Butterfly Valve

TRIODIS 150

Type Series Booklet

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Type Series Booklet TRIODIS 150

Contents

Butterfly Valves

Triple-offset Butterfly Valves

TRIODIS 150

Main applications

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

Fluids handled

- Gas
- Liquefied gas
- Liquefied natural gas
- Aggressive fluids
- Steam
- Solids-laden fluids
- Flammable fluids
- Hot water
- Corrosive fluids
- Fuels
- Volatile fluids
- Fluids containing mineral oils
- Oil
- Thermal oil
- Polymerising/crystallising fluids
- Radioactive fluids
- Vacuum

Operating data

Table 1: Operating properties

Characteristic	Value	
	TRIODIS 150 CRYO	TRIODIS 150 MT
Nominal pressure	Class 150	Class 150 - B25
Nominal size	DN 80-1450	DN 50-1000
Max. permissible pressure [bar]	20	25
Min. permissible temperature [°C]	≥ -196	≥ -50
Max. permissible temperature [°C]	≤ +260	≤ +260
Actuation at ΔP [bar] at ambient temperature	max. 20	max. 20
Vacuum operation down to	0 bar absolute	
Max. permissible flow velocity at operating pressure	4 m/s for liquids 50 m/s for clean gases Higher flow velocities on request	

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

Design

Design

TRIODIS 150 CRYO

- Body with butt weld ends – BW: DN 100-1200 (4-48 inch)
- Flanged body with raised faces – T7: DN 80-1450 (3-58 inch)
- Face-to-face length to ISO 5752-13 and EN 558-1-13 (flanged bodies only)
- Connections for flanged body: ASME B16.5 Class 150, ASME B16.47 Class 150 Series A, MSS SP 44 Class 150, PN 20 to ISO 7005
- Connections for body with butt weld ends: ASME B16.25

TRIODIS 150 MT

- Wafer-type body with flat faces – T1: DN 50-900 (2-36 inch)
- Full-lug body with raised faces – T4: DN 50 - 900 (2-36 inch)
- Flanged body with raised faces – T7: DN 50-1000 (2-40 inch)
- Face-to-face length to EN 558-1-20, API 609 Table 2 Class 150 and ISO 5752-20/25 (T1 and T4 bodies only)
- Face-to-face length to ISO 5752-13 and EN 558-1-13 (flanged bodies only)

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TRIODIS 150 MT/CRYO

- Approved fire-safe design to BS 6755 Part 2, API 6FA and EN ISO 10497 (equivalent to API 607)
- Fugitive emissions performance certified in accordance with EN ISO 15848-1, leakage rate A C03, and in accordance with TA Luft (German Technical Guidelines on Air Quality Control, VDI Directive 2440)
- The valves meet SIL 3 safety requirements in accordance with IEC 61508.
- Dead-end service and downstream dismantling possible with body types T4 and T7.
- For installation between flanges to EN 1092-1, ASME B16.5 and ASME B16.47
- Top flange and square valve shaft end to ISO 5211
- Marking in accordance with EN 19
- Steel body with anti-corrosive surface treatment
- Stainless steel body: pickled and passivated

Variants

- MS / MC manual gearboxes
- ACTAIR EVO / DYNACTAIR EVO pneumatic actuators
- HQ EVO hydraulic actuators
- Electric quarter-turn actuators
- AMTROBOX for open/closed position signalling
- AMTRONIC U on/off control unit
- SMARTRONIC U positioner
- Electrical continuity
- Drain plug
- NACE to MR0175 / ISO15156
- ATEX-compliant version in accordance with Directive 2014/34/EU
- TRIODIS 150 CRYO: lip seal at lower extension end for valve installation in any position (> 75° off the vertical)
- TRIODIS 150 CRYO: insulating plate (drip plate)
- TRIODIS 150 MT: -29 °C to +380 °C for high-temperature applications
- Anti-static design to EN 12266-2

Valve body materials

TRIODIS 150 CRYO

Table 2: Overview of available materials

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

TRIODIS 150 MT

Table 3: Overview of available materials

Material to ASTM	Material to EN	Temperature limit	KSB code	Body design
ASTM A216 Gr. WCC	EN 10213 1.0619	-29 °C to +260 °C	1	T1 T4 T7
ASTM A351 Gr. CF8M	EN 10213 1.4408	-50 °C to + 260 °C	6	

Product benefits

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

Product information

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

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

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

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

EC Machinery Directive 2006/42/EC

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

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

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

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

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

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

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

Certifications

Table 4: Overview

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

Related documents

Table 5: Information/documents

Document	Reference number
Operating manual	8613.81

Purchase order specifications

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

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

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Pressure/temperature ratings

In pressure classes PN 10, PN 16 and PN 25 (European materials), the TRIODIS 150 valve meets the requirements of EN 12516-1. The values given in the table must be adhered to if the valves are to comply with Pressure Equipment Directive 2014/68/EC.

Table 6: Test pressure and operating pressure for pressure class PN 10

Material to EN	Operating pressure [bar]											
	[°C]											
Body	**-200**	**-50**	**-29**	**-10**	**20**	**50**	**100**	**150**	**200**	**250**	**300**	**350**
EN 10213 1.0619	Not permitted	Not permitted	10,0	10,0	10,0	10,0	9,4	8,9	8,4	7,7	7,0	6,5
EN 10213 1.4408 EN 10213 1.4409	10,0	10,0	10,0	10,0	10,0	10,0	9,5	8,5	7,6	7,0	6,4	6,2

Table 7: Test pressure and operating pressure for pressure class PN 16

Material to EN	Operating pressure [bar]											
	[°C]											
Body	**-200**	**-50**	**-29**	**-10**	**20**	**50**	**100**	**150**	**200**	**250**	**300**	**350**
EN 10213 1.0619	Not permitted	Not permitted	16,0	16,0	16,0	16,0	15,0	14,2	13,4	12,3	11,1	10,4
EN 10213 1.4408 EN 10213 1.4409	16,0	16,0	16,0	16,0	16,0	16,0	15,2	13,7	12,1	11,2	10,3	9,9

Table 8: Test pressure and operating pressure for pressure class PN 25

Material to EN	Operating pressure [bar]											
	[°C]											
Body	**-200**	**-50**	**-29**	**-10**	**20**	**50**	**100**	**150**	**200**	**250**	**300**	**350**
EN 10213 1.0619	Not permitted	Not permitted	25,0	25,0	25,0	25,0	23,4	22,2	21,0	19,2	17,4	16,2
EN 10213 1.4408 EN 10213 1.4409	25,0	25,0	25,0	25,0	25,0	25,0	23,8	21,4	18,9	17,5	16,1	15,4

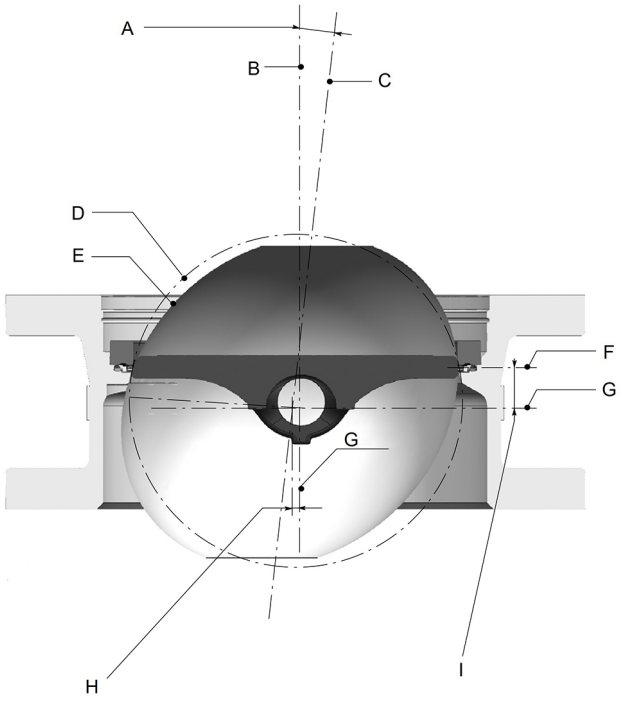
In pressure class Class 150 (ASTM materials), the TRIODIS 150 valve complies with ASME B16.34 Class 150 "Standard Class" as per the following table.

