Butterfly Valve

# TRIODIS 300

## Type Series Booklet

## Legal information/Copyright

Type Series Booklet TRIODIS 300

# Contents

# Butterfly Valves

## Triple-offset Butterfly Valves

# TRIODIS 300

### Main applications

- Mining
- Chemical industry
- Petrochemical industry
- Liquefied natural gas process
- Pressure boosting
- Shipbuilding
- Pipelines and tank farms
- Process engineering
- Gas tanks
- Industrial recirculation systems
- Nuclear power stations
- Air-conditioning systems
- Fossil-fuelled power stations
- Paper industry / pulp industry
- Hot-water heating systems

### Fluids handled

- Gas
- Liquefied gas
- Liquefied natural gas
- Aggressive fluids
- Steam
- Solids-laden fluids
- Flammable fluids
- High-temperature hot water
- Corrosive fluids
- Fuels
- Volatile fluids
- Fluids containing mineral oils
- Oil
- Polymerising/crystallising fluids
- Radioactive fluids
- Vacuum
- Thermal oil
- Oxygen (GOX/LOX)

### Operating data

**Table 1:** Operating properties

| Characteristic | Value | |
|---|---|---|
| | TRIODIS 300 CRYO | TRIODIS 300 MT |
| Nominal pressure | Class 300 | |
| Nominal size | DN 80 - 1200 | DN 80 - 1200 |
| Max. permissible pressure [bar] | 50 | |
| Min. permissible temperature [°C] | ≥ -196 | -50 |
| Max. permissible temperature [°C] | +200 | ≤ +450<br>Higher temperatures on request |
| Vacuum operation down to | 0 bar absolute | |
| Max. permissible flow velocity at operating pressure | 4 m/s for liquids<br>50 m/s for clean gases<br>Higher flow velocities on request | |

The permissible operating temperature depends on the fluid to be handled . Higher temperatures on request

### Design details

### Design

- Full-lug body with raised faces – T4: DN 80-600 (3-24 in.)
- Flanged body with raised/flat faces – T7: DN 80-1200 (3-48 in.)
- Body with butt weld ends – BW: DN 100-1200 (4-48 in.)
- Design to ASME B16.34, API 609, EN 12516-1 and EN 593
- Face-to-face length in accordance with standards:
  - Class 300 T4: API 609-B (A) Class 300
  - Class 300 T7: ISO 5752-13, EN 558-1 Series 13
- Connections for:
  - PN40 to EN 1092-1: DN 80-600 (3-24 in.)
  - ASME B15.5 Class 300 UN/UNC: DN 80-600 (3-24 in.)
  - ASME B16.47 Series A Class 300: DN 700-1200 (28-48 in.)
  - ASME B16.47 Series B Class 300: DN 700-1200 (28-48 in.)
- Fire-safe design approved to ISO 10497 (equivalent to API 607 and BS 6755)
- Fugitive emissions performance certified in accordance with EN ISO 15848-1, leakage rate A C03, and in accordance with TA Luft (German Technical Guidelines on Air Quality Control, VDI Directive 2440)
- The valves meet SIL 3 safety requirements in accordance with IEC 61508.
- Top flange and square valve shaft end to ISO 5211

8613.1783/10-EN

- Dead-end service and downstream dismantling possible with body types T4 and T7.
- For installation between flanges to EN 1092, ASME B16.5 and ASME B16.47
- Marking in accordance with EN 19
- Steel body with anti-corrosive surface treatment
- Stainless steel body: pickled and passivated

### Variants

- MS / MC manual gearboxes
- ACTAIR EVO / DYNACTAIR EVO pneumatic actuators
- HQ hydraulic actuators
- Electric quarter-turn actuators
- AMTROBOX for open/closed position signalling
- AMTRONIC U on/off control unit
- SMARTRONIC U positioner
- Vent hole for additional tightness at shaft passage
- Drain plug
- NACE to MR0175 / ISO15156
- ATEX-compliant version in accordance with Directive 2014/34/EU
- Body with two-coat or three-coat paint system
- Anti-static design to EN 12266-2

### Valve body materials

TRIODIS 300 CRYO

**Table 2:** Overview of available materials

| Material to ASTM[1)] | Material to EN | Temperature limit | KSB code | Body design |
|---|---|---|---|---|
| ASTM A351 Gr. CF8M | EN 10213 1.4408 | -196 °C to +200 °C | 6 | T4 / T7 |
| ASTM A351 Gr. CF3M | EN 10213 1.4409 | | 6t | BW |

TRIODIS 300 MT

**Table 3:** Overview of available materials

| Material to ASTM | Material to EN | Temperature limit | KSB code | Body design |
|---|---|---|---|---|
| ASTM A216 Gr. WCC | EN 10213 1.0619 | -29 °C to +260 °C | 1 | T4 / T7 |
| ASTM A216 Gr. WCB | | | 1p | |
| ASTM A352 Gr. LCB | | -50 °C to +260 °C | 1n | |
| ASTM A352 Gr. LCC | EN 10213 1.6220 | | 1m | |
| ASTM A351 Gr. CF8M | EN 10213 1.4408 | | 6 | |

### Product benefits

- Tight shut-off
  - Perfect bi-directional shut-off: zero leakage to API 598, EN 12266, FCI 70-2, ISO 5208, ISO 28921-1, BS 6364
- Positioning and locking of actuator flange
  - Actuator easy to remove and reinstall in the system
- Ease of service
  - Seat can be replaced easily.
  - Innovative maintenance-free sealing system at the shaft passage
- Operating reliability
  - Anti-blowout design protects operators.
- Lifting lugs
  - for ease of lifting and handling
- Resistance depending on the number of open/closed cycles
  - Compliant with EN 12567 (equivalent to EN 28921)

8613.1783/10-EN

1 Other materials on request.

## Product information

### Product information as per Pressure Equipment Directive 2014/68/EU (PED)

The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Groups 1 and 2.

### Product information as per UK Pressure Equipment (Safety) Regulations 2016

The valves satisfy the safety requirements of the UK Pressure Equipment (Safety) Regulations 2016 (PER) for fluids in Groups 1 and 2.

### EC Machinery Directive 2006/42/EC

Valves with actuators can meet the requirements of the 2006/42/EC Machinery Directive for partly completed machinery.

### Product information as per Regulation No. 1907/2006 (REACH)

For information as per European chemicals regulation (EC) No. 1907/2006 (REACH) see https://www.ksb.com/en-global/company/corporate-responsibility/reach.

### Product information as per Directive 2014/34/EU (ATEX)

The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) to ATEX 2014/34/EU.

### Certifications

**Table 4:** Overview

| Label | Effective in: | Comment |
|---|---|---|
| BUREAU VERITAS | Worldwide | Approved for marine applications |
| Lloyd's Register | Worldwide | Approved for marine applications |
| ABS | Worldwide | Approved for marine applications |
| KR | Worldwide | Approved for marine applications (on request) |
| SSEI | China | TSG D7002-2006 |
| EAC | Eurasian Economic Union | Technical Regulations of the Eurasian Economic Union TR CU 052/2013 |

### Related documents

**Table 5:** Information/documents

| Document | Reference number |
|---|---|
| Operating manual | 8613.81 |

### Purchase order specifications

Please specify the following information in all enquiries or purchase orders:

1. Type
2. Nominal pressure
3. Nominal size
4. Fluid handled
5. Flow rate / flow velocity
6. Operating temperature
7. Materials (body, valve disc, seat)
8. Line connection, flange facing and flange surface quality
9. Actuator / automation
10. Reference number

8613.1783/10-EN

### Pressure/temperature ratings

In pressure class 300 (European materials), the TRIODIS 300 butterfly valve complies with the ASME B16.34 and EN 12516-1 standards as per the following table.
The values in the following table apply to valves subject to the Pressure Equipment Directive 2014/68/EU.

**Table 6:** Test pressure and operating pressure

| Materials | | Operating pressure [bar] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | [°C] | | | | | | | | |
| **Body and extension** | **Seat** | **-250** | **-50** | **-29 to +38** | **50** | **100** | **150** | **200** | **250** | **260** |
| ASTM A216 Gr. WCC / EN 10213 1.0619 | Metal | Not permitted | Not permitted | 51,7 | 51,7 | 51,5 | 50,2 | 48,6 | 46,3 | 45,6 |
| | Plastomer /metal | Not permitted | Not permitted | 51,7 | 51,7 | 51,5 | 50,2 | - | - | - |
| ASTM A216 Gr. WCB | Metal | Not permitted | Not permitted | 51,1 | 50,1 | 46,4 | 45,1 | 43,8 | 41,7 | 41,1 |
| | Plastomer /metal | Not permitted | Not permitted | 51,1 | 50,1 | 46,4 | 45,1 | - | - | - |
| ASTM A352 Gr. LCB | Metal | Not permitted | 47,9[2)] | 48,0 | 47,5 | 45,3 | 43,9 | 42,5 | 40,8 | 40,4 |
| | Plastomer /metal | Not permitted | 47,9[2)] | 48,0 | 47,5 | 45,3 | 43,9 | - | - | - |
| ASTM A352 Gr. LCC / EN 10213 1.6220 | Metal | Not permitted | 51,7[2)] | 51,7 | 51,7 | 51,5 | 50,2 | 48,6 | 46,3 | 45,6 |
| | Plastomer /metal | Not permitted | 51,7[2)] | 51,7 | 51,7 | 51,5 | 50,2 | - | - | - |
| ASTM A351 Gr. CF8M / EN 10213 1.4408 | Metal | 49,6 | 49,6 | 49,6 | 48,1 | 42,2 | 38,5 | 35,7 | 33,4 | 33,0 |
| | Plastomer /metal | 49,6 | 49,6 | 49,6 | 48,1 | 42,2 | 38,5 | - | - | - |
| ASTM A351 Gr. CF3M / EN 10213 1.4409 | Metal | 49,6 | 49,6 | 49,6 | 48,1 | 42,2 | 38,5 | 35,7 | 33,4 | 33,0 |
| | Plastomer /metal | 49,6 | 49,6 | 49,6 | 48,1 | 42,2 | 38,5 | - | - | - |

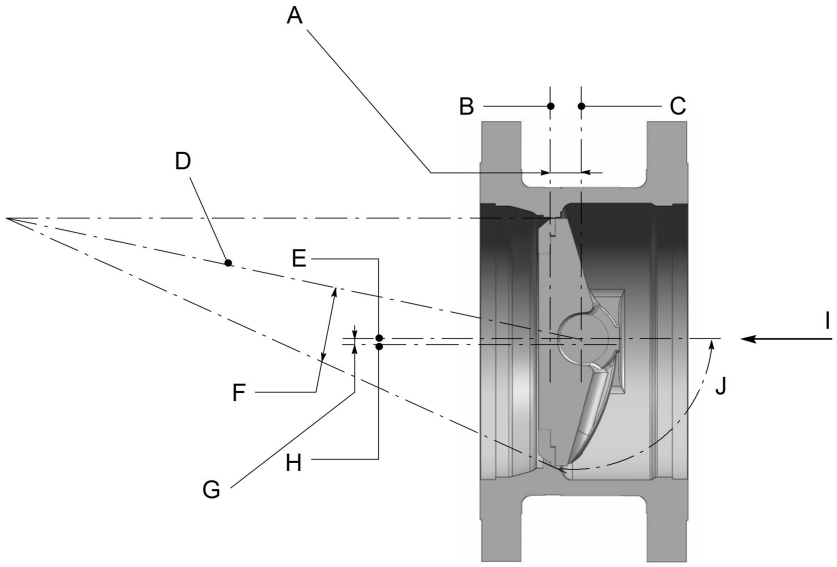
The maximum temperature of the PCTFE seat is 150 °C. Higher temperatures on request.

8613.1783/10-EN

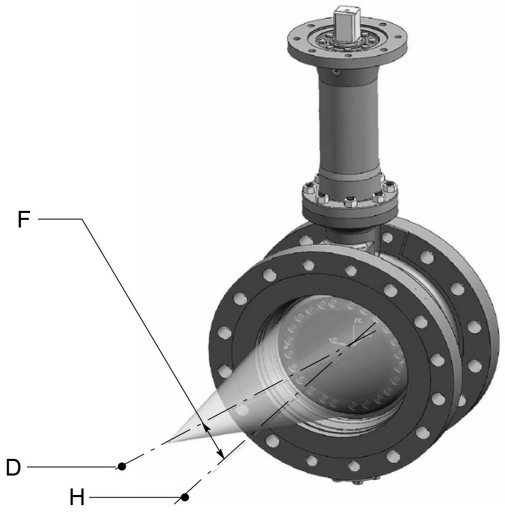
2 For ASME B16.34 standard only

## Technical data

### Sealing system design




Function schematic




3D view

| | | | |
|---|---|---|---|
| A - | First offset | F - | Third offset |
| B - | Seat axis | G - | Second offset |
| C - | Shaft plane | H - | Pipe centreline |
| D - | Axis of cone over seat | I - | Preferred flow direction |
| E - | Shaft axis | J - | Direction of rotation for opening |

**First offset**
The axis of the seal is offset from the shaft axis, enabling tight shut-off without interfering with the shaft passage.

**Second offset**
The shaft plane is offset from the axis of the sphere, reducing friction between the valve disc seat and the body seal.

**Third offset**
The tri-conical shape results from the offset circles of the initial sphere. The tri-conical axis is inclined at a defined angle from the axis of the sphere, preventing friction during valve actuation and thus increasing the service life.

