

Butterfly Valve

# DANAIS 150

DN 50 - 1200  
PS 25 bar

## Type Series Booklet



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Type Series Booklet DANAÏS 150

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## Butterfly Valves

### Double-offset Butterfly Valves

## DANAIS 150



#### Main applications

- Hot-water heating systems
- District heating
- Chemical industry
- Air-conditioning systems
- Beverage industry and food industry
- Paper industry / pulp industry
- Petrochemical industry
- Pharmaceutical industry
- Shipbuilding
- Mining
- Pipelines and tank farms
- Process engineering
- Refinery
- Sugar industry
- Pressure boosting
- Industrial recirculation systems
- Low-pressure steam
- Gases

#### Medien

- Fuels
- Hot water
- High-temperature hot water
- Fluids containing mineral oils
- Solids-laden fluids
- Aggressive fluids
- Heat transfer fluids / Oils
- Corrosive fluids

- Flammable fluids
- Toxic fluids
- Volatile fluids
- Gas
- Oil
- Solids (ore, sand, gravel, ash)
- Steam
- Vacuum

#### Operating data

**Table 1:** Operating properties

| Parameter                                            | Value                                            |
|------------------------------------------------------|--------------------------------------------------|
| Nominal pressure                                     | PN 10/16/25                                      |
| Nominal pressure                                     | Class 150                                        |
| Nominal size [mm]                                    | DN 50 - 1200                                     |
| Nominal size [inch]                                  | NPS 2-48                                         |
| Max. permissible pressure [bar]                      | 25                                               |
| Min. permissible temperature [°C]                    | ≥ -50                                            |
| Max. permissible temperature [°C]                    | ≤ +260                                           |
| Actuation at ΔP                                      | Limited to 20 bar<br>(16 bar for elastomer seat) |
| 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      |

The operating temperature depends on the seat material (⇒ Page 7) and on the packing material. (⇒ Page 17) . For temperatures > 260 °C contact KSB.

#### Design details

##### Design

- Wafer-type body with flat faces - T1: DN 50 - 1200 (2 - 48 in.)
- Full-lug body with raised faces – T4: DN 50 - 1200 (2 - 48 in.)
- Four interchangeable seat types: plastomer, fire-safe plastomer, metal or elastomer
- Dead-end service and downstream dismantling possible with full-lug bodies T4.
- Face-to-face length to EN 558 Series 20, ISO 5752 Series 20 (except DN 350: EN 558 / ISO 5752 Series 25) and API 609 Table 2 Class 150
- EN, ASME, JIS connections
- Marking in accordance with EN 19
- Absolutely tight shut-off (no leakage visible to the naked eye) in either direction of flow in accordance with EN 12266-1, leakage rate A, and ISO 5208, category A.
- Steel body: anti-corrosive primer coat and optional two-layer or three-layer coating system
- Stainless steel body: pickled and passivated
- Fire-safe to API 607
- The valves meet the fugitive emission requirements specified in TA Luft (German Technical Guidelines on Air Quality Control, VDI 2440) and standard ISO 15848-1 (CO3 Class B).

## Variants

- S / SR / SP / CR / CM quarter-turn levers
- MR manual gearbox
- ACTAIR NG / DYNACTAIR NG pneumatic actuators
- Electric quarter-turn actuators
- HQ hydraulic actuators
- AMTROBOX for open/closed position signalling
- AMTRONIC position signalling and control air supply
- SMARTRONIC positioner and process controller
- Other actuators on request
- Anti-static design for manually actuated valves

## Valve body materials

**Table 2:** Overview of materials available for wafer-type body T1 and full-lug body T4

| Material                                                   | Material number                | Temperature limit | KSB code |
|------------------------------------------------------------|--------------------------------|-------------------|----------|
| Carbon steel                                               | ASTM A216 Gr. WCC / 1.0619     | -29 °C to +260 °C | 1        |
| Stainless steel                                            | ASTM A351 Gr. CF 8M / 1.4408   | -50 °C to +260 °C | 6        |
| Stainless steel                                            | ASTM A351 Gr. CF 3M / 1.4409   | -50 °C to +260 °C | 6t       |
| Stainless steel                                            | ASTM A351 Gr. CF3M Mo > 2.75   | -50 °C to +260 °C | 6m       |
| Nodular cast iron (only for body type T1 and DN 80 to 800) | ASTM A536 Gr. 60-40-18         | -10 °C to +260 °C | 3g       |
| High-strength stainless steel                              | ASTM A351 Gr. CK3MCuN (254SMO) | -29 °C to +260 °C | 7d       |

## Product benefits

- Gland packing can be replaced without removing the bracket:
  - Service-friendly
  - Cost-saving
- Shaft in anti-blowout design
  - Actuator can be removed safely
  - Protection of persons
- Shaft perfectly guided by long bearings
  - Tight shut-off: The highest sealing capability on the market, even at full pressure rating
- Valve body without separate bottom cover (up to DN 300)
  - Reliable sealing to atmosphere
- Smooth flange
  - Excellent sealing at the flanged line connections
- Closed-position travel stop
  - Protects seat from damage in the event of improper operation
- Patented seat design
  - Tight shut-off: The highest sealing capability on the market, even at full pressure rating
  - Long service life
  - Service-friendly
- Body seat protected against abrasion
  - Long service life of the seat
- Wafer-type body with centring ribs
  - For greater ease of installation between a variety of flange types

## 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.

### 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 chemicals Regulation (EC) No. 1907/2006 (REACH), see <https://www.ksb.com/ksb-en/About-KSB/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.

## Certification

**Table 3:** Overview

| Label | Effective in: | Comment                                                                                    |
|-------|---------------|--------------------------------------------------------------------------------------------|
|       | Worldwide     |                                                                                            |
|       | Worldwide     | Approved for marine applications                                                           |
|       | Worldwide     | Approved for marine applications                                                           |
|       | Worldwide     | Approved for marine applications                                                           |
|       | Worldwide     | Approved for marine applications                                                           |
|       | Worldwide     | FDA-compliant elastomer material                                                           |
|       | Europe        | Certificate regarding food contact materials as per European Regulation (EC) No. 1935/2004 |

## Related documents

**Table 4:** Information/documents

| Document           | Reference number |
|--------------------|------------------|
| Actuator selection | 8460.15          |
| Operating manual   | 8450.810         |

**Purchase order specifications**

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

## Pressure/temperature ratings

### Pressure classes PN 10, PN 16, PN 25

In pressure classes PN 10, PN 16 and PN 25 (European materials), the DANAIS 150 butterfly valve meets the requirements of EN 12516-1.

The values in the following table are valid for valves to European Pressure Equipment Directive 2014/68/EU:

**Table 5:** Pressure/temperature ratings for pressure classes PN 10, PN 16, PN 25

| Pressure class | Materials              |                              | Operating pressure in [bar] at a temperature in [°C] |      |      |      |      |               |               |               |               |               |               |
|----------------|------------------------|------------------------------|------------------------------------------------------|------|------|------|------|---------------|---------------|---------------|---------------|---------------|---------------|
|                | Body                   | Seat                         | -50                                                  | -10  | 0    | 20   | 100  | 135           | 150           | 180           | 200           | 220           | 260           |
| PN 10          | Carbon steel 1.0619    | Plastomer <sup>1)</sup>      | <sup>2)</sup>                                        | 9,7  | 9,7  | 9,7  | 8,5  | 8,1           | 7,9           | 7,4           | 3,3           | 0,0           | <sup>2)</sup> |
|                |                        | Elastomer <sup>3)</sup>      | <sup>2)</sup>                                        | 9,7  | 9,7  | 9,7  | 8,5  | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> |
|                |                        | Stainless steel 301          | <sup>2)</sup>                                        | 9,7  | 9,7  | 9,7  | 8,5  | 8,1           | 7,9           | 7,4           | 7,1           | 6,9           | 6,4           |
|                | Stainless steel 1.4408 | Plastomer <sup>1)</sup>      | <sup>2)</sup>                                        | 9,7  | 9,7  | 9,7  | 8,3  | 7,7           | 7,5           | 7,1           | 3,3           | 0,0           | <sup>2)</sup> |
|                |                        | Stainless steel 301          | 9,7                                                  | 9,7  | 9,7  | 9,7  | 8,3  | 7,7           | 7,5           | 7,1           | 6,9           | 6,7           | 6,3           |
|                |                        | Pure plastomer <sup>4)</sup> | 9,7                                                  | 9,7  | 9,7  | 9,7  | 8,3  | 7,7           | 7,5           | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> |
|                | Stainless steel 1.4409 | Plastomer <sup>1)</sup>      | <sup>2)</sup>                                        | 9,0  | 9,0  | 8,9  | 7,8  | 7,3           | 7,1           | 7,1           | 3,3           | 0,0           | <sup>2)</sup> |
|                |                        | Pure plastomer <sup>4)</sup> | 9,0                                                  | 9,0  | 9,0  | 8,9  | 7,8  | 7,3           | 7,1           | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> |
| PN 16          | Carbon steel 1.0619    | Plastomer <sup>1)</sup>      | <sup>2)</sup>                                        | 15,6 | 15,6 | 15,6 | 13,6 | 13,0          | 12,7          | 10,0          | 3,3           | 0,0           | <sup>2)</sup> |
|                |                        | Elastomer <sup>3)</sup>      | <sup>2)</sup>                                        | 15,6 | 15,6 | 15,6 | 13,6 | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> |
|                |                        | Stainless steel 301          | <sup>2)</sup>                                        | 15,6 | 15,6 | 15,6 | 13,6 | 13,0          | 12,7          | 11,9          | 11,4          | 11,0          | 10,2          |
|                | Stainless steel 1.4408 | Plastomer <sup>1)</sup>      | <sup>2)</sup>                                        | 15,5 | 15,5 | 15,5 | 13,3 | 12,4          | 12,0          | 10,0          | 3,3           | 0,0           | <sup>2)</sup> |
|                |                        | Stainless steel 301          | 15,5                                                 | 15,5 | 15,5 | 15,5 | 13,3 | 12,4          | 12,0          | 11,4          | 11,0          | 10,7          | 10,1          |
|                |                        | Pure plastomer <sup>4)</sup> | 15,5                                                 | 15,5 | 15,5 | 15,5 | 13,3 | 12,4          | 12,0          | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> |
|                | Stainless steel 1.4409 | Plastomer <sup>1)</sup>      | <sup>2)</sup>                                        | 15,5 | 15,5 | 15,5 | 13,3 | 12,4          | 11,4          | 10,0          | 3,3           | 0,0           | <sup>2)</sup> |
|                |                        | Pure plastomer <sup>4)</sup> | 15,5                                                 | 15,5 | 15,5 | 15,5 | 13,3 | 12,4          | 11,4          | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> |
| PN 25          | Carbon steel 1.0619    | Plastomer <sup>1)</sup>      | <sup>2)</sup>                                        | 24,4 | 24,4 | 24,4 | 21,3 | 20,3          | 15,8          | 10,0          | 3,3           | 0,0           | <sup>2)</sup> |
|                |                        | Stainless steel 301          | <sup>2)</sup>                                        | 24,4 | 24,4 | 24,4 | 21,3 | 20,3          | 19,8          | 18,6          | 17,8          | 17,2          | 15,9          |
|                | Stainless steel 1.4408 | Plastomer <sup>1)</sup>      | <sup>2)</sup>                                        | 24,3 | 24,3 | 24,3 | 20,7 | 19,3          | 15,8          | 10,0          | 3,3           | 0,0           | <sup>2)</sup> |
|                |                        | Stainless steel 301          | 24,3                                                 | 24,3 | 24,3 | 24,3 | 20,7 | 19,3          | 18,7          | 17,8          | 17,2          | 16,7          | 15,8          |
|                |                        | Pure plastomer <sup>4)</sup> | 24,3                                                 | 24,3 | 24,3 | 24,3 | 20,7 | 19,3          | 15,8          | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> |
|                | Stainless steel 1.4409 | Plastomer <sup>1)</sup>      | <sup>2)</sup>                                        | 22,5 | 22,5 | 22,5 | 19,5 | 19,3          | 17,8          | 10,0          | 3,3           | 0,0           | <sup>2)</sup> |
|                |                        | Pure plastomer <sup>4)</sup> | 22,5                                                 | 22,5 | 22,5 | 22,5 | 19,5 | 19,3          | 17,8          | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> | <sup>2)</sup> |

### Pressure class 150

In pressure class 150 (ASTM materials), the DANAIS 150 valve complies with ASME B16.34 Class 150 "Standard Class" as per the following table (except for ASTM B148 Gr. C95800 and ASTM A536 Gr. 60-40-18):

**Table 6:** Pressure/temperature ratings for pressure class 150

| Pressure class  | ASTM materials            |                              | Operating pressure in [bar] at a temperature in [°C] |      |      |      |      |      |      |      |      |      |      |      |
|-----------------|---------------------------|------------------------------|------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
|                 | Body                      | Seat                         | -50                                                  | -29  | -10  | 0    | 50   | 100  | 135  | 150  | 180  | 200  | 220  | 260  |
| Class 150       | A216 Gr. WCC              | Plastomer <sup>1)</sup>      | 2)                                                   | 2)   | 20,0 | 20,0 | 20,0 | 17,7 | 16,4 | 15,8 | 10,0 | 3,3  | 0,0  | 2)   |
|                 |                           | Elastomer <sup>3)</sup>      | 2)                                                   | 2)   | 20,0 | 20,0 | 20,0 | 17,7 | 2)   | 2)   | 2)   | 2)   | 2)   |      |
|                 |                           | Stainless steel 301          | 2)                                                   | 20,0 | 20,0 | 20,0 | 20,0 | 17,7 | 16,4 | 15,8 | 14,7 | 13,8 | 13,2 | 11,7 |
|                 | A351 Gr. CF8M             | Plastomer <sup>1)</sup>      | 2)                                                   | 2)   | 19,0 | 19,0 | 18,4 | 16,2 | 15,2 | 14,8 | 10,0 | 3,3  | 0,0  | 2)   |
|                 |                           | Stainless steel 301          | 19,0                                                 | 19,0 | 19,0 | 19,0 | 18,4 | 16,2 | 15,2 | 14,8 | 14,2 | 13,7 | 13,0 | 11,7 |
|                 |                           | Pure plastomer <sup>4)</sup> | 19,0                                                 | 19,0 | 19,0 | 19,0 | 18,4 | 16,2 | 15,2 | 14,8 | 2)   | 2)   | 2)   | 2)   |
|                 | A351 Gr. CK3MCUN          | Plastomer <sup>1)</sup>      | 2)                                                   | 2)   | 20,0 | 20,0 | 19,5 | 17,7 | 16,4 | 15,8 | 10,0 | 3,3  | 0,0  | 2)   |
|                 | A351 Gr. CF3M             | Plastomer <sup>1)</sup>      | 2)                                                   | 2)   | 19,0 | 19,0 | 18,4 | 16,2 | 15,2 | 14,8 | 10,0 | 3,3  | 0,0  | 2)   |
|                 | A351 Gr. CF3M Mo > 2,75 % | Pure plastomer <sup>4)</sup> | 19,0                                                 | 19,0 | 19,0 | 19,0 | 18,4 | 16,2 | 15,2 | 14,8 | 2)   | 2)   | 2)   | 2)   |
|                 | A536 Gr. 60-40-18         | Elastomer <sup>3)</sup>      | 2)                                                   | 2)   | 17,2 | 17,2 | 17,2 | 16,2 | 2)   | 2)   | 2)   | 2)   | 2)   | 2)   |
| B148 Gr. C95400 | Plastomer <sup>1)</sup>   | 2)                           | 2)                                                   | 15,5 | 15,5 | 15,5 | 15,0 | 14,5 | 14,0 | 10,0 | 3,3  | 0,0  | 2)   |      |

<sup>1)</sup> Plastomer = PTFE / PTFE fire-safe (glass-fibre reinforced PTFE)

<sup>2)</sup> Not permitted

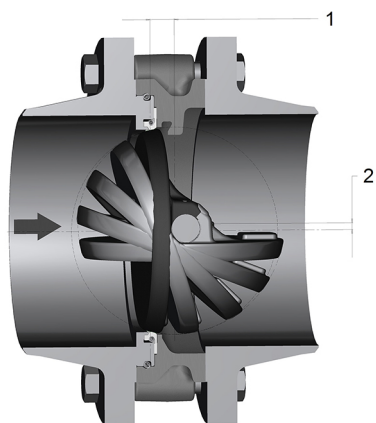
<sup>3)</sup> Elastomer = VITON (FKM) / NBR

<sup>4)</sup> Pure plastomer = pure PTFE / pure PTFE fire-safe

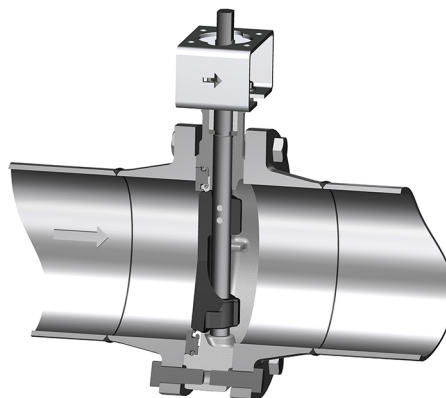
## Technical data

### Kinematics

- The valve disc is pressed onto the seat by double-offset kinematics.
- Double offset:
  - The axis of rotation is offset from the seat/disc interface.
  - The axis of rotation is offset from the piping centreline.
- This design prevents friction between the seat and the sealing surface of the valve disc as the valve discs opens and closes.
- The valve's shut-off capability is maintained even after a very large number of actuating cycles.
- The butterfly valve's shut-off capability meets the most stringent specifications and standards.