Table 9: Test pressure and operating pressure for pressure class Class 150

Material to ASTM	Operating pressure [bar]								
	[°C]								
Body	**-250**	**-50**	**-29 to 38**	**50**	**100**	**150**	**200**	**250**	**260**
ASTM A216 gr. WCC	Not permitted	Not permitted	19,8	19,5	17,7	15,8	13,8	12,1	11,7
ASTM A351 Gr. CF8M ASTM A351 Gr. CF3M	19,0	19,0	19,0	18,4	16,0	14,8	13,7	12,1	11,7

Technical data

Sealing system design



A - Third offset
B - Axis of sphere
C - Axis of the three offset circles = tri-spherical axis
D Sphere
E - Trispherical form
F - Seat axis
G - Shaft axis
H - Second offset
I - First offset

First offset

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

Second offset

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

Third offset

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

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Hydraulic characteristics

Table 10: [Kv0 in m^3/ h / $bar^{0.5}$] and [Cv0 in GUS / min / $psi^{0.5}$]

DN	NPS	Flow coefficient with valve disc fully open		Zeta
		Kv0	Cv0	
50	2	70	81	2,04
65	2½	110	128	2,35
80	3	190	220	1,81
100	4	340	394	1,38
125	5	600	696	1,08
150	6	980	1137	0,84
200	8	1850	2146	0,75
250	10	3350	3886	0,56
300	12	4870	5649	0,55
350	14	7070	8201	0,48
400	16	10350	12006	0,38
450	18	12500	14500	0,42
500	20	15090	17504	0,44
550	22	18280	21205	0,44
600	24	22410	22996	0,41
650	26	26300	30508	0,41
700	28	39650	45994	0,44
750	30	32820	38071	0,47
800	32	37330	43303	0,47
900	36	53840	62454	0,36
1000	40	58290	67616	0,47
1050	42	67390	78172	0,43
1100	44	67390	78172	0,43
1200	48	80000	92800	0,52
1400	56	117600	136416	0,44

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Materials

Materials for TRIODIS 150 MT

Wafer-type body with flat faces (T1)

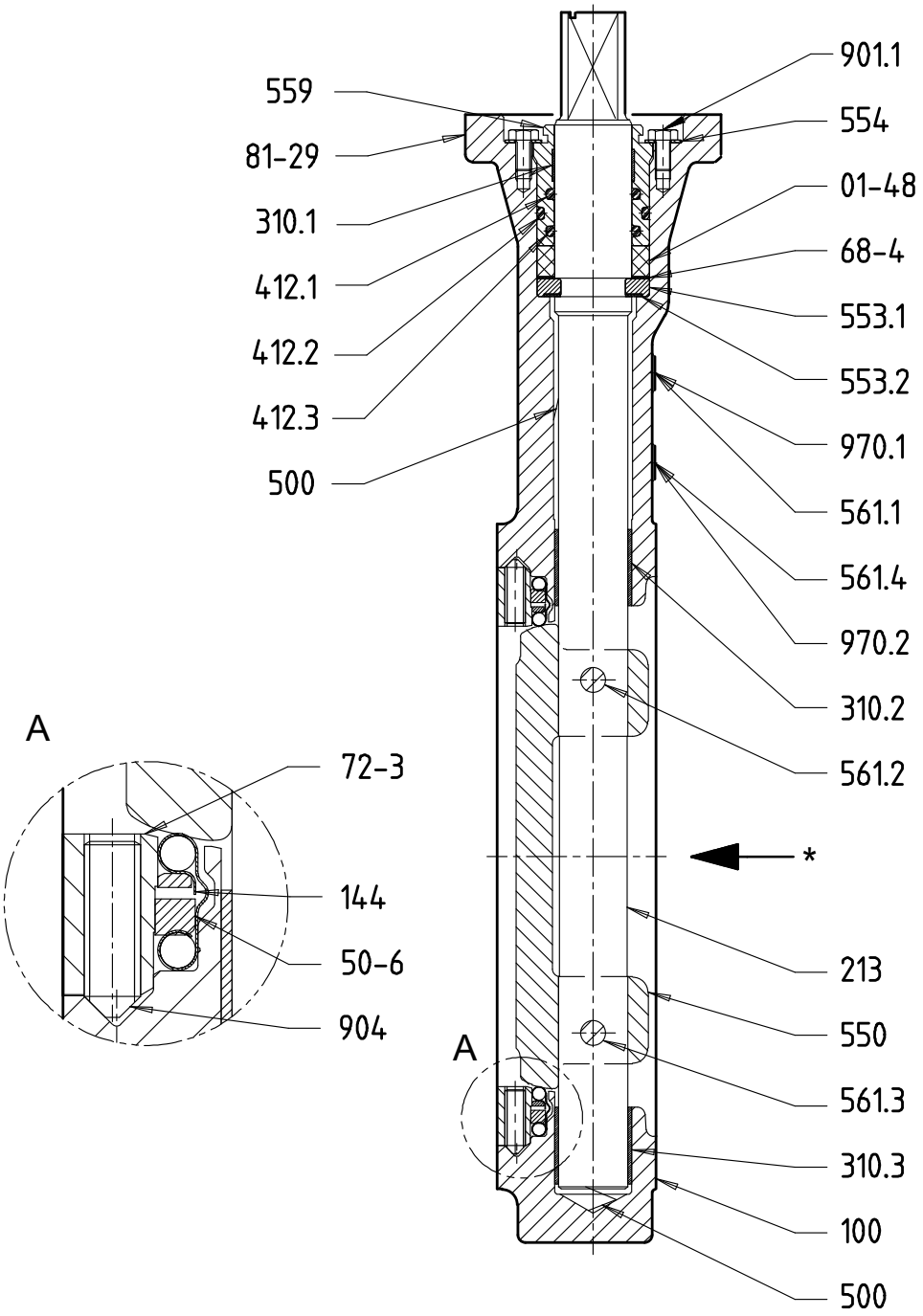

Fig. 1: Sectional drawing of TRIODIS 150 MT T1 - DN 50-150 (2-6 inch)
* Preferred flow direction

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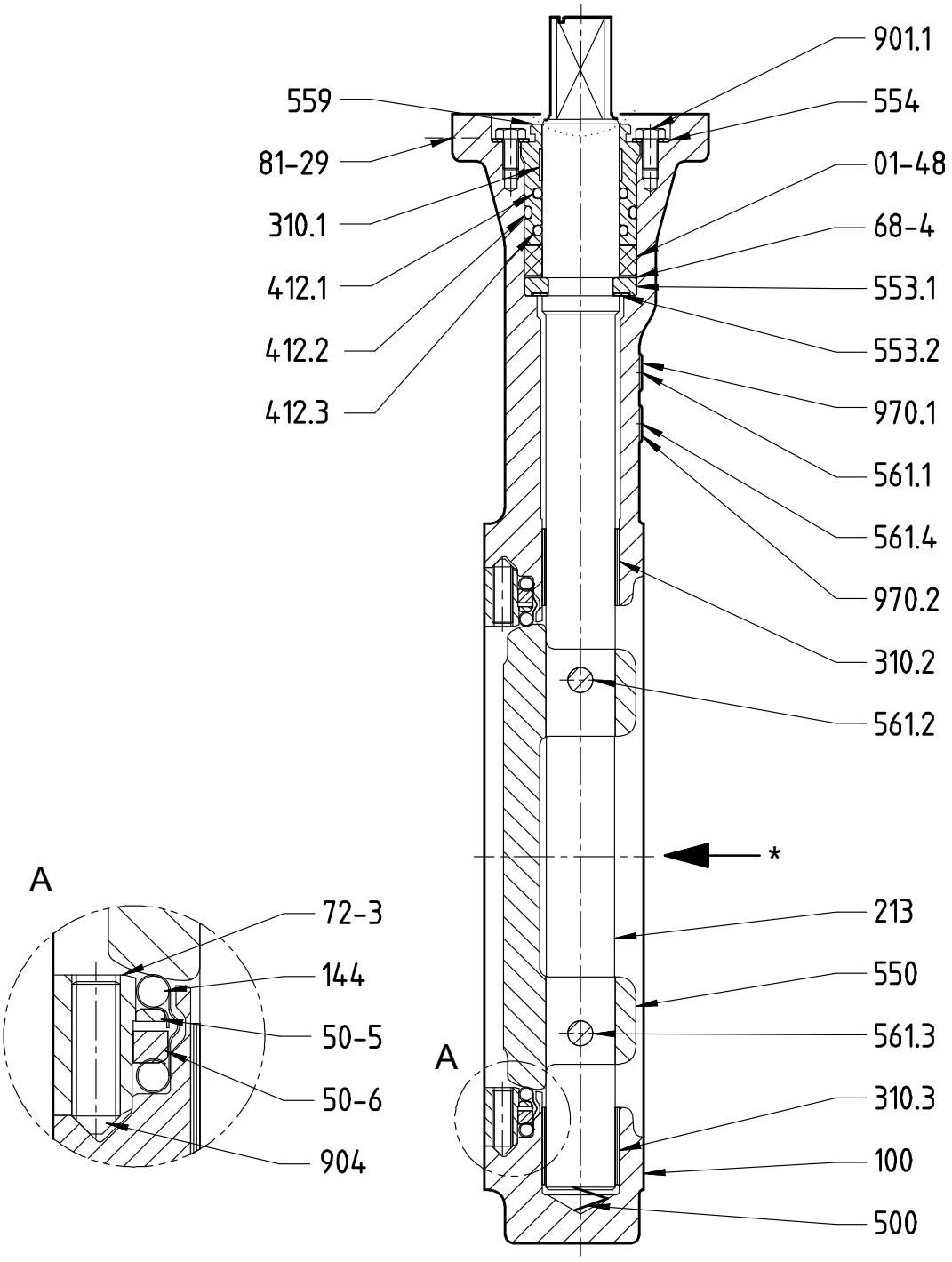