8613.1783/10-EN

## Hydraulic characteristics

**Table 7:** [Kv0 in $m^3$/ h / $bar^{0,5}$] and [Cv0 in GUS / min / $psi^{0,5}$]

| DN | NPS | Flow coefficient with valve disc fully open | | Zeta |
|---|---|---|---|---|
| | [inch] | Kv0 | Cv0 | |
| 80 | 3 | 130 | 151 | 3,87 |
| 100 | 4 | 160 | 186 | 1,9 |
| 150 | 6 | 610 | 708 | 2,17 |
| 200 | 8 | 1140 | 1322 | 1,97 |
| 250 | 10 | 1950 | 2262 | 1,64 |
| 300 | 12 | 2780 | 3225 | 1,67 |
| 350 | 14 | 3970 | 4605 | 1,52 |
| 400 | 16 | 5200 | 6032 | 1,51 |
| 450 | 18 | 7750 | 8990 | 1,09 |
| 500 | 20 | 10420 | 12087 | 0,92 |
| 550 | 22 | 11770 | 13653 | 1,05 |
| 600 | 24 | 16140 | 18722 | 0,79 |
| 700 | 28 | 18520 | 21483 | 1,12 |
| 750 | 30 | 20280 | 23525 | 1,23 |
| 800 | 32 | 23740 | 27538 | 1,16 |
| 900 | 36 | 31420 | 36447 | 1,06 |
| 1000 | 40 | 35290 | 40936 | 1,28 |
| 1050 | 42 | 37710 | 43744 | 1,36 |
| 1200 | 48 | 50520 | 58603 | 1,30 |