Schematic  
Cross-section perpendicular to shaft



Schematic  
Cross-section parallel to shaft

1. First offset
2. Second offset

## Shut-off

- The valve complies with the standards listed below.
- The valve is bi-directional, with a preferred flow direction indicated by the arrow on the yoke (direction of differential pressure applied to valve disc).

**Table 7:** Shut-off table

| Valve       | Plastomer-seated or elastomer-seated                                                    | Metal-seated                                                  |
|-------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------|
| For liquids | EN 12266-1 Leakage rate A<br>ISO 5208 Category A<br>API 598                             | EN 12266-1 Leakage rate D<br>ISO 5208 Category D<br>MSS SP 61 |
| For gases   | EN 12266-1 Leakage rate A<br>ISO 5208 Category A<br>API 598<br>ANSI / FCI 70.2 Class VI | EN 12266-1 Leakage rate D<br>ISO 5208 Category D<br>MSS SP 61 |

## Actuating torque

A safety coefficient has already been included in the actuating torques for actuator selection.

## Actuating torques for plastomer-seated or elastomer-seated valves

**Table 8:** Table of actuating torques for plastomer-seated or elastomer-seated valves [Nm]

| DN                | NPS<br>[inch] | Differential pressure $\Delta P$ [bar] |       |       |               |                              |       |       |               |
|-------------------|---------------|----------------------------------------|-------|-------|---------------|------------------------------|-------|-------|---------------|
|                   |               | Preferred flow direction               |       |       |               | Non-preferred flow direction |       |       |               |
|                   |               | 6                                      | 10    | 16    | 20            | 6                            | 10    | 16    | 20            |
| 50                | 2             | 20                                     | 20    | 30    | 30            | 20                           | 20    | 20    | 20            |
| 65                | 2½            | 30                                     | 30    | 30    | 40            | 20                           | 20    | 30    | 30            |
| 80                | 3             | 30                                     | 40    | 40    | 50            | 30                           | 30    | 40    | 40            |
| 100               | 4             | 50                                     | 50    | 60    | 70            | 40                           | 50    | 60    | 70            |
| 125               | 5             | 70                                     | 80    | 90    | 100           | 60                           | 70    | 90    | 100           |
| 150               | 6             | 100                                    | 110   | 140   | 160           | 90                           | 110   | 140   | 160           |
| 200               | 8             | 160                                    | 180   | 230   | 260           | 150                          | 190   | 240   | 280           |
| 250               | 10            | 290                                    | 340   | 440   | 510           | 270                          | 350   | 470   | 550           |
| 300               | 12            | 400                                    | 470   | 620   | 720           | 380                          | 500   | 680   | 790           |
| 350               | 14            | 610                                    | 720   | 970   | 1140          | 570                          | 780   | 1080  | 1290          |
| 400               | 16            | 820                                    | 980   | 1340  | 1570          | 780                          | 1060  | 1490  | 1770          |
| 450               | 18            | 1130                                   | 1370  | 1880  | 2210          | 1080                         | 1480  | 2090  | 2490          |
| 500               | 20            | 1380                                   | 1680  | 2310  | 2740          | 1320                         | 1820  | 2570  | 3070          |
| 550 <sup>5)</sup> | 22            | 1820                                   | 2220  | 3100  | 3690          | 1740                         | 2450  | 3510  | 4220          |
| 600               | 24            | 2210                                   | 2720  | 3820  | 4560          | 2130                         | 3000  | 4320  | 5200          |
| 650               | 26            | 2590                                   | 3200  | 4510  | <sup>6)</sup> | 2970                         | 4050  | 5660  | <sup>6)</sup> |
| 700               | 28            | 2900                                   | 3630  | 5130  | <sup>6)</sup> | 3810                         | 5090  | 7000  | <sup>6)</sup> |
| 750               | 30            | 3670                                   | 4580  | 6530  | <sup>6)</sup> | 4530                         | 6390  | 8950  | <sup>6)</sup> |
| 800               | 32            | 4300                                   | 5350  | 7660  | <sup>6)</sup> | 5460                         | 7410  | 10340 | <sup>6)</sup> |
| 900               | 36            | 5600                                   | 7040  | 10130 | <sup>6)</sup> | 7150                         | 9740  | 13630 | <sup>6)</sup> |
| 1000              | 40            | 7500                                   | 9510  | 13820 | <sup>6)</sup> | 9450                         | 13060 | 18470 | <sup>6)</sup> |
| 1200              | 48            | 11450                                  | 14670 | 21540 | <sup>6)</sup> | 16200                        | 21670 | 32350 | <sup>6)</sup> |

<sup>5</sup> DN 550 is available for elastomer-seated valves with body type T1 made of nodular cast iron or carbon steel (WCC).

<sup>6</sup> Contact KSB.

## Actuating torques for metal-seated valves

Table 9: Table of actuating torques for metal-seated valves [Nm]

| DN  | NPS<br>[inch] | Differential pressure $\Delta P$ [bar] |      |      |      |                  |      |      |      |                              |      |      |      |                  |      |      |      |
|-----|---------------|----------------------------------------|------|------|------|------------------|------|------|------|------------------------------|------|------|------|------------------|------|------|------|
|     |               | Preferred flow direction               |      |      |      |                  |      |      |      | Non-preferred flow direction |      |      |      |                  |      |      |      |
|     |               | Liquid fluid                           |      |      |      | Non-liquid fluid |      |      |      | Liquid fluid                 |      |      |      | Non-liquid fluid |      |      |      |
|     |               | 6                                      | 10   | 16   | 20   | 6                | 10   | 16   | 20   | 6                            | 10   | 16   | 20   | 6                | 10   | 16   | 20   |
| 50  | 2             | 20                                     | 30   | 30   | 30   | 40               | 50   | 60   | 60   | 20                           | 30   | 30   | 30   | 40               | 50   | 60   | 60   |
| 65  | 2½            | 30                                     | 40   | 40   | 50   | 60               | 70   | 80   | 90   | 30                           | 40   | 40   | 50   | 60               | 70   | 80   | 90   |
| 80  | 3             | 40                                     | 50   | 60   | 60   | 80               | 90   | 110  | 120  | 40                           | 50   | 60   | 60   | 80               | 90   | 110  | 120  |
| 100 | 4             | 70                                     | 80   | 90   | 100  | 130              | 150  | 180  | 190  | 70                           | 80   | 90   | 100  | 130              | 150  | 180  | 190  |
| 125 | 5             | 90                                     | 110  | 130  | 150  | 190              | 220  | 260  | 280  | 90                           | 110  | 130  | 150  | 190              | 220  | 260  | 280  |
| 150 | 6             | 140                                    | 170  | 210  | 230  | 280              | 320  | 380  | 420  | 140                          | 170  | 210  | 230  | 280              | 320  | 380  | 420  |
| 200 | 8             | 250                                    | 290  | 350  | 400  | 500              | 560  | 660  | 730  | 240                          | 290  | 360  | 410  | 480              | 560  | 670  | 740  |
| 250 | 10            | 430                                    | 490  | 620  | 710  | 820              | 920  | 1100 | 1220 | 410                          | 500  | 650  | 750  | 800              | 930  | 1130 | 1270 |
| 300 | 12            | 590                                    | 680  | 860  | 990  | 1130             | 1260 | 1510 | 1680 | 560                          | 700  | 920  | 1060 | 1100             | 1290 | 1560 | 1750 |
| 350 | 14            | 860                                    | 1000 | 1290 | 1490 | 1590             | 1790 | 2160 | 2420 | 820                          | 1050 | 1400 | 1630 | 1550             | 1840 | 2270 | 2560 |
| 400 | 16            | 1170                                   | 1360 | 1770 | 2040 | 2140             | 2410 | 2930 | 3280 | 1120                         | 1440 | 1920 | 2240 | 2090             | 2480 | 3080 | 3470 |
| 450 | 18            | 1590                                   | 1870 | 2450 | 2830 | 2900             | 3280 | 4000 | 4480 | 1530                         | 1980 | 2660 | 3110 | 2840             | 3390 | 4210 | 4750 |
| 500 | 20            | 1920                                   | 2270 | 2990 | 3460 | 3480             | 3950 | 4840 | 5430 | 1860                         | 2410 | 3240 | 3790 | 3420             | 4090 | 5090 | 5760 |
| 600 | 24            | 2980                                   | 3560 | 4760 | 5560 | 5220             | 5950 | 7380 | 8340 | 2890                         | 3830 | 5290 | 6190 | 5130             | 6230 | 7880 | 8970 |

## Hydraulic characteristics

Table 10: Table [Kv0 in m³/h / bar<sup>0.5</sup>] and [Cv0 in GUS / min / psi<sup>0.5</sup>]

| DN   | NPS    | Flow coefficient with valve disc fully open |        | Zeta |
|------|--------|---------------------------------------------|--------|------|
|      | [inch] | Kv0                                         | Cv0    |      |
| 50   | 2      | 70                                          | 80     | 2,04 |
| 65   | 2½     | 110                                         | 145    | 2,35 |
| 80   | 3      | 190                                         | 220    | 1,81 |
| 100  | 4      | 340                                         | 400    | 1,38 |
| 125  | 5      | 600                                         | 700    | 1,08 |
| 150  | 6      | 980                                         | 1150   | 0,84 |
| 200  | 8      | 1850                                        | 2150   | 0,75 |
| 250  | 10     | 3350                                        | 3880   | 0,56 |
| 300  | 12     | 4870                                        | 5650   | 0,55 |
| 350  | 14     | 7070                                        | 8200   | 0,48 |
| 400  | 16     | 10350                                       | 12000  | 0,38 |
| 450  | 18     | 12500                                       | 14500  | 0,42 |
| 500  | 20     | 15090                                       | 17500  | 0,44 |
| 550  | 22     | 18750                                       | 21750  | 0,42 |
| 600  | 24     | 22410                                       | 26000  | 0,41 |
| 650  | 26     | 24655                                       | 28600  | 0,47 |
| 700  | 28     | 26900                                       | 31200  | 0,53 |
| 750  | 30     | 32600                                       | 37820  | 0,48 |
| 800  | 32     | 38000                                       | 44100  | 0,45 |
| 900  | 36     | 59100                                       | 68600  | 0,30 |
| 1000 | 40     | 76700                                       | 89000  | 0,27 |
| 1200 | 48     | 143000                                      | 165880 | 0,16 |

## Fire-safe design

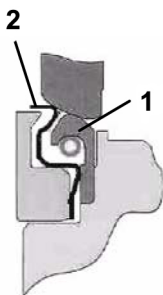
Lloyd's Register certified design to API 607 (and to EN ISO 10497 for aluminium bronze variant)

Design:

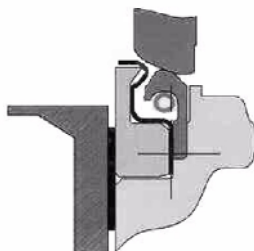
### Tight shut-off

Plastomer seat (1) and fire-safe metal seat made of stainless steel (2)

1. Plastomer seat
2. Disc spring-type fire-safe metal seat

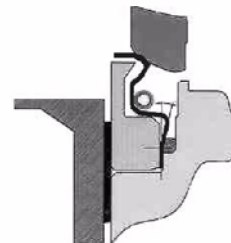


Valve before it is flanged into the piping



Valve flanged into the piping during normal operation (before fire event)

When the valve is clamped between the flanges, the fire-safe metal seat straightens. There is no contact between the fire-safe metal seat and the valve disc. Shut-off is ensured by the plastomer seat.



Valve flanged into the piping (after fire event)

The fire destroys the plastomer seat. The metal seat resumes its original shape and contacts the valve disc. During the fire, the metal seat ensures continued shut-off. The leakage rate is compliant with API 607 or EN ISO 10497.

Fire-safe design is recommended for body type T4 (full-lug body).

In the event of a fire, the flange bolting is thermally isolated and protected by the body lugs.

This protection limits bolt deformation in a fire, thus maintaining the sealing effect of the flange gaskets.

### Sealing at the Shaft passage

Expanded graphite gland packing

### Extension option

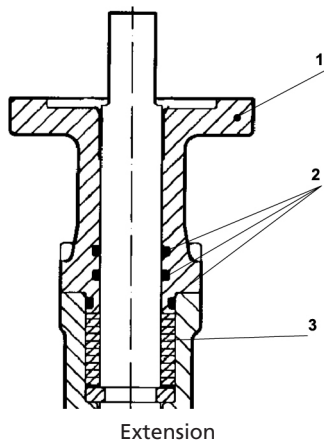
For DN 50 to 600 (up to DN 800 for nodular cast iron)

This option is recommended for applications in aggressive environments (marine, petrochemical industry, etc).

The extension replaces the bracket/gland follower assembly and protects the valve/actuator interface against the environment.

O-rings made of Viton provide a back-up seal at the shaft passage.

Max. operating temperature: +220 °C



- 1: Top flange to ISO 5211
- 2: Back-up seal by O-rings made of VITON (FKM)
- 3: Primary sealing by expanded graphite gland packing

## Configuration of DANAIS 150

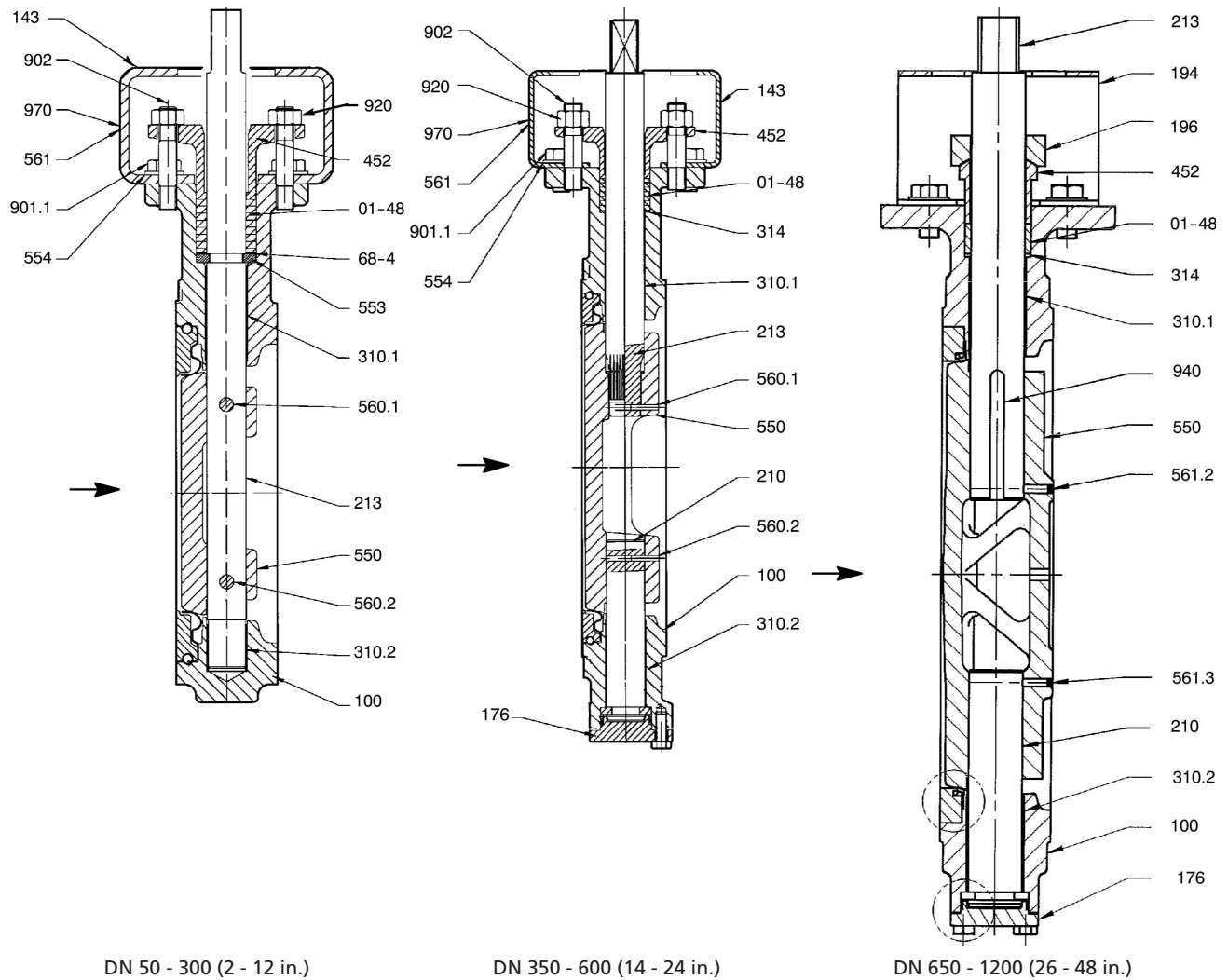
Table 11: Overview of configuration options