Fig. 2: Sectional drawing of TRIODIS 150 MT T1 - DN 200-250 (8-10 inch)

* Preferred flow direction

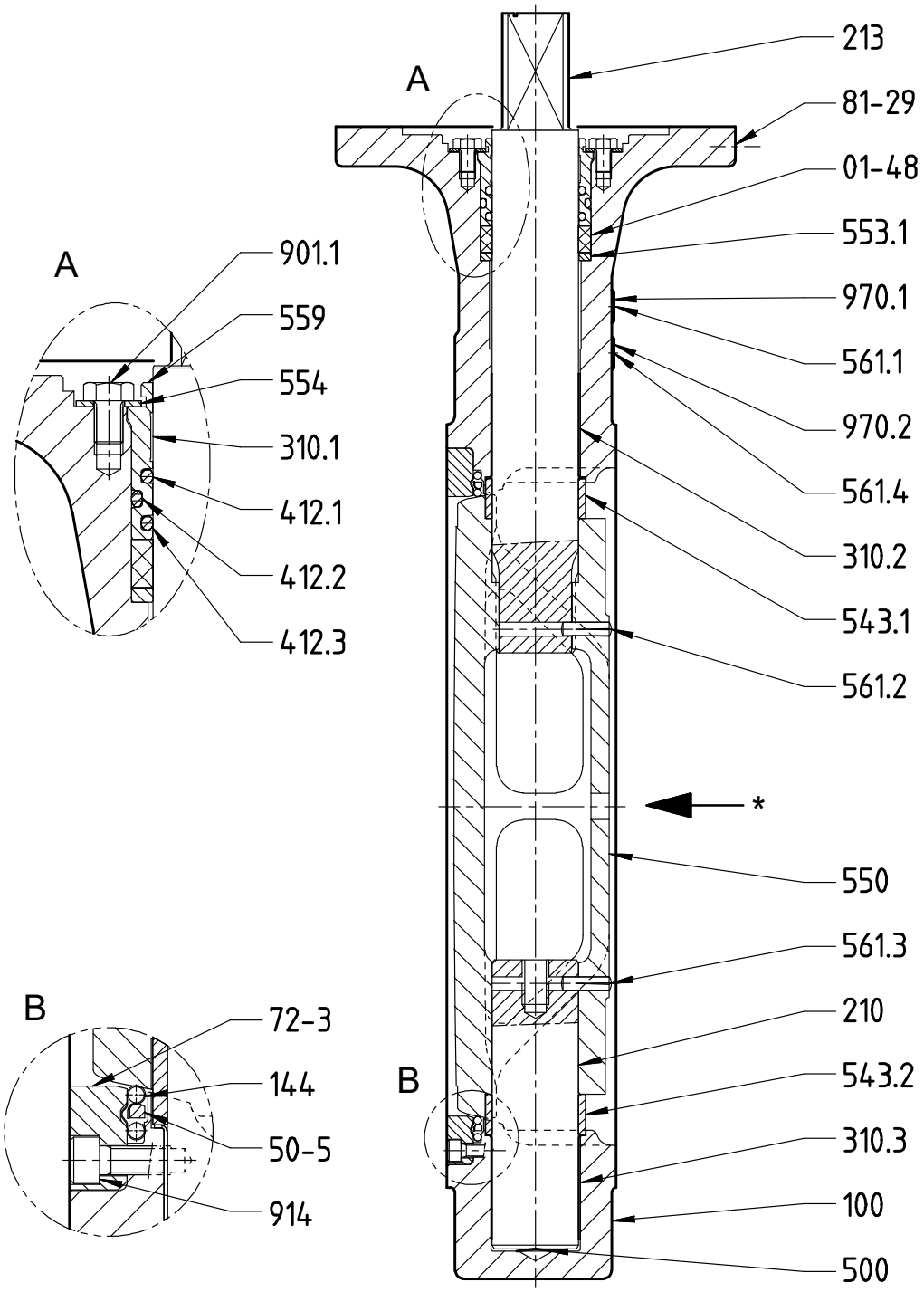

Fig. 3: Sectional drawing of TRIODIS 150 MT T1 - DN 300-600 (12-24 inch)

* Preferred flow direction

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Table 11: List of common parts

Part No.	Description	DN	Materials	KSB code
01-48[1)]	Fire-safe packing	50-600	Graphite, expanded	
50-5	Compression ring	200-600	Stainless steel	
50-6	Locking ring	50-250	Stainless steel	
68-4	Washer	50-250	Stainless steel	
72-3	Retaining flange	50-600	Stainless steel	
81-29	Earth terminal	50-600	Steel	
100	Body	50-600	Steel ASTM A 216 Gr. WCC / 1.0619	1
			Stainless steel ASTM A 351 Gr. CF8M / 1.4408	6
144[2)]	Metal seat	50-600	Nickel	NI
			Stainless steel AISI 316L	IX
			Copper	CU
210	Shaft	300-600	Stainless steel ASTM A564 Gr. 630 / 1.4542	6e
			Stainless steel ASTM A479 Gr. 316L / 1.4404, PS limited to 10 bar	6
			Stainless steel 1.4462, PS limited to 16 bar	7e
213	Actuating shaft	50-600	Stainless steel ASTM A564 Gr. 630 / 1.4542	6e
			Stainless steel ASTM A479 Gr. 316L / 1.4404, PS limited to 10 bar	6
			Stainless steel 1.4462, PS limited to 16 bar	7e
310.1[1)]	Plain bearing	50-600	Stainless steel + PTFE	
310.2[3)]	Plain bearing	50-600	Stainless steel + PTFE	
310.3[3)]	Plain bearing	50-600	Stainless steel + PTFE	
412.1[1)]	O-ring	50-600	VITON®	
412.2[1)]	O-ring	50-600	VITON®	
412.3[1)]	O-ring	50-600	VITON®	
500	Anti-static ring	50-600	Stainless steel	
543.1	Spacer bush	300-600	Stainless steel	
543.2	Spacer bush	300-600	Stainless steel	
550	Valve disc	50-600	Stainless steel ASTM A 351 Gr. CF8M / 1.4408	6
			Stainless steel ASTM A 351 Gr. CF3M Mo > 2.75 for marine applications	6m
553.1	Thrust insert	50-600	Stainless steel	
553.3	Thrust insert	200-250	Stainless steel	
554	Washer	50-600	Stainless steel	
559	Seal retainer	50-600	Stainless steel	
561.1	Half round head grooved pin	50-600	Stainless steel	
561.2[3)]	Grooved pin	50-600	Stainless steel	
561.3[3)]	Grooved pin	50-600	Stainless steel	
561.4	Grooved pin	50-600	Stainless steel	
901.1	Hexagon head bolt	50-600	Stainless steel A4	
904[2)]	Grub screw	50-250	Stainless steel A4	
914	Hexagon socket head cap screw	300-600	Stainless steel A4	
970.1	Name plate	50-600	Stainless steel	
970.2	Name plate	50-600	Stainless steel	

1 Part from shaft seal spare parts kit
2 Part from seat spare parts kit
3 Part from bearing spare parts kit

Full-lug body (T4)