8613.1783/10-EN

## Materials

### Materials for TRIODIS 300 CRYO

**Body type: with butt weld ends**

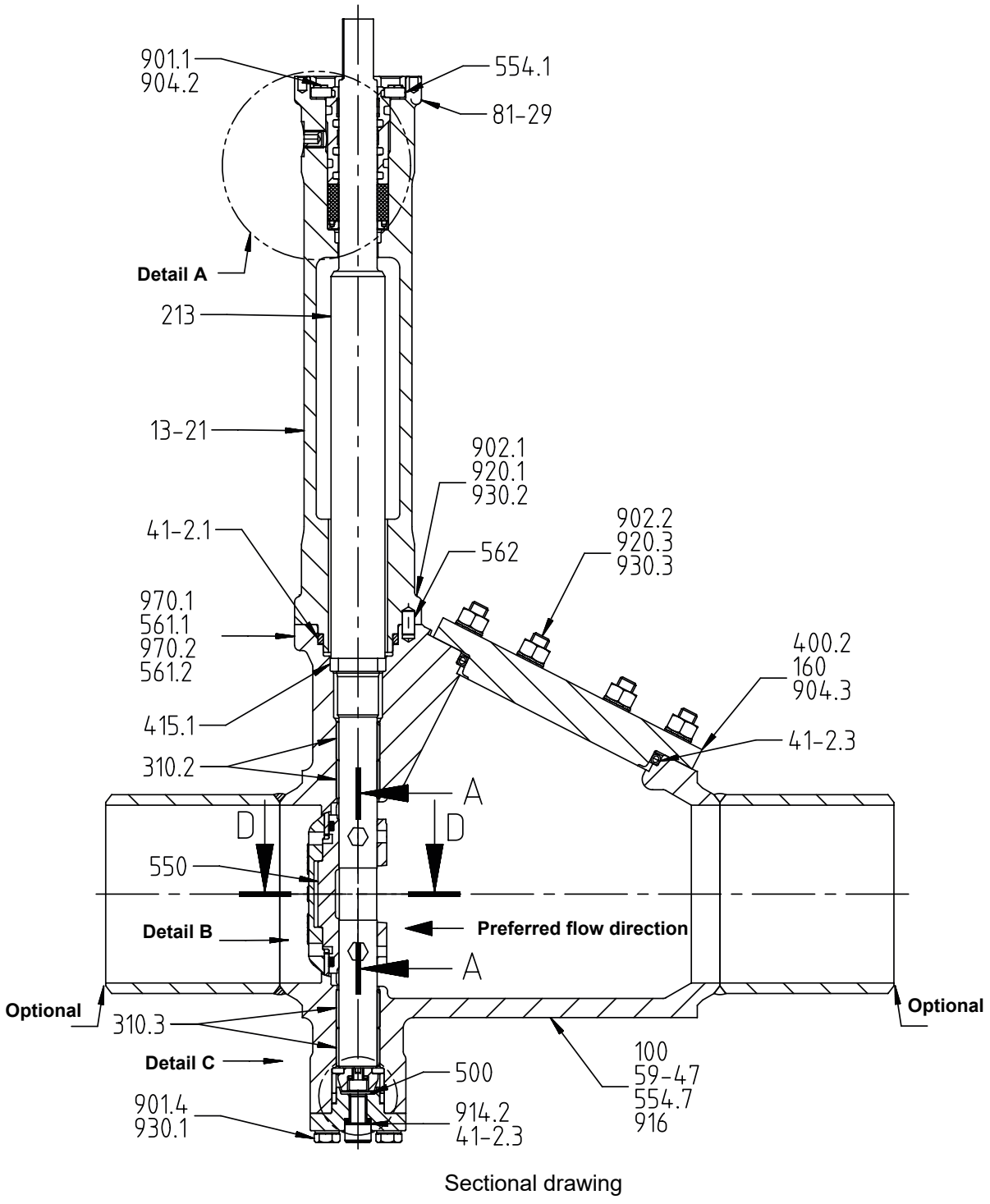



**Fig. 1:** Sectional drawing of TRIODIS 300 CRYO BWSE for DN 100 (4 in.)

8613.1783/10-EN

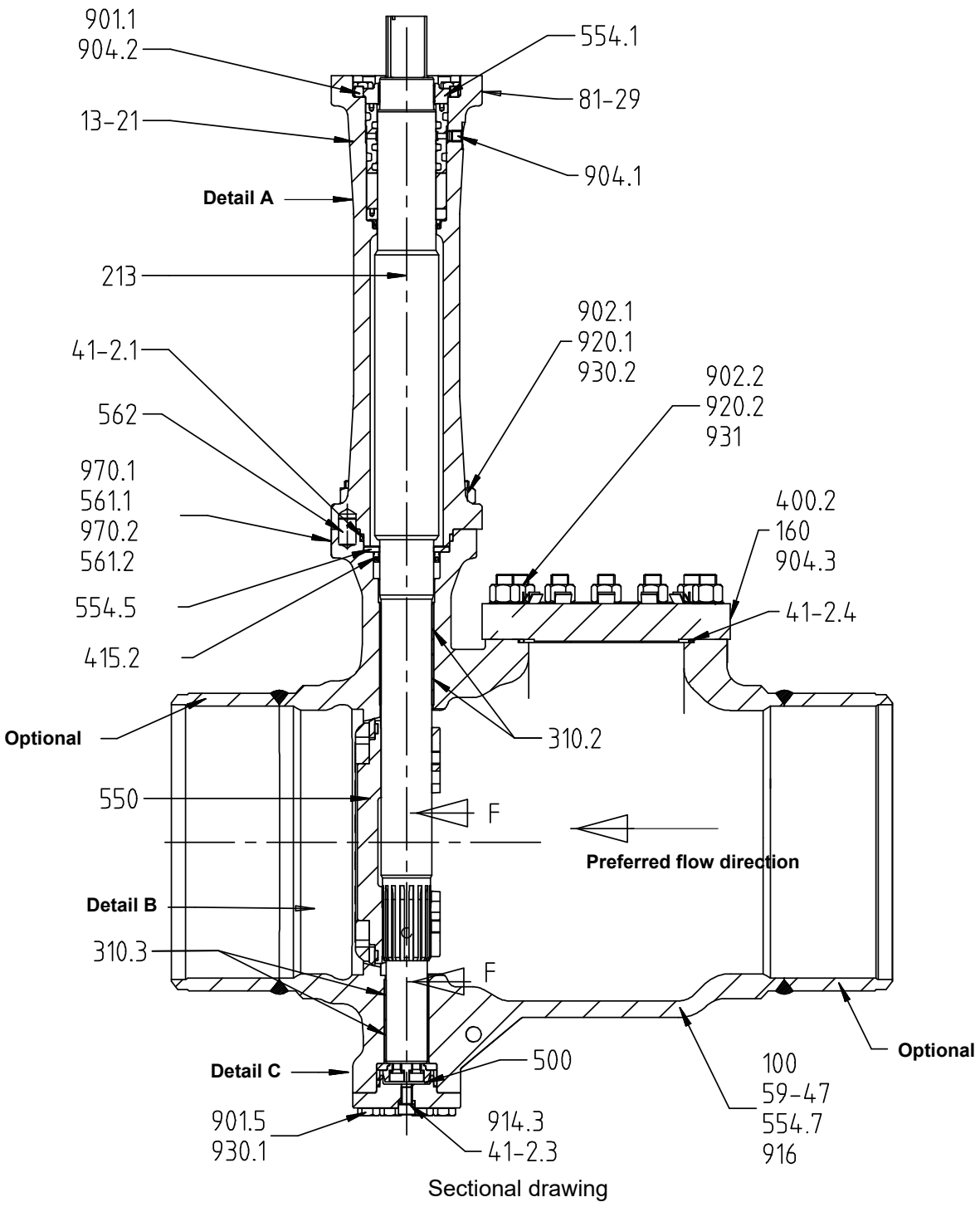



**Fig. 2:** Sectional drawing of TRIODIS 300 CRYO BWSE for DN 150-400 (6-16 in.)

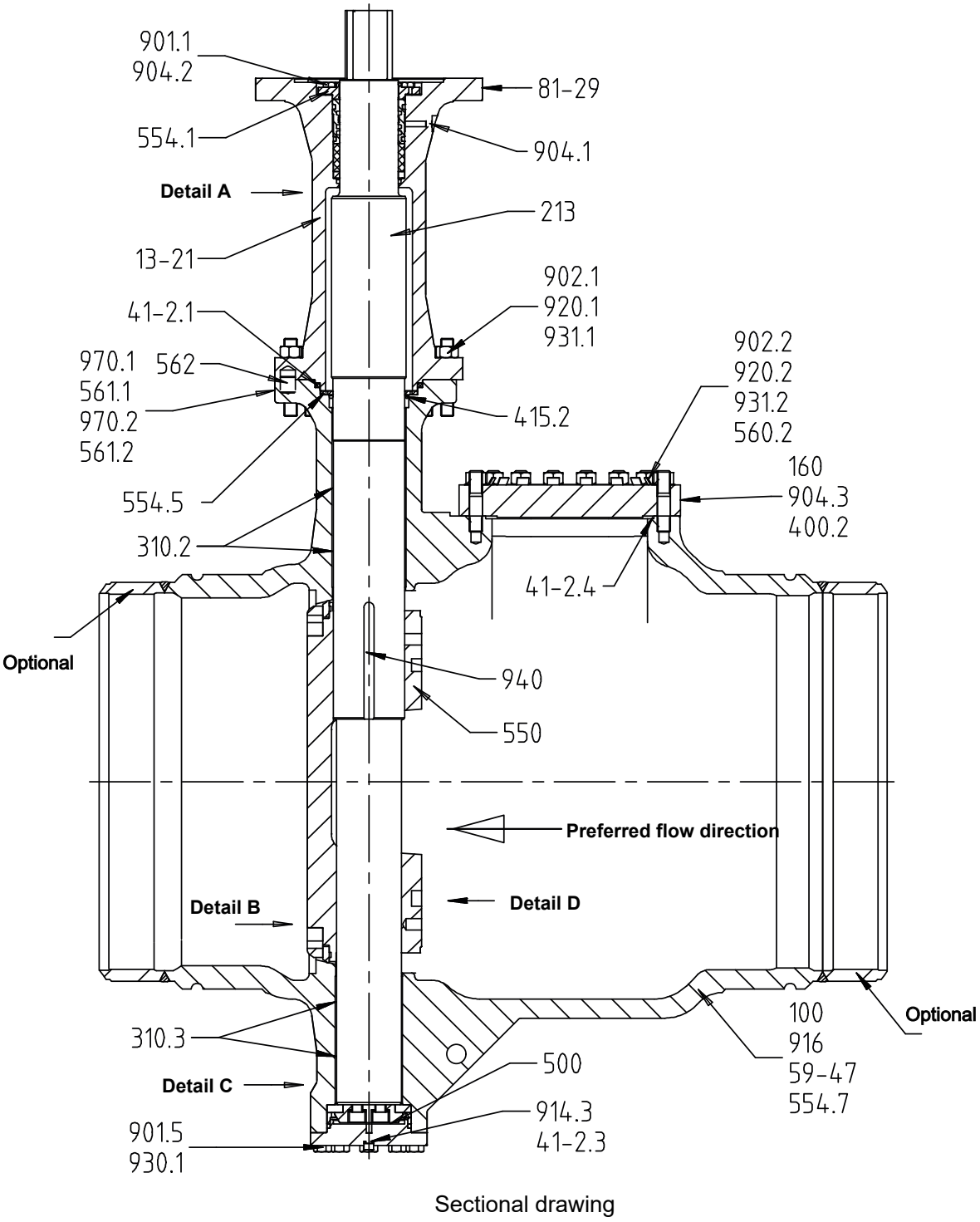



**Fig. 3:** Sectional drawing of TRIODIS 300 CRYO BWSE for DN 450-1200 (18-48 in.)

8613.1783/10-EN

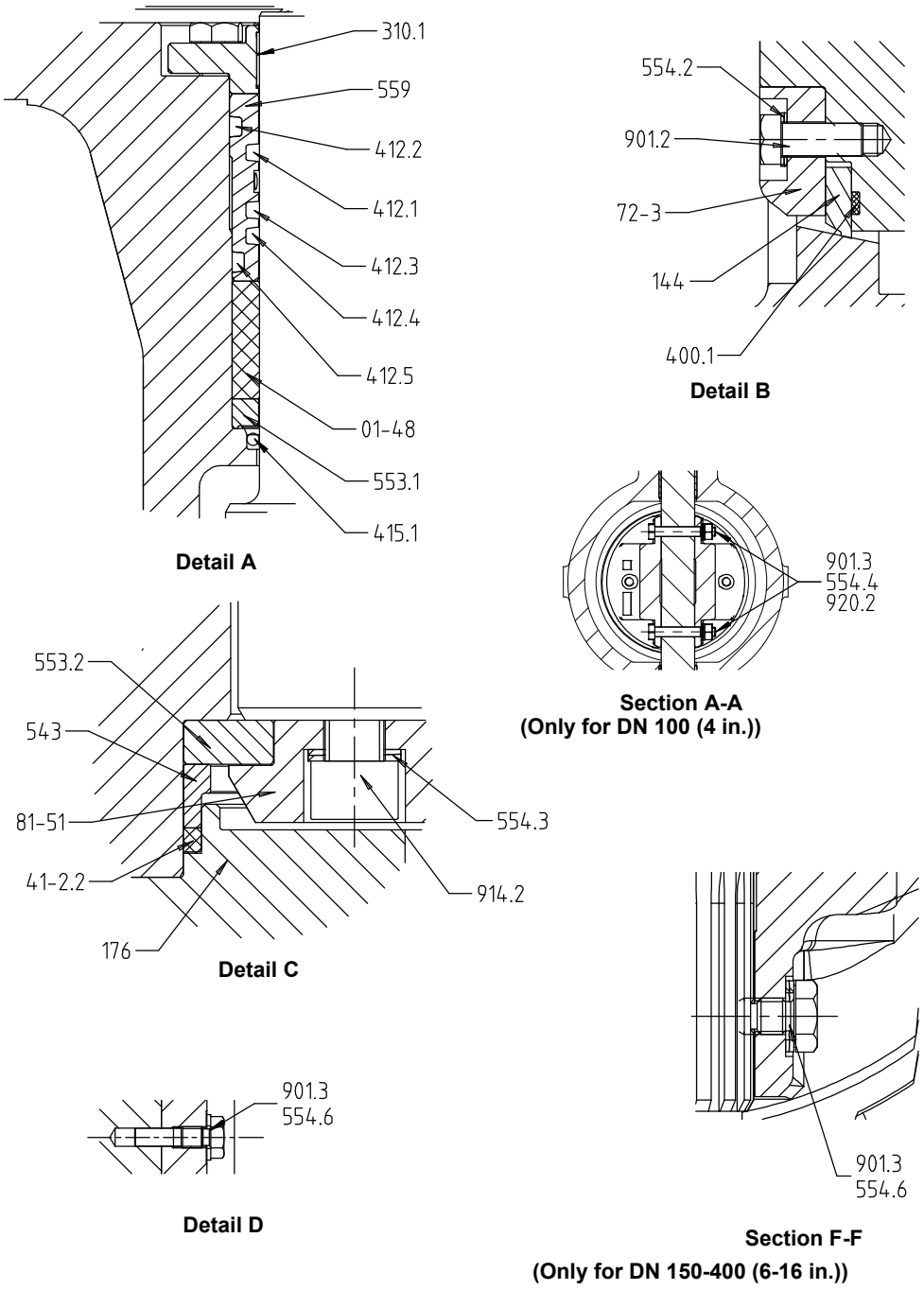



**Fig. 4:** Details of TRIODIS 300 CRYO BWSE for DN 100-1200 (4-48 in.)

**Table 8:** List of components in common

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 13-21 | Extension | 100-1200 | Stainless steel ASTM A351 Gr. CF8M / EN 10213 1.4408 | |
| 41-2.1[3)] | Static sealing element | 150-1200 | Graphite | |
| 41-2.3[3)4)5)] | Static sealing element | 100-1200 | Graphite | |
| 41-2.4[4)] | Static sealing element | 150-1200 | Nickel / copper | |
| 59-47 | Eye hook | 100-1200 | Stainless steel | |
| 81-29 | Earth terminal | 100-1200 | | |
| 100 | Body | 100-1200 | Stainless steel ASTM A351 Gr. CF3M / EN 10213 1.4409 | 6t |
| 160 | Cover | 100-1200 | Stainless steel ASTM A240 Gr. 316L / EN 10028-7 1.4404 | |
| 213 | Actuating shaft | 100-1200 | Stainless steel ASTM A351 Gr. 316L max. 10 bar (for reduced operating pressure) | 6 |
| | | | Stainless steel ASTM A638 Gr. 660 | 6f |
| | | | Stainless steel ASTM A479 Gr. XM19 | 6r |
| 310.2 | Plain bearing | 100-1200 | Steel with reinforced PTFE coating | |
| 310.3 | Plain bearing | 150-1200 | Steel with reinforced PTFE coating | |
| 400.2[4)5)] | Gasket | 100-1200 | PTFE | |
| 415.2[3)6)] | Lip seal | 150-1200 | PTFE + Elgiloy | |
| 500 | Anti-static ring | 100-1200 | Stainless steel 1.4310 | |
| 550 | Valve disc | 100-1200 | Stainless steel ASTM A351 Gr. CF8M / EN 10213 1.4408 | 6 |
| 554.1[3)] | Washer, flat | 100-1200 | Stainless steel | |
| 554.5 | Washer | 150-1200 | Stainless steel 316L | |
| 554.7 | Ring | 100-1200 | Stainless steel A4 | |
| 560.2 | Grooved pin | 450-1200 | Stainless steel | |
| 561.1 | Half round head grooved pin | 100-1200 | Stainless steel 1.4303 | |
| 561.2 | Half round head grooved pin | 100-1200 | Stainless steel 1.4303 | |
| 562 | Pin | 100-1200 | Stainless steel A4 | |
| 901.1 | Bolt | 100-1200 | Stainless steel A4 | |
| 901.4 | Hexagon head bolt | 100 | Stainless steel ASTM A320 Gr. B8M Cl.2 | |
| 901.5 | Hexagon head bolt | 150-1200 | Stainless steel ASTM A320 Gr. B8M Cl.2 | |
| 902.1 | Stud | 100-1200 | Stainless steel ASTM A320 Gr. B8M Cl.2 | |
| 902.2 | Stud | 100-1200 | Stainless steel ASTM A320 Gr. B8M Cl.2 | |
| 904.1 | Bolt | 150-1200 | Stainless steel A2 | |
| 904.2[3)] | Hexagon socket head cap screw | 100-1200 | Stainless steel A4 | |
| 904.3 | Bolt | 100-1200 | Stainless steel A4 | |
| 914.2 | Bolt | 100 | Stainless steel ASTM A320 Gr. B8M Cl.2 | |
| 914.3 | Bolt | 150-1200 | Stainless steel ASTM A320 Gr. B8M Cl.2 | |
| 916 | Plug | 100-1200 | Plastic | |
| 920.1 | Nut | 100-1200 | Stainless steel ASTM A194 Gr. 8M | |
| 920.2 | Hexagon nut | 150-1200 | Stainless steel ASTM A194 Gr. 8M | |
| 920.3 | Hexagon nut | 100 | Stainless steel ASTM A194 Gr. 8M | |
| 930.1 | Locknut | 100-1200 | Stainless steel 316L | |
| 930.2 | Locknut | 100-4500 | Stainless steel 316L | |
| 930.3[4)5)] | Lock washer | 100 | Stainless steel 1.4404 | |
| 931[4)5)] | Lock washer | 150-400 | Stainless steel 1.4404 | |
| 931.1[4)5)] | Lock washer | 450-1200 | Stainless steel 316L | |
| 931.2 | Lock washer | 450-1200 | Stainless steel 1.4404 | |
| 940 | Key | 450-1200 | Stainless steel A638 Gr. 660 | |
| 970.1 | Name plate | 100-1200 | Stainless steel 316 or equivalent | |
| 970.2 | Name plate | 100-1200 | Stainless steel 316 or equivalent | |

3 Part from shaft seal spare parts kit
4 Part from seat spare parts kit
5 Part from extension spare parts kit
6 Standard for marine applications / optional for other applications

8613.1783/10-EN

**Table 9:** List of components Detail A

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 01-48[3)] | Gland packing | 100-1200 | Graphite | |
| 310.1[3)] | Plain bearing | 100-1200 | Stainless steel + PTFE | |
| 412.1[3)] | O-ring | 100-1200 | Nitrile HC | |
| 412.2[3)] | O-ring | 100-1200 | Nitrile HC | |
| 412.3[3)] | O-ring | 100-1200 | Nitrile HC | |
| 412.4[3)] | O-ring | 100-1200 | Nitrile HC | |
| 412.5[3)] | O-ring | 100-1200 | Nitrile HC | |
| 415.1[3)] | Lip seal | 100-1200 | PTFE + Elgiloy | |
| 553.1 | Upper thrust insert | 100-1200 | Stainless steel 1.4404 | |
| 559 | Seal retainer | 100-1200 | Stainless steel 316L | |

**Table 10:** List of components Detail B

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 72-3 | Retaining flange | 100-1200 | Stainless steel 316 | |
| 144[4)] | Seat | 100-1200 | Nickel-based alloy | 8j |
| | | | Nickel-based alloy + PCTFE | FJ |
| 400.1[4)] | Gasket | 100-1200 | Graphite | |
| 554.2[4)] | Washer | 100-1200 | Stainless steel 1.4404 | |
| 901.2[4)] | Hexagon head bolt | 100-1200 | Stainless steel 1.4404 | |

**Table 11:** List of components Detail C

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 41-2.2[3)] | Static sealing element | 100-1200 | Graphite | |
| 81-51 | Clamping element | 100-1200 | Stainless steel 316L | |
| 176 | Bottom | 100-1200 | Stainless steel 316L and 1.4404 | |
| 543 | Bush | 100-1200 | Stainless steel 316L | |
| 553.2 | Thrust insert | 100-1200 | Stainless steel 1.4404 | |
| 554.3 | Washer | 100-1200 | Stainless steel 1.4404 | |
| 914.2 | Bolt | 100-1200 | Stainless steel 316L | |

**Table 12:** List of components Detail D

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 554.6 | Washer | 450-1200 | Stainless steel 1.4404 | |
| 901.3 | Hexagon head bolt | 450-1200 | Stainless steel A4 | |

**Table 13:** List of components Section A-A

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 554.4 | Washer | 100 | Stainless steel 1.4404 | |
| 901.3 | Bolt | 100 | Stainless steel A4 | |
| 920.2 | Hexagon nut | 100 | Stainless steel 316L | |

**Table 14:** List of components Section F-F

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 554.6 | Washer | 150-400 | Stainless steel 1.4404 | |
| 901.3 | Hexagon head bolt | 150-400 | Stainless steel A4 | |

8613.1783/10-EN

**Body type: full-lug body (T4) and flanged body (T7)**

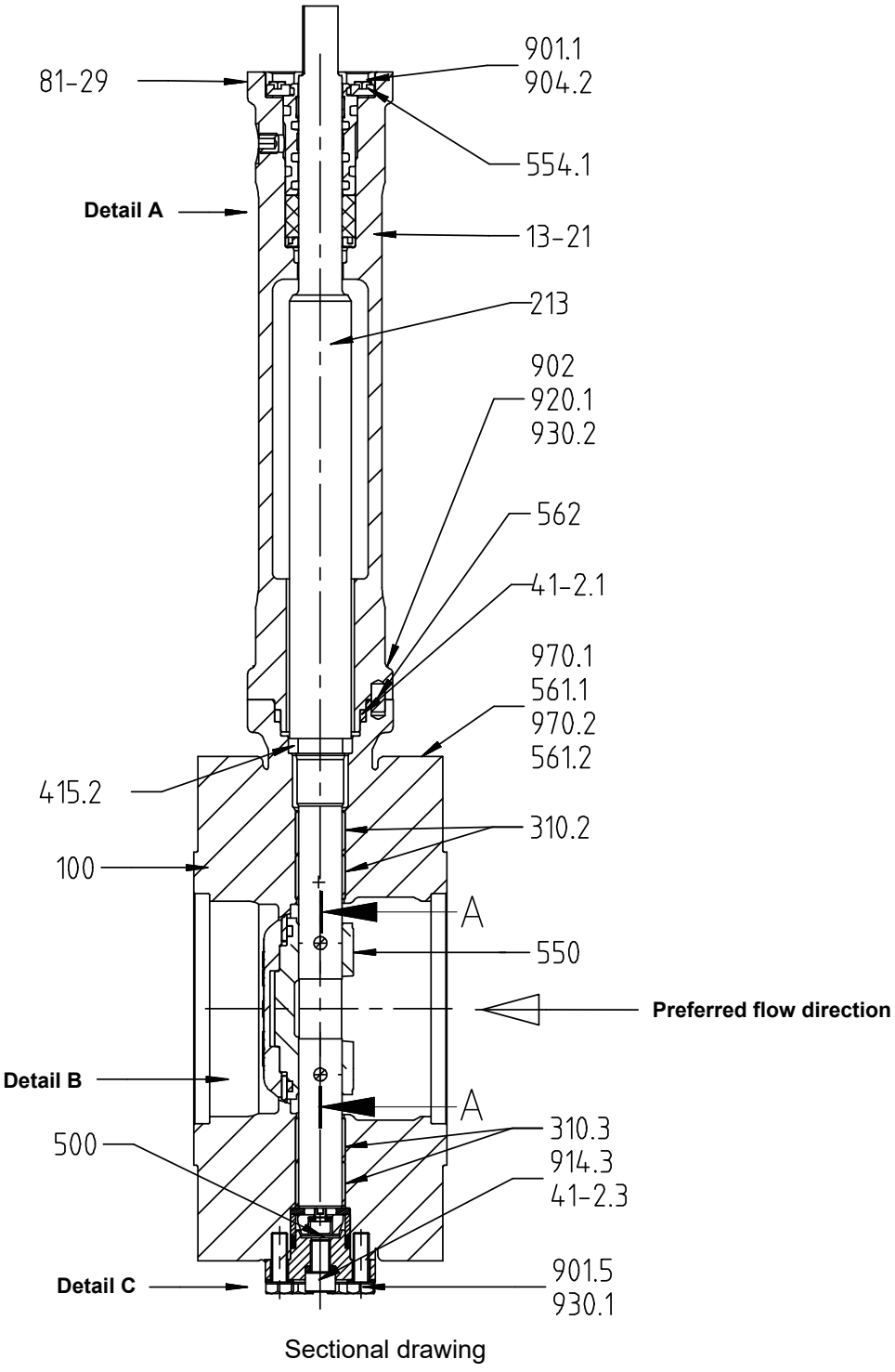
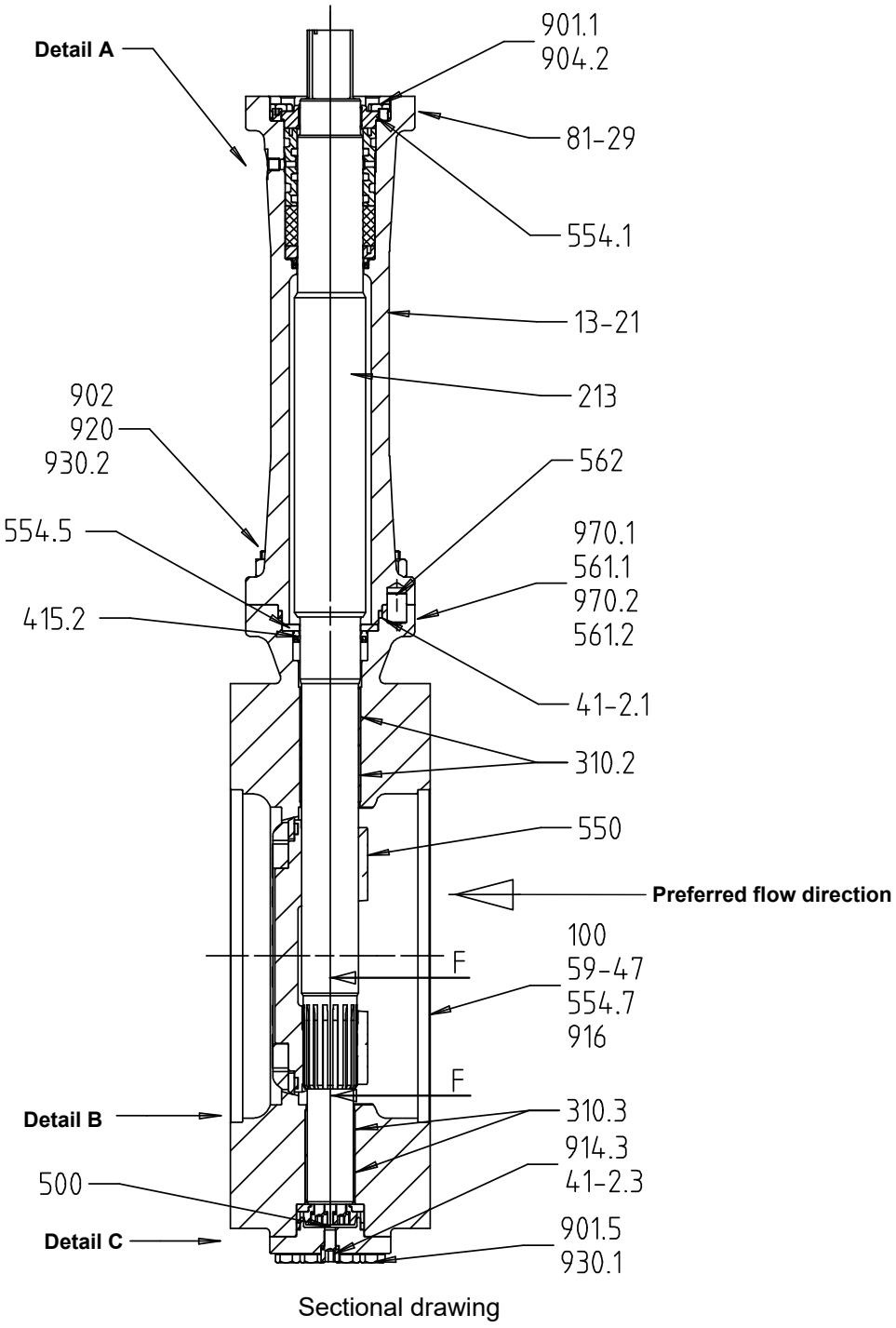