| Material type                            | ASTM material code         | EN material code | KSB code      | DANAIS 150                                   |                                             |                                               |                                             |
|------------------------------------------|----------------------------|------------------|---------------|----------------------------------------------|---------------------------------------------|-----------------------------------------------|---------------------------------------------|
|                                          |                            |                  |               | General industry (Standard)                  | Crude oil (Variant C)                       | Mining (Variant D)                            | Chemical tankers (Variant T)                |
|                                          |                            |                  |               | DN 50-1200 (2 - 48 in.) Body types T1 and T4 | DN 80-800 (3 - 32 in.) Body types T1 and T4 | DN 65-600 (2 ½ - 24 in.) Body types T1 and T4 | DN 50-450 (2 - 18 in.) Body types T1 and T4 |
| <b>BODY</b>                              |                            |                  |               |                                              |                                             |                                               |                                             |
| Stainless steel                          | A351 Gr. CF8M              | 1.4408           | 6             | ✓                                            | -                                           | -                                             | ✓                                           |
| Stainless steel                          | A351 Gr. CF3M              | 1.4409           | 6t            | -                                            | -                                           | -                                             | ✓                                           |
| Stainless steel                          | A351 Gr. CF3M Mo > 2,75 %  |                  | 6m            | -                                            | -                                           | -                                             | ✓                                           |
| High-strength stainless steel (duplex)   | A351 Gr. CK3MCuN (254 SMO) |                  | 7d            | -                                            | -                                           | ✓                                             | -                                           |
| Nodular cast iron (body type T1 only)    | A536 Gr. 60-40-18          |                  | 3g            | -                                            | ✓                                           | -                                             | -                                           |
| Carbon steel                             | A216 Gr. WCC               | 1.0619           | 1             | ✓                                            | ✓                                           | -                                             | -                                           |
| <b>SHAFT AND AXLE</b>                    |                            |                  |               |                                              |                                             |                                               |                                             |
| Stainless steel                          | A564 Gr. 630               | 1.4542           | 6e            | ✓                                            | -                                           | -                                             | ✓                                           |
| Stainless steel                          | AISI 431                   | 1.4057           | 6h            | -                                            | ✓                                           | -                                             | -                                           |
| Stainless steel (duplex)                 |                            | 1.4462           | 7e (0-16 bar) | ✓                                            | -                                           | -                                             | ✓                                           |
| Stainless steel                          | A479 Gr. 316L              |                  | 6 (0-10 bar)  | ✓                                            | -                                           | -                                             | -                                           |
| Stainless steel (duplex)                 |                            | 1.4547           | 7d            | -                                            | -                                           | ✓                                             | -                                           |
| <b>VALVE DISC</b>                        |                            |                  |               |                                              |                                             |                                               |                                             |
| Stainless steel <sup>7)</sup>            | A351 Gr. CF8M              | 1.4408           | 6             | ✓                                            | ✓                                           | -                                             | ✓                                           |
| Stainless steel <sup>7)</sup>            | A351 Gr. CF3M              | 1.4409           | 6t            | -                                            | -                                           | -                                             | ✓                                           |
| Stainless steel <sup>7)</sup>            | A351 Gr. CF3M Mo > 2,75 %  |                  | 6m            | -                                            | -                                           | -                                             | ✓                                           |
| Aluminium bronze                         | B148 Gr. C95400            |                  | 2a            | -                                            | ✓                                           | -                                             | -                                           |
| High-strength stainless steel            | A351 Gr. CK3MCuN (254 SMO) |                  | 7d            | -                                            | -                                           | ✓                                             | -                                           |
| <b>SEAT</b>                              |                            |                  |               |                                              |                                             |                                               |                                             |
| <b>Plastomer seat</b>                    |                            |                  |               |                                              |                                             |                                               |                                             |
| PTFE, glass fibre reinforced             |                            |                  | FB            | ✓                                            | -                                           | ✓                                             | ✓                                           |
| PTFE, glass fibre reinforced + fire-safe |                            | PTFE + 1.4404    | FF            | ✓                                            | -                                           | -                                             | ✓                                           |
| Pure PTFE (DN 50-600)                    |                            |                  | FC            | ✓                                            | -                                           | -                                             | ✓                                           |
| Pure PTFE + fire-safe (DN 50-600)        |                            | PTFE + 1.4404    | FI            | ✓                                            | -                                           | -                                             | ✓                                           |
| <b>Elastomer seat</b>                    |                            |                  |               |                                              |                                             |                                               |                                             |
| Viton (FKM)                              |                            |                  | VD            | -                                            | ✓                                           | -                                             | -                                           |
| Nitrile (NBR)                            |                            |                  | KD            | -                                            | ✓                                           | -                                             | -                                           |
| <b>Metal seat</b>                        |                            |                  |               |                                              |                                             |                                               |                                             |
| Stainless steel (301)                    |                            | 1.4310           | 6a            | ✓                                            | -                                           | -                                             | -                                           |

<sup>7)</sup> For fire-safe plastomer seat or metal seat: Use chrome-plated valve disc.

## Materials

### Components in common



→ Preferred flow direction

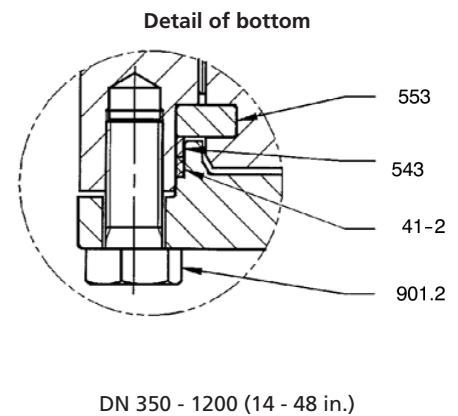
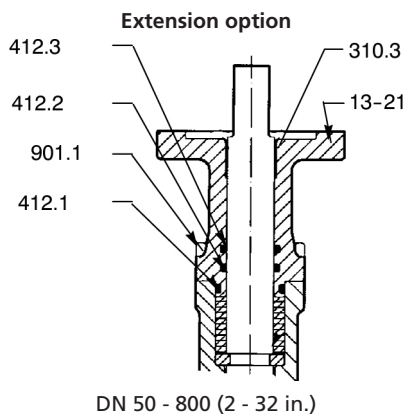


Table 12: List of components in common

| Part No.            | Description                                                                   | DN       | Materials                                                                       | Temperature                        | KSB code |
|---------------------|-------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------|------------------------------------|----------|
| 01-48               | Gland packing                                                                 | 50-1200  | Depending on type of seat 144.1                                                 | Depending on type of gland packing |          |
| 100                 | Wafer-type body with flat faces (T1) and full-lug body with raised faces (T4) | 50-1200  | Carbon steel A216 Gr. WCC / 1.0619                                              | -29 °C to +260 °C                  | 1        |
|                     |                                                                               | 50-1200  | Stainless steel<br>ASTM A351 Gr. CF8M / 1.4408                                  | -50 °C to +260 °C                  | 6        |
|                     |                                                                               | 80-800   | Nodular cast iron<br>ASTM A536 Gr. 60-40-18 (body type T1 only)                 | -10 °C to +260 °C                  | 3g       |
|                     |                                                                               | 50-600   | High-strength stainless steel<br>ASTM A351 Gr. CK3MCuN (254SMO)                 | -29 °C to +260 °C                  | 7d       |
|                     |                                                                               | 50-450   | Stainless steel<br>ASTM A351 Gr. CF3M / 1.4409                                  | -50 °C to +260 °C                  | 6t       |
|                     |                                                                               | 50-450   | Stainless steel<br>ASTM A351 Gr. CF3M Mo > 2,75 %                               | -50 °C to +260 °C                  | 6m       |
| 176                 | Bottom                                                                        | 350-1200 | Stainless steel<br>ASTM A351 Gr. CF8M / 1.4408                                  | -50 °C to +260 °C                  | 6        |
|                     |                                                                               | 350-800  | Nodular cast iron<br>ASTM A536 Gr. 60-40-18 (body type T1 only)                 | -10 °C to +100 °C                  | 3g       |
|                     |                                                                               | 350-600  | High-strength stainless steel<br>ASTM A351 Gr. CK3MCUN (254SMO)                 | -29 °C to +100 °C                  | 7d       |
|                     |                                                                               | 350-450  | Stainless steel<br>ASTM A351 Gr. CF3M / 1.4409                                  | -50 °C to +260 °C                  | 6t       |
|                     |                                                                               | 350-450  | Stainless steel<br>ASTM A351 Gr. CF3M Mo > 2,75 %                               | -50 °C to +260 °C                  | 6m       |
| 210                 | Shaft                                                                         | 350-1200 | Stainless steel<br>ASTM A564 Gr. 630 / 1.4542 (17.4 PH)                         | -50 °C to +260 °C                  | 6e       |
|                     |                                                                               | 350-1200 | Stainless steel<br>AISI 431 / 1.4057                                            | -10 °C to +260 °C                  | 6h       |
|                     |                                                                               | 350-450  | Stainless steel 1.4462<br>(0 bar < operating pressure <= 16 bar)                | -50 °C to +260 °C                  | 7e       |
|                     |                                                                               | 500-1200 | Stainless steel<br>ASTM A479 Gr. 316L<br>(0 bar < operating pressure <= 10 bar) | -50 °C to +260 °C                  | 6        |
|                     |                                                                               | 350-600  | Stainless steel<br>1.4547                                                       | -29 °C to +260 °C                  | 7d       |
| 213                 | Actuating shaft                                                               | 50-1200  | Stainless steel<br>ASTM A564 Gr. 630 / 1.4542 (17-4 PH)                         | -50 °C to +260 °C                  | 6e       |
|                     |                                                                               | 50-1200  | Stainless steel<br>AISI 431 / 1.4057                                            | -50 °C to +260 °C                  | 6h       |
|                     |                                                                               | 50-450   | Stainless steel 1.4462<br>(0 bar < operating pressure <= 16 bar)                | -50 °C to +260 °C                  | 7e       |
|                     |                                                                               | 500-1200 | Stainless steel<br>ASTM A479 Gr. 316L<br>(0 bar < operating pressure <= 10 bar) | -50 °C to +260 °C                  | 6        |
|                     |                                                                               | 50-600   | Stainless steel<br>1.4547                                                       | -50 °C to +260 °C                  | 7d       |
| 310.1 <sup>8)</sup> | Upper plain bearing                                                           | 50-1200  | Stainless steel with reinforced PTFE coating                                    |                                    |          |
| 310.2 <sup>8)</sup> | Lower plain bearing                                                           | 50-1200  | Stainless steel with reinforced PTFE coating                                    |                                    |          |
| 314 <sup>8)</sup>   | Anti-friction disc                                                            | 350-1200 | Stainless steel                                                                 |                                    |          |
| 543 <sup>8)</sup>   | Spacer bush                                                                   | 350-1200 | Stainless steel                                                                 |                                    |          |
| 553 <sup>8)</sup>   | Upper thrust insert                                                           | 50-300   | Stainless steel, hardened                                                       |                                    |          |
|                     | Thrust insert, two-piece                                                      | 350-1200 | Stainless steel                                                                 |                                    |          |
| 560.1 <sup>8)</sup> | Pin                                                                           | 50-600   | Stainless steel                                                                 |                                    |          |
| 560.2 <sup>8)</sup> |                                                                               |          |                                                                                 |                                    |          |

<sup>8</sup> Guiding elements spare parts kit

| Part No.             | Description       | DN       | Materials       | Temperature | KSB code |
|----------------------|-------------------|----------|-----------------|-------------|----------|
| 68-4 <sup>8)9)</sup> | Foil              | 50-300   | Stainless steel |             |          |
| 901.2                | Hexagon head bolt | 350-1200 | Stainless steel |             |          |
| 940 <sup>8)</sup>    | Key               | 650-1200 | Stainless steel |             |          |
| 970                  | Name plate        | 50-1200  | Stainless steel |             |          |

**Table 13:** List of components: bracket and gland follower / DN 50 - 1200

| Part No. | Description       | DN       | Materials                        | Temperature | KSB code |
|----------|-------------------|----------|----------------------------------|-------------|----------|
| 143/194  | Lantern/bracket   | 50-1200  | Steel, sherardised and chromated |             |          |
| 196      | Locking plate     | 650-1200 | Stainless steel 1.4404           |             |          |
| 452      | Gland follower    | 50-1200  | Stainless steel                  |             |          |
| 554      | Washer, flat      | 50-1200  | Stainless steel                  |             |          |
| 901.1    | Hexagon head bolt | 50-1200  | Stainless steel A4-70            |             |          |
| 902      | Stud              | 50-1200  | Stainless steel A4-70            |             |          |
| 920      | Hexagon nut       | 50-1200  | Stainless steel A4-70            |             |          |

**Table 14:** List of components: extension (optional)

| Part No.              | Description         | DN      | Materials              | Temperature | KSB code |
|-----------------------|---------------------|---------|------------------------|-------------|----------|
| 13.21                 | Extension           | 50-600  | Stainless steel        |             |          |
|                       |                     | 80-800  | Nodular cast iron      |             |          |
| 310.3 <sup>8)9)</sup> | Lower plain bearing | 350-600 | Stainless steel + PTFE |             |          |
| 412.1 <sup>8)9)</sup> | O-ring              | 50-600  | Viton (FKM)            |             |          |
| 412.2 <sup>8)9)</sup> | O-ring              | 50-600  | Viton (FKM)            |             |          |
| 412.3 <sup>8)9)</sup> | O-ring              | 50-600  | Viton (FKM)            |             |          |
| 901.1                 | Hexagon head bolt   | 50-600  | Stainless steel A4-70  |             |          |

<sup>9</sup> Part from shaft seal spare parts kit

## Detail views of all seat types

Table 15: Plastomer seat

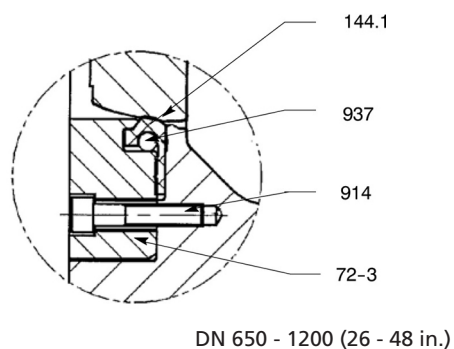
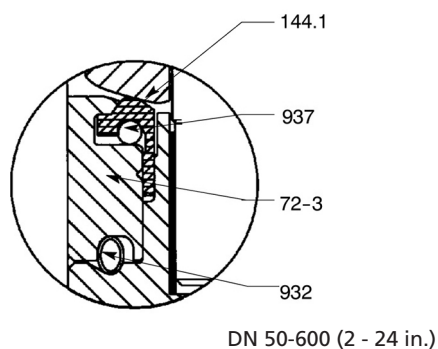


Table 16: Fire-safe plastomer seat

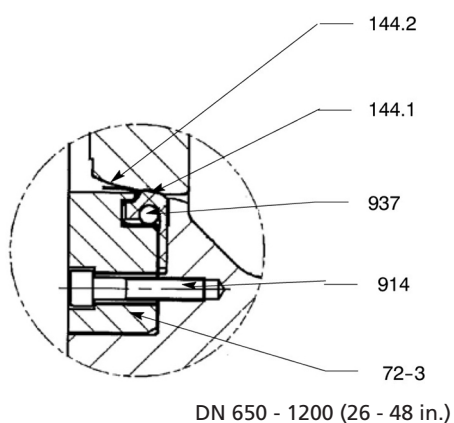
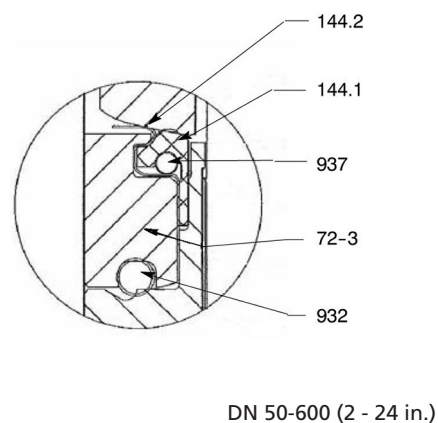


