Drawing No.	Picture	ØC [ØH8 - deep] (mm)	ØD (mm)	ØS (mm)	ØS1 (mm)	TH1 [Ø/M - deep] (mm)	L4 [±0.2] (mm)	L5 [±0.02] (mm)	L6 [±0.2] (mm)	L7 [±0.02] (mm)	H3 (mm)	H7 [±0.1] (mm)	H8 (mm)	H9 (mm)	WS (mm)	A1	A2
30005912	C	16-18	30	53	135	M16-20	80	155	245	45	40	30	162	34	46	-	-
30005932	C	16-18	30	43	110	M16-20	60	135	210	35	34	25	128	28	34	-	-
30006056	C	20-22	40	63	160	M20-25	120	130	240	75	45	25	173	-	55	-	-
30006102	C	25-28	40	73	170	M20-25	140	145	280	80	50	30	197	-	65	-	-

## Installation dimensions – valve and gear – 6- to 12-in



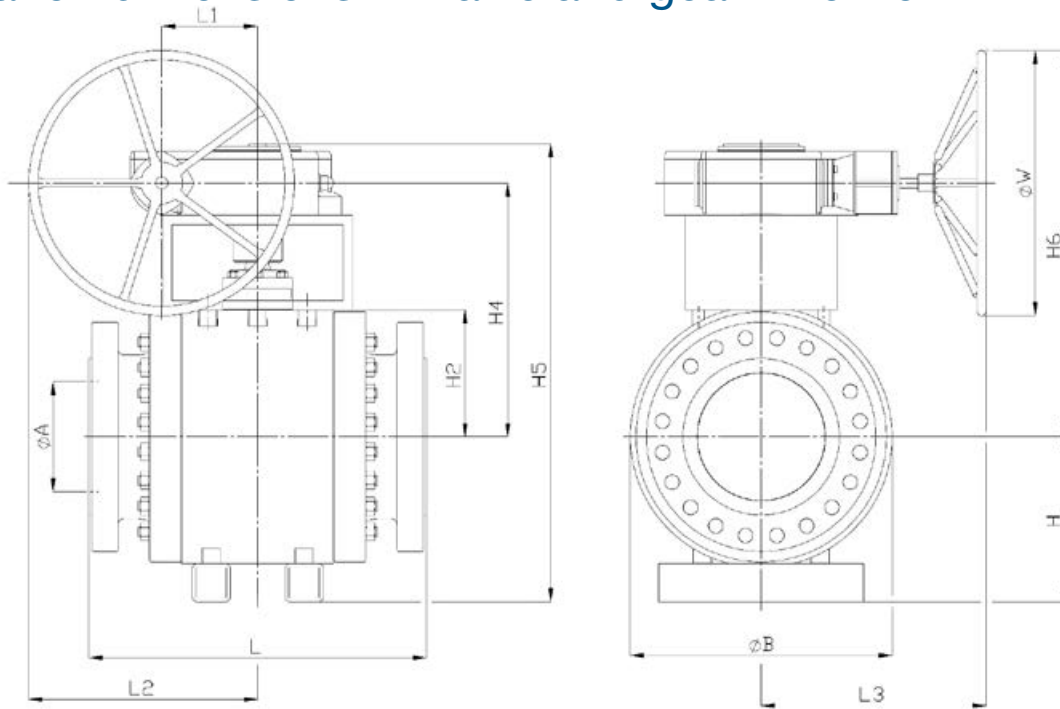
### ASME Valves to 250°C (482°F)

Valve Design	NPS	Pressure Class	Long or Short Pattern	Flange	L (D3) (mm)	ØA (mm)	ØB (mm)	H (D4) (mm)	H2 (D19) (mm)	Weight Valve (kg)*
API 6D	6	Class 150	L	RF	163	150	380	190	225	167
API 6D	6	Class 300	L	RF	403	150	380	190	225	184
API 6D	6	Class 600	L	RF	559	150	380	190	225	236
API 6D	6	Class 900	L	RF	CF	150	385	192.5	180	CF
API 6D	6	Class 600	L	RTJ	562	150	380	190	225	236
API 6D	6	Class 900	L	RTJ	CF	150	385	192.5	180	CF
API 6D	8	Class 150	L	RF	457	202	450	225	272	268
API 6D	8	Class 300	L	RF	502	202	450	225	272	304
API 6D	8	Class 600	L	RF	660	202	450	225	272	377
API 6D	8	Class 900	L	RF	CF	202	470	235	212.5	CF
API 6D	8	Class 600	L	RTJ	663	202	450	225	272	378
API 6D	8	Class 900	L	RTJ	CF	202	470	235	212.5	CF
API 6D	10	Class 150	L	RF	533	254	565	283	270	497
API 6D	10	Class 300	L	RF	568	254	565	283	270	566
API 6D	10	Class 600	L	RF	787	254	565	283	270	722
API 6D	10	Class 900	L	RF	CF	254	565	282.5	270	CF
API 6D	10	Class 600	L	RTJ	790	254	565	283	270	724
API 6D	10	Class 900	L	RTJ	CF	254	565	282.5	270	CF
API 6D	12	Class 150	L	RF	610	305	640	320	307	703
API 6D	12	Class 300	L	RF	648	305	640	320	307	792
API 6D	12	Class 600	L	RF	838	305	640	320	307	973
API 6D	12	Class 900	L	RF	CF	305	650	325	312.5	CF
API 6D	12	Class 600	L	RTJ	841	305	640	320	307	976
API 6D	12	Class 900	L	RTJ	CF	305	650	325	312.5	CF

\* "weight valve" = weight valve only (without gear)

CF = consult factory

## Installation dimensions – valve and gear – 6- to 12-in continued



### ASME Valves to 250°C (482°F) continued

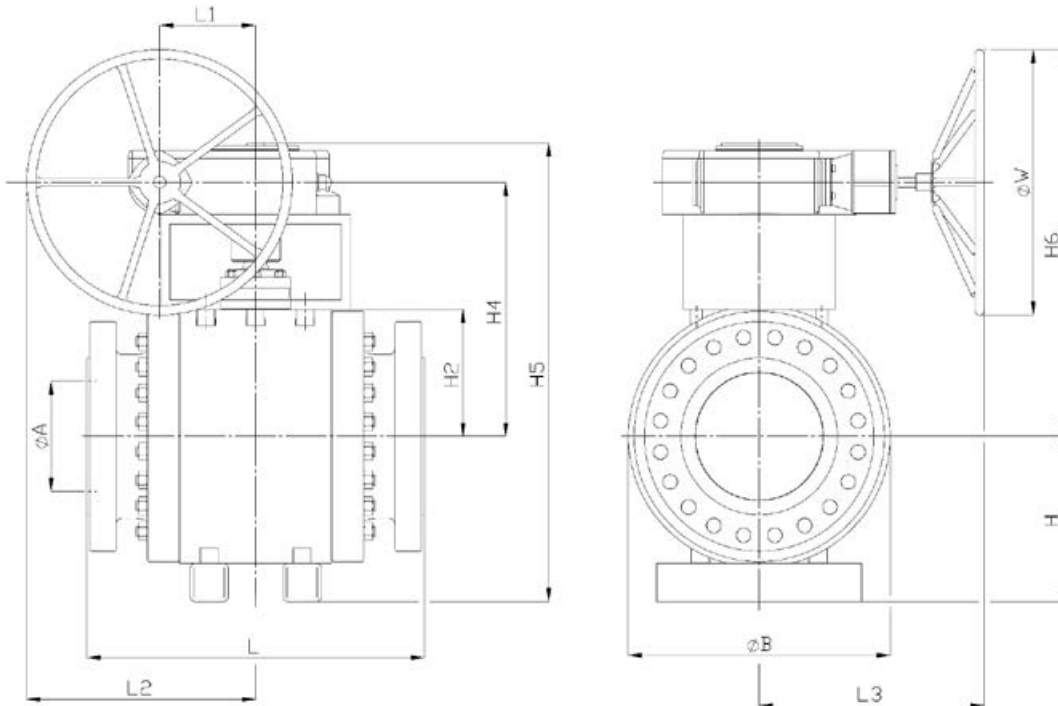
NPS	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight Gear (kg)**	Total Weight (kg)***
6	Class 150	M50	298	538	448	97	247	326	300	23	
6	Class 300	M100	298	538	498	97	247	326	400	23	
6	Class 600										
6	Class 900										
6	Class 600										
6	Class 900										
8	Class 150	M50	CF	CF	CF	97	247	326	300	23	291
8	Class 300	M50	CF	CF	CF	97	247	326	300	23	327
8	Class 600	M50	CF	CF	CF	97	247	326	300	23	400
8	Class 900	M100	CF	CF	CF	97	297	326	400	40	CF
8	Class 600	M50	CF	CF	CF	97	247	362	300	23	401
8	Class 900	M100	CF	CF	CF	97	297	362	400	40	CF
10	Class 150	M50	CF	CF	CF	97	247	326	300	23	520
10	Class 300	M50	CF	CF	CF	97	247	326	300	23	589
10	Class 600	M50	CF	CF	CF	97	247	326	300	23	745
10	Class 900	M100	CF	CF	CF	97	297	326	400	40	CF
10	Class 600	M50	CF	CF	CF	97	247	362	300	23	747
10	Class 900	M100	CF	CF	CF	97	297	362	400	40	CF
12	Class 150	M50	CF	CF	CF	0	150	326	300	23	726
12	Class 300	M50	CF	CF	CF	0	150	326	300	23	815
12	Class 600	M50	CF	CF	CF	0	150	326	300	23	996
12	Class 900	M100	CF	CF	CF	0	200	326	400	40	CF
12	Class 600	M50	CF	CF	CF	0	150	362	300	23	999
12	Class 900	M100	CF	CF	CF	0	200	362	400	40	CF

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.

CF = consult factory

## Installation dimensions – valve and gear – 6- to 12-in continued



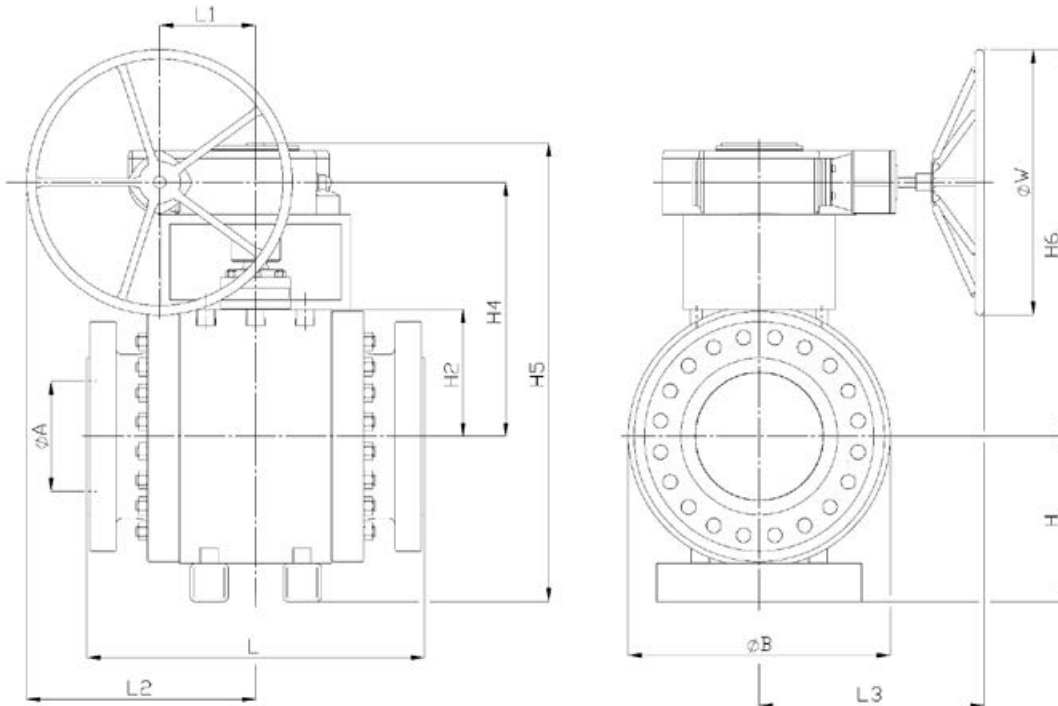
### ASME Valves >250°C (482°F)

Valve Design	NPS	Pressure Class	Long or Short Pattern	Flange	L (D3) (mm)	ØA (mm)	ØB (mm)	H (D4) (mm)	H2 (D19) (mm)	Weight Valve (kg)*
API 6D	6	Class 150	L	RF	394	150	380	190	170	163
API 6D	6	Class 300	L	RF	403	150	380	190	170	181
API 6D	6	Class 600	L	RF	559	150	380	190	170	232
API 6D	6	Class 900	L	RF	CF	CF	CF	CF	CF	CF
API 6D	6	Class 600	L	RTJ	562	150	380	190	170	233
API 6D	6	Class 900	L	RTJ	CF	CF	CF	CF	CF	CF
API 6D	8	Class 150	L	RF	457	202	450	225	205	262
API 6D	8	Class 300	L	RF	502	202	450	225	205	298
API 6D	8	Class 600	L	RF	660	202	450	225	205	371
API 6D	8	Class 900	L	RF	CF	CF	CF	CF	CF	CF
API 6D	8	Class 600	L	RTJ	663	202	450	225	205	372
API 6D	8	Class 900	L	RTJ	CF	CF	CF	CF	CF	CF
API 6D	10	Class 150	L	RF	533	254	565	283	270	498
API 6D	10	Class 300	L	RF	568	254	565	283	270	568
API 6D	10	Class 600	L	RF	787	254	565	283	270	724
API 6D	10	Class 900	L	RF	CF	CF	CF	CF	CF	CF
API 6D	10	Class 600	L	RTJ	760	254	565	283	270	726
API 6D	10	Class 900	L	RTJ	CF	CF	CF	CF	CF	CF
API 6D	12	Class 150	L	RF	610	305	640	320	307	708
API 6D	12	Class 300	L	RF	648	305	640	320	307	797
API 6D	12	Class 600	L	RF	838	305	640	320	307	978
API 6D	12	Class 900	L	RF	CF	CF	CF	CF	CF	CF
API 6D	12	Class 600	L	RTJ	841	305	640	320	307	980
API 6D	12	Class 900	L	RTJ	CF	CF	CF	CF	CF	CF