**Fig. 5:** Sectional drawing of TRIODIS 300 CRYO T4 and T7 for DN 80 and 100 (3-4 in.)

8613.1783/10-EN




Sectional drawing

**Fig. 6:** Sectional drawing of TRIODIS 300 CRYO T4 and T7 for DN 150-400 (6-16 in.)

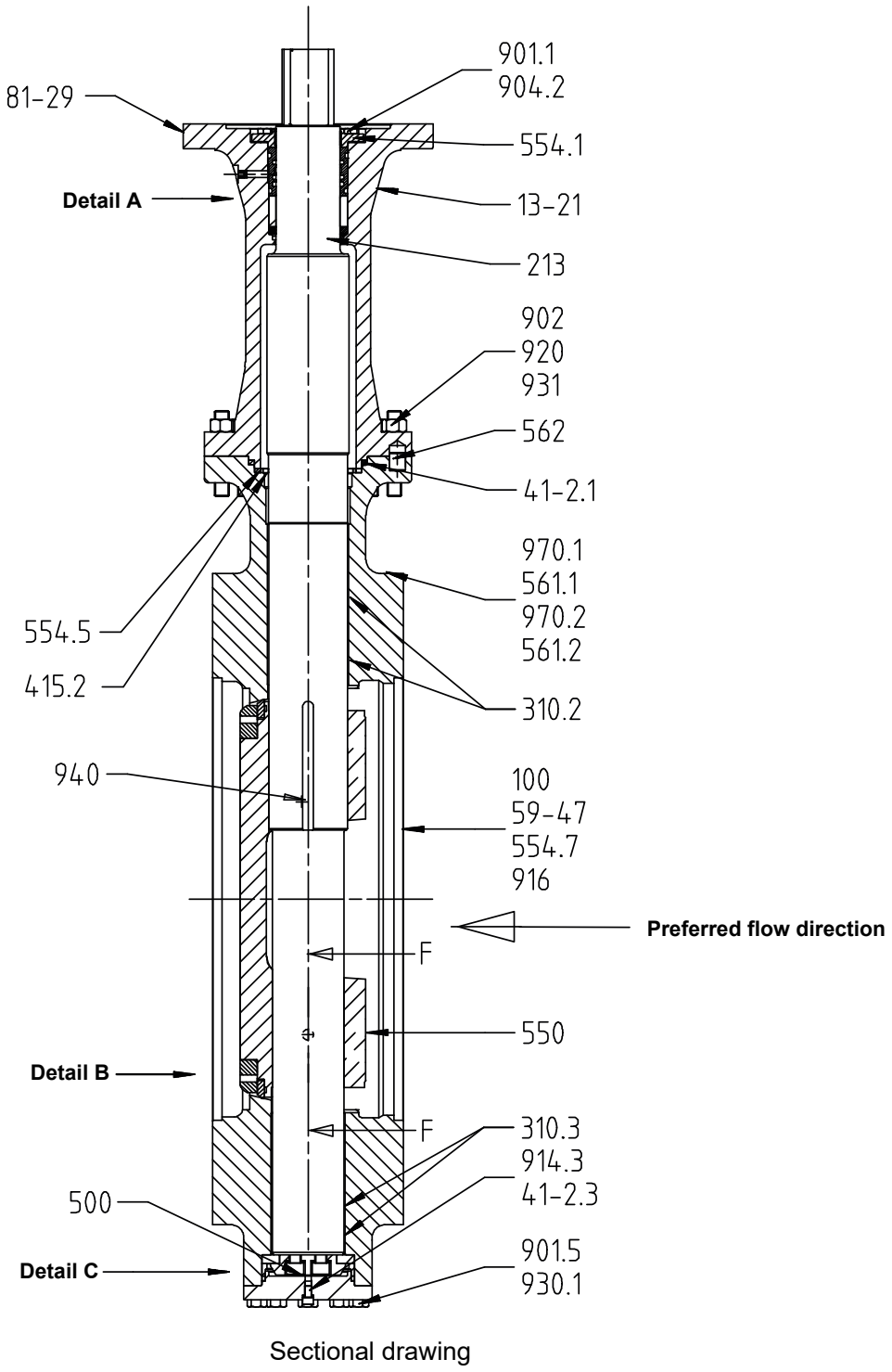
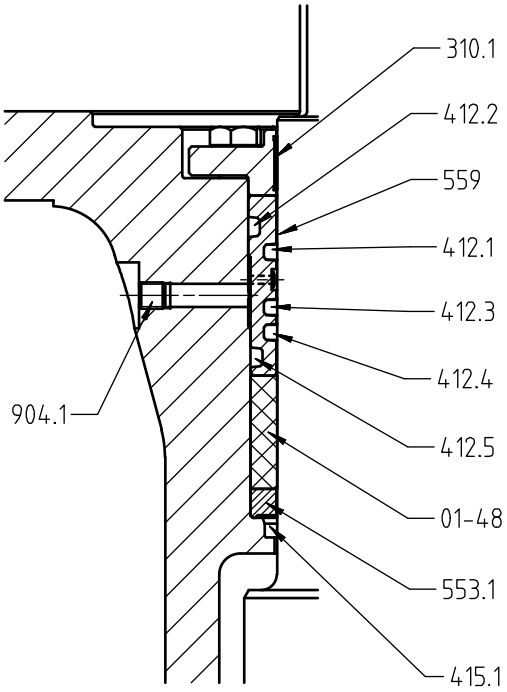
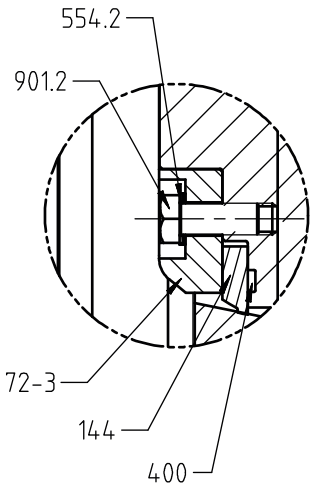



**Fig. 7:** Sectional drawing of TRIODIS 300 CRYO T4 and T7 for DN 450-1200 (18-48 in.)

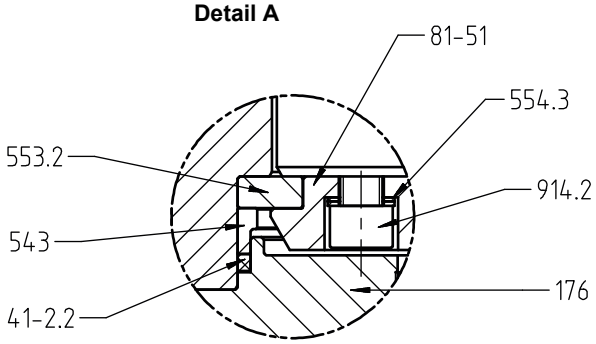
8613.1783/10-EN



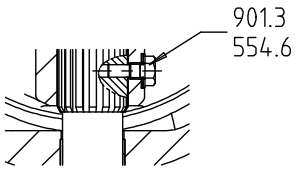

Detail A



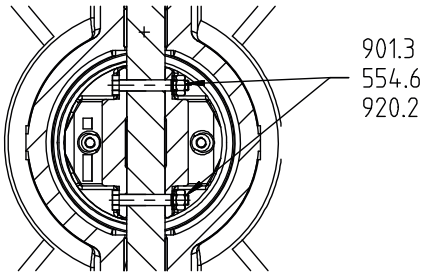

Detail B




Detail C




Section F-F
Only for DN 150-400 (6-16 in.)




Section A-A
Only for DN 80-100 (3-4 in.)

**Fig. 8:** Details of TRIODIS 300 CRYO T4 and T7 for DN 80-1200 (3-48 in.)

**Table 15:** List of components in common

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 100 | Body | 80-1200 | Stainless steel ASTM A351 Gr. CF8M / EN 10213 1.4408 + Stellite | 6 |
| 13-21 | Extension | 80-1200 | Stainless steel ASTM A351 Gr. CF8M / EN 10213 1.4408 | 6 |
| 41-2.1 | Static sealing element | 80-1200 | Graphite | |
| 41-2.3 | Static sealing element | 80-1200 | Graphite | |
| 59-47 | Eye hook | 80-1200 | Stainless steel | |
| 81-29 | Earth terminal | 80-1200 | | |
| 213 | Shaft | 80-1200 | Stainless steel ASTM A479 Gr. XM19 | 6r |
| | | | Stainless steel ASTM A479 Gr. 316L (for reduced operating pressure) | 6 |
| | | | Stainless steel ASTM A638 Gr. 660 | 6f |
| 310.2[7)] | Upper plain bearing | 80-1200 | Stainless steel 316L + PTFE | |
| 310.3[7)] | Lower plain bearing | 80-1200 | Stainless steel 316L + PTFE | |
| 41-2.1[8)] | Static sealing element for extension | 80-1200 | Graphite | |
| 41-2.3 | Static sealing element for extension | 80-1200 | Graphite | |
| 415.2[7)8)] | Lip seal | 80-1200 | PTFE + Elgiloy | |
| 500 | Anti-static ring | 80-1200 | Stainless steel 1.4310 | |
| 550 | Valve disc | 80-1200 | Stainless steel ASTM A351 Gr. CF8M / EN 10213 1.4408 | 6 |
| 554.1 | Washer, flat | 80-1200 | Stainless steel 316L | |
| 554.5 | Spacer | 80-1200 | Stainless steel 316L | |
| 554.6 | Nord-Lock® washer | 80-1200 | Stainless steel 316L | |
| 554.7 | Ring | 80-1200 | Stainless steel A4 | |
| 561 | Half round head grooved pin | 80-1200 | Stainless steel 1.4303 | |
| 561.1 | Half round head grooved pin | 80-1200 | Stainless steel 1.4303 | |
| 561.2 | Half round head grooved pin | 80-1200 | Stainless steel 1.4303 | |
| 562 | Pin | 80-1200 | Stainless steel A638 Gr. 660 | |
| 901.1[7)8)] | Hexagon head bolt | 80-1200 | Stainless steel A4 | |
| 901.3 | Hexagon head bolt | 80-1200 | Stainless steel A4 | |
| 901.5 | Hexagon head bolt | 80-1200 | Stainless steel ASTM A320 Gr. B8M Cl.2 | |
| 902 | Stud | 80-1200 | Steel ASTM A320 Gr. B8M Cl.2 | |
| 904.2[7)8)] | Hexagon socket head cap screw | 80-1200 | Stainless steel A4 | |
| 914.3 | Bolt | 80-1200 | Stainless steel A320 Gr. B8M Cl.2 | |
| 916 | Plug | 80-1200 | Plastic | |
| 920 | Nut | 80-1200 | Stainless steel ASTM A194 Gr. 8M | |
| 920.1 | Nut | 80-1200 | Stainless steel ASTM A194 Gr. 8M | |
| 930.1 | Fastening element | 80-1200 | Stainless steel 316L | |
| 930.2 | Locknut | 80-1200 | Stainless steel 316L | |
| 931 | Lock washer | 80-1200 | Stainless steel 316L | |
| 940 | Cylindrical key | 80-100 / 450-1200 | Stainless steel ASTM A638 Gr. 660 | |
| 970 | Name plate | 80-1200 | Stainless steel 316 or equivalent | |
| 970.1 | Name plate | 80-1200 | Stainless steel 316 or equivalent | |
| 970.2 | Name plate | 80-1200 | Stainless steel 316 or equivalent | |

8613.1783/10-EN

7 Part from bearing spare parts kit
8 Part from shaft seal spare parts kit

**Table 16:** List of components Detail A

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 01-48[7)] | Gland packing | 150-1200 | Graphite, expanded | |
| 310.1[7)8)] | Plain bearing | 80-1200 | Stainless steel + PTFE | |
| 412.1[7)8)] | O-ring | 80-1200 | Nitrile HC | |
| 412.2[7)8)] | O-ring | 80-1200 | Nitrile HC | |
| 412.3[7)8)] | O-ring | 80-1200 | Nitrile HC | |
| 412.4[7)8)] | O-ring | 80-1200 | Nitrile HC | |
| 412.5[7)8)] | O-ring | 80-1200 | Nitrile HC | |
| 415.1[7)8)] | Lip seal | 80-1200 | PTFE + Elgiloy | |
| 553.1 | Thrust insert | 80-1200 | Stainless steel 316L | |
| 559 | Circlip | 80-1200 | Stainless steel 316L | |
| 904.1 | Hexagon socket head cap screw | 80-1200 | Stainless steel A4 | |

**Table 17:** List of components Detail B

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 144[9)] | Seat | 80-1200 | Nickel-based alloy | 8j |
| | | | Nickel-based alloy + PCTFE | FJ |
| 400[9)] | Static sealing element | 80-1200 | Graphite | |
| 554.2[9)] | Nord-Lock® washer | 80-1200 | Stainless steel 316 | |
| 72-3 | Retaining flange | 80-1200 | Stainless steel 316 | |
| 901.2[9)] | Hexagon head bolt | 80-1200 | Steel Cl. 8.8 or stainless steel A4 | |

**Table 18:** List of components Detail C

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 176[7)] | Bottom | 80-1200 | Stainless steel 316L and 1.4404 | |
| 41-2.2[7)8)] | Static sealing element for bottom | 80-1200 | Graphite | |
| 543[7)] | Spacer bush | 80-1200 | Stainless steel 316L | |
| 553.2[7)] | Thrust insert | 80-1200 | Stainless steel 316L | |
| 554.3[7)] | Washer | 80-1200 | Stainless steel 316 | |
| 81-51[7)] | Clamping element | 80-1200 | Stainless steel 316L | |
| 914.2[7)] | Hexagon socket head cap screw | 80-1200 | Stainless steel A4 | |

**Table 19:** List of components Section A-A

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 554.6[7)] | Washer | 80-100 | Stainless steel 1.4404 | |
| 901.3[7)] | Bolt | 80-100 | Stainless steel A4 | |
| 920.2[7)] | Hexagon nut | 80-100 | Stainless steel 316L | |

**Table 20:** List of components Section F-F

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 554.6 | Washer | 150-1200 | Stainless steel 316L | |
| 901.3 | Hexagon head bolt | 150-1200 | Stainless steel A4 | |