Table 17: Elastomer seat

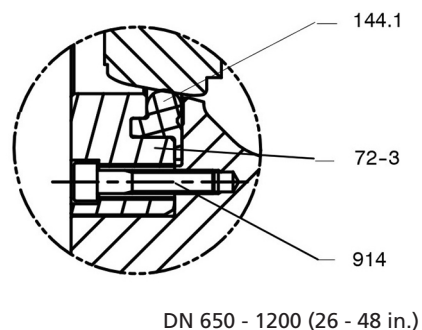
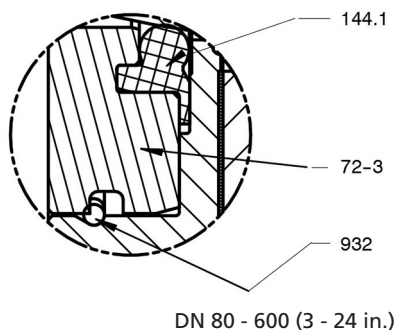
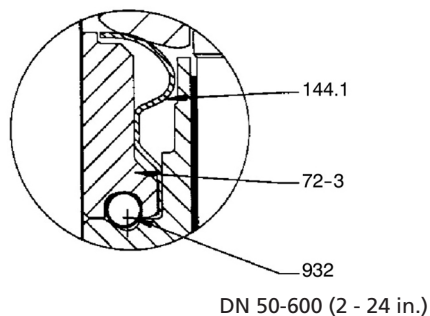


Table 18: Metal seat



**Table 19:** List of components: models with plastomer seat / DN 50 - 1200

| Part No.                | Description            | Materials                                              | Temperature       | KSB code |
|-------------------------|------------------------|--------------------------------------------------------|-------------------|----------|
| 01-48 <sup>10)11)</sup> | Gland packing          | Pure PTFE                                              | -10 °C to +220 °C |          |
|                         |                        | Graphite, expanded                                     | -50 °C to +260 °C |          |
|                         |                        | Graphite compliant with emissions control requirements | -50 °C to +260 °C |          |
| 144.1 <sup>12)</sup>    | Plastomer seat         | PTFE, glass fibre reinforced                           | -10 °C to +220 °C | FB       |
|                         |                        | Pure PTFE                                              | -50 °C to +150 °C | FC       |
| 41-2 <sup>10)11)</sup>  | Static sealing element | Pure PTFE / optional: expanded graphite                |                   |          |
| 72-3                    | Retaining flange       | Stainless steel                                        |                   |          |
| 550                     | Valve disc             | Stainless steel                                        | -50 °C to +260 °C | 6        |
|                         |                        | ASTM A351 Gr. CF8M / 1.4408                            |                   |          |
|                         |                        | Stainless steel                                        | -50 °C to +260 °C | 6t       |
|                         |                        | ASTM A351 Gr. CF3M / 1.4409                            |                   |          |
|                         |                        | Stainless steel                                        | -50 °C to +260 °C | 6m       |
|                         |                        | ASTM A 351 Gr. CF3M Mo > 2,75 %                        |                   |          |
| 932 <sup>12)</sup>      | Upper circlip          | High-strength stainless steel                          | -50 °C to +260 °C | 7d       |
|                         |                        | ASTM A351 Gr. CK3MCuN (254SMO)                         |                   |          |
| 937 <sup>12)</sup>      | Retaining wire         | Stainless steel                                        |                   |          |

**Table 20:** List of components: models with fire-safe plastomer seat / DN 50 - 1200

| Part No.                | Description            | Materials                                              | Temperature       | KSB code |
|-------------------------|------------------------|--------------------------------------------------------|-------------------|----------|
| 01-48 <sup>10)11)</sup> | Gland packing          | Graphite, expanded                                     | -50 °C to +260 °C |          |
|                         |                        | Graphite compliant with emissions control requirements | -50 °C to +260 °C |          |
| 144.1 <sup>12)</sup>    | Plastomer seat         | PTFE, glass fibre reinforced                           | -10 °C to +220 °C | FF       |
| 144.2 <sup>12)</sup>    | Fire-safe metal seat   | Stainless steel                                        |                   |          |
|                         |                        | ASTM A240 Gr. 316L / 1.4404                            |                   |          |
| 144.1 <sup>12)</sup>    | Plastomer seat         | Pure PTFE                                              | -50 °C to +150 °C | FI       |
| 144.2 <sup>12)</sup>    | Fire-safe metal seat   | Stainless steel                                        |                   |          |
|                         |                        | ASTM A240 Gr. 316L / 1.4404                            |                   |          |
| 41-2 <sup>10)11)</sup>  | Static sealing element | Graphite, expanded                                     |                   |          |
| 550                     | Valve disc             | Stainless steel                                        | -50 °C to +260 °C | 6        |
|                         |                        | ASTM A351 Gr. CF8M / 1.4408                            |                   |          |
|                         |                        | Hard chrome plated                                     |                   |          |
|                         |                        | Stainless steel                                        | -50 °C to +260 °C | 6t       |
|                         |                        | ASTM A351 Gr. CF 3M / 1.4409                           |                   |          |
|                         |                        | Hard chrome plated                                     |                   |          |
|                         |                        | Stainless steel                                        | -50 °C to +260 °C | 6m       |
|                         |                        | ASTM A 351 Gr. CF3M Mo > 2,75 %                        |                   |          |
| 932 <sup>12)</sup>      | Upper circlip          | Hard chrome plated                                     | -50 °C to +260 °C | 7d       |
|                         |                        | High-strength stainless steel                          |                   |          |
| 937 <sup>12)</sup>      | Retaining wire         | ASTM A351 Gr. CK3MCuN (254SMO)                         |                   |          |
|                         |                        | Hard chrome plated                                     |                   |          |
| 72-3                    | Retaining flange       | Stainless steel                                        |                   |          |
| 932 <sup>12)</sup>      | Upper circlip          | Stainless steel                                        |                   |          |
| 937 <sup>12)</sup>      | Retaining wire         | Stainless steel                                        |                   |          |

<sup>10)</sup> Guiding elements spare parts kit

<sup>11)</sup> Part from shaft seal spare parts kit

<sup>12)</sup> Seat ring spare parts kit

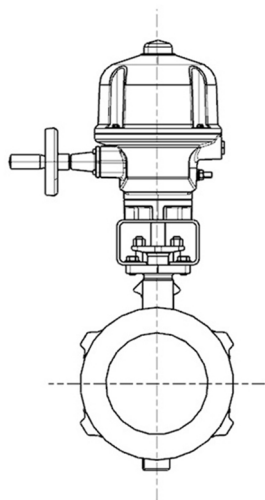
**Table 21:** List of components, model with elastomer seat / DN 50 - 1200

| Part No.                | Description            | Materials                                                                            | Temperature       | KSB code |
|-------------------------|------------------------|--------------------------------------------------------------------------------------|-------------------|----------|
| 01-48 <sup>10)11)</sup> | Gland packing          | Pure PTFE                                                                            | -10 °C to +220 °C |          |
| 144.1 <sup>12)</sup>    | Elastomer seat         | VITON (FKM) ( $\Delta P = 16$ bar max.)                                              | -5 °C to +100 °C  | VD       |
|                         |                        | Nitrile (NBR) ( $\Delta P = 16$ bar max.)                                            | -10 °C to +100 °C | KD       |
| 41-2 <sup>10)11)</sup>  | Static sealing element | Pure PTFE                                                                            | -50 °C to +260 °C |          |
| 72-3                    | Retaining flange       | Carbon steel                                                                         | -29 °C to +260 °C |          |
| 550                     | Valve disc             | Stainless steel<br>ASTM A351 Gr. CF8M / 1.4408                                       | -50 °C to +260 °C | 6        |
|                         |                        | Stainless steel<br>ASTM A351 Gr. CF3M / 1.4409<br>Available up to DN 450 (18 in.)    | -50 °C to +260 °C | 6t       |
|                         |                        | Stainless steel<br>ASTM A351 Gr. CF3M Mo > 2,75 %<br>Available up to DN 450 (18 in.) | -50 °C to +260 °C | 6m       |
|                         |                        | High-strength stainless steel<br>ASTM A351 Gr. CK3MCuN (2545MO)                      | -50 °C to +260 °C | 7d       |
|                         |                        | Aluminium bronze<br>ASTM B148 Gr. C95400<br>Available up to DN 800 (32 in.)          | -29 °C to +260 °C | 2a       |
|                         |                        |                                                                                      |                   |          |
|                         |                        |                                                                                      |                   |          |
| 932 <sup>12)</sup>      | Upper circlip          | Stainless steel                                                                      |                   |          |

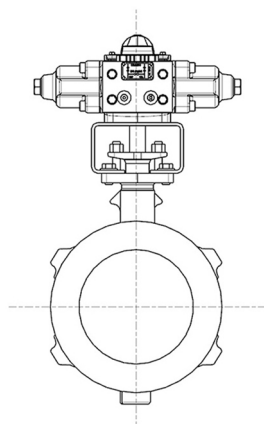
**Table 22:** List of components: models with metal seat / DN 50 - 600

| Part No.                | Description            | Materials                                              | Temperature       | KSB code |
|-------------------------|------------------------|--------------------------------------------------------|-------------------|----------|
| 01-48 <sup>10)11)</sup> | Gland packing          | Graphite, expanded                                     | -50 °C to +260 °C |          |
|                         |                        | Pure PTFE                                              | -10 °C to +220 °C |          |
|                         |                        | Graphite compliant with emissions control requirements | -50 °C to +260 °C |          |
| 144.1 <sup>12)</sup>    | Metal seat             | Stainless steel 301 / 1.4310                           | -50 °C to +260 °C | 6a       |
| 41-2 <sup>10)11)</sup>  | Static sealing element | Graphite, expanded / optional: pure PTFE               |                   |          |
| 550                     | Valve disc             | Stainless steel<br>ASTM A351 Gr. CF8M / 1.4408         | -50 °C to +260 °C | 6        |
|                         |                        | Hard chrome plated                                     |                   |          |
|                         |                        |                                                        |                   |          |
| 72-3                    | Retaining flange       | Stainless steel                                        |                   |          |
| 932 <sup>12)</sup>      | Upper circlip          | Stainless steel                                        |                   |          |

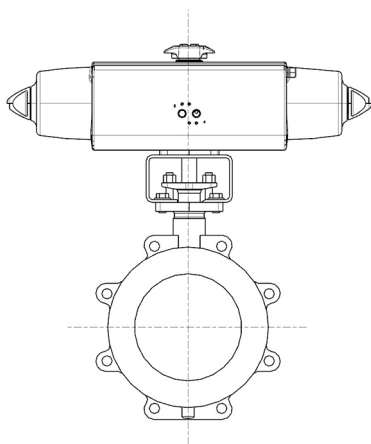
**Variants**



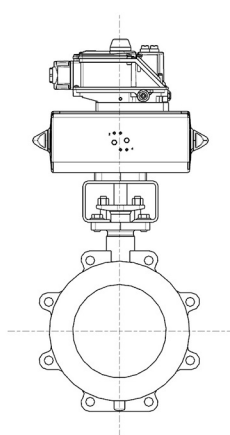
**Electric actuator**



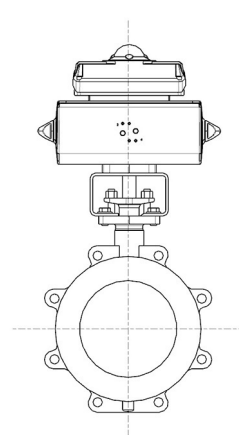
**HQ hydraulic actuator**



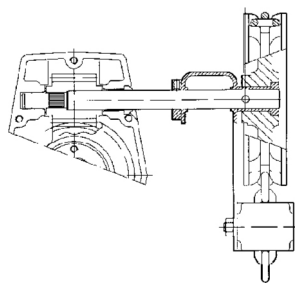
**ACTAIR NG pneumatic actuator**



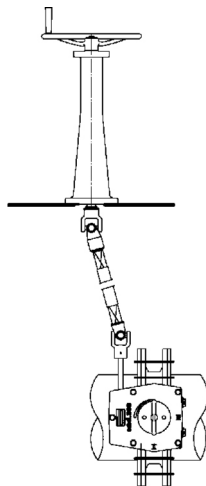
**ACTAIR NG + AMTRONIC**  
**ACTAIR NG + Positionneur**  
**SMARTRONIC**



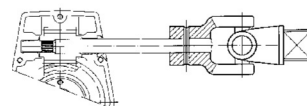
**ACTAIR NG +**  
**AMTROBOX, AMTROBOX S, AMTROBOX R,**  
**AMTROBOX EEx-ed, AMTROBOX EEx-ia**



**Chain wheel**



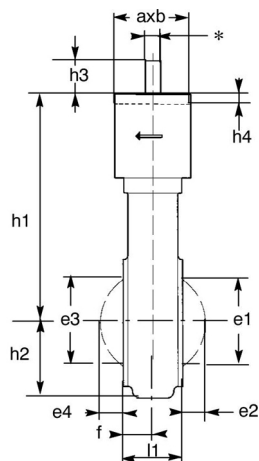
**Deck stand**



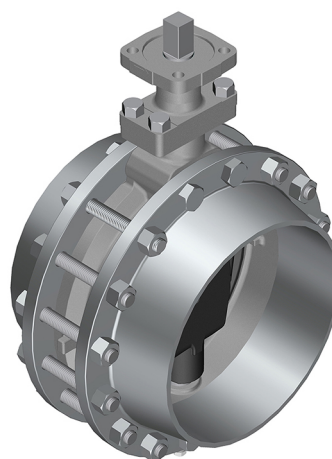
**Cardan connection**

## Dimensions

### Dimensions of DANAIS 150 with wafer-type body with flat faces - T1



DANAIS 150 T1



3D drawing of DANAIS 150 T1 (with extension option)

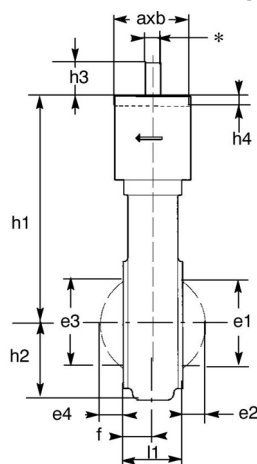
\* Flat end in Ø z or Ø s

Table 23: Dimensions [mm]

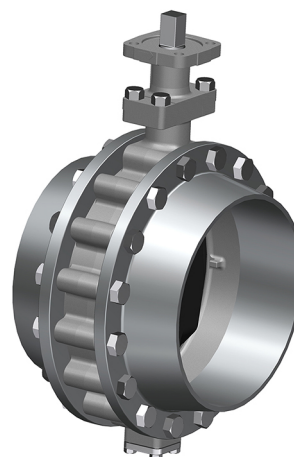
| DN   | NPS<br>[inch] | l1  | h1 <sup>13)</sup> | h2  | f     | Top flange<br>to ISO 5211 |    | a   | b   | Square<br>shaft end |     | Flat shaft end |     |    | Valve disc open |     |      |     |
|------|---------------|-----|-------------------|-----|-------|---------------------------|----|-----|-----|---------------------|-----|----------------|-----|----|-----------------|-----|------|-----|
|      |               |     |                   |     |       | No.                       | h4 |     |     | Ø s                 | h3  | Ø s            | Ø z | h3 | e1              | e2  | e3   | e4  |
| 50   | 2             | 43  | 165               | 53  | 21,5  | F05                       | 5  | 55  | 105 | -                   | -   | 11             | 14  | 24 | 23              | 0   | 33   | 4   |
| 65   | 2½            | 46  | 175               | 60  | 23,0  | F05                       | 5  | 55  | 105 | -                   | -   | 11             | 14  | 24 | 41              | 6   | 48   | 9   |
| 80   | 3             | 46  | 185               | 68  | 24,0  | F05                       | 5  | 55  | 105 | -                   | -   | 11             | 14  | 24 | 59              | 13  | 61   | 15  |
| 100  | 4             | 54  | 200               | 82  | 27,0  | F05                       | 5  | 55  | 105 | -                   | -   | 14             | 18  | 24 | 78              | 18  | 81   | 21  |
| 125  | 5             | 57  | 225               | 92  | 28,5  | F07                       | 5  | 73  | 125 | -                   | -   | 14             | 18  | 30 | 99              | 27  | 103  | 30  |
| 150  | 6             | 57  | 240               | 117 | 28,5  | F07                       | 5  | 73  | 125 | -                   | -   | 17             | 22  | 32 | 127             | 39  | 131  | 43  |
| 200  | 8             | 62  | 290               | 153 | 34,5  | F10                       | 5  | 95  | 145 | -                   | -   | 19             | 25  | 35 | 177             | 62  | 175  | 59  |
| 250  | 10            | 70  | 335               | 182 | 38,0  | F12                       | 5  | 120 | 190 | 25                  | 45  | -              | -   | -  | 225             | 82  | 230  | 80  |
| 300  | 12            | 80  | 365               | 230 | 42,0  | F12                       | 5  | 120 | 190 | 27                  | 45  | -              | -   | -  | 265             | 96  | 266  | 98  |
| 350  | 14            | 92  | 435               | 307 | 47,5  | F14                       | 5  | 135 | 210 | 30                  | 55  | -              | -   | -  | 308             | 112 | 311  | 116 |
| 400  | 16            | 102 | 465               | 332 | 56,5  | F14                       | 5  | 135 | 210 | 36                  | 55  | -              | -   | -  | 359             | 133 | 358  | 132 |
| 450  | 18            | 114 | 530               | 371 | 61,0  | F16                       | 8  | 160 | 250 | 40                  | 65  | -              | -   | -  | 418             | 155 | 418  | 160 |
| 500  | 20            | 127 | 560               | 398 | 65,5  | F16                       | 8  | 160 | 250 | 40                  | 65  | -              | -   | -  | 455             | 167 | 455  | 175 |
| 550  | 22            | 154 | 634               | 422 | 73    | F25                       | 8  | 275 | 320 | 50                  | 65  | -              | -   | -  | 495             | 189 | 489  | 179 |
| 600  | 24            | 154 | 660               | 455 | 77,0  | F25                       | 8  | 275 | 320 | 50                  | 65  | -              | -   | -  | 546             | 201 | 546  | 211 |
| 650  | 26            | 165 | 720               | 511 | 82,5  | F25                       | 8  | 300 | 320 | 55                  | 80  | -              | -   | -  | 585             | 222 | 606  | 232 |
| 700  | 28            | 165 | 750               | 537 | 82,5  | F25                       | 8  | 300 | 320 | 60                  | 80  | -              | -   | -  | 619             | 238 | 640  | 248 |
| 750  | 30            | 190 | 780               | 569 | 95,0  | F25                       | 8  | 300 | 320 | 60                  | 80  | -              | -   | -  | 663             | 250 | 688  | 262 |
| 800  | 32            | 190 | 810               | 599 | 95,0  | F25                       | 8  | 300 | 320 | 70                  | 110 | -              | -   | -  | 715             | 275 | 740  | 287 |
| 900  | 36            | 203 | 930               | 657 | 101,5 | F30                       | 10 | 320 | 400 | 70                  | 110 | -              | -   | -  | 821             | 322 | 845  | 333 |
| 1000 | 40            | 216 | 1000              | 730 | 108,0 | F30                       | 10 | 320 | 400 | 80                  | 111 | -              | -   | -  | 914             | 362 | 942  | 376 |
| 1200 | 48            | 254 | 1170              | 860 | 127,0 | F35                       | 12 | 380 | 500 | 90                  | 110 | -              | -   | -  | 1070            | 423 | 1103 | 439 |