\* "weight valve" = weight valve only (without gear)

CF = consult factory

## Installation dimensions – valve and gear – 6- to 12-in continued



### ASME Valves >250°C (482°F) continued

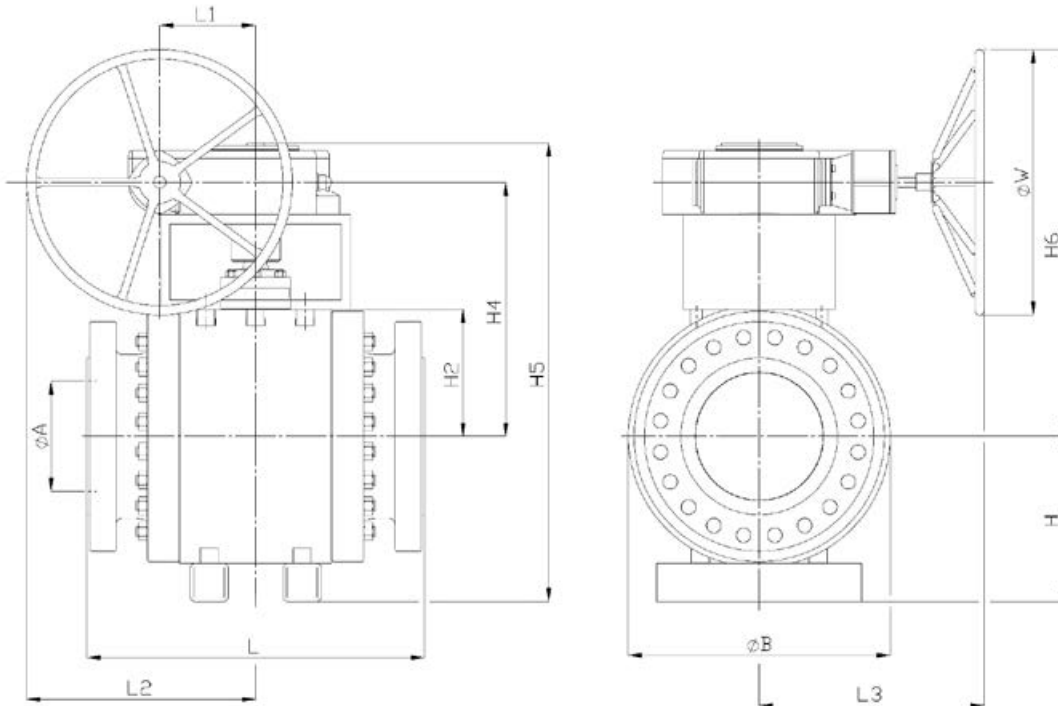
NPS	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight Gear (kg)**	Total Weight (kg)***
6	Class 150	M50	CF	CF	CF	97	247	326	300	23	186
6	Class 300	M50	CF	CF	CF	97	247	326	300	23	204
6	Class 600	M50	CF	CF	CF	97	247	326	300	23	255
6	Class 900	M100	CF	CF	CF	97	297	326	400	40	CF
6	Class 600	M50	CF	CF	CF	97	247	457	300	23	256
6	Class 900	M100	CF	CF	CF	97	297	362	400	40	CF
8	Class 150	M50	CF	CF	CF	97	247	326	300	23	285
8	Class 300	M50	CF	CF	CF	97	247	326	300	23	321
8	Class 600	M50	CF	CF	CF	97	247	326	300	23	394
8	Class 900	M200	CF	CF	CF	138	438	326	600	55	CF
8	Class 600	M50	CF	CF	CF	97	247	457	300	23	395
8	Class 900	M200	CF	CF	CF	0	300	362	600	55	CF
10	Class 150	M50	CF	CF	CF	97	247	326	300	23	521
10	Class 300	M50	CF	CF	CF	97	247	326	300	23	591
10	Class 600	M50	CF	CF	CF	97	247	326	300	23	747
10	Class 900	M200	CF	CF	CF	138	438	326	600	55	CF
10	Class 600	M50	CF	CF	CF	97	247	457	300	23	749
10	Class 900	M200	CF	CF	CF	138	438	362	600	55	CF
12	Class 150	M50	CF	CF	CF	0	150	326	300	23	731
12	Class 300	M50	CF	CF	CF	0	150	326	300	23	820
12	Class 600	M50	CF	CF	CF	0	150	326	300	23	1001
12	Class 900	M200	CF	CF	CF	0	300	326	600	55	CF
12	Class 600	M50	CF	CF	CF	0	150	457	300	23	1003
12	Class 900	M200	CF	CF	CF	0	300	362	600	55	CF

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.

CF = consult factory

## Installation dimensions – valve and gear – 6- to 12-in continued



### DIN Valves to 250°C (482°F)

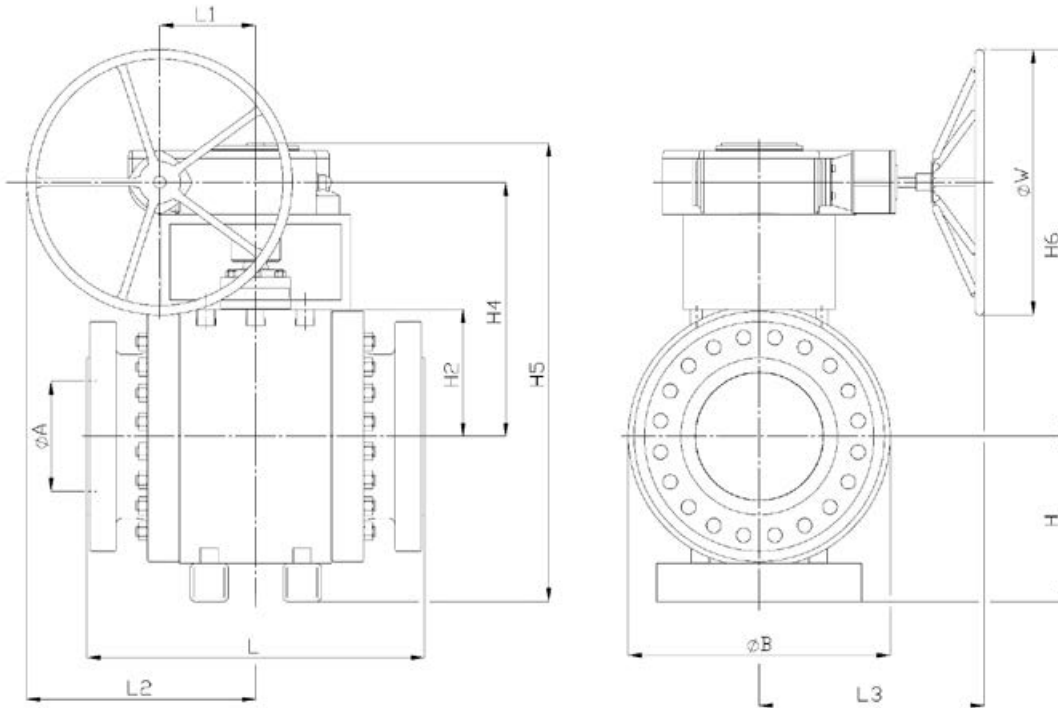
Valve Design	DN	Pressure Class	Long or Short Pattern	Flange	L (D3) (mm)	ØA (mm)	ØB (mm)	H (D4) (mm)	H2 (D19) (mm)	Weight Valve (kg)*
API 6D	150	PN 16	S	RF	CF	CF	CF	CF	CF	CF
API 6D	150	PN 40	S	RF	CF	CF	CF	CF	CF	CF
API 6D	150	PN 63	L	RF	CF	CF	CF	CF	CF	CF
API 6D	150	PN 100	L	RF	CF	CF	CF	CF	CF	CF
API 6D	200	PN 10	S	RF	CF	CF	CF	CF	CF	CF
API 6D	200	PN 16	S	RF	CF	CF	CF	CF	CF	CF
API 6D	200	PN 25	L	RF	CF	CF	CF	CF	CF	CF
API 6D	200	PN 40	L	RF	CF	CF	CF	CF	CF	CF
API 6D	200	PN 63	L	RF	CF	CF	CF	CF	CF	CF
API 6D	200	PN 100	L	RF	CF	CF	CF	CF	CF	CF
API 6D	250	PN 10	L	RF	CF	CF	CF	CF	CF	CF
API 6D	250	PN 16	L	RF	CF	CF	CF	CF	CF	CF
API 6D	250	PN 25	L	RF	CF	CF	CF	CF	CF	CF
API 6D	250	PN 40	L	RF	CF	CF	CF	CF	CF	CF
API 6D	250	PN 63	L	RF	CF	CF	CF	CF	CF	CF
API 6D	250	PN 100	L	RF	CF	CF	CF	CF	CF	CF
API 6D	300	PN 10	L	RF	CF	CF	CF	CF	CF	CF
API 6D	300	PN 16	L	RF	CF	CF	CF	CF	CF	CF
API 6D	300	PN 25	L	RF	CF	CF	CF	CF	CF	CF
API 6D	300	PN 40	L	RF	CF	CF	CF	CF	CF	CF
API 6D	300	PN 63	L	RF	CF	CF	CF	CF	CF	CF
API 6D	300	PN 100	L	RF	CF	CF	CF	CF	CF	CF

\* "weight valve" = weight valve only (without gear)

CF = consult factory



## Installation dimensions – valve and gear – 6- to 12-in continued



### DIN Valves to 250°C (482°F) *continued*

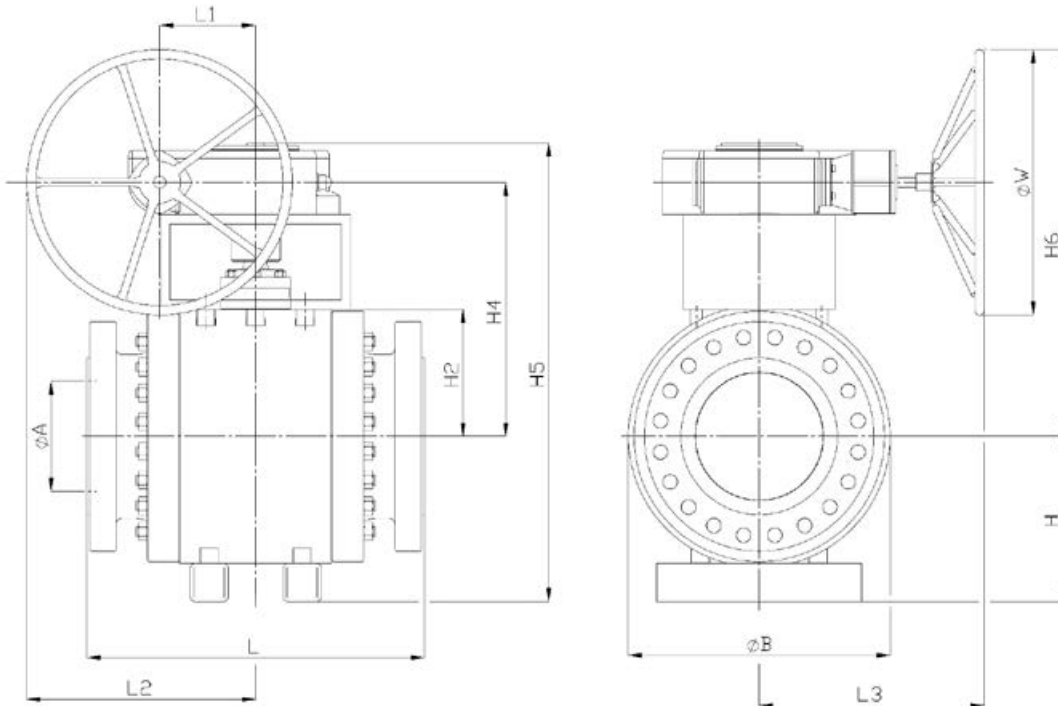
DN	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight Gear (kg)**	Total Weight (kg)***
150	PN 16	M50	CF	CF	CF	97	247	326	300	23	CF
150	PN 40	M50	CF	CF	CF	97	247	326	300	23	CF
150	PN 63	M50	CF	CF	CF	97	247	326	300	23	CF
150	PN 100	M50	CF	CF	CF	97	247	326	300	23	CF
200	PN 10	M50	CF	CF	CF	97	247	326	300	23	CF
200	PN 16	M50	CF	CF	CF	97	247	326	300	23	CF
200	PN 25	M50	CF	CF	CF	97	247	326	300	23	CF
200	PN 40	M50	CF	CF	CF	97	247	326	300	23	CF
200	PN 63	M50	CF	CF	CF	97	247	326	300	23	CF
200	PN 100	M50	CF	CF	CF	97	247	326	300	23	CF
250	PN 10	M50	CF	CF	CF	CF	CF	326	300	23	CF
250	PN 16	M50	CF	CF	CF	97	247	326	300	23	CF
250	PN 25	M50	CF	CF	CF	97	247	326	300	23	CF
250	PN 40	M50	CF	CF	CF	138	288	326	300	23	CF
250	PN 63	M50	CF	CF	CF	138	288	326	300	23	CF
250	PN 100	M50	CF	CF	CF	138	288	326	300	23	CF
300	PN 10	M50	CF	CF	CF	292	442	326	300	23	CF
300	PN 16	M50	CF	CF	CF	292	442	326	300	23	CF
300	PN 25	M50	CF	CF	CF	400	550	326	300	23	CF
300	PN 40	M50	CF	CF	CF	0	150	326	300	23	CF
300	PN 63	M50	CF	CF	CF	0	150	326	300	23	CF
300	PN 100	M50	CF	CF	CF	0	150	326	300	23	CF

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.