8613.1783/10-EN

9 Part from seat spare parts kit

**Materials for TRIODIS 300 MT**

**Body type: full-lug body (T4) and flanged body (T7)**

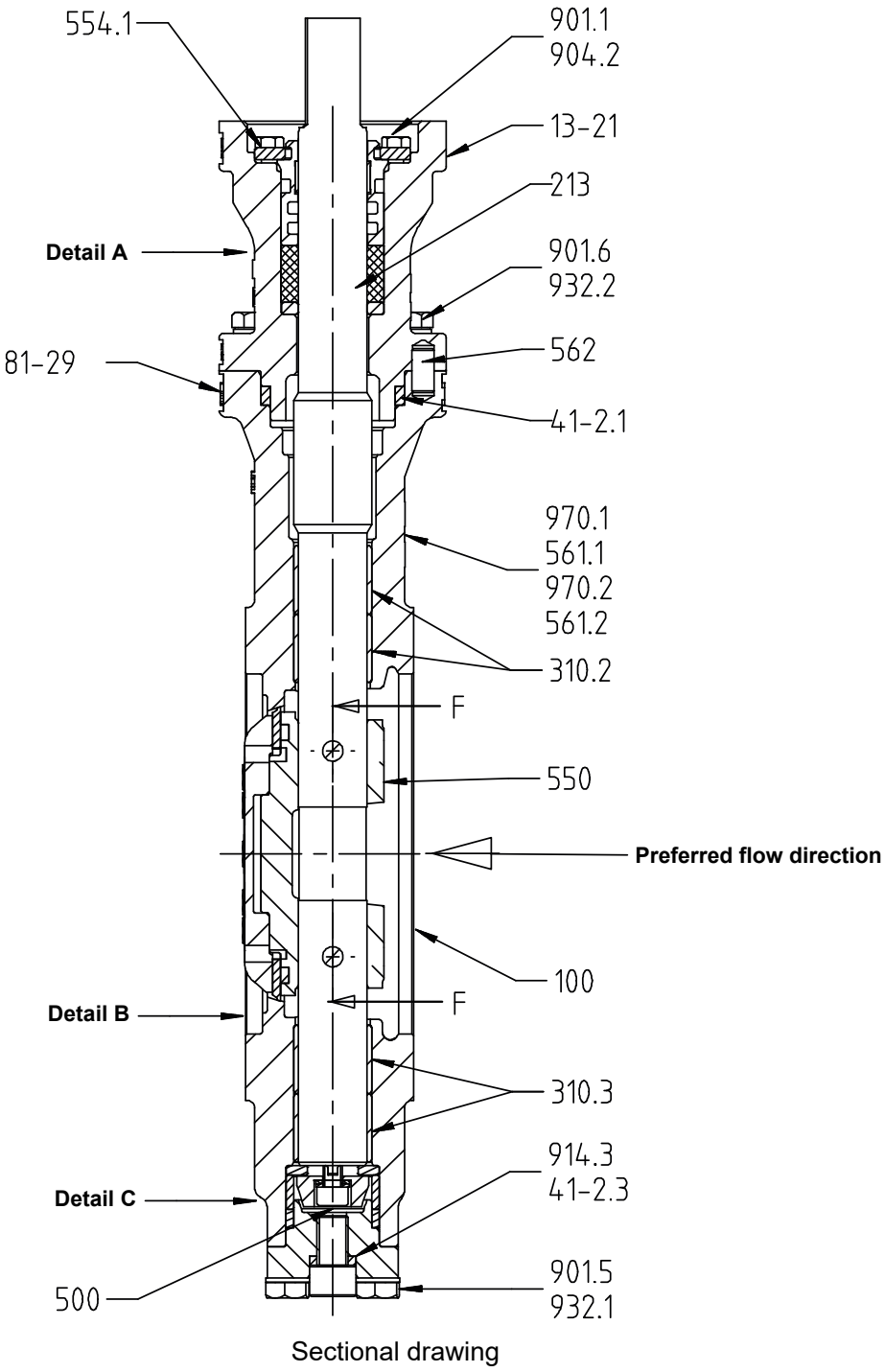



**Fig. 9:** Sectional drawing of TRIODIS 300 MT T4 and T7 for DN 100 (4 in.)

8613.1783/10-EN

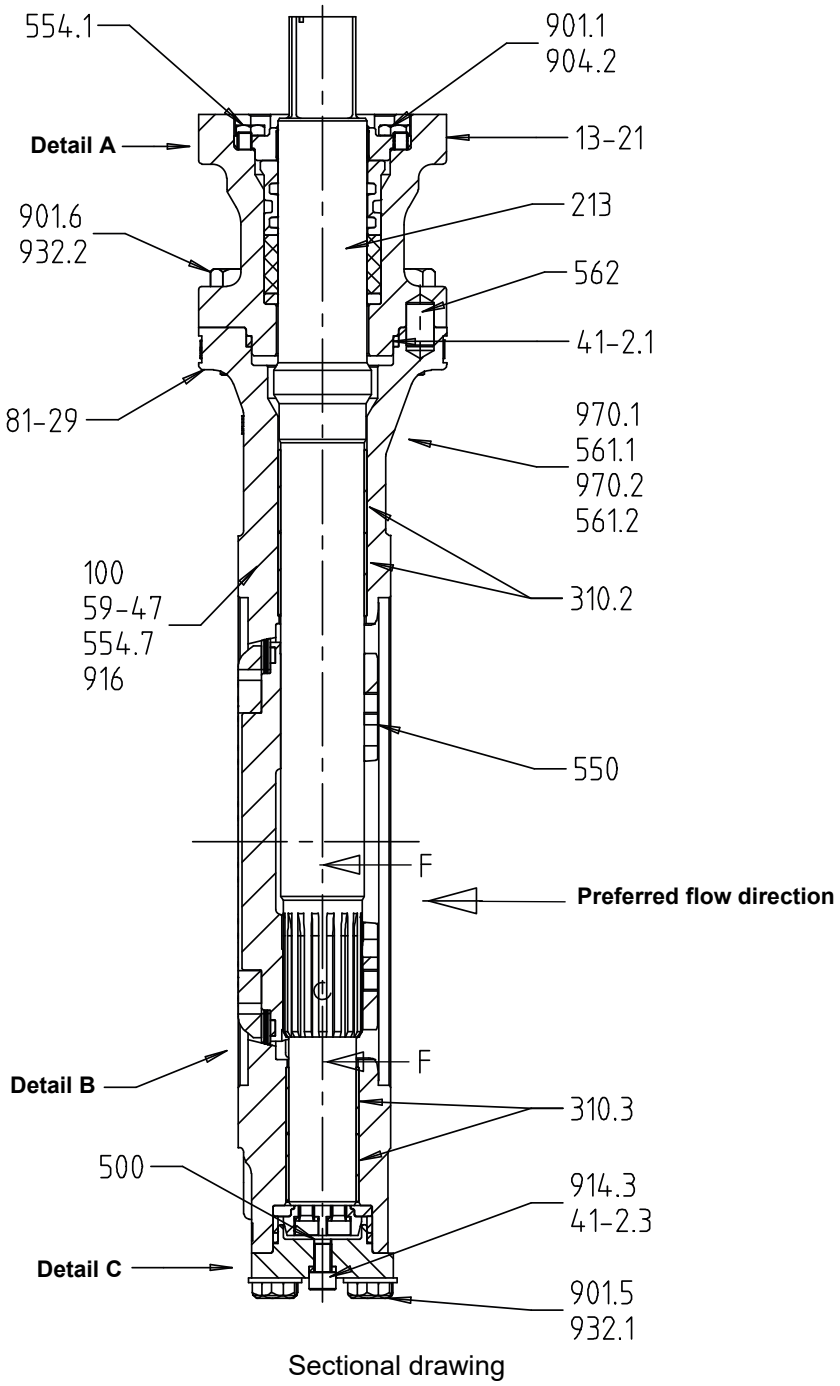



**Fig. 10:** Sectional drawing of TRIODIS 300 MT T4 and T7 for DN 150-400 (6-16 in.)

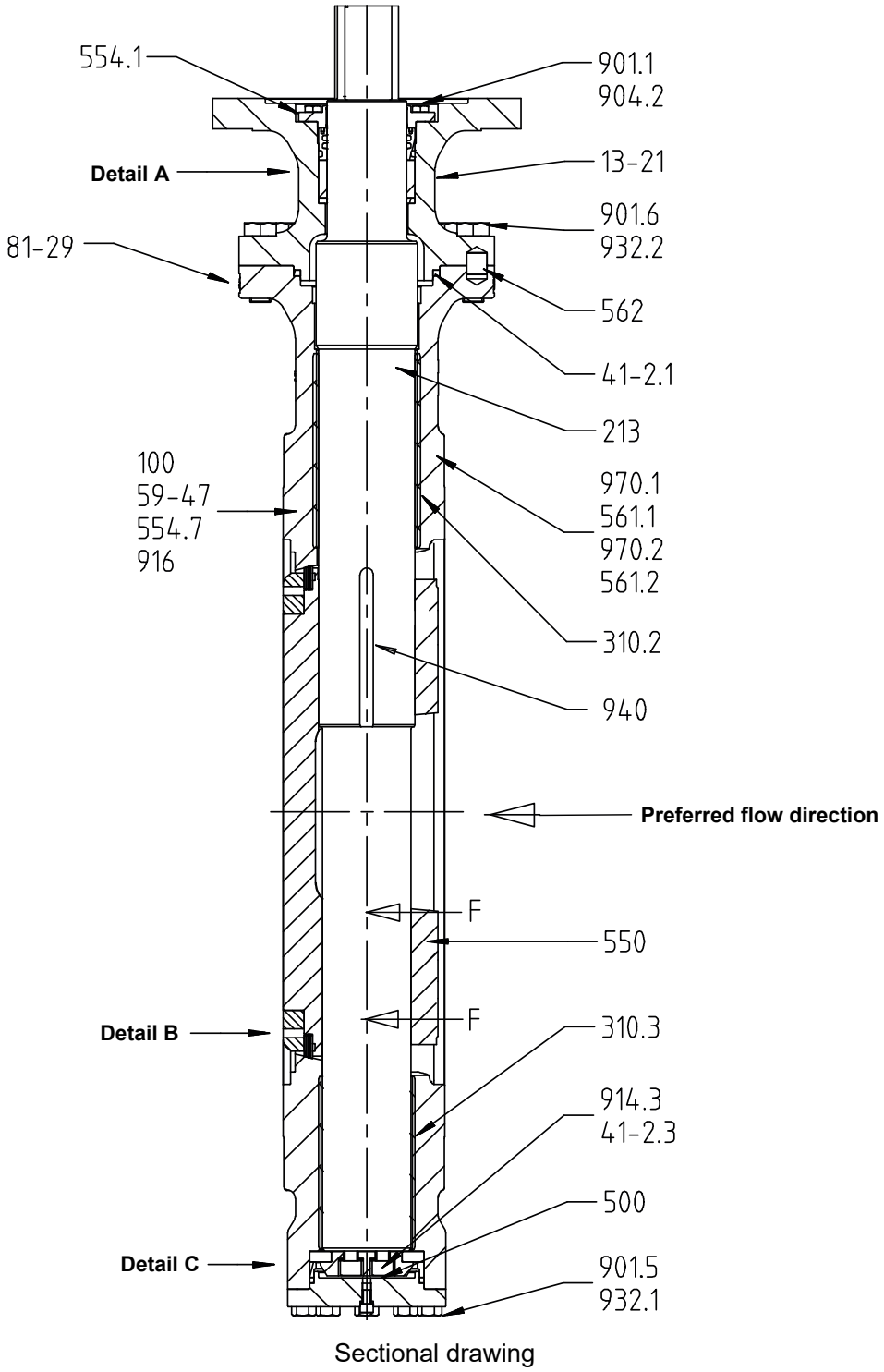
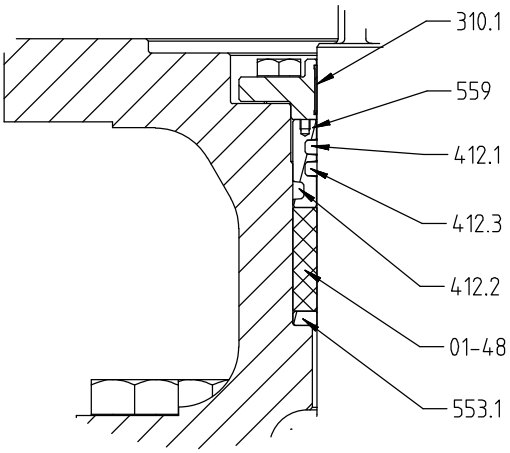
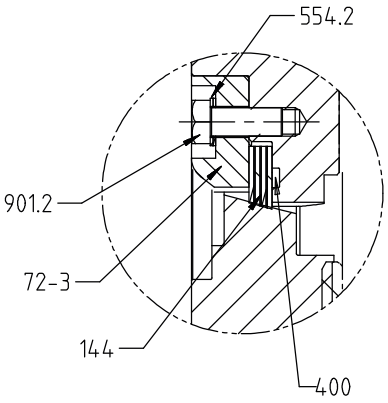



**Fig. 11:** Sectional drawing of TRIODIS 300 MT T4 and T7 for DN 450-1200 (18-48 in.)

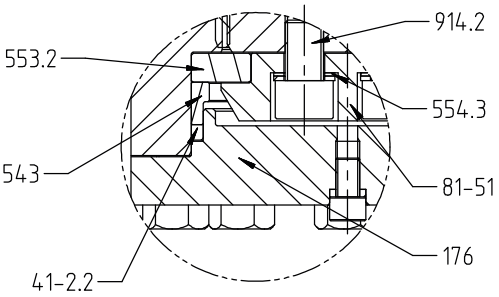
8613.1783/10-EN



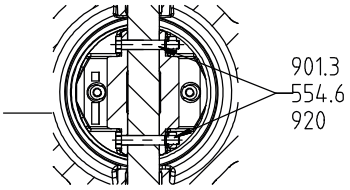

Detail A




Detail B




Detail C




Section F-F
Only for DN 100 (4 in.)