<sup>13</sup> h1 is identical for the standard design with bracket and for the extension option.

# Dimensions of DANAIS 150 with full-lug body – T4



DANAIS 150 T4



3D drawing of DANAIS 150 T4 (with extension option)

\* Flat end in Ø z or Ø s

Table 24: Dimensions [mm]

| DN                 | NPS<br>[inch] | l1  | h1   | h2  | f     | Top flange<br>to ISO 5211 |    | a   | b   | Square<br>shaft end |     | Flat shaft end |     |    | Valve disc open |     |      |     |
|--------------------|---------------|-----|------|-----|-------|---------------------------|----|-----|-----|---------------------|-----|----------------|-----|----|-----------------|-----|------|-----|
|                    |               |     |      |     |       | No.                       | h4 |     |     | Ø s                 | h3  | Ø s            | Ø z | h3 | e1              | e2  | e3   | e4  |
| 50                 | 2             | 43  | 165  | 60  | 21,5  | F05                       | 5  | 55  | 105 | -                   | -   | 11             | 14  | 24 | 23              | 0   | 33   | 4   |
| 65 <sup>14)</sup>  | 2½            | 46  | 175  | 67  | 23,0  | F05                       | 5  | 55  | 105 | -                   | -   | 11             | 14  | 24 | 41              | 6   | 48   | 9   |
| 65 <sup>15)</sup>  | 2½            | 46  | 175  | 82  | 23,0  | F05                       | 5  | 55  | 105 | -                   | -   | 11             | 14  | 24 | 41              | 6   | 48   | 9   |
| 80 <sup>16)</sup>  | 3             | 46  | 185  | 70  | 24,0  | F05                       | 5  | 55  | 105 | -                   | -   | 11             | 14  | 24 | 59              | 13  | 61   | 15  |
| 80 <sup>17)</sup>  | 3             | 46  | 185  | 89  | 24,0  | F05                       | 5  | 55  | 105 | -                   | -   | 11             | 14  | 24 | 59              | 13  | 61   | 15  |
| 100                | 4             | 54  | 200  | 104 | 27,0  | F05                       | 5  | 55  | 105 | -                   | -   | 14             | 18  | 24 | 78              | 18  | 81   | 21  |
| 125                | 5             | 57  | 225  | 121 | 28,5  | F07                       | 5  | 73  | 125 | -                   | -   | 14             | 18  | 30 | 99              | 27  | 103  | 30  |
| 150                | 6             | 57  | 240  | 135 | 28,5  | F07                       | 5  | 73  | 125 | -                   | -   | 17             | 22  | 32 | 127             | 39  | 131  | 43  |
| 200 <sup>18)</sup> | 8             | 62  | 290  | 157 | 34,5  | F10                       | 5  | 95  | 145 | -                   | -   | 19             | 25  | 35 | 177             | 62  | 175  | 59  |
| 200 <sup>19)</sup> | 8             | 62  | 290  | 169 | 34,5  | F10                       | 5  | 95  | 145 | -                   | -   | 19             | 25  | 35 | 177             | 62  | 175  | 59  |
| 250                | 10            | 70  | 335  | 205 | 38,0  | F12                       | 5  | 120 | 190 | 25                  | 45  | -              | -   | -  | 225             | 82  | 230  | 80  |
| 300 <sup>20)</sup> | 12            | 80  | 365  | 230 | 42,0  | F12                       | 5  | 120 | 190 | 27                  | 45  | -              | -   | -  | 265             | 96  | 266  | 98  |
| 300 <sup>21)</sup> | 12            | 80  | 365  | 235 | 42,0  | F12                       | 5  | 120 | 190 | 27                  | 45  | -              | -   | -  | 265             | 96  | 266  | 98  |
| 350                | 14            | 92  | 435  | 307 | 47,5  | F14                       | 5  | 135 | 210 | 30                  | 55  | -              | -   | -  | 308             | 112 | 311  | 116 |
| 400                | 16            | 102 | 465  | 332 | 56,5  | F14                       | 5  | 135 | 210 | 36                  | 55  | -              | -   | -  | 359             | 133 | 358  | 132 |
| 450                | 18            | 114 | 530  | 371 | 61,0  | F16                       | 8  | 160 | 250 | 40                  | 65  | -              | -   | -  | 418             | 155 | 418  | 160 |
| 500                | 20            | 127 | 560  | 398 | 65,5  | F16                       | 8  | 160 | 250 | 40                  | 65  | -              | -   | -  | 455             | 167 | 455  | 175 |
| 550                | 22            | 154 | 634  | 422 | 73,0  | F25                       | 8  | 275 | 320 | 50                  | 65  | -              | -   | -  | 495             | 189 | 489  | 179 |
| 600                | 24            | 154 | 660  | 455 | 77,0  | F25                       | 8  | 275 | 320 | 50                  | 65  | -              | -   | -  | 546             | 201 | 546  | 211 |
| 650                | 26            | 165 | 720  | 511 | 82,5  | F25                       | 8  | 300 | 320 | 55                  | 80  | -              | -   | -  | 585             | 222 | 606  | 232 |
| 700                | 28            | 165 | 750  | 537 | 82,5  | F25                       | 8  | 300 | 320 | 60                  | 80  | -              | -   | -  | 619             | 238 | 640  | 248 |
| 750                | 30            | 190 | 780  | 569 | 95,0  | F25                       | 8  | 300 | 320 | 60                  | 80  | -              | -   | -  | 663             | 250 | 688  | 262 |
| 800                | 32            | 190 | 810  | 599 | 95,0  | F25                       | 8  | 300 | 320 | 70                  | 110 | -              | -   | -  | 715             | 275 | 740  | 287 |
| 900                | 36            | 203 | 930  | 657 | 101,5 | F30                       | 10 | 320 | 400 | 70                  | 110 | -              | -   | -  | 821             | 322 | 845  | 333 |
| 1000               | 40            | 216 | 1000 | 730 | 108,0 | F30                       | 10 | 320 | 400 | 80                  | 111 | -              | -   | -  | 914             | 362 | 942  | 376 |
| 1200               | 48            | 254 | 1170 | 860 | 127,0 | F35                       | 12 | 380 | 500 | 90                  | 110 | -              | -   | -  | 1070            | 423 | 1103 | 439 |

<sup>14</sup> Installed between flanges EN 1092-1 PN 10 and PN 16 - 4 holes, ASME B16.5 Class 150 and JIS B2220 10K

<sup>15</sup> Installed between flanges EN 1092-1 PN 10 and PN 16 - 8 holes, PN 25 and JIS B2220 16K

<sup>16</sup> Installed between flanges ISO 7005-1 PN 20 and ASME B16.5 Class 150

<sup>17</sup> Installed between flanges EN 1092-1 PN 10, 16 and JIS B2220 10K, 16K

<sup>18</sup> Installed between flanges EN 1092-1 PN 10 and ASME B16.5 Class 150

<sup>19</sup> Installed between flanges EN 1092-1 PN 16, 25 and JIS B2220 10K, 16K

<sup>20</sup> Installed between flanges EN 1092-1 PN 10, 16 and ASME B16.5 Class 150

<sup>21</sup> Installed between flanges EN 1092-1 PN 25 and JIS B2220 10K, 16K

## Line connections

The valves can be installed between flanges in accordance with the following standards:

- EN 1092-1 PN 10, PN 16 and PN 25
- ISO 2084 PN 10, PN 16 and PN 25
- ISO 7005-1 PN 20
- ASME B16.5 Class 150
- ASME B16.47 Class 150 Series A
- JIS B2220 5K, 10K and 16K
- JIS 2238 16K

Other connection options on request.

**Table 25: Wafer-type body with flat faces – T1**

| DN   | NPS    | EN 1092          |                  |                  | ISO 7005-1 | ASME            |                           | JIS B2220 |     |                    |
|------|--------|------------------|------------------|------------------|------------|-----------------|---------------------------|-----------|-----|--------------------|
|      | [inch] | PN 10            | PN 16            | PN 25            | PN 20      | B16.5 Class 150 | B16.47 Class 150 Series A | 5k        | 10K | 16K <sup>22)</sup> |
| 50   | 2      | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ☒         | ✓   | ☒                  |
| 65   | 2½     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ☒         | ✓   | ✓                  |
| 80   | 3      | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 100  | 4      | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 125  | 5      | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 150  | 6      | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 200  | 8      | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 250  | 10     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 300  | 12     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 350  | 14     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 400  | 16     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 450  | 18     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 500  | 20     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 550  | 22     | ✓ <sup>23)</sup> | ✓ <sup>23)</sup> | •                | •          | •               | •                         | ✓         | ✓   | ✓                  |
| 600  | 24     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 650  | 26     | ✓ <sup>23)</sup> | ✓ <sup>23)</sup> | ✓ <sup>23)</sup> | ✓          | •               | ✓                         | ✓         | ✓   | ✓ <sup>22)</sup>   |
| 700  | 28     | ✓                | ✓                | ✓                | ✓          | •               | ✓                         | ✓         | ✓   | ✓ <sup>22)</sup>   |
| 750  | 30     | ✓ <sup>23)</sup> | ✓ <sup>23)</sup> | ✓ <sup>23)</sup> | ✓          | •               | ✓                         | ✓         | ✓   | ✓ <sup>22)</sup>   |
| 800  | 32     | ✓                | ✓                | ✓                | ✓          | •               | ✓                         | ✓         | ✓   | ✓ <sup>22)</sup>   |
| 900  | 36     | ✓                | ✓                | ✓                | ✓          | •               | ✓                         | ☒         | ✓   | ✓ <sup>22)</sup>   |
| 1000 | 40     | ✓                | ✓                | ✓                | ✓          | •               | ✓                         | ☒         | ✓   | ✓ <sup>22)</sup>   |
| 1200 | 48     | ✓                | ✓                | ✓                | ✓          | •               | ✓                         | ☒         | ✓   | ✓ <sup>22)</sup>   |

**Table 26: Symbols key**

| Symbol | Description           | Symbol | Description                 |
|--------|-----------------------|--------|-----------------------------|
| ✓      | Installation possible | •      | Non-standardised connection |
| ☒      | Contact KSB.          |        |                             |

<sup>22)</sup> To JIS B2238

<sup>23)</sup> Nach ISO 2084

Table 27: Full-lug body – T4

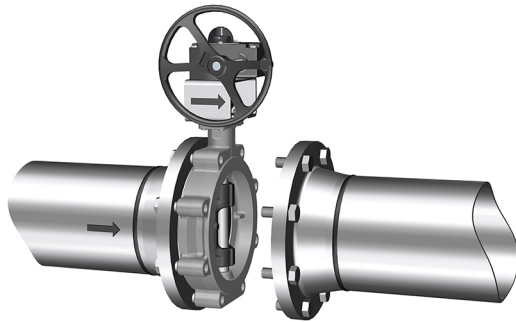
| DN   | NPS    | EN 1092          |                  |                  | ISO 7005-1 | ASME            |                           | JIS B2220 |     |                    |
|------|--------|------------------|------------------|------------------|------------|-----------------|---------------------------|-----------|-----|--------------------|
|      | [inch] | PN 10            | PN 16            | PN 25            | PN 20      | B16.5 Class 150 | B16.47 Class 150 Series A | 5k        | 10K | 16K <sup>22)</sup> |
| 50   | 2      | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ☒         | ✓   | ☒                  |
| 65   | 2½     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ☒         | ✓   | ✓                  |
| 80   | 3      | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 100  | 4      | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 125  | 5      | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 150  | 6      | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ☒                  |
| 200  | 8      | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 250  | 10     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 300  | 12     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 350  | 14     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 400  | 16     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 450  | 18     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 500  | 20     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ✓   | ✓                  |
| 550  | 22     | ✓ <sup>23)</sup> | ✓ <sup>23)</sup> | •                | •          | •               | •                         | ✓         | ✓   | ✓                  |
| 600  | 24     | ✓                | ✓                | ✓                | ✓          | ✓               | •                         | ✓         | ☒   | ☒                  |
| 650  | 26     | ✓ <sup>23)</sup> | ✓ <sup>23)</sup> | ✓ <sup>23)</sup> | ✓          | •               | ✓                         | ✓         | ✓   | ✓ <sup>22)</sup>   |
| 700  | 28     | ✓                | ✓                | ☒                | ✓          | •               | ✓                         | ✓         | ✓   | ☒                  |
| 750  | 30     | ✓ <sup>23)</sup> | ✓ <sup>23)</sup> | ☒                | ✓          | •               | ✓                         | ✓         | ✓   | ☒                  |
| 800  | 32     | ✓                | ✓                | ☒                | ✓          | •               | ✓                         | ✓         | ✓   | ☒                  |
| 900  | 36     | ✓                | ✓                | ☒                | ✓          | •               | ✓                         | ☒         | ✓   | ☒                  |
| 1000 | 40     | ✓                | ✓                | ☒                | ✓          | •               | ✓                         | ☒         | ✓   | ☒                  |
| 1200 | 48     | ✓                | ✓                | ☒                | ✓          | •               | ✓                         | ☒         | ✓   | ☒                  |

Table 28: Symbols key

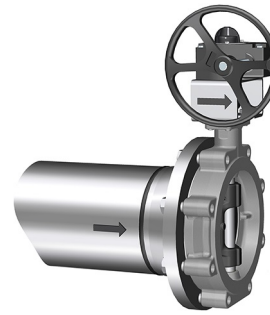
| Symbol | Description           | Symbol | Description                 |
|--------|-----------------------|--------|-----------------------------|
| ✓      | Installation possible | •      | Non-standardised connection |
| ☒      | Contact KSB.          |        |                             |

## Installation information

### Dead-end service and downstream dismantling



Downstream dismantling



Dead-end service

Use of standard valves for dead-end service or downstream dismantling at ambient temperature:

- T1 (wafer-type body): dead-end service or downstream dismantling not permitted
- T4 (full-lug body): dead-end service or downstream dismantling permitted

**Table 29:** Use of DANAIS 150 in the following fluids

| DANAIS 150               | Gases or liquids <sup>24)</sup> |                                      | Liquids                              |                                      |
|--------------------------|---------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
|                          | Hazardous<br>(Group 1)          | Non-hazardous<br>Group 2             | Hazardous<br>(Group 1)               | Non-hazardous<br>Group 2             |
| Class 150 <sup>25)</sup> | All DN:<br>Not permitted        | All DN:<br>$\Delta PS = 15$ bar max. | All DN:<br>$\Delta PS = 15$ bar max. | All DN:<br>$\Delta PS = 15$ bar max. |
| PN 25 <sup>25)</sup>     |                                 |                                      |                                      |                                      |

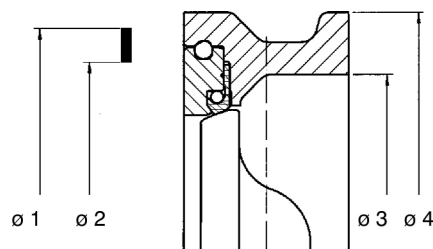
$\Delta PS$ : Differential pressure

N.B.: A valve installed with a counterflange at the end of a pipeline is not a dead-end valve.