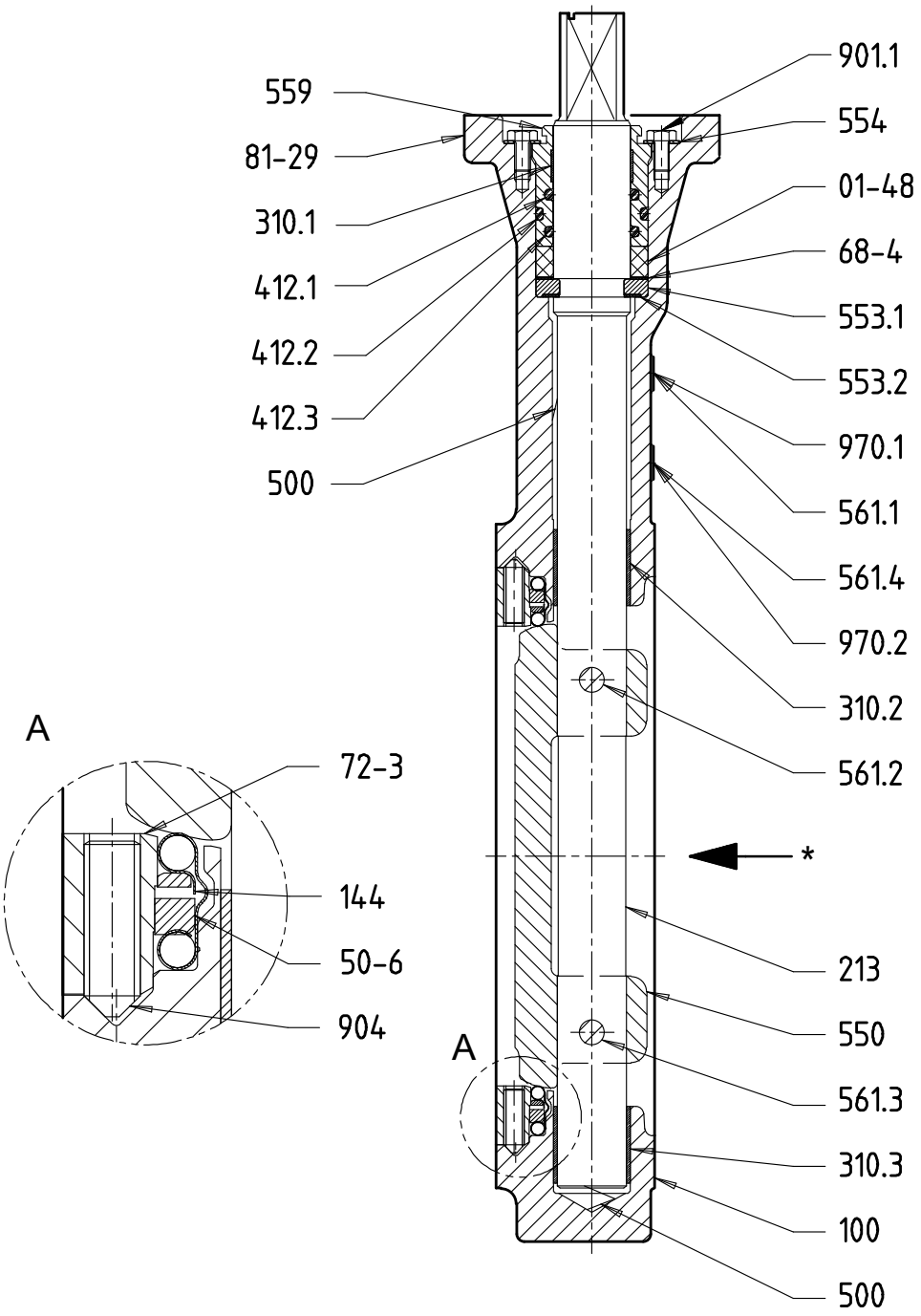

Fig. 4: Sectional drawing of TRIODIS 150 MT T4 - DN 50-150 (2-6 inch)

* Preferred flow direction

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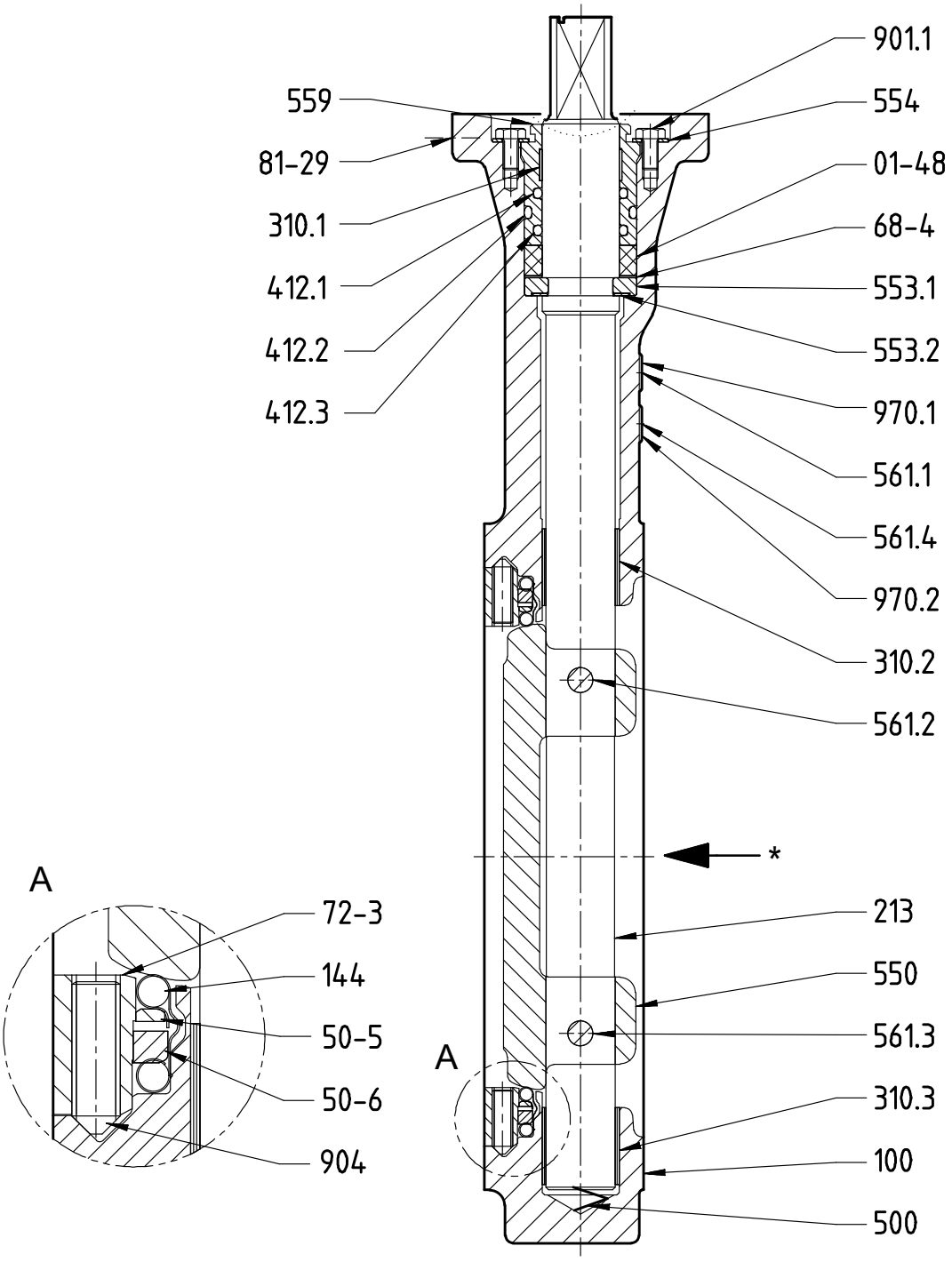

Fig. 5: Sectional drawing of TRIODIS 150 MT T4 - DN 200-250 (8-10 inch)