**Fig. 12:** Details of TRIODIS 300 MT T4 and T7 for DN 100-1200 (4-48 in.)

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 100 | Body | 80-1200 | Steel ASTM A 216 Gr. WCC / EN 10213 1.0619 + Stellite | 1 |
| | | | Steel ASTM A216 Gr. WCB + Stellite | 1p |
| | | | Steel ASTM A352 Gr. LCB + Stellite | 1n |
| | | | Steel ASTM A 352 Gr. LCC / EN 10213 1.6220 + Stellite | 1m |
| | | | Stainless steel ASTM A351 Gr. CF8M / EN 10213 1.4408 + Stellite | 6 |
| 13-21 | Extension | 80-1200 | Steel ASTM A216 Gr. WCC / EN 10213 1.0619 | 1 |
| | | | Steel ASTM A216 Gr. WCB | 1p |
| | | | Steel ASTM A352 Gr. LCB | 1n |
| | | | Steel ASTM A352 Gr. LCC / EN 10213 1.6220 | 1m |
| | | | Stainless steel ASTM A351 Gr. CF8M / EN 10213 1.4408 | 6 |
| 213 | Shaft | 80-1200 | Stainless steel ASTM 431 and EN 10272 1.4057 (0 °C min. to +250 °C) | 6h |
| | | | Stainless steel ASTM A564 Gr. 630 and EN 10088-3 1.4542 (-50 °C to +260 °C) | 6e |
| 310.2[10)] | Upper plain bearing | 80-1200 | Stainless steel 316L + PTFE | |
| 310.3[10)] | Lower plain bearing | 80-1200 | Stainless steel 316L + PTFE | |
| 41-2.1[10)11)] | Static sealing element for extension | 80-1200 | Graphite | |
| 41-2.3[11)] | Static sealing element for extension | 80-1200 | Graphite | |
| 59-47 | Eye hook | 80-1200 | Stainless steel | |
| 81-29 | Earth terminal | 80-1200 | | |
| 500 | Anti-static ring | 80-1200 | Stainless steel 1.4310 | |
| 550 | Valve disc | 80-1200 | Steel ASTM A216 Gr. WCC / EN 10213 1.0619 | 1 |
| | | | Steel ASTM A216 Gr. WCB | 1p |
| | | | Steel ASTM A352 Gr. LCB | 1n |
| | | | Steel ASTM A352 Gr. LCC / EN 10213 1.6220 | 1m |
| | | | Stainless steel ASTM A351 Gr. CF8M / EN 10213 1.4408 | 6 |
| 554.1 | Washer, flat | 80-1200 | Stainless steel 316L or EN 10025 S235 | |
| 554.7 | Ring | 80-1200 | Stainless steel A4 | |
| 561.1 | Half round head grooved pin | 80-1200 | Stainless steel 1.4303 | |
| 561.2 | Half round head grooved pin | 80-1200 | Stainless steel 1.4303 | |
| 562 | Pin | 80-1200 | Stainless steel A638 Gr. 660 | |
| 901.1[10)11)] | Hexagon head bolt | 80-1200 | Steel Cl. 8.8 or stainless steel A4 | |
| 901.3 | Hexagon head bolt | 80-1200 | Stainless steel A4 | |
| 901.5 | Hexagon head bolt | 80-1200 | Stainless steel A4 | |
| 901.6 | Hexagon head bolt | 80-1200 | Stainless steel A4 | |
| 904.2[10)11)] | Hexagon socket head cap screw | 80-1200 | Stainless steel A4 | |
| 914.3 | Bolt | 80-1200 | Stainless steel ASTM A320 Gr. B8M Cl. 2 | |
| 916 | Plug | 80-1200 | Plastic | |
| 932.1 | Lock washer | 80-1200 | Stainless steel 316L | |
| 932.2 | Lock washer | 80-1200 | Stainless steel 316L | |
| 940 | Cylindrical key | 450-1200 | Stainless steel ASTM A638 Gr. 660 (for DN > 12 in.) | |
| 970.1 | Name plate | 80-1200 | Stainless steel 316 or equivalent | |
| 970.2 | Name plate | 80-1200 | Stainless steel 316 or equivalent | |

8613.1783/10-EN

10 Part from bearing spare parts kit
11 Part from shaft seal spare parts kit

**Table 21:** List of components Detail A

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 01-48[10)] | Gland packing | 80-1200 | Graphite, expanded | |
| 310.1[10)11)] | Plain bearing | 80-1200 | Stainless steel + PTFE | |
| 412.1[10)11)] | O-ring | 80-1200 | Nitrile HC | |
| 412.2[10)11)] | O-ring | 80-1200 | Nitrile HC | |
| 412.3[10)11)] | O-ring | 80-1200 | Nitrile HC | |
| 553.1 | Thrust insert | 80-1200 | Stainless steel 316L | |
| 559 | Circlip | 80-1200 | Stainless steel 316L or EN 10025 S235 | |

**Table 22:** List of components Detail B

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 144[12)] | Seat | 80-1200 | Duplex stainless steel | 7e |
| | | | Duplex stainless steel + PCTFE | FE |
| 400[10)] | Static sealing element | 80-1200 | Graphite | |
| 554.2[10)] | Washer | 80-1200 | Stainless steel 316 | |
| 72-3 | Retaining flange | 80-1200 | Stainless steel EN 10025 S355 or EN 10088-2 1.4462 | |
| 901.2[10)] | Hexagon head bolt | 80-1200 | Steel Cl. 8.8 or stainless steel A4 | |

**Table 23:** List of components Detail C

| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 176 | Bottom | 80-1200 | Stainless steel 316L | |
| 41-2.2[10)11)] | Static sealing element for bottom | 80-1200 | Graphite | |
| 543[10)] | Spacer bush | 80-1200 | Stainless steel 316L | |
| 553.2[10)] | Thrust insert | 80-1200 | Stainless steel 316L | |
| 554.3[10)] | Nord-Lock® washer | 80-1200 | Stainless steel 316 | |
| 81-51 | Clamping element | 80-1200 | Stainless steel 316L | |
| 914.2[10)] | Hexagon socket head cap screw | 80-1200 | Stainless steel A4 | |

**Table 24:** List of components Section F-F

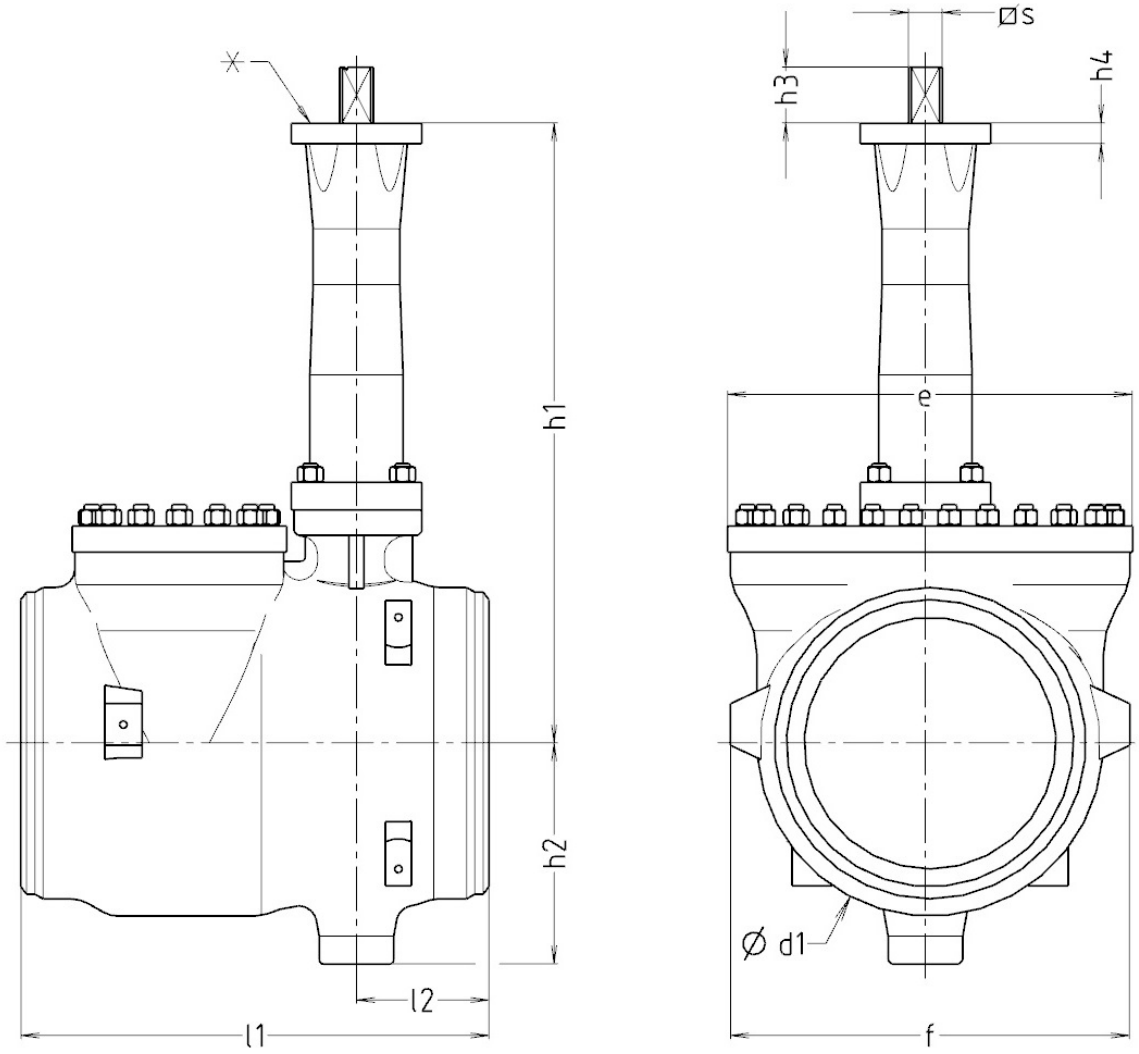
| Part No. | Description | DN | Materials | KSB code |
|---|---|---|---|---|
| 554.6[10)] | Washer | 80-1200 | Stainless steel 316L | |
| 901.3[10)] | Hexagon head bolt | 80-1200 | Stainless steel A4 | |
| 920[10)] | Nut | 80-1200 | Stainless steel ASTM A194 Gr. 8M | |

8613.1783/10-EN

12 Part from seat spare parts kit

## Dimensions and weights

### Dimensions and weights of body with butt weld ends DN 100-1200 (4-48 in.)




Drawings of body with butt weld ends

* : Top flange to ISO 5211

**Table 25:** Body with butt weld ends and flat shaft end [mm]

| DN | NPS | Face-to-face length | h1 | h2 | d1 | l2 | e | f | Top flange to ISO 5211 | | Flat shaft end | | | | [kg] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [inch] | l1 | | | | | | | No. | h4 | 6[13)] | 6r | 6f | h3 | |
| 100 | 4 | 253 | 470 | 143 | 142 | 45 | 174 | 148 | F07 | 16 | 17 | 17 | 17 | 33 | 26 |
| 150 | 6 | 385 | 565 | 174,5 | 219 | 80 | 282 | 216 | F10 | 15 | 22 | 22 | 22 | 40 | 76 |

**Table 26:** Body with butt weld ends and square shaft end [mm]

| DN | NPS | Face-to-face length | h1 | h2 | d1 | l2 | e | f | Top flange to ISO 5211 | | Square shaft end ⍁ s | | | | [kg] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [inch] | l1 | | | | | | | No. | h4 | 6[13)] | 6r | 6f | h3 | |
| 200 | 8 | 421 | 635 | 220 | 274 | 95 | 334 | 236 | F10 | 18 | 27 | 27 | 27 | 45 | 103 |
| 250 | 10 | 468 | 710 | 232 | 325 | 118 | 382 | 324 | F12 | 20,5 | 36 | 36 | 36 | 55 | 172 |
| 300 | 12 | 532 | 782,5 | 286,5 | 381 | 148 | 438 | 388 | F16 | 27 | 50 | 50 | 50 | 70 | 222 |

13 Operating pressure limit applies. Contact the manufacturer.

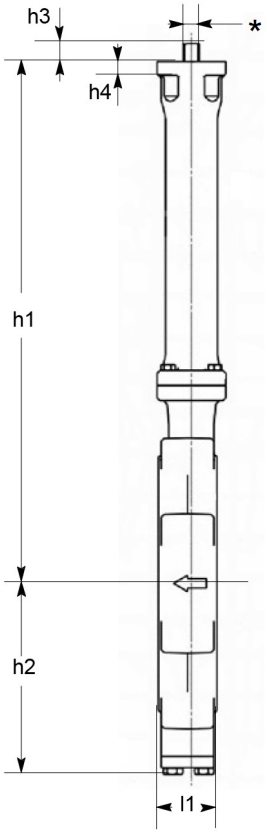
8613.1783/10-EN

| DN | NPS | Face-to-face length | h1 | h2 | d1 | l2 | e | f | Top flange to ISO 5211 | | Square shaft end ⍁ s | | | | [kg] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [inch] | l1 | | | | | | | No. | h4 | 6[13)] | 6r | 6f | h3 | |
| 350 | 14 | 650 | 825 | 349 | 439 | 205 | 492 | 440 | F16 | 27 | 50 | 50 | 50 | 70 | 327 |
| 400 | 16 | 765 | 900 | 381 | 493 | 240 | 538 | 480 | F25 | 30 | 60 | 60 | 60 | 80 | 494 |
| 450 | 18 | 868 | 960 | 428 | 557 | 262 | 625 | 550 | F25 | 30 | 60 | 60 | 60 | 80 | 632 |
| 500 | 20 | 990 | 1000 | 485,5 | 611 | 310 | 675 | 560 | F30 | 34 | 70 | 70 | 70 | 105 | 862 |
| 600 | 24 | 1015 | 1085 | 571 | 729 | 315 | 786 | 676 | F30 | 34 | 70 | 70 | 70 | 105 | 1220 |
| 650 | 26 | 1015 | 1085 | 571 | 729 | 315 | 786 | 676 | F30 | 34 | 70 | 70 | 70 | 105 | 1220 |
| 700 | 28 | 960 | 1150 | 652 | 772 | 299 | 828 | 710 | F35 | 38 | 80 | 80 | 80 | 110 | 1440 |
| 750 | 30 | 978 | 1210 | 680 | 830 | 313 | 866 | 690 | F35 | 38 | 80 | 80 | 80 | 110 | 1680 |
| 800 | 32 | 1036 | 1250 | 735 | 875 | 321 | 940 | 768 | F35 | 38 | 90 | 90 | 90 | 110 | 1930 |
| 900 | 36 | 1165 | 1381 | 843 | 970 | 370 | 1043 | 950 | F40 | 45 | 110 | 110 | 110 | 129 | 2790 |
| 1000 | 40 | 1178 | 1435 | 842 | 1050 | 362 | 1118 | 1024 | F40 | 45 | 110 | 110 | 110 | 130 | 3175 |
| 1050 | 42 | 1171 | 1530 | 852 | 1084 | 355 | 1148 | 1024 | F40 | 45 | 120 | 120 | 120 | 130 | 3260 |
| 1200 | 48 | Contact the manufacturer | | | | | | | | | | | | | |