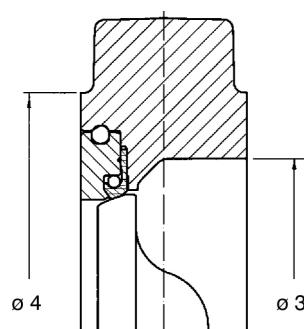
<sup>24</sup> Liquids whose vapour pressure at the max. permissible temperature is at least 0.5 bar higher than atmospheric pressure (1013 mbar)

<sup>25</sup> If the shaft is made of AISI 316L,  $\Delta PS$  is limited to 10 bar max.

## Definition of sealing element



Wafer-type body with flat faces – T1



Full-lug body – T4

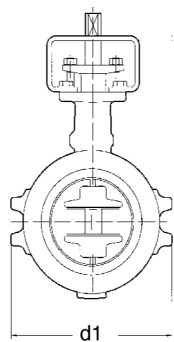
| DN   | NPS    | Sealing element      |                       |                      |                       |          | Connections                                                      |                                                     |
|------|--------|----------------------|-----------------------|----------------------|-----------------------|----------|------------------------------------------------------------------|-----------------------------------------------------|
|      |        | Minimum              |                       | Maximum              |                       |          | T1                                                               | T4                                                  |
|      |        | Max. inside diameter | Min. outside diameter | Min. inside diameter | Min. outside diameter |          |                                                                  |                                                     |
|      | [inch] | Ø 2                  | Ø 1                   | Ø 3                  | Ø 4 - T1              | Ø 4 - T4 |                                                                  |                                                     |
| 50   | 2      | 69,6                 | 84,6                  | 62,0                 | 90,5                  | 91,0     | PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 10K                  |                                                     |
| 65   | 2½     | 83,6                 | 98,6                  | 75,0                 | 108,0                 | 104,0    | PN 10/16/20 - ASME B16.5 Class 150 - JIS 10K                     |                                                     |
|      |        |                      |                       |                      |                       | 117,0    | PN 25 - JIS 16K                                                  |                                                     |
| 80   | 3      | 101,2                | 116,6                 | 91,0                 | 125,0                 | 126,0    | PN 20 - ASME B16.5 Class 150 - JIS 5K                            |                                                     |
|      |        |                      |                       |                      |                       | 131,0    | PN 10/16/25 - JIS 10K/16K                                        |                                                     |
| 100  | 4      | 126,6                | 142,6                 | 117,0                | 154,0                 | 156,5    | PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K           |                                                     |
| 125  | 5      | 153,6                | 169,6                 | 144,0                | 183,0                 | 185,0    | PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K           |                                                     |
| 150  | 6      | 180,6                | 199,1                 | 171,0                | 214,0                 | 215,0    | PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K           | PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K  |
| 200  | 8      | 231,5                | 253,5                 | 222,0                | 267,0                 | 269,0    | PN 10/20 - ASME B16.5 Class 150 - JIS 5K                         |                                                     |
|      |        |                      |                       |                      |                       | 265,0    | PN 16/25 - JIS 10K/16K                                           |                                                     |
| 250  | 10     | 286,9                | 305,5                 | 275,0                | 321,5                 | 323,0    | PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K           |                                                     |
| 300  | 12     | 339,3                | 358,5                 | 327,0                | 377,0                 | 380,0    | PN 10/16/20 - ASME B16.5 Class 150 - JIS 5K                      |                                                     |
|      |        |                      |                       |                      |                       | 388,0    | PN 25 - JIS 10K/16K                                              |                                                     |
| 350  | 14     | 374,6                | 400,0                 | 359,0                | 411,5                 | 412,0    | PN 20 - ASME B16.5 Class 150 - JIS 5K                            |                                                     |
|      |        |                      |                       |                      |                       | 428,0    | PN 10/16/25 - JIS 10K/16K                                        |                                                     |
| 400  | 16     | 425,9                | 452,0                 | 410,0                | 467,5                 | 469,0    | PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K           |                                                     |
| 450  | 18     | 478,5                | 510,0                 | 461,0                | 530,5                 | 532,5    | PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K           |                                                     |
| 500  | 20     | 528,0                | 562,0                 | 512,0                | 581,5                 | 583,5    | PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K           |                                                     |
| 550  | 22     | 584                  | 620                   | 556                  | 635                   | 635      | PN 10/16 - JIS 5K/10K/16K                                        |                                                     |
| 600  | 24     | 635,0                | 671,0                 | 614,0                | 689,5                 | 691,5    | PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K/10K/16K           | PN 10/16/20/25 - ASME B16.5 Class 150 - JIS 5K      |
| 650  | 26     | 673,0                | 705,0                 | 654,0                | 740,0                 | 747,0    | PN 10/16/20/25 - ASME B16.47 Class 150 Series A - JIS 5K/10K/16K |                                                     |
| 700  | 28     | 722,0                | 756,0                 | 704,0                | 794,0                 | 794,0    | PN 10/16/20/25 - ASME B16.47 Class 150 Series A - JIS 5K/10K/16K | PN 10/16 - JIS 5K/10K                               |
|      |        |                      |                       |                      |                       | 798,0    | PN 20 - ASME B16.47 Class 150 Series A                           | PN 20 - ASME B16.47 Class 150 Series A              |
| 750  | 30     | 774,0                | 807,0                 | 754,0                | 855                   | 853,5    | PN 10/16/20/25 - ASME B16.47 Class 150 Series A - JIS 5K/10K/16K | PN 10/16 - JIS 5K/10K                               |
|      |        |                      |                       |                      |                       | 855,0    | PN 20 - ASME B16.47 Class 150 Series A                           | PN 20 - ASME B16.47 Class 150 Series A              |
| 800  | 32     | 830,0                | 864,0                 | 804,0                | 899,0                 | 899,0    | PN 10/16/20/25 - ASME B16.47 Class 150 Series A - JIS 5K/10K/16K | PN 10/16                                            |
|      |        |                      |                       |                      |                       | 912,0    | PN 20 - ASME B16.47 Class 150 Series A - JIS 5K/10K              | PN 20 - ASME B16.47 Class 150 Series A - JIS 5K/10K |
| 900  | 36     | 930,0                | 964,0                 | 904,0                | 999,0                 | 999,0    | PN 10/16/20/25 - ASME B16.47 Class 150 Series A - JIS 10K/16K    | PN 10/16 - JIS 10K                                  |
|      |        |                      |                       |                      |                       | 1020,0   | PN 20 - ASME B16.47 Class 150 Series A                           | PN 20 - ASME B16.47 Class 150 Series A              |
| 1000 | 40     | 1030,0               | 1074,0                | 1004,0               | 1114,0                | 1114,0   | PN 10/16/20/25 - ASME B16.47 Class 150 Series A - JIS 10K/16K    | PN 10/16 - JIS 10K                                  |
|      |        |                      |                       |                      |                       | 1122,0   | PN 20 - ASME B16.47 Class 150 Series A                           | PN 20 - ASME B16.47 Class 150 Series A              |

| DN    | NPS    | Sealing element                                                                                                                                       |                       |                      |                       |                  | Connections                                                         |                                                                     |
|-------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|-----------------------|------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
|       |        | Minimum                                                                                                                                               |                       | Maximum              |                       |                  | T1                                                                  | T4                                                                  |
|       |        | Max. inside diameter                                                                                                                                  | Min. outside diameter | Min. inside diameter | Min. outside diameter |                  |                                                                     |                                                                     |
|       | [inch] | Ø 2                                                                                                                                                   | Ø 1                   | Ø 3                  | Ø 4 - T1              | Ø 4 - T4         |                                                                     |                                                                     |
| 1200  | 48     | 1232,0                                                                                                                                                | 1280,0                | 1205,0               | 1329,0                | 1329,0<br>1357,0 | PN 10/16/20/25 - ASME<br>B16.47 Class 150 Series A - JIS<br>10K/16K | PN 10/16 - JIS 10K<br><br>PN 20 - ASME B16.47 Class<br>150 Series A |
| N.B.: |        | For DN ≤ 600 we recommend using spiral wound gaskets to ISO 7483 - PN 10 to 25.<br>For DN > 600 we recommend using spiral wound gaskets to EN 1514-2. |                       |                      |                       |                  |                                                                     |                                                                     |

N.B.: The inside diameter of the gasket can be smaller than Ø 3.

## Bolting and weights

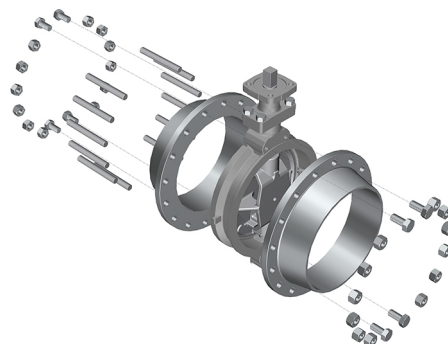
### Bolting and weights for wafer-type body with flat faces - T1



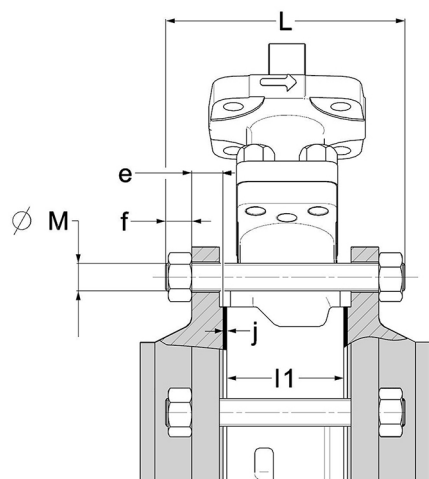
Drawing of DANAIS 150 T1

The drawings do not indicate the exact product design (number of tapped lugs/clearance holes).

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



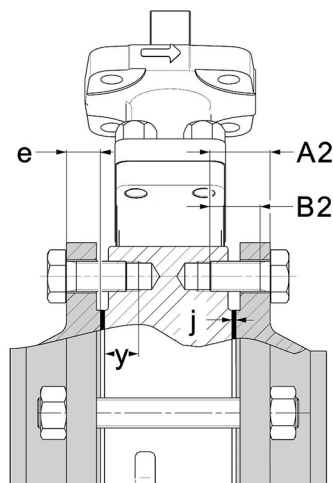
Exploded view of DANAIS 150 T1



Sectional drawing of T1 body bolting with tie bolts

Length of tie bolt  
 $L = l1 + 2e + 2f + 2j$

l1: face-to-face length of valve  
e: flange thickness (customer-specific)  
f: standardised overhang of tie bolt  
j: flange gasket thickness



Sectional drawing of T1 body bolting with bolts

Length of bolt 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  $B2 > A2 - e$

**Table 30:** Wafer-type body with flat faces – T1 for EN 1092-1 PN 10 and PN 16

| DN   | NPS | I1  | d1   | EN 1092-1 PN 10 |     |         |     |     | EN 1092-1 PN 16 |     |         |     |   | [kg]   |
|------|-----|-----|------|-----------------|-----|---------|-----|-----|-----------------|-----|---------|-----|---|--------|
|      | Ø M |     |      | Tie bolt        |     | Bolt A2 |     | Ø M | Tie bolt        |     | Bolt A2 |     |   |        |
|      |     |     |      | f               | Qty | Y       | Qty |     | f               | Qty | Y       | Qty |   |        |
| 50   | 2   | 43  | 104  | M16             | 20  | 4       | -   | -   | M16             | 20  | 4       | -   | - | 3,2    |
| 65   | 2½  | 46  | 123  | M16             | 20  | 4/8     | -   | -   | M16             | 20  | 4/8     | -   | - | 3,8    |
| 80   | 3   | 46  | 140  | M16             | 20  | 8       | -   | -   | M16             | 20  | 8       | -   | - | 4,5    |
| 100  | 4   | 54  | 180  | M16             | 20  | 8       | -   | -   | M16             | 20  | 8       | -   | - | 6,4    |
| 125  | 5   | 57  | 210  | M16             | 20  | 8       | -   | -   | M16             | 20  | 8       | -   | - | 9,7    |
| 150  | 6   | 57  | 235  | M20             | 24  | 8       | -   | -   | M20             | 24  | 8       | -   | - | 12,7   |
| 200  | 8   | 62  | 271  | M20             | 24  | 8       | -   | -   | M20             | 24  | 12      | -   | - | 22,5   |
| 250  | 10  | 70  | 323  | M20             | 24  | 12      | -   | -   | M24             | 29  | 12      | -   | - | 34,0   |
| 300  | 12  | 80  | 380  | M20             | 24  | 12      | -   | -   | M24             | 29  | 12      | -   | - | 48,8   |
| 350  | 14  | 92  | 449  | M20             | 24  | 16      | -   | -   | M24             | 29  | 16      | -   | - | 64,5   |
| 400  | 16  | 102 | 505  | M24             | 29  | 16      | -   | -   | M27             | 32  | 16      | -   | - | 89,0   |
| 450  | 18  | 114 | 570  | M24             | 29  | 16      | 32  | 4   | M27             | 32  | 16      | 31  | 4 | 133,5  |
| 500  | 20  | 127 | 621  | M24             | 29  | 16      | 35  | 4   | M30             | 35  | 16      | 39  | 4 | 168,0  |
| 550  | 22  | 154 | 635  | M27             | 32  | 16      | 42  | 4   | M30             | 35  | 16      | 42  | 4 | 218,0  |
| 600  | 24  | 154 | 730  | M27             | 32  | 16      | 40  | 4   | M33             | 38  | 16      | 48  | 4 | 270,5  |
| 650  | 26  | 165 | 742  | M27             | 32  | 20      | 39  | 4   | M33             | 38  | 20      | 35  | 4 | 360,0  |
| 700  | 28  | 165 | 798  | M27             | 32  | 20      | 39  | 4   | M33             | 38  | 20      | 36  | 4 | 415,0  |
| 750  | 30  | 190 | 859  | M30             | 35  | 20      | 47  | 4   | M33             | 38  | 20      | 46  | 4 | 510,0  |
| 800  | 32  | 190 | 903  | M30             | 35  | 20      | 47  | 4   | M36             | 42  | 20      | 44  | 4 | 575,0  |
| 900  | 36  | 203 | 1003 | M30             | 35  | 24      | 47  | 4   | M36             | 42  | 24      | 43  | 4 | 725,0  |
| 1000 | 40  | 216 | 1118 | M33             | 38  | 24      | 48  | 4   | M39             | 45  | 24      | 46  | 4 | 930,0  |
| 1200 | 48  | 254 | 1333 | M36             | 42  | 28      | 53  | 4   | M45             | 52  | 28      | 48  | 4 | 1470,0 |

**Table 31:** Wafer-type body with flat faces – T1 for EN 1092-1 PN 25

| DN   | NPS    | I1  | d1   | EN 1092-1 PN 25 |          |     |         |     | [kg]   |
|------|--------|-----|------|-----------------|----------|-----|---------|-----|--------|
|      | [inch] |     |      | Ø M             | Tie bolt |     | Bolt A2 |     |        |
|      |        |     |      |                 | f        | Qty | Y       | Qty |        |
| 50   | 2      | 43  | 104  | M16             | 20       | 4   | -       | -   | 3,2    |
| 65   | 2½     | 46  | 123  | M16             | 20       | 8   | -       | -   | 3,8    |
| 80   | 3      | 46  | 140  | M16             | 20       | 8   | -       | -   | 4,5    |
| 100  | 4      | 54  | 180  | M20             | 24       | 8   | -       | -   | 6,4    |
| 125  | 5      | 57  | 210  | M24             | 29       | 8   | -       | -   | 9,7    |
| 150  | 6      | 57  | 235  | M24             | 29       | 8   | -       | -   | 12,7   |
| 200  | 8      | 62  | 271  | M24             | 29       | 12  | -       | -   | 22,5   |
| 250  | 10     | 70  | 323  | M27             | 29       | 12  | -       | -   | 34,0   |
| 300  | 12     | 80  | 380  | M27             | 32       | 16  | -       | -   | 48,8   |
| 350  | 14     | 92  | 449  | M30             | 35       | 16  | -       | -   | 64,5   |
| 400  | 16     | 102 | 505  | M33             | 38       | 16  | -       | -   | 89,0   |
| 450  | 18     | 114 | 570  | M33             | 38       | 16  | 31      | 4   | 133,5  |
| 500  | 20     | 127 | 621  | M33             | 38       | 16  | 42      | 4   | 168,0  |
| 550  | 22     | -   | -    | -               | -        | -   | -       | -   | -      |
| 600  | 24     | 154 | 730  | M36             | 42       | 16  | 46      | 4   | 270,5  |
| 650  | 26     | 165 | 742  | M36             | 42       | 20  | 34      | 4   | 360,0  |
| 700  | 28     | 165 | 798  | M39             | 45       | 20  | 33      | 4   | 415,0  |
| 750  | 30     | 190 | 859  | M39             | 45       | 20  | 44      | 4   | 510,0  |
| 800  | 32     | 190 | 903  | M45             | 52       | 20  | 40      | 4   | 575,0  |
| 900  | 36     | 203 | 1003 | M45             | 52       | 24  | 39      | 4   | 725,0  |
| 1000 | 40     | 216 | 1118 | M52             | 60       | 24  | 43      | 4   | 930,0  |
| 1200 | 48     | 254 | 1333 | M52             | 60       | 28  | 45      | 4   | 1470,0 |