CF = consult factory

## Installation dimensions – valve and gear – 6- to 12-in continued



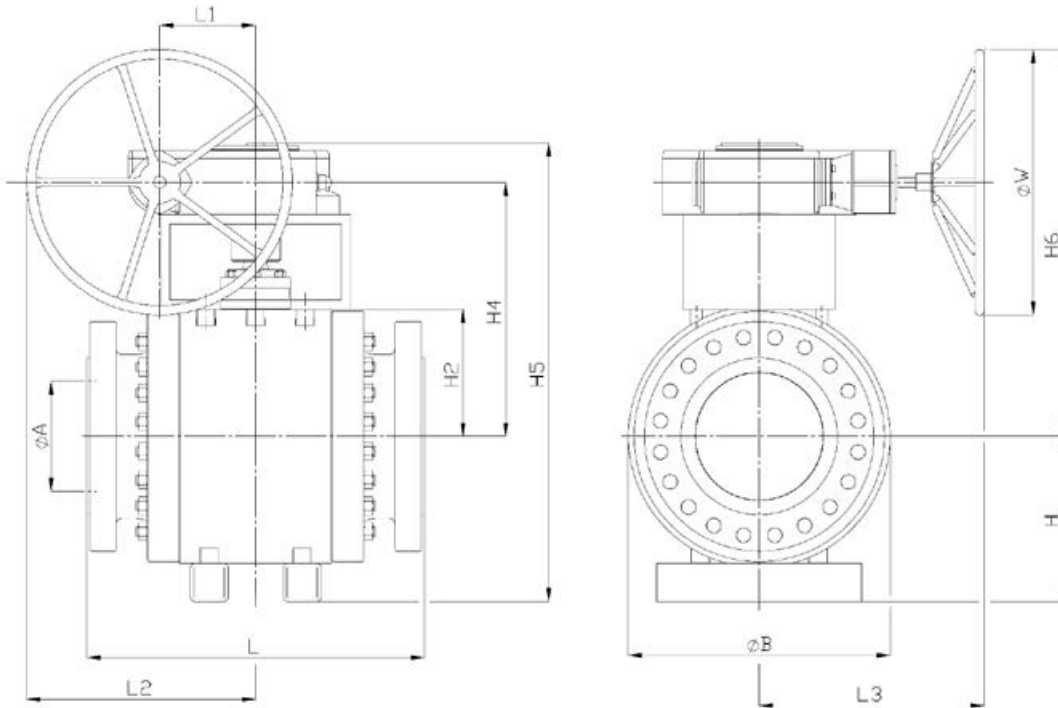
### DIN Valves >250°C (482°F)

Valve Design	DN	Pressure Class	Long or Short Pattern	Flange	L (D3) (mm)	ØA (mm)	ØB (mm)	H (D4) (mm)	H2 (D19) (mm)	Weight Valve (kg)*
API 6D	150	PN 16	S	RF	CF	CF	CF	CF	CF	CF
API 6D	150	PN 40	S	RF	CF	CF	CF	CF	CF	CF
API 6D	150	PN 63	L	RF	CF	CF	CF	CF	CF	CF
API 6D	150	PN 100	L	RF	CF	CF	CF	CF	CF	CF
API 6D	200	PN 10	S	RF	CF	CF	CF	CF	CF	CF
API 6D	200	PN 16	S	RF	CF	CF	CF	CF	CF	CF
API 6D	200	PN 25	L	RF	CF	CF	CF	CF	CF	CF
API 6D	200	PN 40	L	RF	CF	CF	CF	CF	CF	CF
API 6D	200	PN 63	L	RF	CF	CF	CF	CF	CF	CF
API 6D	200	PN 100	L	RF	CF	CF	CF	CF	CF	CF
API 6D	250	PN 10	L	RF	CF	CF	CF	CF	CF	CF
API 6D	250	PN 16	L	RF	CF	CF	CF	CF	CF	CF
API 6D	250	PN 25	L	RF	CF	CF	CF	CF	CF	CF
API 6D	250	PN 40	L	RF	CF	CF	CF	CF	CF	CF
API 6D	250	PN 63	L	RF	CF	CF	CF	CF	CF	CF
API 6D	250	PN 100	L	RF	CF	CF	CF	CF	CF	CF
API 6D	300	PN 10	L	RF	CF	CF	CF	CF	CF	CF
API 6D	300	PN 16	L	RF	CF	CF	CF	CF	CF	CF
API 6D	300	PN 25	L	RF	CF	CF	CF	CF	CF	CF
API 6D	300	PN 40	L	RF	CF	CF	CF	CF	CF	CF
API 6D	300	PN 63	L	RF	CF	CF	CF	CF	CF	CF
API 6D	300	PN 100	L	RF	CF	CF	CF	CF	CF	CF

\* "weight valve" = weight valve only (without gear)

CF = consult factory

## Installation dimensions – valve and gear – 6- to 12-in continued



### DIN Valves >250°C (482°F) continued

DN	Pressure Class	Gear	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (Approx.) (mm)	ØW (mm)	Weight Gear (kg)**	Total Weight (kg)***
150	PN 16	M50	CF	CF	CF	292	442	326	300	23	CF
150	PN 40	M50	CF	CF	CF	292	442	326	300	23	CF
150	PN 63	M50	CF	CF	CF	292	442	326	300	23	CF
150	PN 100	M50	CF	CF	CF	292	442	326	300	23	CF
200	PN 10	M50	CF	CF	CF	97	247	326	300	23	CF
200	PN 16	M50	CF	CF	CF	97	247	326	300	23	CF
200	PN 25	M50	CF	CF	CF	97	247	326	300	23	CF
200	PN 40	M50	CF	CF	CF	97	247	326	300	23	CF
200	PN 63	M50	CF	CF	CF	97	247	326	300	23	CF
200	PN 100	M100	CF	CF	CF	97	297	326	400	23	CF
250	PN 10	M50	CF	CF	CF	97	247	326	300	23	CF
250	PN 16	M50	CF	CF	CF	97	247	326	300	23	CF
250	PN 25	M50	CF	CF	CF	138	288	326	300	23	CF
250	PN 40	M50	CF	CF	CF	138	288	326	300	23	CF
250	PN 63	M50	CF	CF	CF	180	330	326	300	23	CF
250	PN 100	M100	CF	CF	CF	253	453	326	400	23	CF
300	PN 10	M50	CF	CF	CF	292	442	326	300	23	CF
300	PN 16	M50	CF	CF	CF	292	442	326	300	23	CF
300	PN 25	M50	CF	CF	CF	400	550	326	300	23	CF
300	PN 40	M50	CF	CF	CF	0	150	326	300	23	CF
300	PN 63	M50	CF	CF	CF	0	150	326	300	23	CF
300	PN 100	M100	CF	CF	CF	0	200	326	400	23	CF

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

\*\*\* "total weight" = weight of valve, gear and bracket, coupling, screws, etc.

CF = consult factory

## Dimensions – 6- to 12-in valves – mounting brackets

### ASME Valves to 250°C (482°F)

Valve Design	Max. Torque (Nm)	Type of Gear*	Connection Gear	Height of Gear (mm)	Height of Mounting Bracket (mm)							
					NPS 6				NPS 8			
					Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900
API 6D	1000	M50 (Q2000)	F14	100	120	120	120	120				
API 6D	2000	M100 (Q2000)	F14	100	120	120	120	120	180	180	180	
API 6D	4000	M200 (Q4000)	F16	128					180	180	180	
API 6D	4000	Q4000	F16	128					180	180	180	
API 6D	6500	Q6500	F16	128					180	180	180	
API 6D	12,000	Q12000	F25	135					180	180	180	
API 6D	24,000	Q24000	F35	186								
API 6D	32,000	Q32000	F35	186								
API 6D	50,000	Q50000	F40	263								
API 6D	70,000	Q70000	F40	263								

Valve Design	Max. Torque (Nm)	Type of Gear*	Connection Gear	Height of Gear (mm)	Height of Mounting Bracket (mm)							
					NPS 10				NPS 12			
					Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900
API 6D	1000	M50 (Q2000)	F14	100								
API 6D	2000	M100 (Q2000)	F14	100	350	350	350	350	350	350	350	350
API 6D	4000	M200 (Q4000)	F16	128	350	350	350	350	350	350	350	350
API 6D	4000	Q4000	F16	128	350	350	350	350	350	350	350	350
API 6D	6500	Q6500	F16	128	350	350	350	350	350	350	350	350
API 6D	12,000	Q12000	F25	135	350	350	350	350	350	350	350	350
API 6D	24,000	Q24000	F35	186								
API 6D	32,000	Q32000	F35	186								
API 6D	50,000	Q50000	F40	263								
API 6D	70,000	Q70000	F40	263								

\*Manufacturer: Pro-Gear

## Dimensions – 6- to 12-in valves – mounting brackets continued

### ASME Valves – 251°C to 400°C (484°F to 752°F)

Valve Design	Max. Torque (Nm)	Type of Gear*	Connection Gear	Height of Gear (mm)	Height of Mounting Bracket (mm)								
					NPS 6				NPS 8				
					Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900	
API 6D	1000	M50 (Q2000)	F14	100	260	260	260						
API 6D	2000	M100 (Q2000)	F14	100	260	260	260		260	260	260		
API 6D	4000	M200 (Q4000)	F16	128	260	260	260		260	260	260		
API 6D	4000	Q4000	F16	128	260	260	260		260	260	260		
API 6D	6500	Q6500	F16	128	260	260	260		260	260	260		
API 6D	12,000	Q12000	F25	135	260	260	260		260	260	260		
API 6D	24,000	Q24000	F35	186									
API 6D	32,000	Q32000	F35	186									
API 6D	50,000	Q50000	F40	263									
API 6D	70,000	Q70000	F40	263									

Valve Design	Max. Torque (Nm)	Type of Gear*	Connection Gear	Height of Gear (mm)	Height of Mounting Bracket (mm)								
					NPS 10				NPS 12				
					Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900	
API 6D	1000	M50 (Q2000)	F14	100									
API 6D	2000	M100 (Q2000)	F14	100	350	350	350		350	350	350		
API 6D	4000	M200 (Q4000)	F16	128	350	350	350		350	350	350		
API 6D	4000	Q4000	F16	128	350	350	350		350	350	350		
API 6D	6500	Q6500	F16	128	350	350	350		350	350	350		
API 6D	12,000	Q12000	F25	135	350	350	350		350	350	350		
API 6D	24,000	Q24000	F35	186									
API 6D	32,000	Q32000	F35	186									
API 6D	50,000	Q50000	F40	263									
API 6D	70,000	Q70000	F40	263									

\*Manufacturer: Pro-Gear

## Dimensions – 6- to 12-in valves – mounting brackets *continued*

**DIN Valves to 250°C (482°F)**

Valve Design	Max. Torque (Nm)	Type of Gear*	Connection Gear	Height of Gear (mm)	Height of Mounting Bracket (mm)										
					DN 150				DN 200						
					PN 16	PN 40	PN 63	PN 100	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100	
API 6D	1000	M50 (Q2000)	F14	100	260	260	260	260							260
API 6D	2000	M100 (Q2000)	F14	100	260	260	260	260	260	260	260	260	260	260	
API 6D	4000	M200 (Q4000)	F16	128	260	260	260	260	260	260	260	260	260	260	260
API 6D	4000	Q4000	F16	128	260	260	260	260	260	260	260	260	260	260	260
API 6D	6500	Q6500	F16	128	260	260	260	260	260	260	260	260	260	260	260
API 6D	12,000	Q12000	F25	135	260	260	260	260	260	260	260	260	260	260	260
API 6D	24,000	Q24000	F35	186											
API 6D	32,000	Q32000	F35	186											
API 6D	50,000	Q50000	F40	263											
API 6D	70,000	Q70000	F40	263											