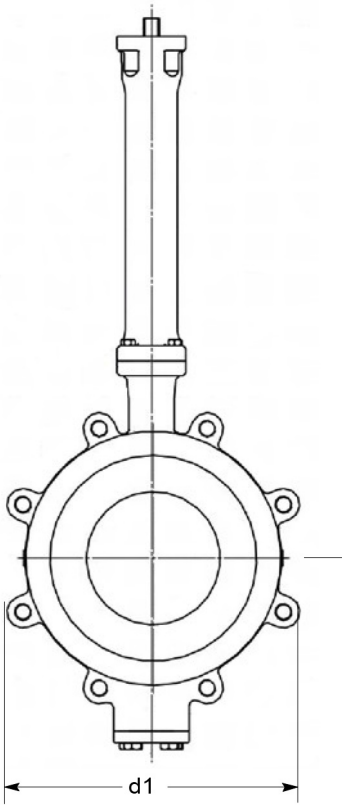
8613.1783/10-EN

## Dimensions and weights of full-lug body – T4 (TRIODIS 300 CRYO and MT)

CRYO design

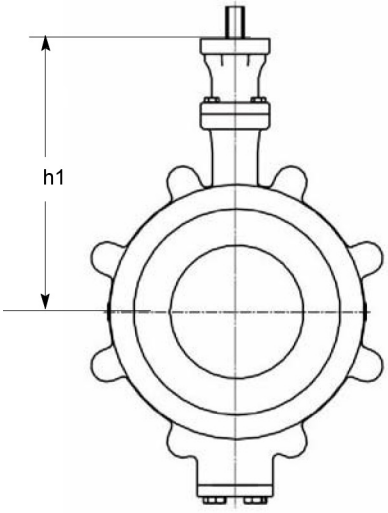



Drawing of CRYO design, side view




Drawing of CRYO design, front view

MT design




Drawing of MT design, front view

* Flat end s in Ø z or ⍁ s

**Table 27:** Full-lug body [mm]

| DN | NPS | d1 | Face-to-face length | CRYO | MT | h2 | Top flange to ISO 5211 | | Square shaft end | | Flat shaft end | | | [kg] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [inch] | | l1 | h1 | | | No. | h4 | ⍁ s | h3 | ⍁ s | Ø Z | h3 | CRYO | MT |
| 80 | 3 | 190 | 48 | 445 | 210 | 125 | F07 | 12 | - | - | 14 | 18 | 30 | 14 | 9 |
| 100 | 4 | 220 | 54 | 470 | 235 | 145 | F07 | 12 | - | - | 17 | 22 | 33 | 17 | 12 |
| 150 | 6 | 300 | 61 | 565 | 300 | 185 | F10 | 15 | - | - | 22 | 28 | 40 | 32 | 26 |
| 200 | 8 | 365 | 75 | 635 | 345 | 210 | F12 | 18 | 27 | 45 | - | - | - | 59 | 54 |
| 250 | 10 | 440 | 86 | 710 | 410 | 260 | F14 | 23 | 36 | 55 | - | - | - | 95 | 75 |
| 300 | 12 | 505 | 95 | 785 | 480 | 290 | F16 | 27 | 50 | 65 | - | - | - | 140 | 120 |
| 350 | 14 | 570 | 120 | 825 | 520 | 350 | F16 | 27 | 50 | 65 | - | - | - | 195 | 175 |
| 400 | 16 | 650 | 135 | 900 | 600 | 385 | F25 | 30 | 60 | 80 | - | - | - | 300 | 270 |
| 450 | 18 | 690 | 152 | 960 | 660 | 430 | F25 | 30 | 60 | 80 | - | - | - | 350 | 315 |
| 500 | 20 | 745 | 162 | 1010 | 725 | 465 | F30 | 34 | 70 | 105 | - | - | - | 496 | 439 |
| 550 | 22 | 815 | 184 | 1045 | 770 | 540 | F30 | 34 | 70 | 105 | - | - | - | 620 | 555 |
| 600 | 24 | 885 | 184 | 1085 | 810 | 565 | F30 | 34 | 70 | 105 | - | - | - | 750 | 673 |

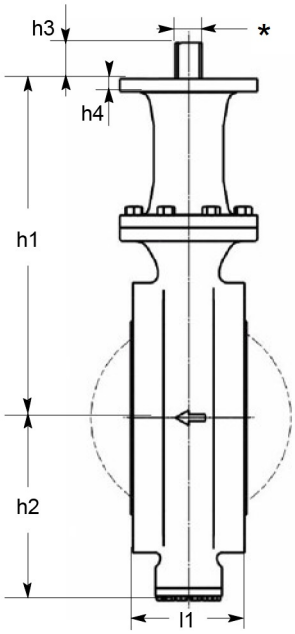
**Table 28: Face-to-face length**

The face-to-face lengths of TRIODIS 300 butterfly valves with full-lug body meet the requirements of EN 558-1, API 609 Table 2 Class 300.

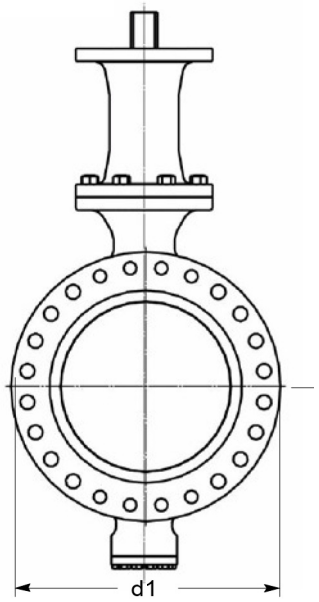
8613.1783/10-EN

## Dimensions and weights of flanged body – T7 (TRIODIS 300 CRYO and MT)

CRYO design

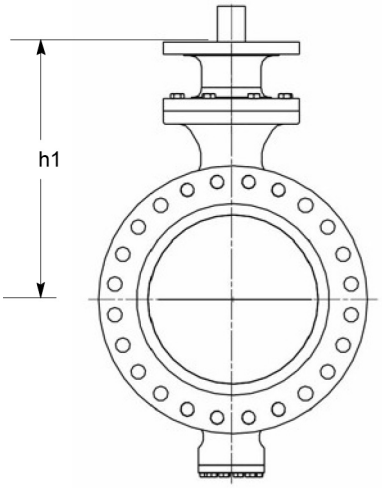



Drawing of CRYO design, side view




Drawing of CRYO design, front view

MT design




Drawing of MT design, front view

* Flat end s in Ø z or ⍁ s

**Table 29:** Flanged body [mm]

| DN | NPS | d1 | Face-to-face length | CRYO | MT | h2 | Top flange ISO 5211 | | Square shaft end | | Flat shaft end | | | [kg] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [inch] | | l1 | h1 | | | No. | h4 | ⍁ s | h3 | ⍁ s | Ø z | h3 | CRYO | MT |
| 80 | 3 | 208 | 114 | 445 | 210 | 125 | F07 | 12 | - | - | 14 | 18 | 30 | 24 | 19 |
| 100 | 4 | 253 | 127 | 470 | 235 | 145 | F07 | 12 | - | - | 17 | 22 | 33 | 34 | 29 |
| 150 | 6 | 320 | 140 | 565 | 300 | 185 | F10 | 15 | - | - | 22 | 28 | 40 | 56 | 50 |
| 200 | 8 | 380 | 152 | 635 | 345 | 210 | F12 | 18 | 27 | 45 | - | - | - | 95 | 84 |
| 250 | 10 | 450 | 165 | 710 | 410 | 260 | F14 | 23 | 36 | 55 | - | - | - | 147 | 127 |
| 300 | 12 | 520 | 178 | 785 | 480 | 290 | F16 | 27 | 50 | 65 | - | - | - | 214 | 189 |
| 350 | 14 | 585 | 190 | 825 | 520 | 350 | F16 | 27 | 50 | 65 | - | - | - | 280 | 252 |
| 400 | 16 | 660 | 216 | 900 | 600 | 385 | F25 | 30 | 60 | 80 | - | - | - | 402 | 368 |
| 450 | 18 | 710 | 222 | 960 | 660 | 430 | F25 | 30 | 60 | 80 | - | - | - | 474 | 436 |
| 500 | 20 | 775 | 229 | 1000 | 725 | 465 | F30 | 34 | 70 | 105 | - | - | - | 616 | 569 |
| 550 | 22 | 840 | 267 | 1045 | 770 | 540 | F30 | 34 | 70 | 105 | - | - | - | 760 | 703 |
| 600 | 24 | 915 | 267 | 1085 | 810 | 565 | F30 | 34 | 70 | 105 | - | - | - | 891 | 843 |
| **ASME B16.47-A** | | | | | | | | | | | | | | | |
| 700 | 28 | 1035 | 292 | 1150 | 910 | 650 | F35 | 38 | 80 | 110 | - | - | - | 1306 | 1234 |
| 750 | 30 | 1090 | 318 | 1210 | 970 | 680 | F35 | 38 | 80 | 110 | - | - | - | 1561 | 1483 |
| 800 | 32 | 1150 | 318 | 1250 | 1010 | 735 | F35 | 38 | 90 | 110 | - | - | - | 1790 | 1709 |
| 900 | 36 | 1270 | 330 | 1381 | 1131 | 750 | F40 | 45 | 110 | 130 | - | - | - | 2408 | 2306 |
| 1000 | 40 | 1275 | 410 | 1435 | 945 | 845 | F40 | 45 | 110 | 130 | - | - | - | 2600 | 2336 |
| 1050 | 42 | 1330 | 410 | 1530 | 1040 | 855 | F40 | 45 | 120 | 130 | - | - | - | 2834 | 2672 |
| 1200 | 48 | 1465 | 470 | 1610 | 1130 | 1030 | F48 | 50 | 140 | 140 | - | - | - | 4232 | 3809 |
| **ASME B16.47-B** | | | | | | | | | | | | | | | |
| 700 | 28 | 920 | 292 | 1150 | 910 | 650 | F35 | 38 | 80 | 110 | - | - | - | 1082 | 1016 |
| 750 | 30 | 990 | 318 | 1210 | 970 | 680 | F35 | 38 | 80 | 110 | - | - | - | 1322 | 1245 |
| 800 | 32 | 1055 | 318 | 1250 | 1010 | 735 | F35 | 38 | 90 | 110 | - | - | - | 1538 | 1456 |
| 900 | 36 | 1170 | 330 | 1381 | 1131 | 750 | F40 | 45 | 110 | 130 | - | - | - | 2125 | 2024 |
| 1000 | 40 | 1275 | 410 | 1435 | 945 | 845 | F40 | 45 | 110 | 130 | - | - | - | 2580 | 2320 |
| 1050 | 42 | 1330 | 410 | 1530 | 1040 | 855 | F40 | 45 | 120 | 130 | - | - | - | 2829 | 2560 |
| 1200 | 48 | 1510 | 470 | 1610 | 1130 | 1030 | F48 | 50 | 140 | 140 | - | - | - | 4384 | 3960 |

**Table 30: Face-to-face length**

The dimensions of TRIODIS 300 valves with flanged body meet the requirements of the EN 558-1 and ISO 5752-13 standards.

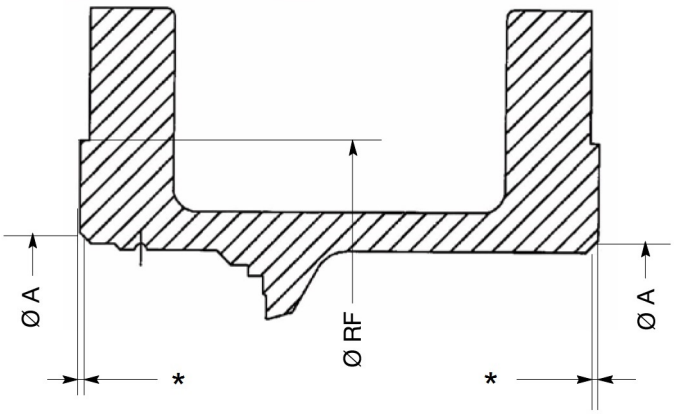
8613.1783/10-EN

## Flange dimensions for full-lug body (T4) and flanged body (T7)

The TRIODIS 300 valves can be installed between all common mating flange types and line connections using standard gaskets or serrated gaskets.

### Flange faces

To ensure proper connection the flange gasket dimensions must be compatible with the dimensions specified below:




Sectional drawing of flange gaskets

*: 45° chamfer

**Table 31:** Flange dimensions for standards B16.5 and PN 40 [mm]

| DN | NPS | Body T4 | | | | Body T7 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Ø A $^{+/-0,5}$ | | Ø RF $^{0/-10}$ | | Ø A $^{+/-0,5}$ | | Ø RF $^{0/-10}$ | |
| | [inch] | B16-5 | PN 40 | B16-5 | PN 40 | B16-5 | PN 40 | B16-5 | PN 40 |
| 80 | 3 | 91 | - | 127 | - | 91 | 91 | 127 | 138 |
| 100 | 4 | 116,5 | - | 158 | - | 116,5 | 116,5 | 157,2 | 162 |
| 150 | 6 | 170,5 | 170,5 | 216 | 218 | 170,5 | 170,5 | 216 | 218 |
| 200 | 8 | 221 | - | 270 | - | 221 | 221 | 270 | 285 |
| 250 | 10 | 276 | 276 | 324 | 345 | 276 | 276 | 324 | 345 |
| 300 | 12 | 328 | 328 | 381 | 410 | 328 | 328 | 381 | 410 |
| 350 | 14 | 366 | 366 | 413 | 465 | 366 | 366 | 412,8 | 465 |
| 400 | 16 | 415 | 415 | 470 | 535 | 415 | 415 | 470 | 535 |
| 450 | 18 | 463 | 163 | 533,5 | 560 | 463 | 463 | 533,4 | 560 |
| 500 | 20 | 519 | 519 | 584 | 615 | 519 | 519 | 584,2 | 615 |
| 550 | 22 | 553 | 553 | [14] | 641 | 553 | 553 | [14] | 641 |
| 600 | 24 | 619 | 619 | 692 | 735 | 619 | 619 | 692,2 | 735 |

**Table 32:** Flange dimensions for standards B16.47 A UN/UNC and B16.47 B UN/UNC [mm]

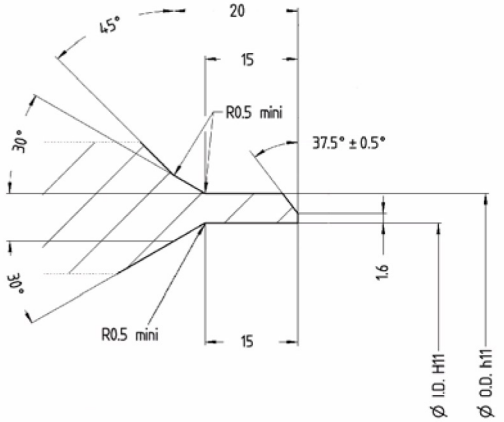
| DN | NPS | Body T7 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Ø A $^{+/-0,5}$ | Ø RF $^{0/-10}$ | Ø A $^{+/-0,5}$ | Ø RF $^{0/-10}$ | Ø A $^{+/-0,5}$ | Ø RF $^{0/-10}$ | Ø A $^{+/-0,5}$ | Ø RF $^{0/-10}$ |
| | [inch] | B16-47 A UN | | B16-47 A UNC | | B16-47 B UN | | B16-47 B UNC | |
| 700 | 28 | 716 | 800 | - | - | 716 | 787 | 716 | 787 |
| 750 | 30 | 767 | 857 | 767 | 857 | 767 | 845 | 767 | 845 |
| 800 | 32 | 819 | 914 | 819 | 914 | 819 | 902 | 819 | 902 |
| 900 | 36 | 917 | 1022 | 917 | 1022 | 917 | 1010 | 917 | 1010 |
| 1000 | 40 | 981 | 1086 | 981 | 1081 | 981 | 1114 | 981 | 1114 |
| 1050 | 42 | 1035 | 1137 | 1035 | 1137 | 1035 | 1168 | 1035 | 1168 |
| 1200 | 48 | 1180 | 1302 | 1180 | 1302 | 1180 | 1327 | 1180 | 1327 |

### Flange finish

Spiral serrated to ASME B16.5 Class 300 or ASME B16.47 Class 300
Standard: smooth finish (Ra 3.2 and Ra 6.3)
Optional: stock finish (Ra 6.3 to Ra 12.5)

14 Contact the manufacturer.

## Butt weld end dimensions of body with butt weld ends (BW)




Sectional drawing of butt weld end

**Table 33:** Butt weld end dimensions [mm]

| DN | NPS [inch] | Outside diameter (OD) | Inside diameter (ID) Schedule 40S |
|---|---|---|---|
| 100 | 4 | 114,3 | 102,26 |
| 150 | 6 | 168,3 | 154,1 |
| 200 | 8 | 219,1 | 202,7 |
| 250 | 10 | 273,1 | 254,6 |
| 300 | 12 | 323,9 | 304,8 |
| 350 | 14 | 355,6 | 336,5 |
| 400 | 16 | 406,4 | 387,3 |
| 450 | 18 | 457,2 | 437,9 |
| 500 | 20 | 508 | 488,9 |
| 600 | 24 | 610 | 584,2 |
| 650 | 26 | 660 | 631,5 |
| 700 | 28 | 711 | 679,2 |
| 750 | 30 | 762 | 730,2 |
| 800 | 32 | 813 | 781,2 |
| 900 | 36 | 914 | 882,2 |
| 1000 | 40 | 1016 | 968,3 |
| 1050 | 42 | 1067 | 1016,2 |
| 1200 | 48 | 1219 | 1168,2 |

8613.1783/10-EN

## Line connections

The valves can be installed between flanges to EN 1092-1 PN 40, to ASME B16.5 Class 300, to ASME B16.47 and to ASME B16.47-B (other line connections on request).