**Table 32:** Wafer-type body with flat faces – T1 for EN 1092-1 PN 20, ASME B16.5 Class 150 and ASME B16.47 Class 150 Series A

| DN   | NPS | I1  | d1   | EN 1092-1 PN 20 |          |    |         |        | ASME B16.5 Class 150<br>For DN ≤ 600<br>ASME B16.47 Class 150 Series A<br>For DN > 600 |          |     |         |     | [kg]   |
|------|-----|-----|------|-----------------|----------|----|---------|--------|----------------------------------------------------------------------------------------|----------|-----|---------|-----|--------|
|      |     |     |      | Ø M             | Tie bolt |    | Bolt A2 |        | UN/<br>UNC <sup>26)</sup>                                                              | Tie bolt |     | Bolt A2 |     |        |
|      | f   |     |      |                 | Qty      | Y  | Qty     | [inch] |                                                                                        | f        | Qty | Y       | Qty |        |
| 50   | 2   | 43  | 104  | M16             | 20       | 4  | -       | -      | 5/8                                                                                    | 20       | 4   | -       | -   | 3,2    |
| 65   | 2½  | 46  | 123  | M16             | 20       | 4  | -       | -      | 5/8                                                                                    | 20       | 4   | -       | -   | 3,8    |
| 80   | 3   | 46  | 140  | M16             | 20       | 4  | -       | -      | 5/8                                                                                    | 20       | 4   | -       | -   | 4,5    |
| 100  | 4   | 54  | 180  | M16             | 20       | 8  | -       | -      | 5/8                                                                                    | 20       | 8   | -       | -   | 6,4    |
| 125  | 5   | 57  | 210  | M20             | 24       | 8  | -       | -      | 3/4                                                                                    | 24       | 8   | -       | -   | 9,7    |
| 150  | 6   | 57  | 235  | M20             | 24       | 8  | -       | -      | 3/4                                                                                    | 24       | 8   | -       | -   | 12,7   |
| 200  | 8   | 62  | 271  | M20             | 24       | 8  | -       | -      | 3/4                                                                                    | 24       | 8   | -       | -   | 22,5   |
| 250  | 10  | 70  | 323  | M24             | 29       | 12 | -       | -      | 7/8                                                                                    | 29       | 12  | -       | -   | 34,0   |
| 300  | 12  | 80  | 380  | M24             | 29       | 12 | -       | -      | 7/8                                                                                    | 29       | 12  | -       | -   | 48,8   |
| 350  | 14  | 92  | 449  | M27             | 32       | 12 | -       | -      | 1                                                                                      | 32       | 12  | -       | -   | 64,5   |
| 400  | 16  | 102 | 505  | M27             | 32       | 16 | -       | -      | 1                                                                                      | 32       | 16  | -       | -   | 89,0   |
| 450  | 18  | 114 | 570  | M30             | 35       | 12 | 40      | 4      | 1½ <sub>8</sub>                                                                        | 35       | 12  | 40      | 4   | 133,5  |
| 500  | 20  | 127 | 621  | M30             | 35       | 16 | 39      | 4      | 1½ <sub>8</sub>                                                                        | 35       | 16  | 39      | 4   | 168,0  |
| 550  | 22  | -   | -    | -               | -        | -  | -       | -      | -                                                                                      | -        | -   | -       | -   | -      |
| 600  | 24  | 154 | 730  | M33             | 38       | 16 | 48      | 4      | 1½ <sub>4</sub>                                                                        | 38       | 16  | 48      | 4   | 270,5  |
| 650  | 26  | 165 | 742  | M33             | 38       | 20 | 35      | 4      | 1½ <sub>4</sub>                                                                        | 38       | 20  | 35      | 4   | 360,0  |
| 700  | 28  | 165 | 798  | M33             | 38       | 24 | 30      | 4      | 1½ <sub>4</sub>                                                                        | 38       | 24  | 30      | 4   | 415,0  |
| 750  | 30  | 190 | 859  | M33             | 38       | 24 | 39      | 4      | 1½ <sub>4</sub>                                                                        | 38       | 24  | 39      | 4   | 510,0  |
| 800  | 32  | 190 | 903  | M39             | 45       | 24 | 35      | 4      | 1½ <sub>2</sub>                                                                        | 45       | 24  | 35      | 4   | 575,0  |
| 900  | 36  | 203 | 1003 | M39             | 45       | 28 | 37      | 4      | 1½ <sub>2</sub>                                                                        | 45       | 28  | 37      | 4   | 725,0  |
| 1000 | 40  | 216 | 1118 | M39             | 45       | 32 | 36      | 4      | 1½ <sub>2</sub>                                                                        | 45       | 32  | 36      | 4   | 930,0  |
| 1200 | 48  | 254 | 1333 | M39             | 45       | 40 | 41      | 4      | 1½ <sub>2</sub>                                                                        | 45       | 40  | 41      | 4   | 1470,0 |

<sup>26)</sup> For bolting < 1 in.: only UNC

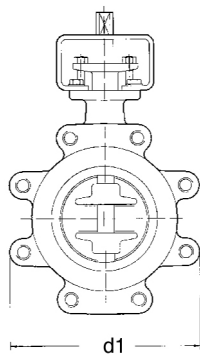
Table 33: Wafer-type body with flat faces – T1 for JIS B2220 5K

| DN   | NPS    | I1  | d1  | JIS B2220 5K |          |    |         |   | [kg]  |
|------|--------|-----|-----|--------------|----------|----|---------|---|-------|
|      | [inch] |     |     | Ø M          | Tie bolt |    | Bolt A2 |   |       |
|      |        | f   |     |              | Qty      | Y  | Qty     |   |       |
| 50   | 2      | -   | -   | -            | -        | -  | -       | - | -     |
| 65   | 2½     | -   | -   | -            | -        | -  | -       | - | -     |
| 80   | 3      | 46  | 140 | M16          | 20       | 4  | -       | - | 4,5   |
| 100  | 4      | 54  | 180 | M16          | 20       | 8  | -       | - | 6,4   |
| 125  | 5      | 57  | 210 | M16          | 20       | 8  | -       | - | 9,7   |
| 150  | 6      | 57  | 235 | M16          | 20       | 8  | -       | - | 12,7  |
| 200  | 8      | 62  | 271 | M20          | 24       | 8  | -       | - | 22,5  |
| 250  | 10     | 70  | 323 | M20          | 24       | 12 | -       | - | 34,0  |
| 300  | 12     | 80  | 380 | M20          | 24       | 12 | -       | - | 48,8  |
| 350  | 14     | 92  | 449 | M22          | 26       | 12 | -       | - | 64,5  |
| 400  | 16     | 102 | 505 | M22          | 26       | 16 | -       | - | 89,0  |
| 450  | 18     | 114 | 570 | M22          | 26       | 12 | 40      | 4 | 133,5 |
| 500  | 20     | 127 | 621 | M22          | 26       | 16 | 41      | 4 | 168,0 |
| 550  | 22     | 154 | 635 | M24          | 29       | 16 | 42      | 4 | 218,0 |
| 600  | 24     | 154 | 715 | M24          | 29       | 16 | 43      | 4 | 270,5 |
| 650  | 26     | 165 | 742 | M24          | 29       | 20 | 39      | 4 | 360,0 |
| 700  | 28     | 165 | 798 | M24          | 29       | 20 | 39      | 4 | 415,0 |
| 750  | 30     | 190 | 859 | M30          | 35       | 20 | 47      | 4 | 510,0 |
| 800  | 32     | 190 | 903 | M30          | 35       | 20 | 47      | 4 | 575,0 |
| 900  | 36     | -   | -   | -            | -        | -  | -       | - | -     |
| 1000 | 40     | -   | -   | -            | -        | -  | -       | - | -     |
| 1200 | 48     | -   | -   | -            | -        | -  | -       | - | -     |

Table 34: Wafer-type body with flat faces – T1 for JIS 2220 10K and 16K

| DN   | NPS | I1  | d1   | JIS B2220 10K |     |         |     |     | JIS B2220 16K for DN <= 600<br>JIS B2238 16K for DN > 600 |     |         |     |   | [kg]   |
|------|-----|-----|------|---------------|-----|---------|-----|-----|-----------------------------------------------------------|-----|---------|-----|---|--------|
|      | Ø M |     |      | Tie bolt      |     | Bolt A2 |     | Ø M | Tie bolt                                                  |     | Bolt A2 |     |   |        |
|      |     |     |      | f             | Qty | Y       | Qty |     | f                                                         | Qty | Y       | Qty |   |        |
| 50   | 2   | 43  | 104  | M16           | 20  | 4       | -   | -   | M16                                                       | 20  | 8       | -   | - | 3,2    |
| 65   | 2½  | 46  | 123  | M16           | 20  | 4       | -   | -   | M16                                                       | 20  | 8       | -   | - | 3,8    |
| 80   | 3   | 46  | 140  | M16           | 20  | 8       | -   | -   | M20                                                       | 24  | 8       | -   | - | 4,5    |
| 100  | 4   | 54  | 180  | M16           | 20  | 8       | -   | -   | M20                                                       | 24  | 8       | -   | - | 6,4    |
| 125  | 5   | 57  | 210  | M20           | 24  | 8       | -   | -   | M22                                                       | 26  | 8       | -   | - | 9,7    |
| 150  | 6   | 57  | 235  | M20           | 24  | 8       | -   | -   | M22                                                       | 26  | 12      | -   | - | 12,7   |
| 200  | 8   | 62  | 271  | M20           | 24  | 12      | -   | -   | M22                                                       | 26  | 12      | -   | - | 22,5   |
| 250  | 10  | 70  | 323  | M22           | 26  | 12      | -   | -   | M24                                                       | 29  | 12      | -   | - | 34,0   |
| 300  | 12  | 80  | 380  | M22           | 26  | 16      | -   | -   | M24                                                       | 29  | 16      | -   | - | 48,8   |
| 350  | 14  | 92  | 449  | M22           | 26  | 16      | -   | -   | M30 x 3                                                   | 35  | 16      | -   | - | 64,5   |
| 400  | 16  | 102 | 505  | M24           | 29  | 16      | -   | -   | M30 x 3                                                   | 35  | 16      | -   | - | 89,0   |
| 450  | 18  | 114 | 570  | M24           | 29  | 16      | 32  | 4   | M30 x 3                                                   | 35  | 16      | 32  | 4 | 133,5  |
| 500  | 20  | 127 | 621  | M24           | 29  | 16      | 35  | 4   | M30 x 3                                                   | 35  | 16      | 42  | 4 | 168,0  |
| 550  | 22  | 154 | 635  | M30           | 35  | 16      | 42  | 4   | M36 x 3                                                   | 42  | 16      | 42  | 4 | 218,0  |
| 600  | 24  | 154 | 730  | M30           | 35  | 20      | 38  | 4   | M36 x 3                                                   | 42  | 20      | 41  | 4 | 270,5  |
| 650  | 26  | 165 | 742  | M30           | 35  | 20      | 36  | 4   | M36 x 3                                                   | 42  | 20      | 38  | 4 | 360,0  |
| 700  | 28  | 165 | 798  | M30           | 35  | 20      | 37  | 4   | M39 x 3                                                   | 45  | 20      | 37  | 4 | 415,0  |
| 750  | 30  | 190 | 859  | M30           | 35  | 20      | 47  | 4   | M39 x 3                                                   | 45  | 20      | 48  | 4 | 510,0  |
| 800  | 32  | 190 | 903  | M30           | 35  | 24      | 39  | 4   | M45 x 3                                                   | 52  | 20      | 46  | 4 | 575,0  |
| 900  | 36  | 203 | 1003 | M30           | 35  | 24      | 47  | 4   | M45 x 3                                                   | 52  | 24      | 45  | 4 | 725,0  |
| 1000 | 40  | 216 | 1118 | M36           | 42  | 24      | 46  | 4   | M52 x 3                                                   | 60  | 24      | 46  | 4 | 930,0  |
| 1200 | 48  | 254 | 1333 | M36           | 42  | 28      | 53  | 4   | M52 x 3                                                   | 60  | 28      | 52  | 4 | 1470,0 |

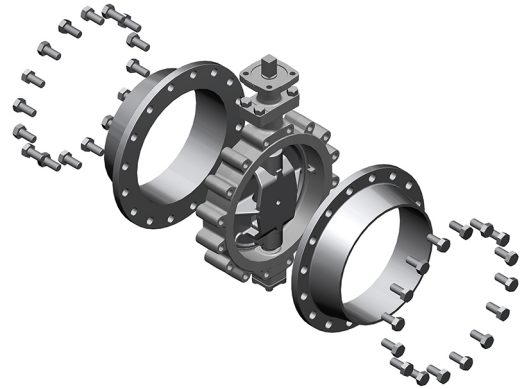
## Bolting and weights for full-lug body – T4



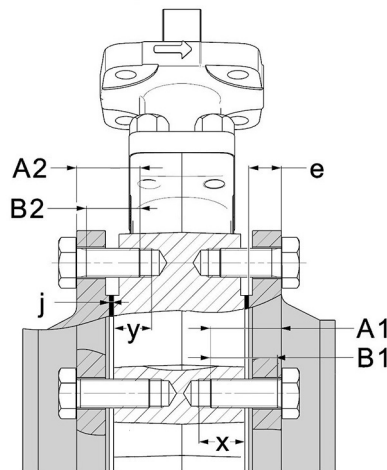
Drawing of DANAIS 150 T4

The drawings do not indicate the exact product design  
(number of tapped lugs)

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



Exploded view of DANAIS 150 T4



Sectional drawing of bolting, body type T4 with bolts

Bolt length

$$A1 \max = e + X + j$$

e: flange thickness (customer-specific)

X: depth of drilled hole

j: flange gasket thickness

B1: min. bolt thread length  $B1 > A1 - e$

Length of bolt 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  $B2 > A2 - e$