Valve Design	Max. Torque (Nm)	Type of Gear*	Connection Gear	Height of Gear (mm)	Height of Mounting Bracket (mm)											
					DN 250						DN 300					
					PN 10	PN 16	PN 25	PN 40	PN 63	PN 100	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100
API 6D	1000	M50 (Q2000)	F14	100												
API 6D	2000	M100 (Q2000)	F14	100	350	350	350	350	350	350	350	350	350	350	350	350
API 6D	4000	M200 (Q4000)	F16	128	350	350	350	350	350	350	350	350	350	350	350	350
API 6D	4000	Q4000	F16	128	350	350	350	350	350	350	350	350	350	350	350	350
API 6D	6500	Q6500	F16	128	350	350	350	350	350	350	350	350	350	350	350	350
API 6D	12,000	Q12000	F25	135	350	350	350	350	350	350	350	350	350	350	350	350
API 6D	24,000	Q24000	F35	186												
API 6D	32,000	Q32000	F35	186												
API 6D	50,000	Q50000	F40	263												
API 6D	70,000	Q70000	F40	263												

\*Manufacturer: Pro-Gear

## Dimensions – 6- to 12-in valves – mounting brackets continued

### DIN Valves – 251°C to 400°C (484°F to 752°F)

Valve Design	Max. Torque (Nm)	Type of Gear*	Connection Gear	Height of Gear (mm)	Height of Mounting Bracket (mm)										
					DN 150				DN 200						
					PN 16	PN 40	PN 63	PN 100	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100	
API 6D	1000	M50 (Q2000)	F14	100	120	120	120	120							
API 6D	2000	M100 (Q2000)	F14	100	120	120	120	120	180	180	180	180	180	180	180
API 6D	4000	M200 (Q4000)	F16	128					180	180	180	180	180	180	180
API 6D	4000	Q4000	F16	128					180	180	180	180	180	180	180
API 6D	6500	Q6500	F16	128					180	180	180	180	180	180	180
API 6D	12,000	Q12000	F25	135					180	180	180	180	180	180	180
API 6D	24,000	Q24000	F35	186											
API 6D	32,000	Q32000	F35	186											
API 6D	50,000	Q50000	F40	263											
API 6D	70,000	Q70000	F40	263											

Valve Design	Max. Torque (Nm)	Type of Gear*	Connection Gear	Height of Gear (mm)	Height of Mounting Bracket (mm)											
					DN 250						DN 300					
					PN 10	PN 16	PN 25	PN 40	PN 63	PN 100	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100
API 6D	1000	M50 (Q2000)	F14	100												
API 6D	2000	M100 (Q2000)	F14	100	350	350	350	350	350	350	350	350	350	350	350	350
API 6D	4000	M200 (Q4000)	F16	128	350	350	350	350	350	350	350	350	350	350	350	350
API 6D	4000	Q4000	F16	128	350	350	350	350	350	350	350	350	350	350	350	350
API 6D	6500	Q6500	F16	128	350	350	350	350	350	350	350	350	350	350	350	350
API 6D	12,000	Q12000	F25	135	350	350	350	350	350	350	350	350	350	350	350	350
API 6D	24,000	Q24000	F35	186												
API 6D	32,000	Q32000	F35	186												
API 6D	50,000	Q50000	F40	263												
API 6D	70,000	Q70000	F40	263												

## Dimensions – 6- to 12-in valves – mounting brackets continued

### ASME Valves to 250°C (482°F)

Type of Gear	Weight of Mounting Bracket + Coupling (kg)							
	NPS 6				NPS 8			
	Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900
M50 (Q2000)	6.3	6.3	6.3					
M100 (Q2000)	6.3	6.3	6.3		6.9	6.9	6.9	
M200 (Q4000)					8.9	8.9	8.9	
Q4000					8.9	8.9	8.9	
Q6500					8.9	8.9	8.9	
Q12000					15	15	15	
Q24000								
Q32000								
Q50000								
Q70000								

Type of Gear	Weight of Mounting Bracket + Coupling (kg)							
	NPS 10				NPS 12			
	Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900
M50 (Q2000)								
M100 (Q2000)	7.9	7.9	7.9		80	80	80	
M200 (Q4000)	7.9	7.9	7.9		83	83	83	
Q4000	7.9	7.9	7.9		83	83	83	
Q6500	7.9	7.9	7.9		83	83	83	
Q12000	15	15	15		105	105	105	
Q24000								
Q32000								
Q50000								
Q70000								



## Dimensions – 6- to 12-in valves – mounting brackets continued

### ASME Valves – 251°C to 400°C (484°F to 752°F)

Type of Gear	Weight of Mounting Bracket + Coupling (kg)							
	NPS 6				NPS 8			
	Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900
M50 (Q2000)	23	23	23					
M100 (Q2000)	23	23	23		27	27	27	
M200 (Q4000)	23	23	23		27	27	27	
Q4000	23	23	23		27	27	27	
Q6500	23	23	23		27	27	27	
Q12000	40	40	40		42	42	42	
Q24000								
Q32000								
Q50000								
Q70000								

Type of Gear	Weight of Mounting Bracket + Coupling (kg)							
	NPS 10				NPS 12			
	Class 150	Class 300	Class 600	Class 900	Class 150	Class 300	Class 600	Class 900
M50 (Q2000)								
M100 (Q2000)	50	50	50		72	72	72	
M200 (Q4000)	52	52	52		75	75	75	
Q4000	52	52	52		75	75	75	
Q6500	52	52	52		75	75	75	
Q12000	64	64	64		95	95	95	
Q24000								
Q32000								
Q50000								
Q70000								

## Dimensions – 6- to 12-in valves – mounting brackets *continued*

**DIN Valves to 250°C (482°F)**

Type of Gear	Weight of Mounting Bracket + Coupling (kg)									
	DN 150				DN 200					
	PN 16	PN 40	PN 63	PN 100	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100
M50 (Q2000)	6.3	6.3	6.3	6.3						
M100 (Q2000)	6.3	6.3	6.3	6.3	6.9	6.9	6.9	6.9	6.9	6.9
M200 (Q4000)					8.9	8.9	8.9	8.9	8.9	8.9
Q4000					8.9	8.9	8.9	8.9	8.9	8.9
Q6500					8.9	8.9	8.9	8.9	8.9	8.9
Q12000					15	15	15	15	15	15
Q24000										
Q32000										
Q50000										
Q70000										

Type of Gear	Weight of Mounting Bracket + Coupling (kg)											
	DN 250						DN 300					
	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100
M50 (Q2000)												
M100 (Q2000)	7.9	7.9	7.9	7.9	7.9	7.9	80	80	80	80	80	80
M200 (Q4000)	7.9	7.9	7.9	7.9	7.9	7.9	83	83	83	83	83	83
Q4000	7.9	7.9	7.9	7.9	7.9	7.9	83	83	83	83	83	83
Q6500	7.9	7.9	7.9	7.9	7.9	7.9	83	83	83	83	83	83
Q12000	15	15	15	15	15	15	105	105	105	105	105	105
Q24000												
Q32000												
Q50000												
Q70000												

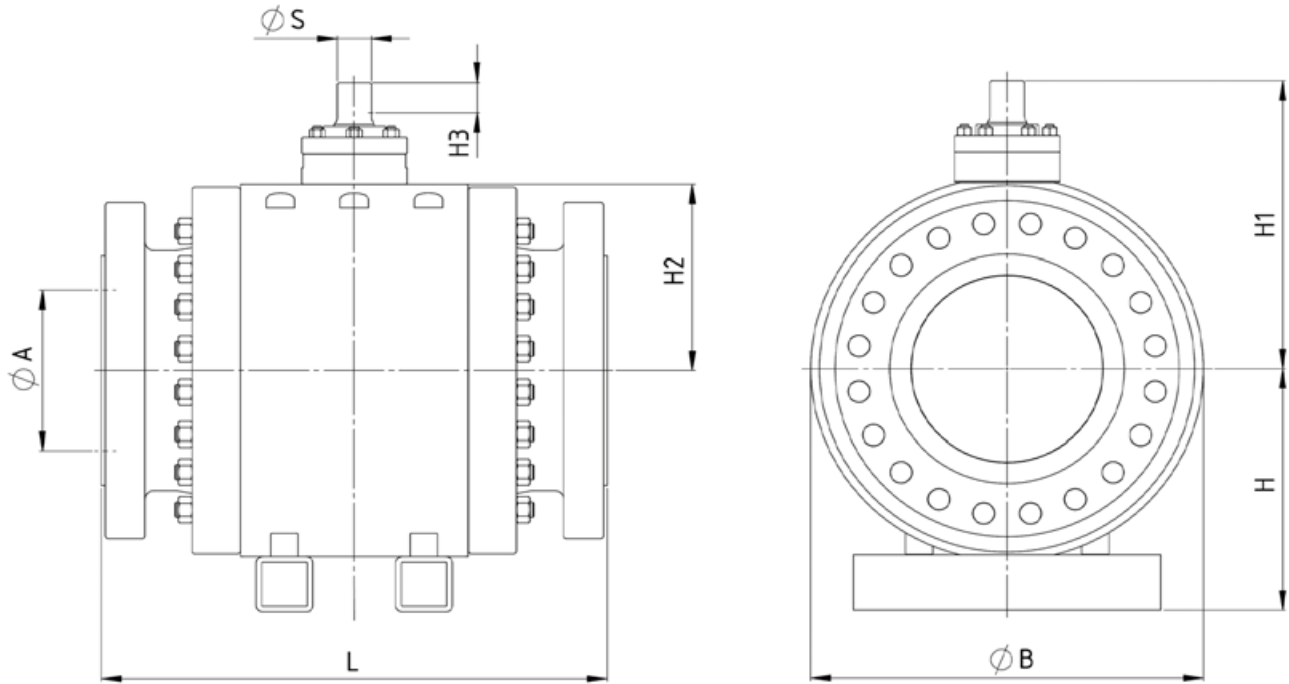
## Dimensions – 6- to 12-in valves – mounting brackets continued

### DIN Valves – 251°C to 400°C (484°F to 752°F)

Type of Gear	Weight of Mounting Bracket + Coupling (kg)									
	DN 150				DN 200					
	PN 16	PN 40	PN 63	PN 100	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100
M50 (Q2000)	23	23	23	23						
M100 (Q2000)	23	23	23	23	27	27	27	27	27	27
M200 (Q4000)	23	23	23	23	27	27	27	27	27	27
Q4000	23	23	23	23	27	27	27	27	27	27
Q6500	23	23	23	23	27	27	27	27	27	27
Q12000	40	40	40	40	42	42	42	42	42	42
Q24000										
Q32000										
Q50000										
Q70000										

Type of Gear	Weight of Mounting Bracket + Coupling (kg)											
	DN 250						DN 300					
	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100
M50 (Q2000)												
M100 (Q2000)	50	50	50	50	50	50	72	72	72	72	72	72
M200 (Q4000)	52	52	52	52	52	52	75	75	75	75	75	75
Q4000	52	52	52	52	52	52	75	75	75	75	75	75
Q6500	52	52	52	52	52	52	75	75	75	75	75	75
Q12000	64	64	64	64	64	64	95	95	95	95	95	95
Q24000												
Q32000												
Q50000												
Q70000												