**Table 34: Full-lug body (T4) for TRIODIS 300 CRYO and MT**

| DN | NPS [inch] | EN 1092-1 PN 40 | ASME B16.5 Class 300 |
|---|---|---|---|
| 80 | 3 | ✓ | ✓ |
| 100 | 4 | ✓ | ✓ |
| 150 | 6 | ✓ | ✓ |
| 200 | 8 | ✓ | ✓ |
| 250 | 10 | ✓ | ✓ |
| 300 | 12 | ✓ | ✓ |
| 350 | 14 | ✓ | ✓ |
| 400 | 16 | ✓ | ✓ |
| 450 | 18 | ✓ | ✓ |
| 500 | 20 | ✓ | ✓ |
| 550 | 22 | ✓[15)] | • |
| 600 | 24 | ✓ | ✓ |

**Table 35: Flanged body (T7) for TRIODIS 300 CRYO and MT**

| DN | NPS [inch] | EN 1092-1 PN 40 | ASME | | |
|---|---|---|---|---|---|
| | | | B16.5 Class 300 | B16.47-A | B16.47-B |
| 80 | 3 | ✓ | ✓ | • | • |
| 100 | 4 | ✓ | ✓ | • | • |
| 150 | 6 | ✓ | ✓ | • | • |
| 200 | 8 | ✓ | ✓ | • | • |
| 250 | 10 | ✓ | ✓ | • | • |
| 300 | 12 | ✓ | ✓ | • | • |
| 350 | 14 | ✓ | ✓ | • | • |
| 400 | 16 | ✓ | ✓ | • | • |
| 450 | 18 | ✓ | ✓ | • | • |
| 500 | 20 | ✓ | ✓ | • | • |
| 550 | 22 | ✓[15)] | • | • | • |
| 600 | 24 | ✓ | ✓ | • | • |
| 700 | 28 | • | • | ✓ | ✓ |
| 750 | 30 | • | • | ✓ | ✓ |
| 800 | 32 | • | • | ✓ | ✓ |
| 900 | 36 | • | • | ✓ | ✓ |
| 1000 | 40 | • | • | ✓ | ✓ |
| 1050 | 42 | • | • | ✓ | ✓ |
| 1200 | 48 | • | • | ✓ | ✓ |

**Table 36:** Key

| Symbol | Description |
|---|---|
| ✓ | Installation possible |
| • | Not available |

15 ISO 2084

## Installation information

### Flange faces

**Table 37:** Overview

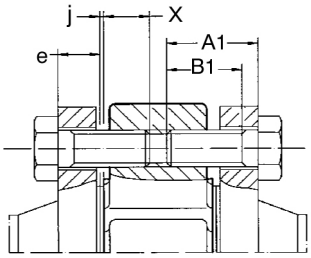
| | Raised face | Flat face |
|---|---|---|
| | RF | FF |
| Smooth finish | Standard | On request |
| Stock finish | Possible on request. | Possible on request. |

### Dead-end service and downstream dismantling

Possible on request.

### Screws, bolts and nuts

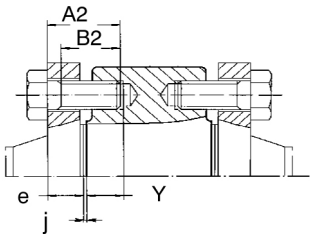
### Bolting for full-lug body – T4




Bolt length for tapped lugs

**A1 max = e + X + j**

e: flange thickness (customer-specific)
X: max. thread engagement depth
j: flange gasket thickness
B1: min. bolt thread length B1 > A1-e




Bolt length at shaft passage

**A2 max = e + Y + j**

e: flange thickness (customer-specific)
Y: max. thread engagement depth
j: flange gasket thickness
B2: min. bolt thread length B2 > A2-e

**N.B.: Bolting is not included in our standard scope of supply.**

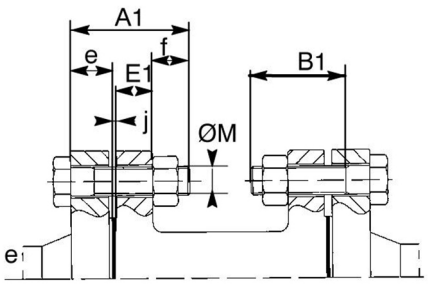
**Table 38:** Dimensions [mm] for full-lug body T4 – Connections to EN 1092-1 PN 40 and ASME B16.5 Class 300

| DN | NPS | EN 1092-1 PN 40 | | | | | ASME B16.5 Class 300 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ø M | Bolt A1 | | Bolt A2 | | UN/UNC | Bolt A1 | | Bolt A2 | |
| | [inch] | | X | Qty[16)] | Y | Qty[16)] | [inch] | X | Qty[16)] | Y | Qty[16)] |
| 80 | 3 | M16 | 23 | 8 | - | - | 3/4" | 23 | 8 | - | - |
| 100 | 4 | M20 | 26 | 8 | - | - | 3/4" | 26 | 8 | - | - |
| 150 | 6 | M24 | 29 | 8 | - | - | 3/4" | 29 | 12 | - | - |
| 200 | 8 | M27 | 35 | 12 | - | - | 7/8" | 35 | 12 | - | - |
| 250 | 10 | M30 | 41 | 12 | - | - | 1" | 40 | 12 | 20,5 | 4 |
| 300 | 12 | M30 | 45 | 12 | 23 | 4 | 1"1/8 | 45 | 12 | 23 | 4 |
| 350 | 14 | M33 | 53 | 12 | 26,5 | 4 | 1"1/8 | 50 | 16 | 20 | 4 |
| 400 | 16 | M36 | 58 | 12 | 38,5 | 4 | 1"1/4 | 52 | 16 | 29 | 4 |
| 450 | 18 | M36 | 58 | 16 | 32 | 4 | 1"1/4 | 54 | 20 | 27,5 | 4 |
| 500 | 20 | M39 | 64 | 16 | 28,5 | 4 | 1"1/4 | 58 | 20 | 26 | 4 |
| 550 | 22 | M45 | 64 | 16 | 30 | 4 | - | - | - | - | - |
| 600 | 24 | M45 | 75 | 16 | 33,5 | 4 | 1"1/2 | 65 | 20 | 30 | 4 |

8613.1783/10-EN

16 Number of bolts per side

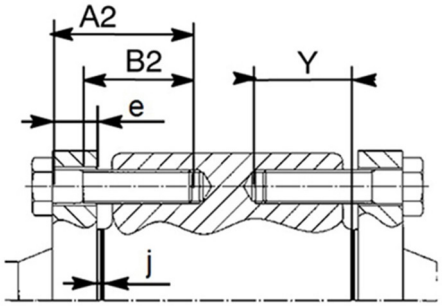
## Bolting for flanged body – T7




Bolt length for flanges

**A1 max. = e + j + E1 max. + f**

E1: valve flange thickness
e: flange thickness (customer-specific)
f: bolt overhang
j: flange gasket thickness
B1: min. bolt thread length B1 > A1-e




Bolt length at shaft passage

**A2 max. = e + Y + j**

e: flange thickness (customer-specific)
Y: max. thread engagement depth at shaft passage
j: flange gasket thickness
B2: min. bolt thread length B2 > A2-e

**N.B.: Bolting is not included in our standard scope of supply.**

**Table 39:** Dimensions [mm] for flanged body T7 – Connections to EN 1092-1 PN 40 and ASME B16.5 Class 300

| DN | NPS | E1 | EN 1092-1 PN 40 | | | | | ASME B16.5 Class 300 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ø M | Bolt A1 | | Bolt A2 | | UN / UNC | Bolt A1 | | Bolt A2 | |
| | [inch] | | | f | Qty | Y | Qty | [inch] | f | Qty | Y | Qty |
| 80 | 3 | 28 | M16 | 22 | 4 | 28 | 4 | 3/4" | 22 | 4 | 28 | 4 |
| 100 | 4 | 32 | M20 | 24 | 4 | 30 | 4 | 3/4" | 22 | 4 | 30 | 4 |
| 150 | 6 | 36 | M24 | 26 | 4 | 30 | 4 | 3/4" | 22 | 8 | 30 | 4 |
| 200 | 8 | 45,5 | M27 | 28 | 8 | 35 | 4 | 7/8" | 25 | 8 | 35 | 4 |
| 250 | 10 | 49 | M30 | 31 | 8 | 40 | 4 | 1" | 28 | 12 | 40 | 4 |
| 300 | 12 | 54,5 | M30 | 31 | 12 | 45 | 4 | 1"1/8 | 32 | 12 | 45 | 4 |
| 350 | 14 | 58,5 | M33 | 34 | 12 | 45 | 4 | 1"1/8 | 32 | 16 | 45 | 4 |
| 400 | 16 | 60,5 | M36 | 39 | 12 | 50 | 4 | 1"1/4 | 34 | 16 | 50 | 4 |
| 450 | 18 | 67 | M36 | 39 | 16 | 52 | 4 | 1"1/4 | 34 | 20 | 52 | 4 |
| 500 | 20 | 69 | M39 | 41 | 16 | 55 | 4 | 1"1/4 | 34 | 20 | 52 | 4 |
| 550 | 22 | 66,5 | M45 | 45 | 16 | 50 | 4 | - | - | - | - | - |
| 600 | 24 | 74 | M45 | 45 | 16 | 65 | 4 | 1"1/2 | 41 | 20 | 65 | 4 |

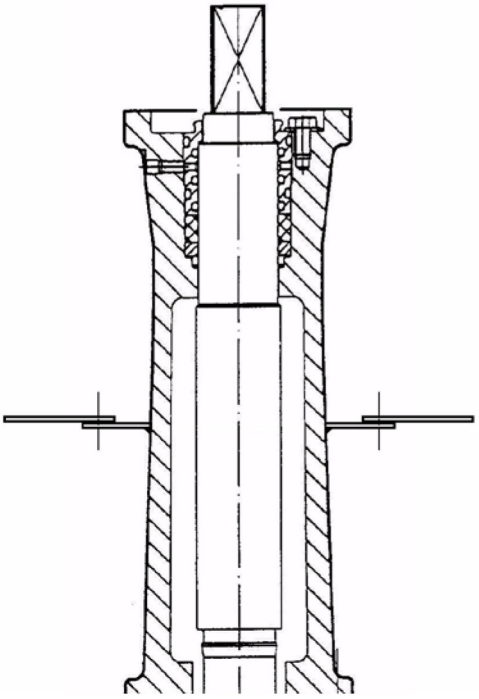
**Table 40:** Dimensions [mm] for flanged body T7 – Connections to ASME B16.47-A and B16.47-B

| DN | NPS | E1 | ASME B16.47-A | | | | | ASME B16.47-B | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | UN / UNC | Bolt A1 | | Bolt A2 | | UN / UNC | Bolt A1 | | Bolt A2 | |
| | [inch] | | [inch] | f | Qty | Y | Qty | [inch] | f | Qty | Y | Qty |
| 700 | 28 | 84,5 | 1"5/8 | 48 | 20 | 56 | 8 | - | - | - | - | - |
| 700 | 28 | 90 | - | - | - | - | - | 1"1/4 | 34 | 28 | 56 | 8 |
| 750 | 30 | 100 | 1"3/4 | 54 | 20 | 62 | 8 | 1"3/8 | 38 | 28 | 62 | 8 |
| 800 | 32 | 97 | 1"7/8 | 55 | 20 | 60 | 8 | - | - | - | - | - |
| 800 | 32 | 103 | - | - | - | - | - | 1"1/2 | 41 | 24 | 60 | 8 |
| 900 | 36 | 103,5 | 2" | 56 | 24 | 48,5 | 8 | 1"5/8 | 48 | 24 | 48,5 | 8 |
| 1000 | 40 | 114,5 | 1"5/8 | 48 | 24 | 70 | 8 | 1"5/8 | 48 | 32 | 70 | 8 |
| 1050 | 42 | 117,5 | 1"5/8 | 48 | 24 | 70 | 8 | 1"3/4 | 54 | 28 | 70 | 8 |
| 1200 | 48 | 133,5 | 1"7/8 | 55 | 24 | 70 | 8 | 1"7/8 | 55 | 32 | 70 | 8 |

8613.1783/10-EN

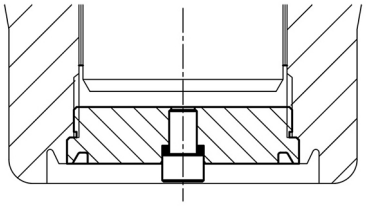
## Option

### Insulating plate (drip plate)



Sectional drawing

### Drain plug



Sectional drawing

8613.1783/10-EN

2022-11-09

8613.1783/10-EN

**KSB S.A.S.**
4, allée des Barbanniers • 92635 Gennevilliers Cedex (France)
Tél. 09 69 39 29 79
www.ksb.com/fr-fr