* Preferred flow direction

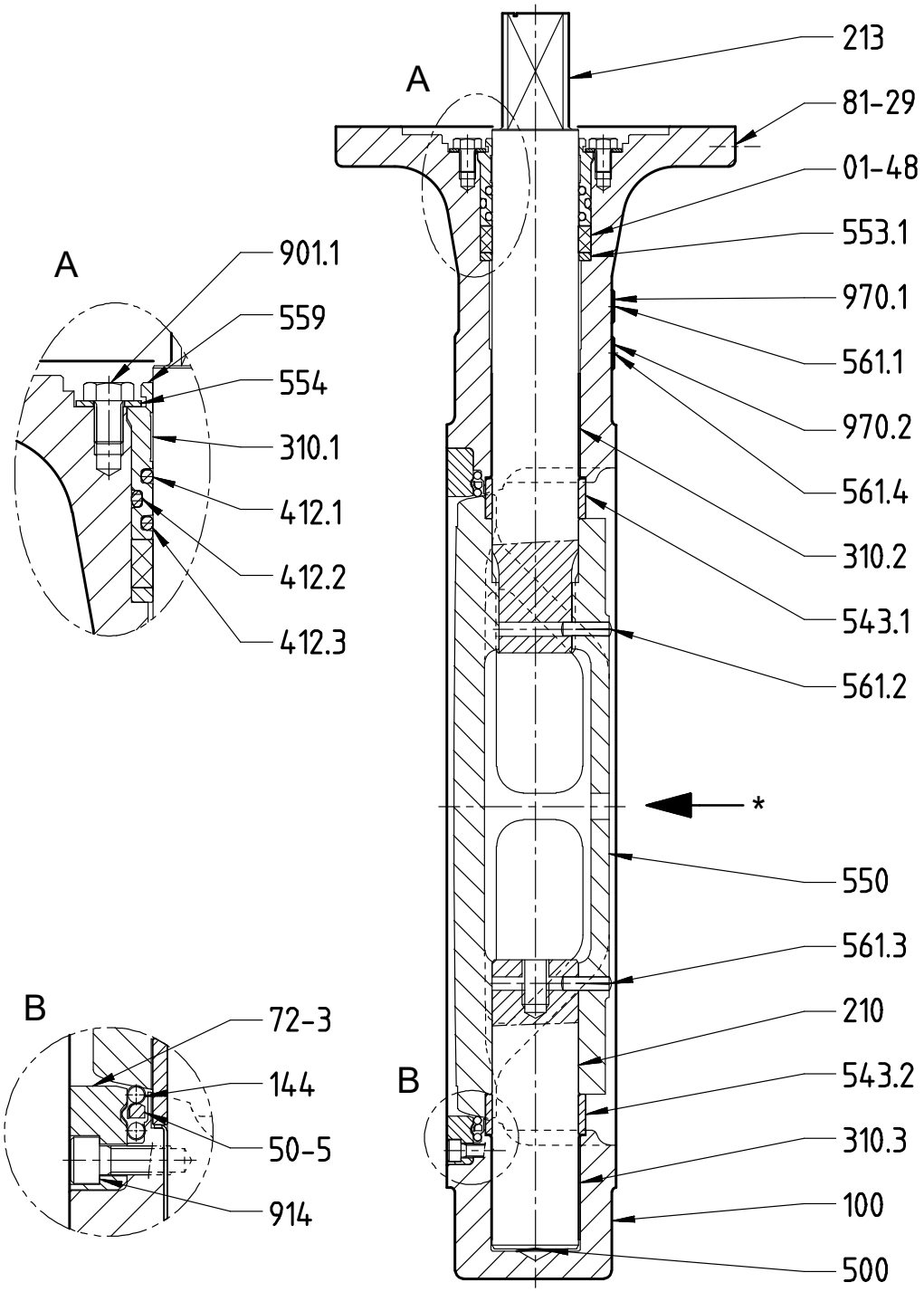

Fig. 6: Sectional drawing of TRIODIS 150 MT T4 - DN 300-600 (12-24 inch)

* Preferred flow direction

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Table 12: List of common parts

Part No.	Description	DN	Materials	KSB code
01-48[4)]	Fire-safe packing	50-600	Graphite, expanded	
50-5	Compression ring	200-600	Stainless steel	
50-6	Locking ring	50-250	Stainless steel	
68-4	Washer	50-250	Stainless steel	
72-3	Retaining flange	50-600	Stainless steel	
81-29	Earth terminal	50-600	Steel	
100	Body	50-600	Steel ASTM A 216 Gr. WCC / 1.0619	1
			Stainless steel ASTM A 351 Gr. CF8M / 1.4408	6
144[5)]	Metal seat	50-600	Nickel	NI
			Stainless steel AISI 316L	IX
			Copper	CU
210	Shaft	300-600	Stainless steel ASTM A564 Gr. 630 / 1.4542	6e
			Stainless steel ASTM A479 Gr. 316L / 1.4404, PS limited to 10 bar	6
			Stainless steel 1.4462, PS limited to 16 bar	7e
213	Actuating shaft	50-600	Stainless steel ASTM A564 Gr. 630 / 1.4542	6e
			Stainless steel ASTM A479 Gr. 316L / 1.4404, PS limited to 10 bar	6
			Stainless steel 1.4462, PS limited to 16 bar	7e
310.1[4)]	Plain bearing	50-600	Stainless steel + PTFE	
310.2[6)]	Plain bearing	50-600	Stainless steel + PTFE	
310.3[6)]	Plain bearing	50-600	Stainless steel + PTFE	
412.1[4)]	O-ring	50-600	VITON®	
412.2[4)]	O-ring	50-600	VITON®	
412.3[4)]	O-ring	50-600	VITON®	
500	Anti-static ring	50-600	Stainless steel	
543.1	Spacer bush	300-600	Stainless steel	
543.2	Spacer bush	300-600	Stainless steel	
550	Valve disc	50-600	Stainless steel ASTM A 351 Gr. CF8M / 1.4408	6
			Stainless steel ASTM A 351 Gr. CF3M Mo > 2.75 for marine applications	6m
553.1	Thrust insert	50-600	Stainless steel	
553.3	Thrust insert	200-250	Stainless steel	
554	Washer	50-600	Stainless steel	
559	Seal retainer	50-600	Stainless steel	
561.1[6)]	Half round head grooved pin	50-600	Stainless steel	
561.2[6)]	Grooved pin	50-600	Stainless steel	
561.3	Grooved pin	50-600	Stainless steel	
561.4	Grooved pin	50-600	Stainless steel	
901.1	Hexagon head bolt	50-600	Stainless steel A4	
904[5)]	Grub screw	50-250	Stainless steel A4	
914	Hexagon socket head cap screw	300-600	Stainless steel A4	
970.1	Name plate	50-600	Stainless steel	
970.2	Name plate	50-600	Stainless steel	

4 Part from shaft seal spare parts kit
5 Part from seat spare parts kit
6 Part from bearing spare parts kit

Flanged body (T7)