**Table 35:** Full-lug body – T4 for EN 1092-1 PN 10 and PN 16

| DN   | NPS | I1  | d1   | EN 1092-1 PN 10 |     |         |     |     | EN 1092-1 PN 16 |     |         |     |   | [kg]   |
|------|-----|-----|------|-----------------|-----|---------|-----|-----|-----------------|-----|---------|-----|---|--------|
|      | Ø M |     |      | Bolt A1         |     | Bolt A2 |     | Ø M | Bolt A1         |     | Bolt A2 |     |   |        |
|      |     |     |      | X               | Qty | Y       | Qty |     | X               | Qty | Y       | Qty |   |        |
| 50   | 2   | 43  | 117  | M16             | 20  | 4       | -   | -   | M16             | 20  | 4       | -   | - | 4,6    |
| 65   | 2½  | 46  | 131  | M16             | 22  | 4       | -   | -   | M16             | 22  | 4       | -   | - | 5,2    |
| 65   | 2½  | 46  | 162  | M16             | 22  | 8       | -   | -   | M16             | 22  | 8       | -   | - | 6,5    |
| 80   | 3   | 46  | 136  | M16             | 22  | 8       | -   | -   | M16             | 22  | 8       | -   | - | 7,4    |
| 100  | 4   | 54  | 206  | M16             | 25  | 8       | -   | -   | M16             | 25  | 8       | -   | - | 10,2   |
| 125  | 5   | 57  | 240  | M16             | 25  | 8       | -   | -   | M16             | 25  | 8       | -   | - | 14,6   |
| 150  | 6   | 57  | 267  | M20             | 27  | 8       | -   | -   | M20             | 27  | 8       | -   | - | 17,2   |
| 200  | 8   | 62  | 310  | M20             | 30  | 8       | -   | -   | -               | -   | -       | -   | - | 25,5   |
| 200  | 8   | 62  | 338  | -               | -   | -       | -   | -   | M20             | 30  | 12      | -   | - | 28,5   |
| 250  | 10  | 70  | 410  | M20             | 32  | 12      | -   | -   | M24             | 34  | 12      | -   | - | 44,0   |
| 300  | 12  | 80  | 460  | M20             | 32  | 12      | -   | -   | M24             | 38  | 12      | -   | - | 64,8   |
| 350  | 14  | 92  | 508  | M20             | 30  | 16      | -   | -   | M24             | 35  | 16      | -   | - | 97,5   |
| 400  | 16  | 102 | 593  | M24             | 34  | 16      | -   | -   | M27             | 38  | 16      | -   | - | 130,0  |
| 450  | 18  | 114 | 620  | M24             | 32  | 16      | 32  | 4   | M27             | 40  | 16      | 31  | 4 | 178,5  |
| 500  | 20  | 127 | 705  | M24             | 35  | 16      | 35  | 4   | M30             | 39  | 16      | 39  | 4 | 218,0  |
| 550  | 22  | 154 | 770  | M27             | 54  | 16      | 42  | 4   | M30             | 60  | 16      | 42  | 4 | 283,0  |
| 600  | 24  | 154 | 822  | M27             | 40  | 16      | 40  | 4   | M33             | 48  | 16      | 48  | 4 | 355,0  |
| 650  | 26  | 165 | 875  | M27             | 46  | 20      | 39  | 4   | M33             | 55  | 20      | 35  | 4 | 470,0  |
| 700  | 28  | 165 | 895  | M27             | 46  | 20      | 39  | 4   | M33             | 55  | 20      | 36  | 4 | 500,0  |
| 750  | 30  | 190 | 950  | M30             | 50  | 20      | 47  | 4   | M33             | 55  | 20      | 46  | 4 | 610,0  |
| 800  | 32  | 190 | 1010 | M30             | 50  | 20      | 47  | 4   | M36             | 59  | 20      | 44  | 4 | 680,0  |
| 900  | 36  | 203 | 1111 | M30             | 50  | 24      | 47  | 4   | M36             | 59  | 24      | 43  | 4 | 860,0  |
| 1000 | 40  | 216 | 1236 | M33             | 55  | 24      | 48  | 4   | M39             | 64  | 24      | 46  | 4 | 1140,0 |
| 1200 | 48  | 254 | 1470 | M36             | 59  | 28      | 53  | 4   | M45             | 73  | 28      | 48  | 4 | 1850,0 |

**Table 36:** Full-lug body – T4 for EN 1092-1 PN 25

| DN   | NPS    | I1  | d1  | EN 1092-1 PN 25 |         |     |         |     | [kg]  |
|------|--------|-----|-----|-----------------|---------|-----|---------|-----|-------|
|      | [inch] |     |     | Ø M             | Bolt A1 |     | Bolt A2 |     |       |
|      |        |     |     |                 | X       | Qty | Y       | Qty |       |
| 50   | 2      | 43  | 117 | M16             | 20      | 4   | -       | -   | 4,6   |
| 65   | 2½     | 46  | 162 | M16             | 22      | 8   | -       | -   | 6,5   |
| 80   | 3      | 46  | 136 | M16             | 22      | 8   | -       | -   | 7,4   |
| 100  | 4      | 54  | 206 | M20             | 26      | 8   | -       | -   | 10,2  |
| 125  | 5      | 57  | 240 | M24             | 27      | 8   | -       | -   | 14,6  |
| 150  | 6      | 57  | 267 | M24             | 27      | 8   | -       | -   | 17,2  |
| 200  | 8      | 62  | 338 | M24             | 30      | 12  | -       | -   | 28,5  |
| 250  | 10     | 70  | 410 | M27             | 32      | 12  | -       | -   | 44,0  |
| 300  | 12     | 80  | 470 | M27             | 39      | 16  | -       | -   | 68,8  |
| 350  | 14     | 92  | 508 | M30             | 38      | 16  | -       | -   | 97,5  |
| 400  | 16     | 102 | 593 | M33             | 43      | 16  | -       | -   | 130,0 |
| 450  | 18     | 114 | 620 | M33             | 41      | 16  | 31      | 4   | 178,5 |
| 500  | 20     | 127 | 705 | M33             | 42      | 16  | 42      | 4   | 218,0 |
| 550  | 22     | -   | -   | -               | -       | -   | -       | -   | -     |
| 600  | 24     | 154 | 822 | M36             | 46      | 16  | 46      | 4   | 355,0 |
| 650  | 26     | 165 | 875 | M36             | 59      | 20  | 34      | 4   | 470,0 |
| 700  | 28     | -   | -   | -               | -       | -   | -       | -   | -     |
| 750  | 30     | -   | -   | -               | -       | -   | -       | -   | -     |
| 800  | 32     | -   | -   | -               | -       | -   | -       | -   | -     |
| 900  | 36     | -   | -   | -               | -       | -   | -       | -   | -     |
| 1000 | 40     | -   | -   | -               | -       | -   | -       | -   | -     |
| 1200 | 48     | -   | -   | -               | -       | -   | -       | -   | -     |

Table 37: Full-lug body – T4 for EN 1092-1 PN 20, ASME B16.5 Class 150 and ASME B16.47 Class 150 Series A

| DN   | NPS    | l1  | d1   | EN 1092-1 PN 20 |         |     |         |     | ASME B16.5 Class 150<br>For DN ≤ 600<br>ASME B16.47 Class 150 Series A<br>For DN > 600 |         |    |         |   | [kg]   |
|------|--------|-----|------|-----------------|---------|-----|---------|-----|----------------------------------------------------------------------------------------|---------|----|---------|---|--------|
|      |        |     |      | Ø M             | Bolt A1 |     | Bolt A2 |     | UN/<br>UNC <sup>27)</sup>                                                              | Bolt A1 |    | Bolt A2 |   |        |
|      | [inch] |     |      |                 | X       | Qty | Y       | Qty |                                                                                        | [inch]  | X  | Qty     | Y |        |
| 50   | 2      | 43  | 117  | M16             | 20      | 4   | -       | -   | 5/8                                                                                    | 20      | 4  | -       | - | 4,6    |
| 65   | 2½     | 46  | 131  | M16             | 22      | 4   | -       | -   | 5/8                                                                                    | 22      | 4  | -       | - | 6,5    |
| 80   | 3      | 46  | 136  | M16             | 22      | 4   | -       | -   | 5/8                                                                                    | 22      | 4  | -       | - | 7,4    |
| 100  | 4      | 54  | 206  | M16             | 25      | 8   | -       | -   | 5/8                                                                                    | 25      | 8  | -       | - | 10,2   |
| 125  | 5      | 57  | 240  | M20             | 27      | 8   | -       | -   | 3/4                                                                                    | 27      | 8  | -       | - | 14,6   |
| 150  | 6      | 57  | 267  | M20             | 27      | 8   | -       | -   | 3/4                                                                                    | 27      | 8  | -       | - | 17,2   |
| 200  | 8      | 62  | 310  | M20             | 30      | 8   | -       | -   | 3/4                                                                                    | 30      | 8  | -       | - | 28,5   |
| 250  | 10     | 70  | 410  | M24             | 34      | 12  | -       | -   | 7/8                                                                                    | 34      | 12 | -       | - | 44,0   |
| 300  | 12     | 80  | 470  | M24             | 38      | 12  | -       | -   | 7/8                                                                                    | 38      | 12 | -       | - | 68,8   |
| 350  | 14     | 92  | 508  | M27             | 37      | 12  | -       | -   | 1                                                                                      | 37      | 12 | -       | - | 97,5   |
| 400  | 16     | 102 | 593  | M27             | 38      | 16  | -       | -   | 1                                                                                      | 38      | 16 | -       | - | 130,0  |
| 450  | 18     | 114 | 620  | M30             | 40      | 16  | -       | -   | 1½ <sub>8</sub>                                                                        | 40      | 16 | -       | - | 178,5  |
| 500  | 20     | 127 | 705  | M30             | 39      | 16  | 39      | 4   | 1½ <sub>8</sub>                                                                        | 39      | 20 | -       | - | 218,0  |
| 550  | 22     | -   | -    | -               | -       | -   | -       | -   | -                                                                                      | -       | -  | -       | - | -      |
| 600  | 24     | 154 | 822  | M33             | 48      | 16  | 48      | 4   | 1½ <sub>4</sub>                                                                        | 48      | 20 | -       | - | 355,0  |
| 650  | 26     | 165 | 875  | M33             | 55      | 20  | 35      | 4   | 1½ <sub>4</sub>                                                                        | 55      | 20 | 35      | 4 | 470,0  |
| 700  | 28     | 165 | 920  | M33             | 55      | 24  | 30      | 4   | 1½ <sub>4</sub>                                                                        | 55      | 24 | 30      | 4 | 530,0  |
| 750  | 30     | 190 | 970  | M33             | 55      | 24  | 39      | 4   | 1½ <sub>4</sub>                                                                        | 55      | 24 | 39      | 4 | 640,0  |
| 800  | 32     | 190 | 1045 | M39             | 64      | 24  | 35      | 4   | 1½ <sub>2</sub>                                                                        | 64      | 24 | 35      | 4 | 750,0  |
| 900  | 36     | 203 | 1155 | M39             | 64      | 28  | 37      | 4   | 1½ <sub>2</sub>                                                                        | 64      | 28 | 37      | 4 | 965,0  |
| 1000 | 40     | 216 | 1270 | M39             | 64      | 32  | 36      | 4   | 1½ <sub>2</sub>                                                                        | 64      | 32 | 36      | 4 | 1230,0 |
| 1200 | 48     | 254 | 1493 | M39             | 64      | 40  | 41      | 4   | 1½ <sub>2</sub>                                                                        | 64      | 40 | 41      | 4 | 1980,0 |

<sup>27)</sup> UN thread; bolts < 1 in.: UNC thread

Table 38: Full-lug body – T4 for JIS B2220 5K

| DN   | NPS    | l1  | d1   | JIS B2220 5K |         |     |         |     | [kg]  |
|------|--------|-----|------|--------------|---------|-----|---------|-----|-------|
|      | [inch] |     |      | Ø M          | Bolt A1 |     | Bolt A2 |     |       |
|      |        |     |      |              | X       | Qty | Y       | Qty |       |
| 50   | 2      | -   | -    | -            | -       | -   | -       | -   | -     |
| 65   | 2½     | -   | -    | -            | -       | -   | -       | -   | -     |
| 80   | 3      | 46  | 176  | M16          | 20      | 4   | -       | -   | 6,0   |
| 100  | 4      | 54  | 206  | M16          | 24      | 8   | -       | -   | 10,2  |
| 125  | 5      | 57  | 240  | M16          | 27      | 8   | -       | -   | 14,6  |
| 150  | 6      | 57  | 267  | M16          | 27      | 8   | -       | -   | 17,2  |
| 200  | 8      | 62  | 310  | M20          | 30      | 8   | -       | -   | 25,5  |
| 250  | 10     | 70  | 410  | M20          | 33      | 12  | -       | -   | 44,0  |
| 300  | 12     | 80  | 470  | M20          | 33      | 12  | -       | -   | 64,8  |
| 350  | 14     | 92  | 508  | M22          | 31      | 12  | -       | -   | 87,7  |
| 400  | 16     | 102 | 593  | M22          | 34      | 16  | -       | -   | 130,0 |
| 450  | 18     | 114 | 620  | M22          | 40      | 16  | -       | -   | 163,5 |
| 500  | 20     | 127 | 705  | M22          | 48      | 16  | 38      | 4   | 218,0 |
| 550  | 22     | 154 | 635  | M24          | 48      | 16  | 42      | 4   | 283,0 |
| 600  | 24     | 154 | 822  | M24          | 50      | 16  | 50      | 4   | 355,0 |
| 650  | 26     | 165 | 875  | M24          | 41      | 20  | 39      | 4   | 470,0 |
| 700  | 28     | 165 | 895  | M24          | 46      | 20  | 39      | 4   | 500,0 |
| 750  | 30     | 190 | 950  | M30          | 50      | 20  | 47      | 4   | 610,0 |
| 800  | 32     | 190 | 1010 | M30          | 50      | 20  | 47      | 4   | 680,0 |
| 900  | 36     | -   | -    | -            | -       | -   | -       | -   | -     |
| 1000 | 40     | -   | -    | -            | -       | -   | -       | -   | -     |
| 1200 | 48     | -   | -    | -            | -       | -   | -       | -   | -     |

Table 39: Full-lug body – T4 for JIS B2220 10K and 16K

| DN   | NPS    | l1  | d1   | JIS B2220 10K |         |    |         |   | JIS B2220 16K for DN <= 600<br>JIS B2238 16K for DN > 600 |         |    |         |   | [kg]   |
|------|--------|-----|------|---------------|---------|----|---------|---|-----------------------------------------------------------|---------|----|---------|---|--------|
|      |        |     |      | Ø M           | Bolt A1 |    | Bolt A2 |   | Ø M                                                       | Bolt A1 |    | Bolt A2 |   |        |
|      | X      |     |      |               | Qty     | Y  | Qty     | X |                                                           | Qty     | Y  | Qty     |   |        |
|      | [inch] |     |      |               |         |    |         |   |                                                           |         |    |         |   |        |
| 50   | 2      | 43  | 117  | M16           | 20      | 4  | -       | - | Contact KSB.                                              |         |    |         |   | 4,6    |
| 65   | 2½     | 46  | 131  | M16           | 22      | 4  | -       | - | -                                                         | -       | -  | -       | - | 5,2    |
| 65   | 2½     | 46  | 162  | -             | -       | -  | -       | - | M16                                                       | 22      | 8  | -       | - | 6,5    |
| 80   | 3      | 46  | 136  | M16           | 22      | 8  | -       | - | M20                                                       | 22      | 8  | -       | - | 6,0    |
| 100  | 4      | 54  | 206  | M16           | 25      | 8  | -       | - | M20                                                       | 26      | 8  | -       | - | 10,2   |
| 125  | 5      | 57  | 240  | M20           | 27      | 8  | -       | - | M22                                                       | 27      | 8  | -       | - | 14,6   |
| 150  | 6      | 57  | 267  | M20           | 27      | 8  | -       | - | Contact KSB.                                              |         |    |         |   | 17,2   |
| 200  | 8      | 62  | 310  | -             | -       | -  | -       | - | M22                                                       | 30      | 12 | -       | - | 25,5   |
| 200  | 8      | 62  | 338  | M20           | 30      | 12 | -       | - | -                                                         | -       | -  | -       | - | 25,5   |
| 250  | 10     | 70  | 410  | M22           | 34      | 12 | -       | - | M24                                                       | 34      | 12 | -       | - | 44,0   |
| 300  | 12     | 80  | 470  | M22           | 35      | 16 | -       | - | M24                                                       | 38      | 16 | -       | - | 64,8   |
| 350  | 14     | 92  | 508  | M22           | 31      | 16 | -       | - | M30 x 3                                                   | 41      | 16 | -       | - | 87,7   |
| 400  | 16     | 102 | 593  | M24           | 34      | 16 | -       | - | M30 x 3                                                   | 40      | 16 | -       | - | 130,0  |
| 450  | 18     | 114 | 620  | M24           | 32      | 16 | 32      | 4 | M30 x 3                                                   | 40      | 16 | 32      | 4 | 163,5  |
| 500  | 20     | 127 | 705  | M24           | 35      | 16 | 35      | 4 | M30 x 3                                                   | 42      | 16 | 42      | 4 | 218,0  |
| 550  | 22     | 154 | 635  | M30           | 60      | 16 | 42      | 4 | M36 x 3                                                   | 72      | 16 | 42      | 4 | 283,0  |
| 600  | 24     | 154 | 822  | Contact KSB.  |         |    |         |   | Contact KSB.                                              |         |    |         |   | 355,0  |
| 650  | 26     | 165 | 875  | M30           | 50      | 20 | 36      | 4 | M36 x 3                                                   | 59      | 20 | 38      | 4 | 470,0  |
| 700  | 28     | 165 | 895  | M30           | 50      | 20 | 37      | 4 | Contact KSB.                                              |         |    |         |   | 500,0  |
| 750  | 30     | 190 | 950  | M30           | 50      | 20 | 47      | 4 | Contact KSB.                                              |         |    |         |   | 610,0  |
| 800  | 32     | 190 | 1045 | M30           | 50      | 24 | 39      | 4 | Contact KSB.                                              |         |    |         |   | 750,0  |
| 900  | 36     | 203 | 1111 | M30           | 50      | 24 | 47      | 4 | Contact KSB.                                              |         |    |         |   | 860,0  |
| 1000 | 40     | 216 | 1236 | M36           | 59      | 24 | 46      | 4 | Contact KSB.                                              |         |    |         |   | 1140,0 |
| 1200 | 48     | 254 | 1470 | M36           | 59      | 28 | 53      | 4 | Contact KSB.                                              |         |    |         |   | 1850,0 |







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