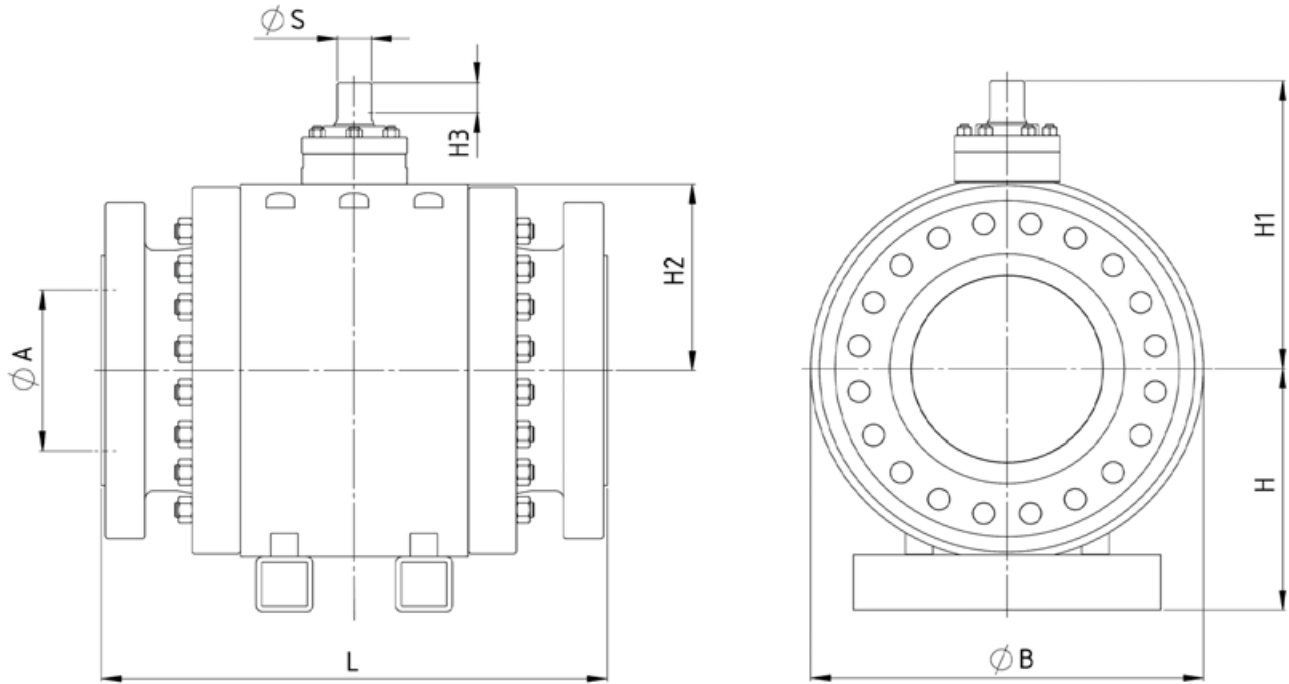
## Dimensions – 14- to 24-in valves



### ASME Valves

Size (NPS)	Pressure Class	Valve Number	Valve Code	Dimensional Drawing No.	Operating Head Drawing No.	Weight (kg)	L (mm) (D3)		$\phi A$ (mm)	$\phi B$ (mm)	H (D4) (mm)	H1 (mm)	H2 (D19) (mm)	H3 (mm)	$\phi S$ (mm)
							RF	RTJ							
14	Class 150	702100	Standard	20006385	20006168	1110	686	-	336.6	690	435	519	335	30	W60x3x18x8f
14	Class 150	702105	Std.-high temp.	on request	20006476	1130	686	-	336.6	690	435	531	335	30	W60x3x18x8f
14	Class 300	702107	Standard	20006364	20006168	1250	762	-	336.6	690	435	519	335	30	W60x3x18x8f
14	Class 300	702112	Std.-high temp.	on request	20006476	1270	762	-	336.6	690	435	531	335	31	W60x3x18x8f
14	Class 600	702114	Standard	20006162	20006168	1460	889	-	336.6	690	435	519	335	30	W60x3x18x8f
14	Class 600	702120	Std.-high temp.	20006472	20006476	1480	889	-	336.6	690	435	531	335	30	W60x3x18x8f
14	Class 900	702122	Standard	20006095	20006067	1840	1029	-	336.6	715	445	549	345	35	W70x3x22x8f
14	Class 900	702128	Std.-high temp.	on request	20006462	1860	1029	-	336.6	715	445	575	345	35	W70x3x22x8f
14	Class 900	702130	Standard	20006066	20006067	1850	-	1039	336.6	715	445	549	345	35	W70x3x22x8f
14	Class 900	702136	Std.-high temp.	20006460	20006462	1870	-	1039	336.6	715	445	575	345	35	W70x3x22x8f
16	Class 150	702138	Standard	20006051	20006059	1460	762	-	387.4	760	468	570	368	40	W80x3x25x8f
16	Class 150	702143	Std.-high temp.	on request	20006401	1480	762	-	387.4	760	468	603	368	40	W80x3x25x8f
16	Class 300	702145	Standard	20006050	20006059	1620	838	-	387.4	760	468	570	368	40	W80x3x25x8f

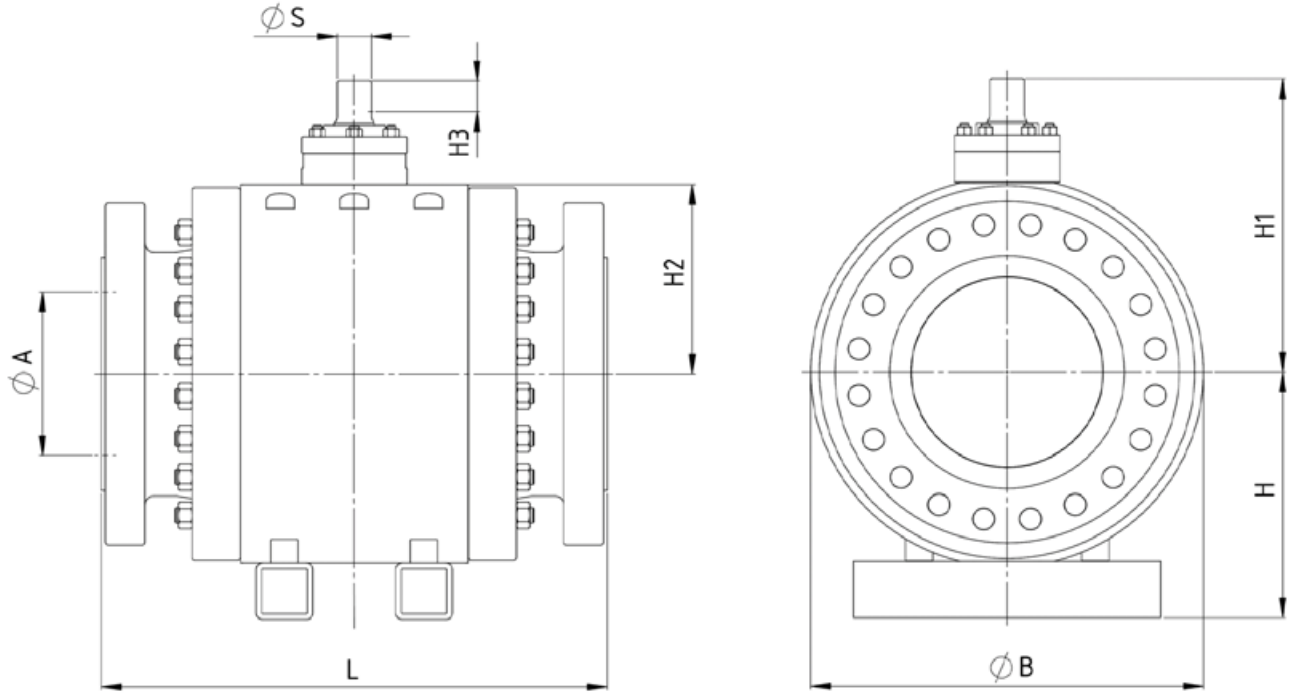
## Dimensions – 14- to 24-in valves continued



### ASME Valves *continued*

Size (NPS)	Pressure Class	Valve Number	Valve Code	Dimensional Drawing No.	Operating Head Drawing No.	Weight (kg)	L (mm) (D3)		ØA (mm)	ØB (mm)	H (D4) (mm)	H1 (mm)	H2 (D19) (mm)	H3 (mm)	ØS (mm)
							RF	RTJ							
16	Class 300	702150	Std.-high temp.	on request	20006401	1640	838	-	387.4	760	468	603	368	40	W80x3x25x8f
16	Class 600	702152	Standard	20006049	20006059	1950	991	-	387.4	760	468	570	368	40	W80x3x25x8f
16	Class 600	702158	Std.-high temp.	20006399	20006401	1970	991	-	387.4	760	468	603	368	40	W80x3x25x8f
16	Class 900	702160	Standard	20006048	20006058	2370	1130	-	387.4	780	495	589	375	45	W90x3x28x8f
16	Class 900	702166	Std.-high temp.	on request	20006452	2390	1130	-	387.4	780	495	640	375	45	W90x3x28x8f
16	Class 900	702168	Standard	20006047	20006058	2380	-	1140	387.4	780	495	589	375	45	W90x3x28x8f
16	Class 900	702174	Std.-high temp.	20006450	20006452	2400	-	1140	387.4	780	495	640	375	45	W90x3x28x8f
18	Class 150	702176	Standard	20006045	20006046	1980	864	-	438	840	529	611	409	40	W80x3x25x8f
18	Class 150	702181	Std.-high temp.	on request	20006448	2000	864	-	438	840	529	644	409	40	W80x3x25x8f
18	Class 300	702183	Standard	20006044	20006046	2160	914	-	438	840	529	611	409	40	W80x3x25x8f
18	Class 300	702188	Std.-high temp.	on request	20006448	2180	914	-	438	840	529	644	409	40	W80x3x25x8f
18	Class 600	702190	Standard	20006043	20006046	2580	1092	-	438	840	529	611	409	40	W80x3x25x8f
18	Class 600	702196	Std.-high temp.	20006446	20006448	2600	1092	-	438	840	529	644	409	40	W80x3x25x8f

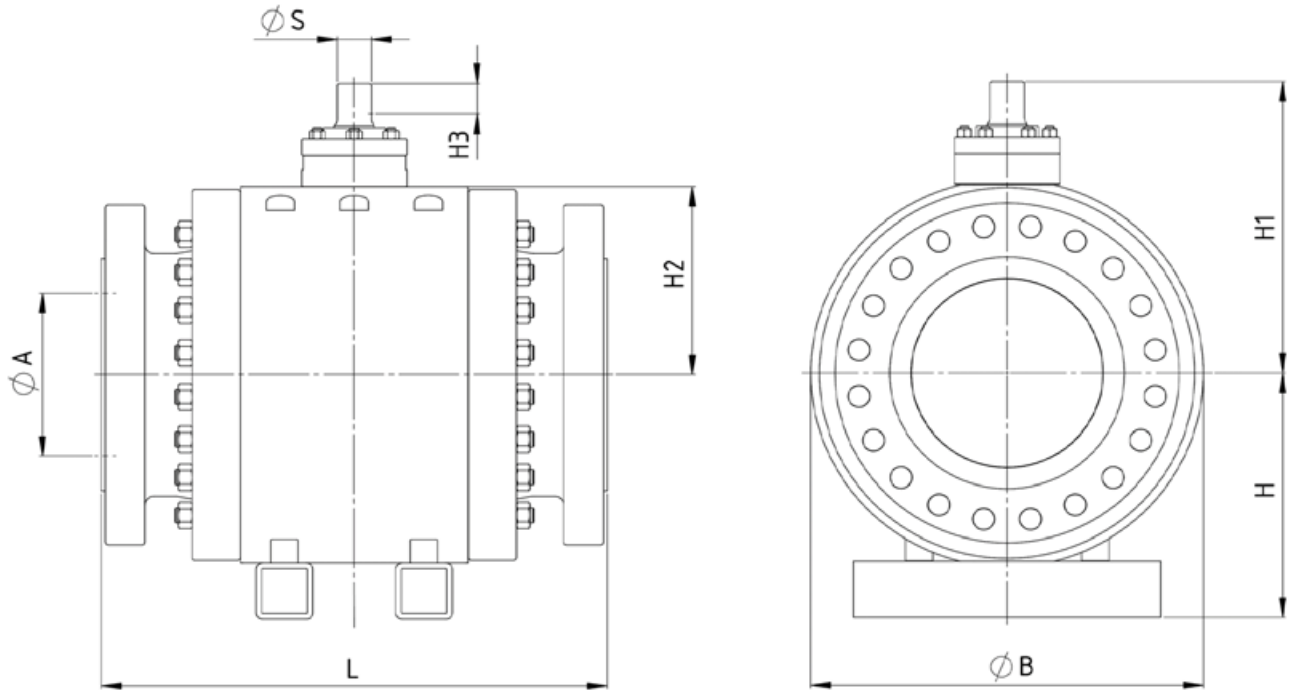
## Dimensions – 14- to 24-in valves continued



### ASME Valves *continued*

Size (NPS)	Pressure Class	Valve Number	Valve Code	Dimensional Drawing No.	Operating Head Drawing No.	Weight (kg)	L (mm) (D3)		ØA (mm)	ØB (mm)	H (D4) (mm)	H1 (mm)	H2 (D19) (mm)	H3 (mm)	ØS (mm)
							RF	RTJ							
18	Class 900	702198	Standard	20006041	20006042	3210	1219	-	425.2	860	539	646	419	45	W90x3x28x8f
18	Class 900	702204	Std.-high temp.	on request	20006444	3230	1219	-	425.2	860	539	686	419	45	W90x3x28x8f
18	Class 900	702206	Standard	20006040	20006042	3220	-	1232	425.2	860	539	646	419	45	W90x3x28x8f
18	Class 900	702212	Std.-high temp.	20006441	20006444	3240	-	1232	425.2	860	539	686	419	45	W90x3x28x8f
20	Class 150	702214	Standard	20006038	20006024	2480	914	-	489	920	569	656	449	45	W90x3x28x8f
20	Class 150	702219	Std.-high temp.	on request	20006420	2500	914	-	489	920	569	714	449	45	W90x3x28x8f
20	Class 300	702221	Standard	20006037	20006024	2740	991	-	489	920	569	656	449	45	W90x3x28x8f
20	Class 300	702226	Std.-high temp.	on request	20006420	2770	991	-	489	920	569	714	449	45	W90x3x28x8f
20	Class 600	702228	Standard	20006036	20006024	3330	1194	-	489	920	569	656	449	45	W90x3x28x8f
20	Class 600	702234	Std.-high temp.	20006418	20006420	3350	1194	-	489	920	569	714	449	45	W90x3x28x8f
20	Class 900	702236	Standard	20006020	20006021	4150	1321	-	471	950	583	695	463	50	W100x3x32x8f
20	Class 900	702242	Std.-high temp.	on request	20006416	4170	1321	-	471	950	583	735	463	50	W100x3x32x8f