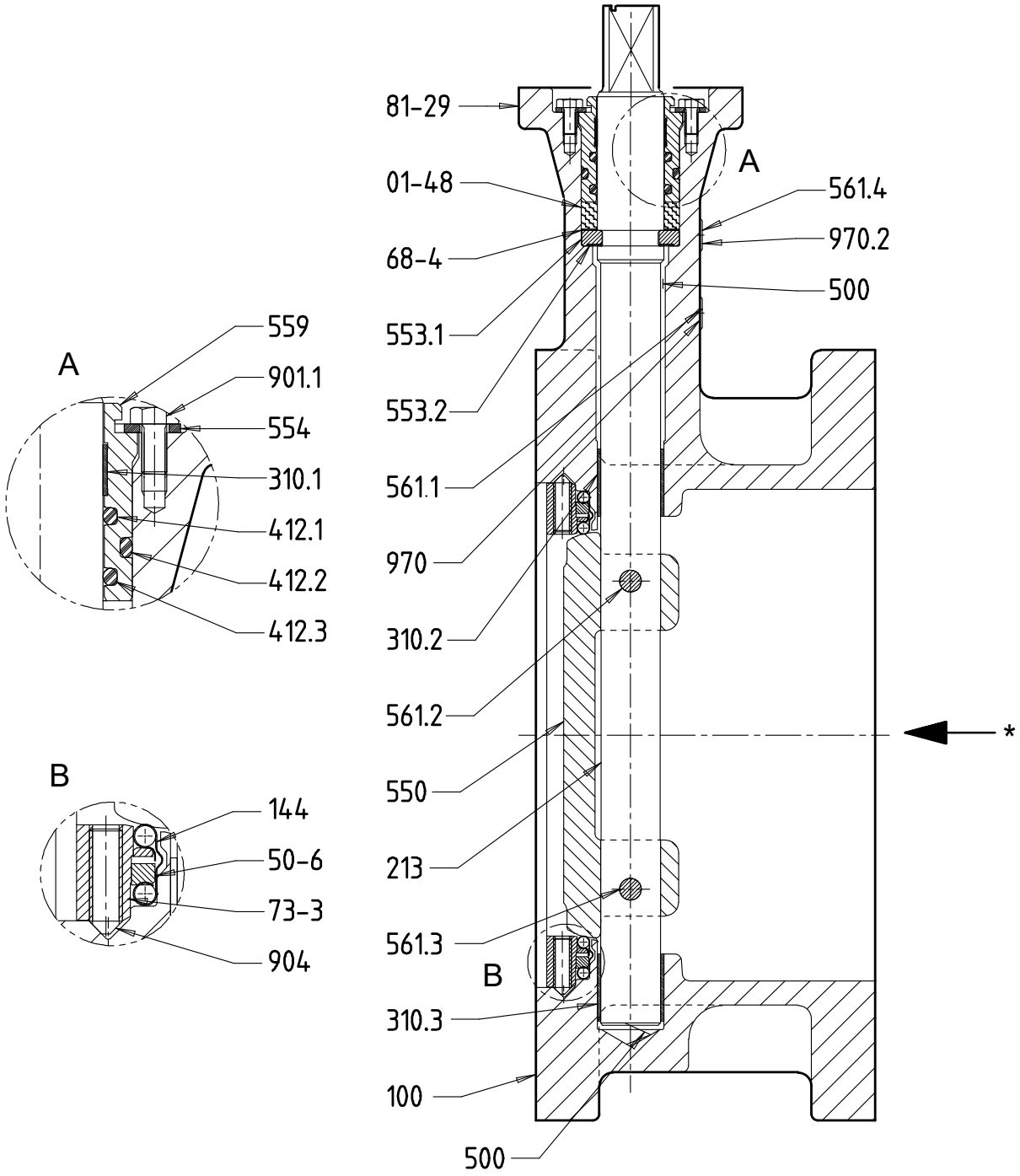

Fig. 7: Part from bearing spare parts kit TRIODIS 150 MT T7 - DN 50-150 (2-6 inch)

* Preferred flow direction

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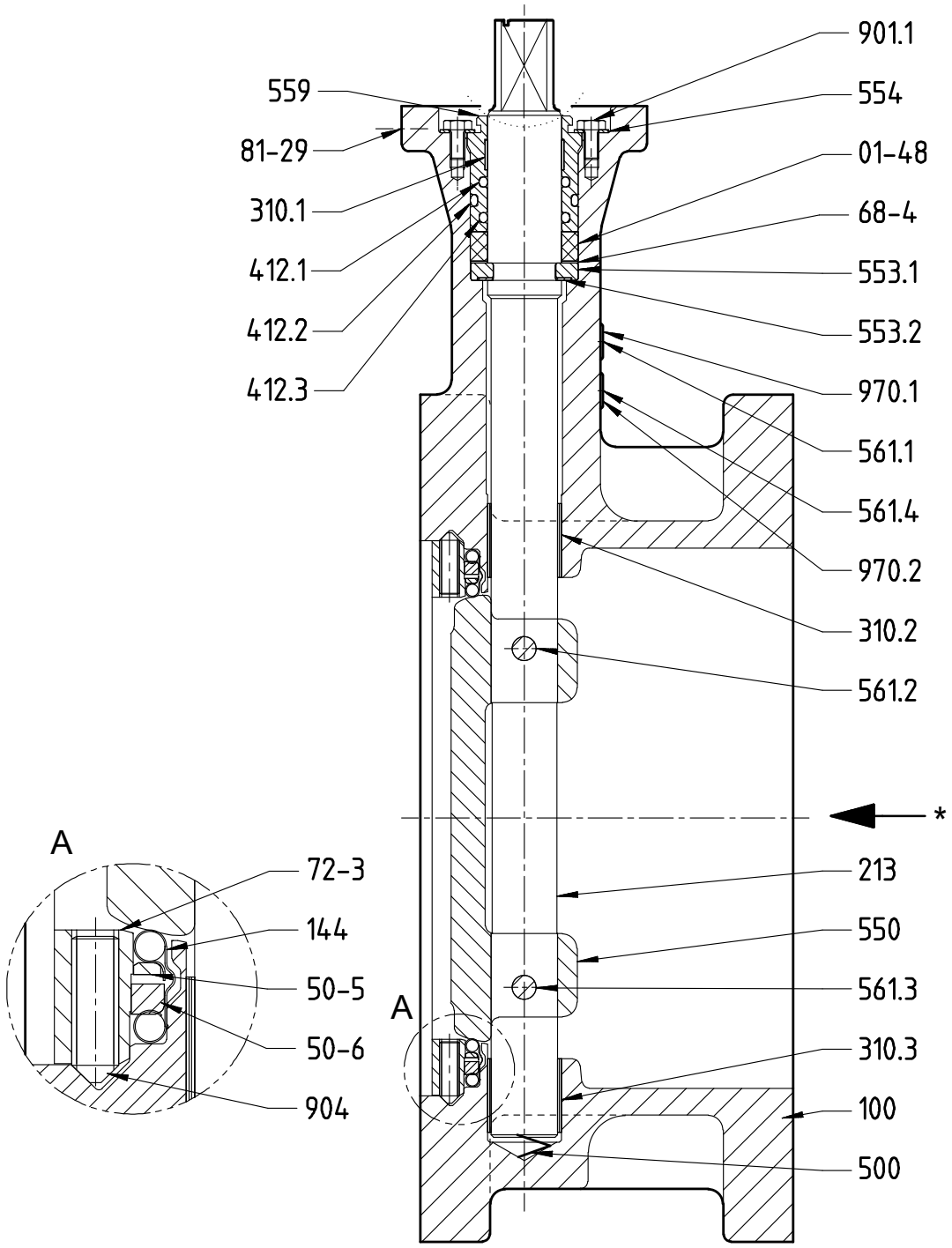

Fig. 8: Sectional drawing of TRIODIS 150 MT T7 - DN 200-250 (8-10 inch)

* Preferred flow direction

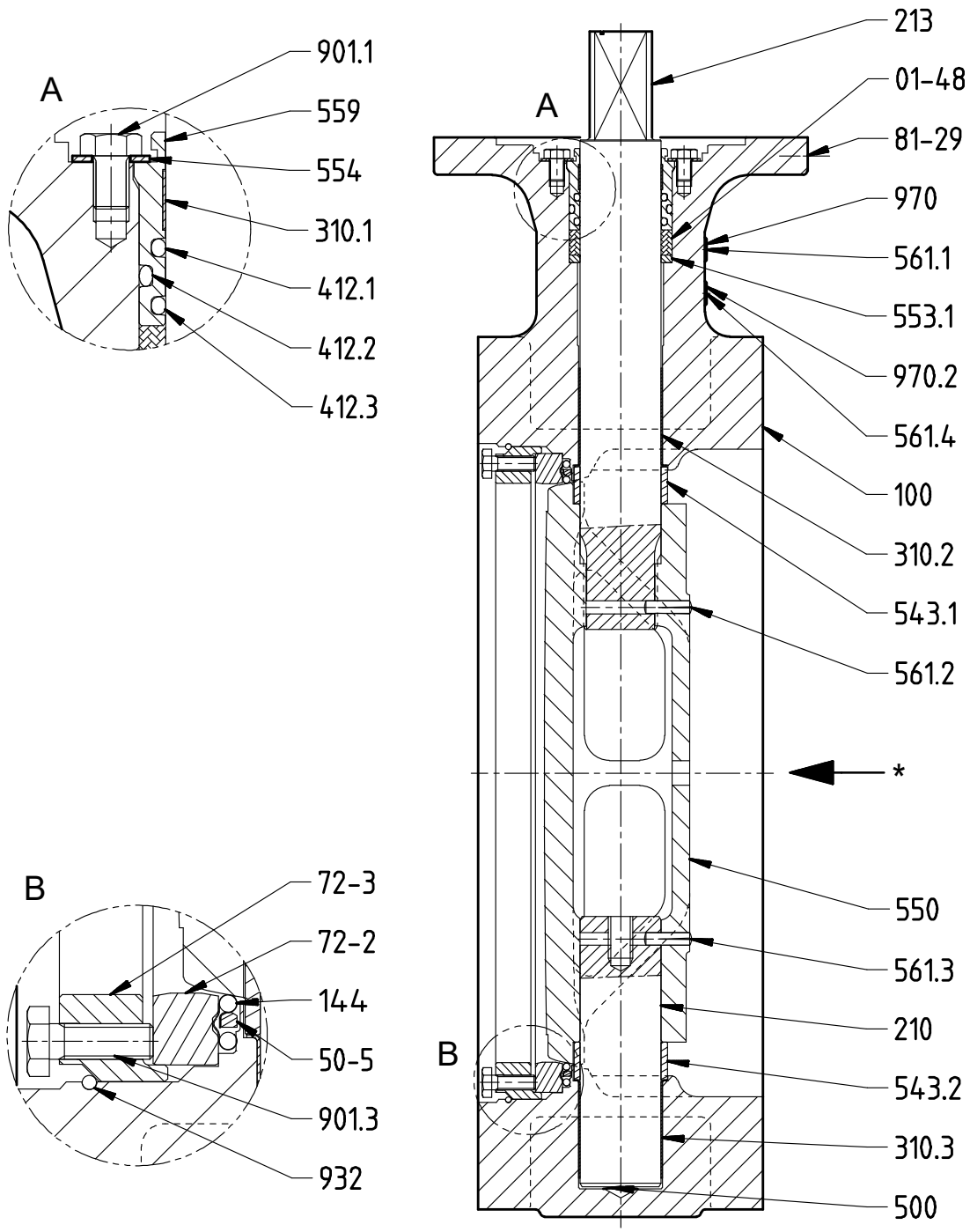

Fig. 9: Sectional drawing of TRIODIS 150 MT T7 - DN 300-600 (12-24 inch)

* Preferred flow direction

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Table 13: List of common parts

Part No.	Description	DN	Materials	KSB code
01-48[7)]	Fire-safe packing	50-600	Graphite, expanded	
50-5	Compression ring	200-600	Stainless steel	
50-6	Locking ring	50-250	Stainless steel	
68-4	Washer	50-250	Stainless steel	
72-2	Retaining flange	300-600	Stainless steel	
72-3	Retaining flange	50-600	Stainless steel	
81-29	Earth terminal	50-600	Steel	
100	Body	50-600	Steel ASTM A 216 Gr. WCC / 1.0619	1
			Stainless steel ASTM A 351 Gr. CF8M / 1.4408	6
144[8)]	Metal seat	50-600	Nickel	NI
			Stainless steel AISI 316L	IX
			Copper	CU
210	Shaft	300-600	Stainless steel ASTM A564 Gr. 630 / 1.4542	6e
			Stainless steel ASTM A479 Gr. 316L / 1.4404, PS limited to 10 bar	6
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213	Actuating shaft	50-600	Stainless steel ASTM A564 Gr. 630 / 1.4542	6e
			Stainless steel ASTM A479 Gr. 316L / 1.4404, PS limited to 10 bar	6
			Stainless steel 1.4462, PS limited to 16 bar	7e
310.1[7)]	Plain bearing	50-600	Stainless steel + PTFE	
310.2[9)]	Plain bearing	50-600	Stainless steel + PTFE	
310.3[9)]	Plain bearing	50-600	Stainless steel + PTFE	
412.1[7)]	O-ring	50-600	VITON®	
412.2[7)]	O-ring	50-600	VITON®	
412.3[7)]	O-ring	50-600	VITON®	
500	Anti-static ring	50-600	Stainless steel	
543.1	Spacer bush	300-600	Stainless steel	
543.2	Spacer bush	300-600	Stainless steel	
550	Valve disc	50-600	Stainless steel ASTM A 351 Gr. CF8M / 1.4408	6
			Stainless steel ASTM A 351 Gr. CF3M Mo > 2.75 for marine applications	6m
553.1	Thrust insert	50-600	Stainless steel	
553.3	Thrust insert	200-250	Stainless steel	
554	Washer	50-600	Stainless steel	
559	Seal retainer	50-600	Stainless steel	
561.1	Half round head grooved pin	50-600	Stainless steel	
561.2[9)]	Grooved pin	50-600	Stainless steel	
561.3[9)]	Grooved pin	50-600	Stainless steel	
561.4	Grooved pin	50-600	Stainless steel	
901.1	Hexagon head bolt	50-600	Stainless steel A4	
901.3[9)]	Hexagon head bolt	300-600	Stainless steel A4	
904[8)]	Grub screw	50-250	Stainless steel A4	
932	Internal circlip	300-600	Stainless steel 316 or equivalent	
970.1	Name plate	50-600	Stainless steel	
970.2	Name plate	50-600	Stainless steel	

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

Materials for TRIODIS 150 CRYO

Body with butt weld ends (BW)

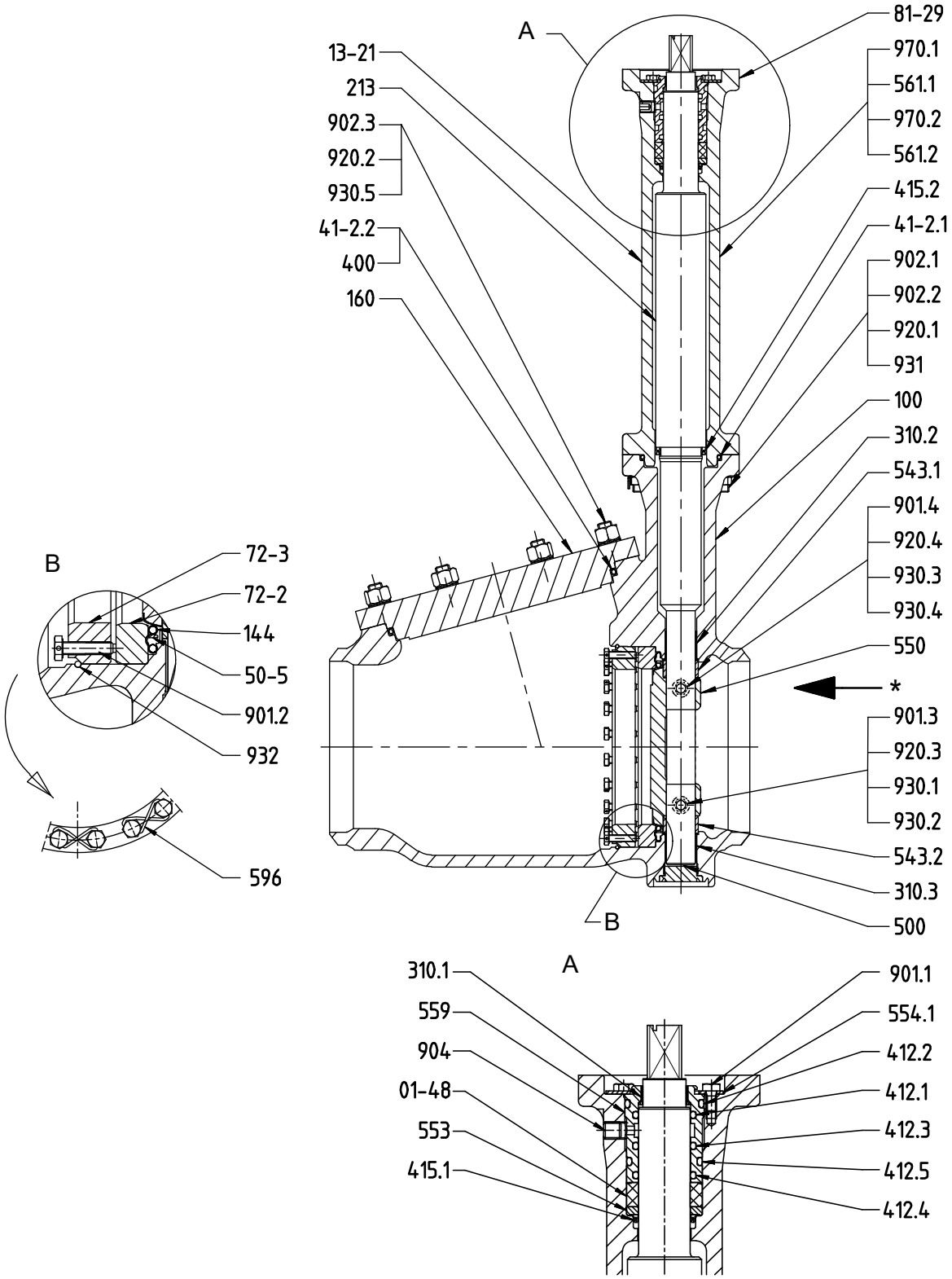

Fig. 10: Sectional drawing of TRIODIS 150 CRYO BWSE for DN 100-150 (4-6 inch)