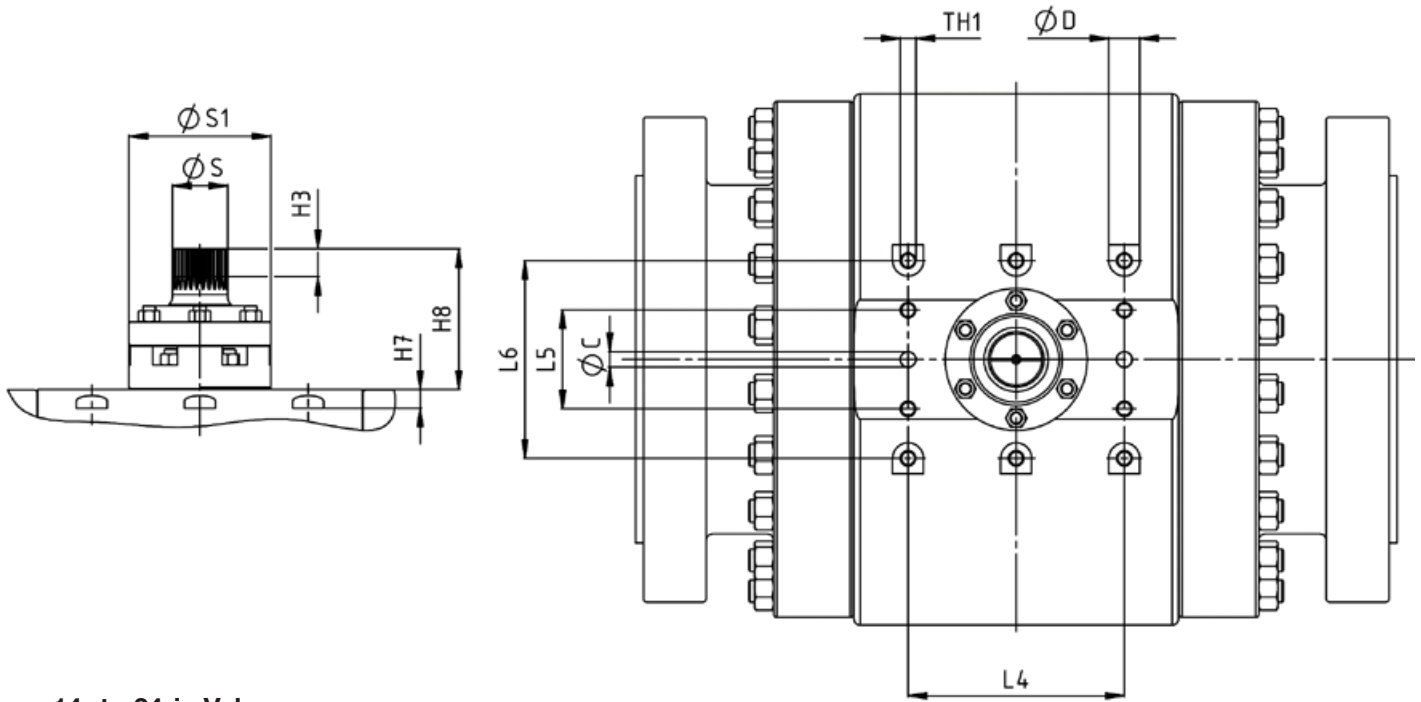
## Dimensions – 14- to 24-in valves continued



### ASME Valves *continued*

Size (NPS)	Pressure Class	Valve Number	Valve Code	Dimensional Drawing No.	Operating Head Drawing No.	Weight (kg)	L (mm) (D3)		ØA (mm)	ØB (mm)	H (D4) (mm)	H1 (mm)	H2 (D19) (mm)	H3 (mm)	ØS (mm)
							RF	RTJ							
20	Class 900	702244	Standard	20006034	20006021	4170	-	1334	471	950	583	695	463	50	W100x3x32x8f
20	Class 900	702250	Std.-high temp.	20006414	20006416	4190	-	1334	471	950	583	735	463	50	W100x3x32x8f
24	Class 150	702252	Standard	20006030	20006033	3980	1067	-	591	1090	656	748	536	50	W100x3x32x8f
24	Class 150	702257	Std.-high temp.	on request	20006393	4000	1067	-	591	1090	656	806	536	50	W100x3x32x8f
24	Class 300	702259	Standard	20006029	20006033	4350	1143	-	591	1090	656	748	536	50	W100x3x32x8f
24	Class 300	702264	Std.-high temp.	on request	20006393	4370	1143	-	591	1090	656	806	536	50	W100x3x32x8f
24	Class 600	702266	Standard	20006027	20006033	5290	1397	-	591	1090	656	748	536	50	W100x3x32x8f
24	Class 600	702272	Std.-high temp.	20006390	20006393	5310	1397	-	591	1090	656	806	536	50	W100x3x32x8f
24	Class 900	702274	Standard	20006026	20006031	6910	1549	-	570	1130	672	804	552	60	W120x3x38x8f
24	Class 900	702280	Std.-high temp.	on request	20006408	6930	1549	-	570	1130	672	839	552	60	W120x3x38x8f
24	Class 900	702282	Standard	20006025	20006031	6940	-	1568	570	1130	672	804	552	60	W120x3x38x8f
24	Class 900	702288	Std.-high temp.	20006404	20006408	6960	-	1568	570	1130	672	839	552	60	W120x3x38x8f

## Dimensions – 14- to 24-in valves – bare stem

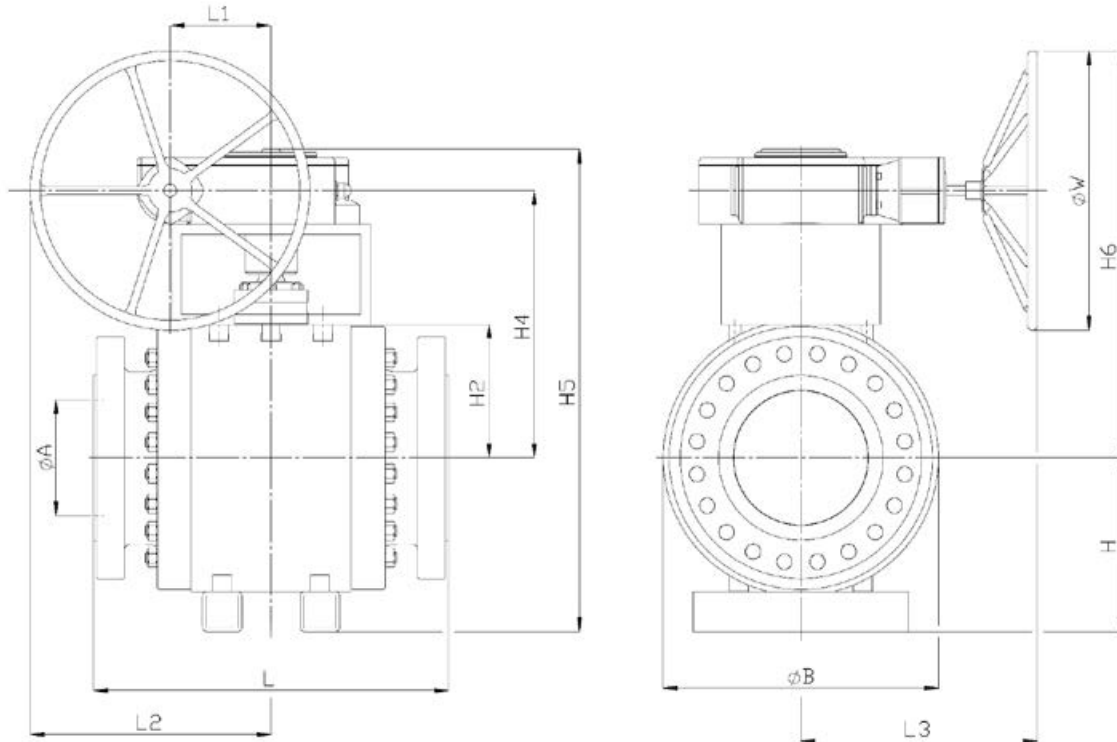


### 14- to 24-in Valves

Operating Head Drawing No.	ØC [ØH11 - deep] (mm)	ØD [+0.2] (mm)	ØS [DIN 548] (mm)	ØS1 (mm)	TH1 [Ø - deep] (mm)	L4 [±0.05] (mm)	L5 (mm)	L6 (mm)	H3 (mm)	H7 [±0.1] (mm)	H8 (mm)
20006021	30-30	50	W100x3x32x8f	240	M24-29	350	160	320	50	25	232
20006024	25-25	40	W90x3x28x8f	220	M20-24	350	150	300	45	25	207
20006031	40-40	60	W120x3x38x8f	280	M30-36	400	200	400	60	36	252
20006033	30-30	50	W100x3x32x8f	230	M24-29	350	160	320	50	25	212
20006042	25-25	50	W90x3x28x8f	230	M24-29	350	160	320	45	31	227
20006046	25-25	40	W80x3x25x8f	210	M20-24	350	150	300	40	25	202
20006058	25-25	50	W90x3x28x8f	220	M24-29	300	-	380	45	52	214
20006059	25-25	40	W80x3x25x8f	210	M20-28	280	-	320	40	35	202
20006067	25-28	50	W70x3x22x8f	200	M24-30	260	-	310	35	42	204
20006168	25-28	50	W60x3x18x8f	185	M24-30	260	-	310	30	42	184
20006393	30-30	50	W100x3x32x8f	245	M24-29	350	160	320	50	25	270
20006401	25-25	40	W80x3x25x8f	215	M20-28	280	-	320	40	35	235
20006408	40-40	60	W120x3x38x8f	280	M30-36	400	200	400	60	36	287
20006416	30-30	50	W100x3x32x8f	245	M24-29	350	160	320	50	25	272
20006420	25-25	40	W90x3x28x8f	235	M20-24	350	150	300	45	25	265
20006444	25-25	50	W90x3x28x8f	235	M24-29	350	160	320	45	31	267
20006448	25-25	40	W80x3x25x8f	215	M20-24	350	150	300	40	25	235
20006452	25-25	50	W90x3x28x8f	235	M24-29	300	-	380	45	52	265
20006462	25-28	50	W70x3x22x8f	205	M24-30	260	-	310	35	42	230
20006476	25-28	50	W60x3x18x8f	185	M24-30	260	-	310	30	42	196



## Installation dimensions – valve and gear – NPS 14



### NPS 14

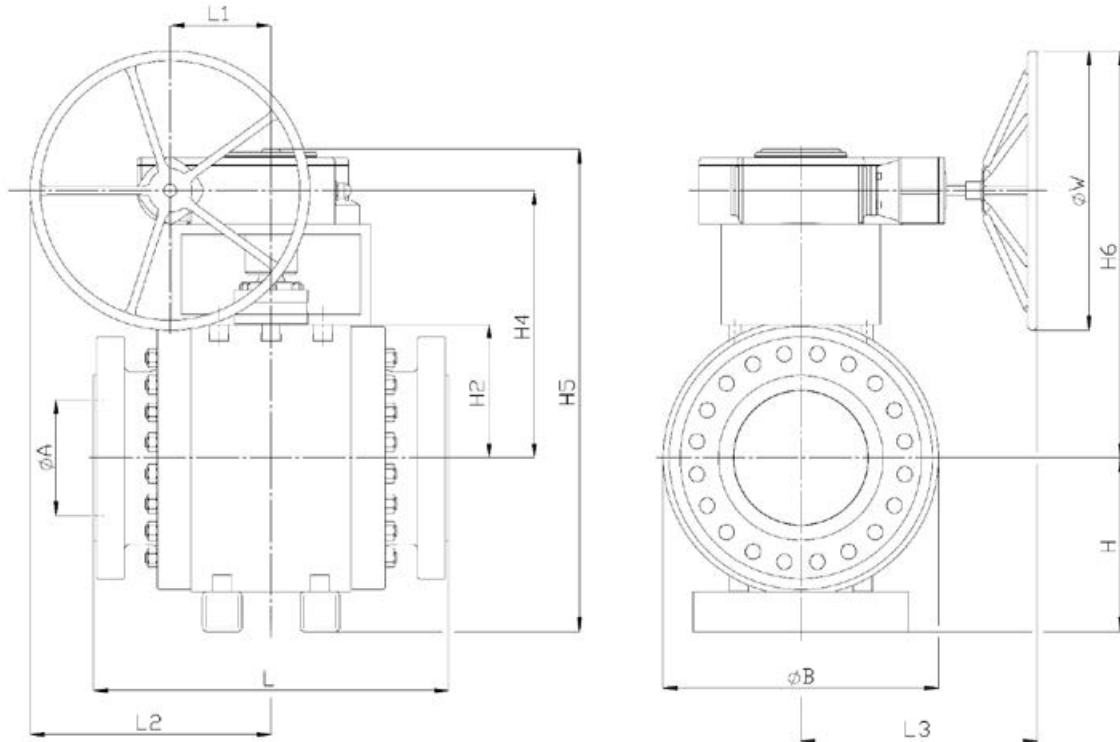
Pressure Class	Flange	L (D3) (mm)	ØA (mm)	ØB (mm)	H (D4) (mm)	H2 (D19) (mm)	Weight Valve (kg)*
Class 150	RF	686	336.6	690	435	335	1130
Class 300	RF	762	336.6	690	435	335	1270
Class 600	RF	889	336.6	690	435	335	1480
Class 900	RF	1029	336.6	715	445	345	1860
Class 900	RTJ	1039	336.6	715	445	345	1870

\* "weight valve" = weight valve only (without gear)

Gear	Applicable Classes	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	ØW (mm)	Weight Gear (kg)**
Q4000	Class 150–600	690	1198	990	138	438	457	600	114
Q6500		690	1198	890	138	338	469	400	129
Q12000		634	1140	934	180	480	535	600	152
Q24000		670	1206	1020	253	603	622	700	287
Q4000	Class 900	700	1218	1000	138	438	457	600	114
Q6500		700	1218	900	138	338	469	400	129
Q12000		644	1160	944	180	480	535	600	152
Q24000		680	1226	1030	253	603	622	700	287

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

## Installation dimensions – valve and gear – NPS 16



### NPS 16

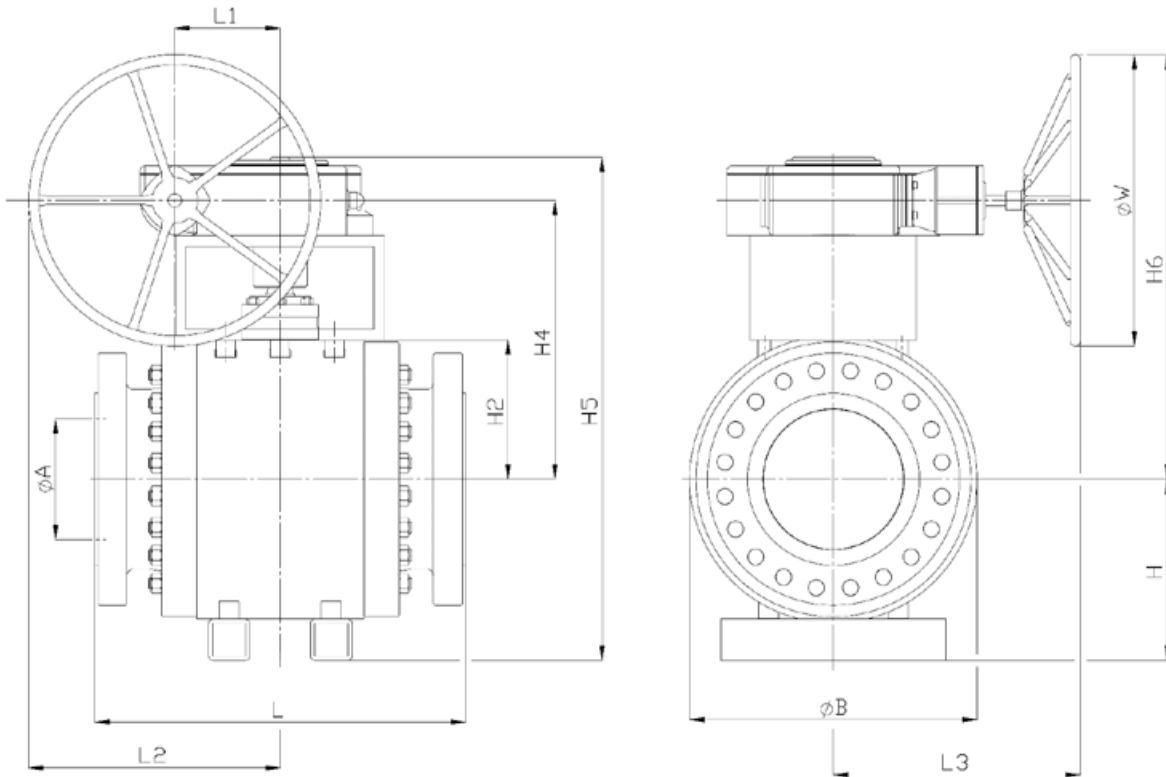
Pressure Class	Flange	L (D3) (mm)	ØA (mm)	ØB (mm)	H (D4) (mm)	H2 (D19) (mm)	Weight Valve (kg)*
Class 150	RF	762	387.4	760	468	368	1480
Class 300	RF	838	387.4	760	468	368	1640
Class 600	RF	991	387.4	760	468	368	1970
Class 900	RF	1130	387.4	780	495	375	2390
Class 900	RTJ	1140	387.4	780	495	375	2400

\* "weight valve" = weight valve only (without gear)

Gear	Applicable Classes	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	ØW (mm)	Weight Gear (kg)**
Q4000	Class 150–600	723	1264	1023	138	438	457	600	114
Q6500		723	1264	923	138	338	469	400	120
Q12000		667	1206	967	180	480	535	600	152
Q24000		703	1272	1053	253	603	622	700	287
Q4000	Class 900	730	1298	1030	138	438	457	600	114
Q6500		730	1298	930	138	338	469	400	120
Q12000		674	1240	974	180	480	535	600	152
Q24000		685	1281	1035	253	603	622	700	287
Q32000		685	1281	1035	253	603	622	700	278

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

## Installation dimensions – valve and gear – NPS 18



### NPS 18

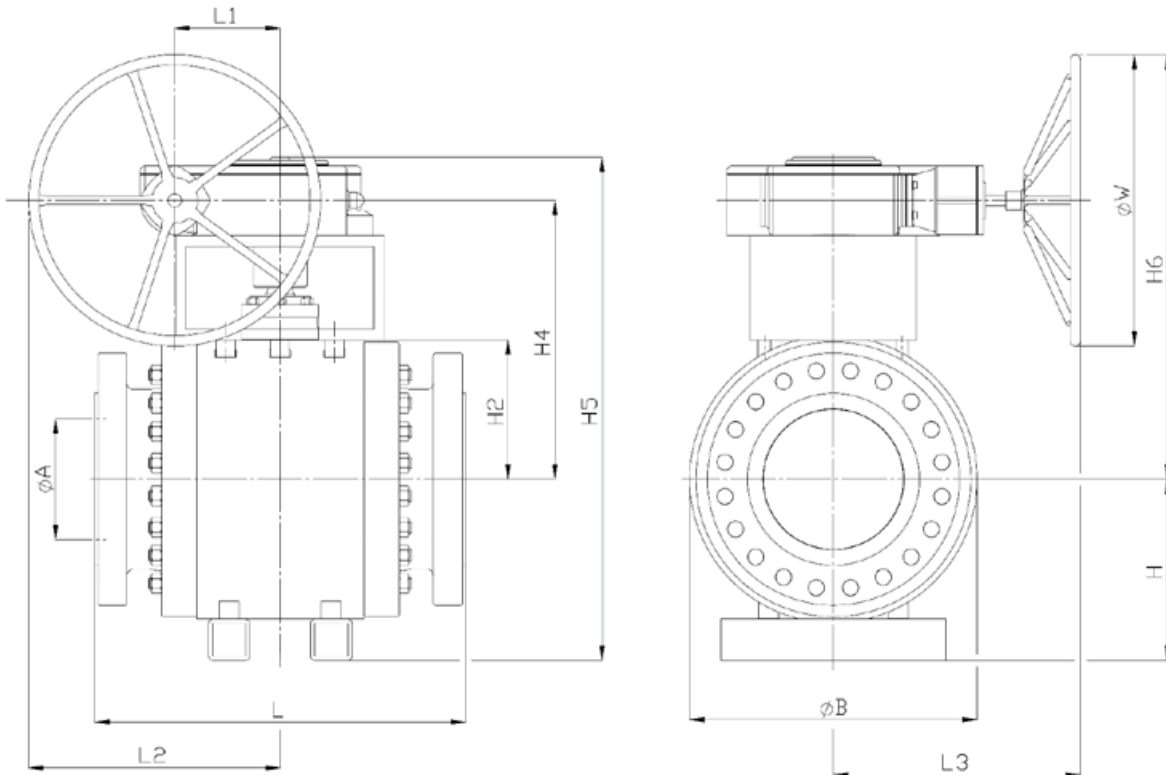
Pressure Class	Flange	L (D3) (mm)	ØA (mm)	ØB (mm)	H (D4) (mm)	H2 (D19) (mm)	Weight Valve (kg)*
Class 150	RF	864	438	840	529	409	2000
Class 300	RF	914	438	840	529	409	2180
Class 600	RF	1092	438	840	529	409	2600
Class 900	RF	1219	425.2	860	539	419	3230
Class 900	RTJ	1232	425.2	860	539	419	3240

\* "weight valve" = weight valve only (without gear)

Gear	Applicable Classes	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	ØW (mm)	Weight Gear (kg)**
Q6500	Class 150–600	764	1366	964	138	338	469	400	120
Q12000		723	1323	1023	180	480	535	600	152
Q24000		744	1374	1094	253	603	622	700	287
Q32000		744	1374	1094	253	603	622	700	290
Q12000	Class 900	733	1343	1033	180	480	535	600	152
Q24000		754	1394	1104	253	603	622	700	287
Q32000		754	1394	1104	253	603	622	700	290
Q50000		917	1581	1267	292	642	792	700	499

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

## Installation dimensions – valve and gear – NPS 20



### NPS 20

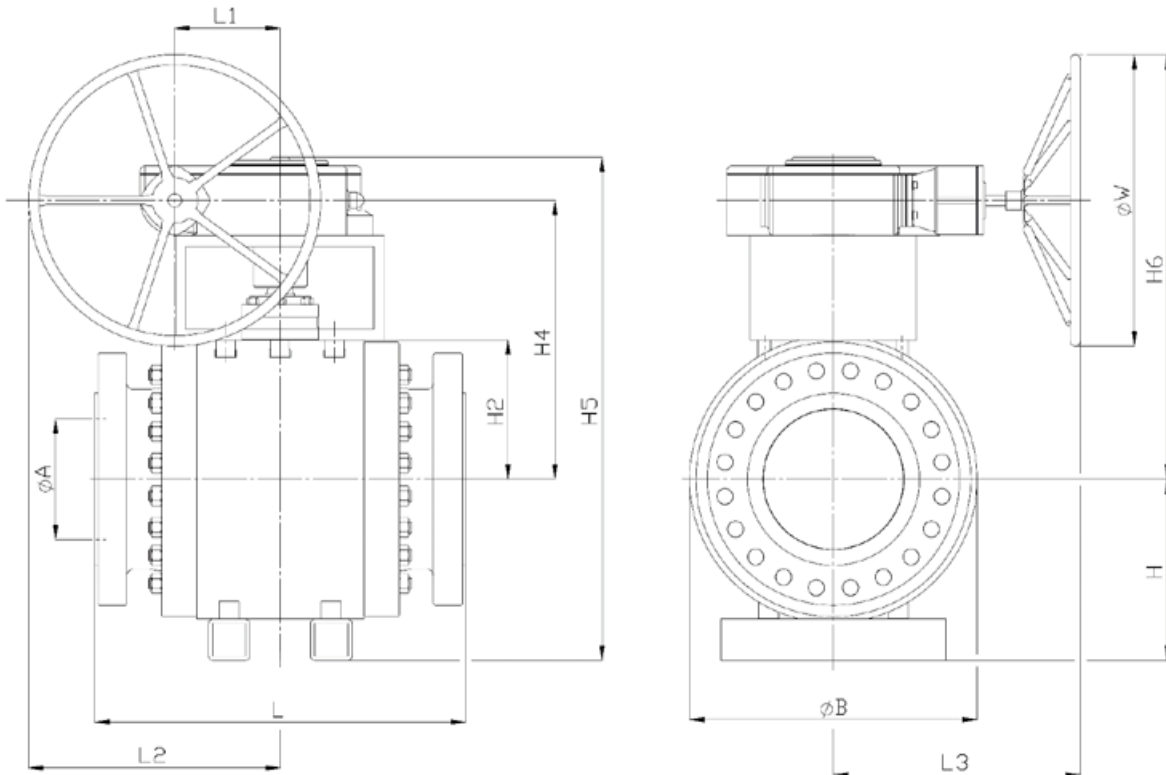
Pressure Class	Flange	L (D3) (mm)	ØA (mm)	ØB (mm)	H (D4) (mm)	H2 (D19) (mm)	Weight Valve (kg)*
Class 150	RF	914	489	920	569	449	2500
Class 300	RF	991	489	920	569	449	2770
Class 600	RF	1194	489	920	569	449	3350
Class 900	RF	1321	471	950	583	463	4170
Class 900	RTJ	1334	471	950	583	463	4190

\* "weight valve" = weight valve only (without gear)

Gear	Applicable Classes	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	ØW (mm)	Weight Gear (kg)**
Q12000	Class 150–600	813	1453	1113	180	480	535	600	139
Q24000		759	1429	1109	253	603	622	700	287
Q32000		759	1429	1109	253	603	622	700	290
Q50000		887	1581	1237	292	642	792	700	557
Q12000	Class 900	827	1481	1127	180	480	535	600	139
Q24000		773	1457	1123	253	603	622	700	287
Q32000		773	1457	1123	253	603	622	700	290
Q50000		901	1609	1251	292	642	792	700	557
Q70000		951	1659	1301	292	642	792	700	519

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

## Installation dimensions – valve and gear – NPS 24



### NPS 24

Pressure Class	Flange	L (D3) (mm)	ØA (mm)	ØB (mm)	H (D4) (mm)	H2 (D19) (mm)	Weight Valve (kg)*
Class 150	RF	1067	591	1090	656	536	4000
Class 300	RF	1143	591	1090	656	536	4370
Class 600	RF	1397	591	1090	656	536	5310
Class 900	RF	1549	570	1130	672	552	6930
Class 900	RTJ	1568	570	1130	672	552	6960

\* "weight valve" = weight valve only (without gear)

Gear	Applicable Classes	H4 (mm)	H5 (mm)	H6 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	ØW (mm)	Weight Gear (kg)**
Q24000	Class 150–600	931	1688	1281	253	603	622	700	295
Q32000		931	1688	1281	253	603	622	700	298
Q50000		1024	1805	1374	292	642	792	700	557
Q70000		1024	1805	1374	292	642	792	700	557
Q32000	Class 900	1087	1860	1437	253	603	622	700	616
Q50000		1140	1937	1490	292	642	792	700	773
Q70000		1140	1937	1490	292	642	792	700	773
Q90000		1140	1937	1490	292	642	859	700	789
GS400+GZ35		1177	2044	1577	400	800	800	800	1521

\*\* "weight gear" = gear and bracket, coupling, screws, etc.

## Dimensions – 14- to 24-in valves – mounting brackets

### Height of Mounting Bracket (mm)

Max. Torque (Nm)	Type of Gear*	Connection Gear	Height of Gear (mm)	DN 350		DN 400		DN 450		DN 500		DN 600	
				Class 150 – Class 600	Class 900	Class 150 – Class 600	Class 900	Class 150 – Class 600	Class 900	Class 150 – Class 600	Class 900	Class 150 – Class 600	Class 900
4000	Q4000	F16	128	300	300	300	300	-	-	-	-	-	-
6500	Q6500	F16	128	300	300	300	300	300	-	-	-	-	-
12,000	Q12000	F25	135	235	235	235	235	250	250	300	300	-	-
24,000	Q24000	F35	186	250	250	250	225	250	250	225	225	310	-
32,000	Q32000	F35	186	-	-	-	225	250	250	225	225	310	450
50,000	Q50000	F40	263	-	-	-	-	-	360	300	300	350	450
70,000	Q70000	F40	263	-	-	-	-	-	-	-	350	350	450
90,000	Q90000	F48	263	-	-	-	-	-	-	-	-	-	450
180,000	GS400+GZ35	F48	370	-	-	-	-	-	-	-	-	-	450

\*Manufacturer: Pro-Gear

Example 1: Valve is DN400, Class 300, Torque = 5000 Nm => Gear = Q6500 => High of gear = 128 mm, High of mounting bracket = 300 mm

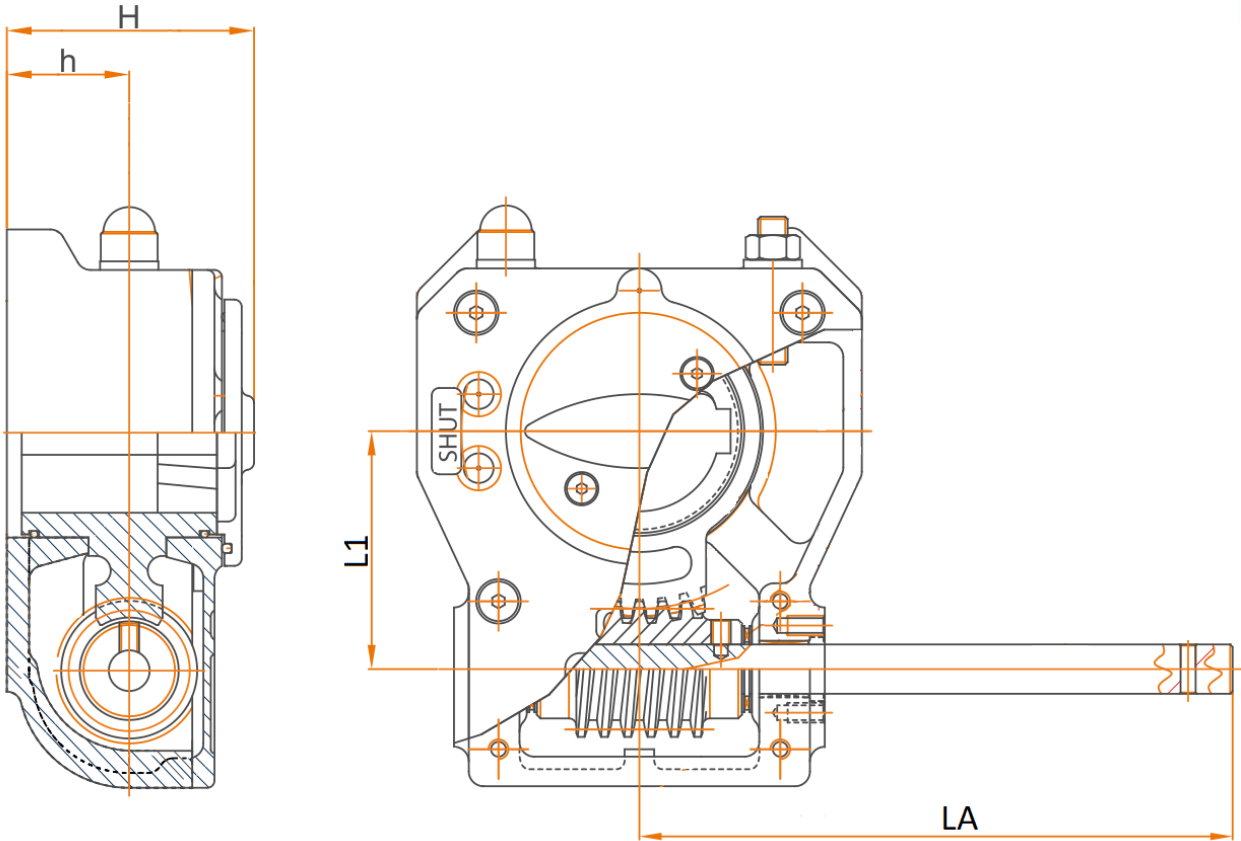
Example 2: Valve is DN500, Class 600, Torque = 30 000 Nm => Gear = Q32000 => High of gear = 168 mm, High of mounting bracket = 225 mm

Example 3: Valve is DN600, Class 900, Torque = 95 000 Nm => Gear = GS400+GZ35 => High of gear = 370 mm, High of mounting bracket = 450 mm

### Weight of Mounting Bracket + Coupling (mm)

Type of Gear	DN 350		DN 400		DN 450		DN 500		DN 600	
	Class 150 – Class 600	Class 900	Class 150 – Class 600	Class 900	Class 150 – Class 600	Class 900	Class 150 – Class 600	Class 900	Class 150 – Class 600	Class 900
Q4000	82	82	82	82	-	-	-	-	-	-
Q6500	91	91	82	82	82	-	-	-	-	-
Q12000	95	95	95	95	95	95	82	82	-	-
Q24000	95	95	95	95	95	95	95	95	103	-
Q32000	-	-	-	83	95	95	95	95	103	421
Q50000	-	-	-	-	-	147	205	205	205	421
Q70000	-	-	-	-	-	-	-	167	205	421
Q90000	-	-	-	-	-	-	-	-	-	421
GS400+GZ35	-	-	-	-	-	-	-	-	-	421

## Dimensions – gear



Max. Torque (Nm)	Manufacturer	Gear Type	Argus No.	Connection to Valve	Ø Wheel (mm)	Length of Wheel (mm)	h (mm)	H (mm)	L1 (mm)	LA (mm)	Weight (kg)
1000	Pro-Gear	M50 (Q2000)	675183	F14	300	86	50	100	97	240	15
2000	Pro-Gear	M100 (Q2000)	675185	F14	400	122	50	100	97	240	15
4000	Pro-Gear	Q4000 (M200)	675188	F16	600	157	55	128	138	300	32
6500	Pro-Gear	Q6500 (M400)	675189	F16	400	122	55	128	138	347	38
12,000	Pro-Gear	Q12000	675190	F25	600	157	64	135	180	378	57
24,000	Pro-Gear	Q24000	675250	F35	700	180	85	186	253	442	192
32,000	Pro-Gear	Q32000	675251	F35	700	180	85	186	253	442	195
50,000	Pro-Gear	Q50000	675366	F40	700	180	138	263	292	612	352
70,000	Pro-Gear	Q70000	675367	F40	700	180	138	263	292	612	352
90,000	Pro-Gear	Q90000	675368	F48	700	180	138	263	292	679	368
180,000	AUMA	GS400+GZ35	675237	F48	800	200	175	370	400	600	1100

## Bolting torques

### Metric (Nm)

Material ASTM	M8	M10	M12	M14x1.5	M16	M20	M22	M24	M27	M30	M33	M36	M39	M42	M48
A 193 Gr. B7	24	49	84	130	205	395	525	675	1000	1340	1850	2360	3030	3750	5650
A193 B8	16	30	53	81	127	246	330	426							
A193 B8MN Cl. 2	22	45	80	120	185	300	405	520	720	970	1300	1700	2200	2700	4000
A453 660 Cl. B	19	41	71	108	170	330	440	570	830	1100	1500	1950	2500	3150	4700

### UNC (Nm)

Material ASTM	1/2 - 13 UNC	5/8 - 11 UNC	3/4 - 10 UNC	7/8 - 9 UNC	1 - 8 UNC	1 1/8 - 7 UNC	1 1/4 - 7 UNC	1 5/8 - 6 UNC	1 1/2 - 6 UNC	1 3/4 - 5 UNC	2 - 4.5 UNC	2 1/4 - 4.5 UNC	2 1/2 - 4 UNC
A 193 Gr. B7	102	200	350	555	830	1158*	1609*	2080*	2738*	4294*	6318*	9221*	12,522*

\*Tighten torque according to screws Grohmann Table G72. Values determined by the ratio of the stress cross-section, since only 8UN threads are listed in table G72.

## Threads and materials

Size	250°C (482°F)				400°C (752°F)			
	Pos.	Gew.	CS	SS	Pos.	Gew.	CS	SS
DN 80-100	15+16	M10	A4-70	A4-70	16	M10	A4-70	A4-70
		M12	A4-70	A4-70		M12	A4-70	A4-70
		M16	A4-70	A4-70		M16	A4-70	A4-70
	19	M12	A 193 Gr. B7	A193 B8M	19	M12	A 193 Gr. B7	A193 B8M
		M14	A 193 Gr. B7	A193 B8M		M14	A 193 Gr. B7	A193 B8M
		M16	A 193 Gr. B7	A193 B8M		M16	A 193 Gr. B7	A193 B8M
		M20	A 193 Gr. B7	A193 B8M		M20	A 193 Gr. B7	A193 B8M
					68	M10	A193 B8M	A193 B8M
					M12	A193 B8M	A193 B8M	
					M16	A193 B8M	A193 B8M	
DN 150-300							1.4980	
DN 350-600	15		A 193 Gr. B7					
	19	UNC	A 193 Gr. B7					
	68		A 193 Gr. B7					



## Proactive maintenance recommendations

### Metal-seated ball valves

1. Use only OEM spare parts.
2. Perform first maintenance no more than *two years* after operational startup of plant.
3. Replace all soft parts, including all O-rings, sealing rings and bearings.
4. Examine metal trim kit (ball and ball seats) to ensure all components are still in good shape.  
**NOTE:** The metal trim kit is a wearing part; however, under normal operating conditions, it should last at least 200,000 cycles (approximately three years).
5. Examine stem and stem journal to ensure all components are still in good shape.
6. It is strongly recommended that this maintenance be repeated every two to three years, even though the metal trim kit can last much longer. Failure of a soft part, e.g., a bearing, the metal trim kit or valve body could be severely damaged.

### Soft-seated ball valves

1. Use only OEM spare parts.
2. Perform first maintenance no more than *one year* after operational startup of plant.
3. Replace all soft parts, including all O-rings, sealing rings, bearings and PEEK (Lytan) ball seats.
4. Examine ball, stem and stem journal to ensure all components are still in good shape.
5. It is strongly recommended that this maintenance be repeated every two years.

### Automated valves in severe services

Severe service conditions—such as high cycling, high temperatures, abrasive or erosive media, or solids-containing fluids—may influence the service life and performance of the valve. In the case of automated valves, it is recommended that proactive and regular maintenance of the bracket and actuator bolting also be performed.

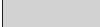
## Dimensions and weights

**Face-to-Face Dimensions (mm) – RF**

NPS	150	300	600	900
3	203	282	356	381
4	229	305	432	457
5	356	381	508	559
6	394	403	559	610
8	457	502	660	737
10	533	568	787	838
12	610	648	838	965
14	686	762	889	1029
16	762	838	991	1130
18	864	914	1092	1219
20	914	991	1194	1321
24	1067	1143	1397	1549

**Face-to-Face Dimensions (mm) – RTJ**

NPS	150	300	600	900
3			359	384
4			435	460
5			511	562
6			562	613
8			663	740
10			790	841
12			841	968
14				1039
16				1140
18				1232
20				1334
24				1568

 No RTJ available

## Dimensions and weights continued

Weight (kg) – RF / ≤250°C (482°F)

NPS	150	300	600	900
3	37	55	61	105
4	51	75	95	144
5	64	91	129	184
6	167	184	236	342
8	268	304	377	542
10	497	566	722	957
12	703	792	973	1395
14	1110	1250	1460	1840
16	1460	1620	1950	2370
18	1980	2160	2580	3210
20	2480	2740	3330	4150
24	3980	4350	5290	6910

Weight (kg) – RF / 250°C to 400°C (482°C to 752°F)


NPS	150	300	600	900
3	38	56	62	106
4	52	77	94	146
5	65	92	130	186
6	163	181	232	338
8	262	298	371	536
10	498	568	724	959
12	708	797	978	1400
14	1130	1270	1480	1860
16	1480	1640	1970	2390
18	2000	2180	2600	3230
20	2500	2770	3350	4170
24	4000	4370	5310	6930


Weight (kg) – RTJ / ≤250°C (482°F)

NPS	150	300	600	900
3			61	105
4			95	145
5			130	184
6			236	342
8			378	543
10			724	959
12			976	1398
14				1850
16				2380
18				3220
20				4170
24				6940

Weight (kg) – RTJ / 250°C to 400°C (482°C to 752°F)

NPS	150	300	600	900
3			62	106
4			94	147
5			131	187
6			233	339
8			372	537
10			726	961
12			980	1402
14				1870
16				2400
18				3240
20				4190
24				6960

 No RTJ available

 No RTJ available



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