* Preferred flow direction

8465.53/04-EN

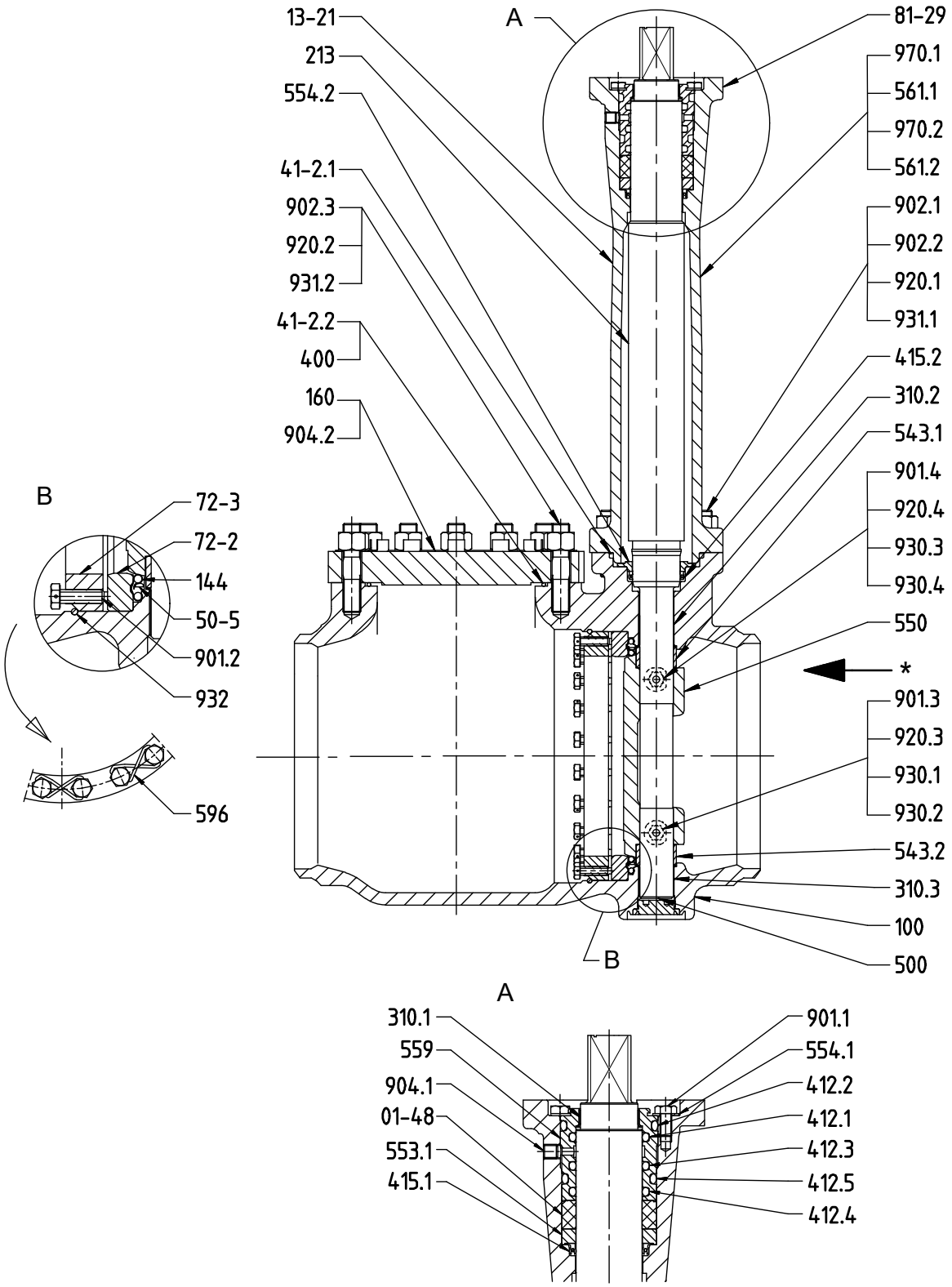

Fig. 11: Sectional drawing of TRIODIS 150 CRYO BWSE - DN 200-250 (8-10 inch)

* Preferred flow direction

8465.53/04-EN

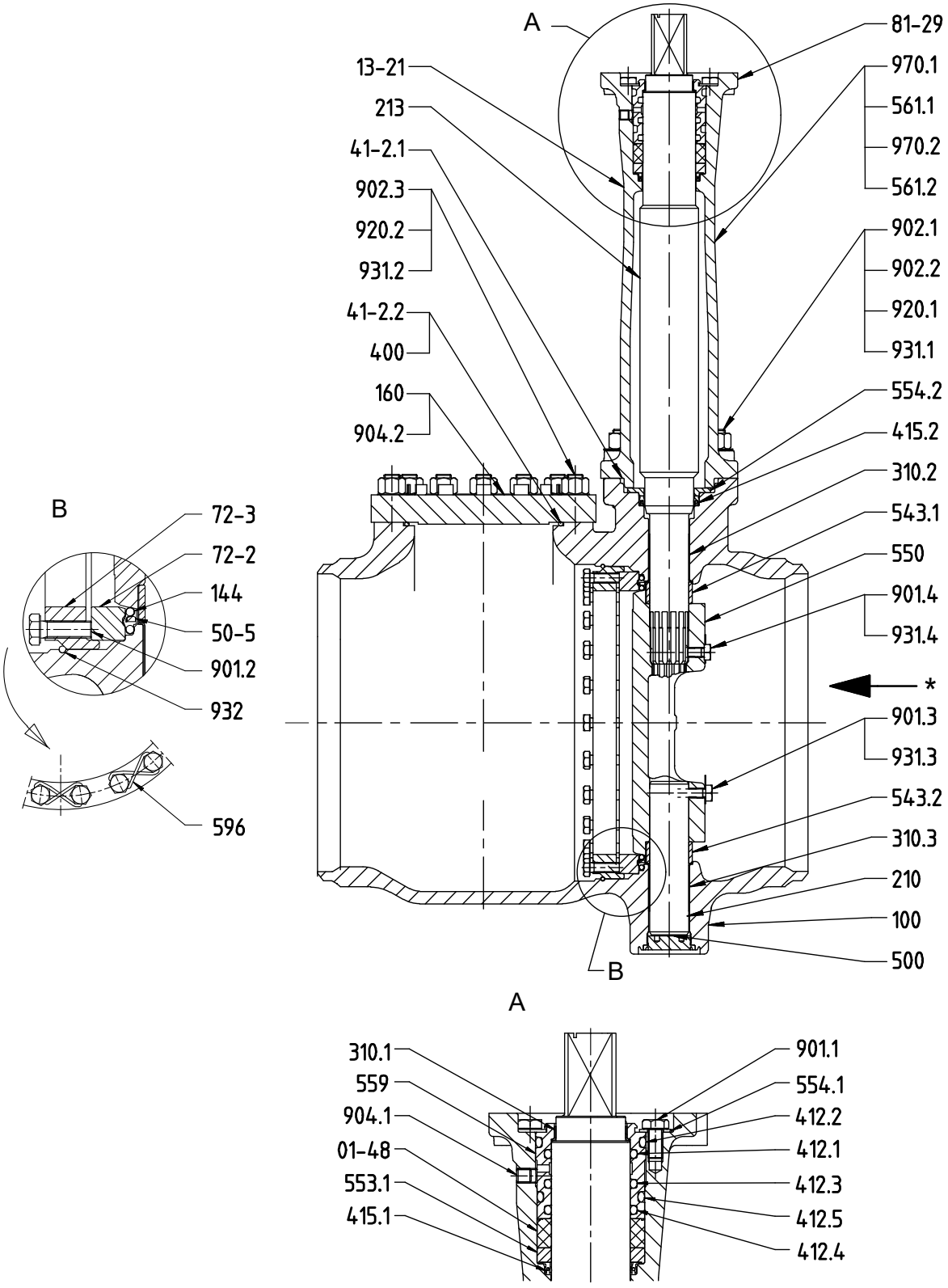

Fig. 12: Sectional drawing of TRIODIS 150 CRYO BWSE - DN 300-400 (12-16 inch)

* Preferred flow direction

8465.53/04-EN

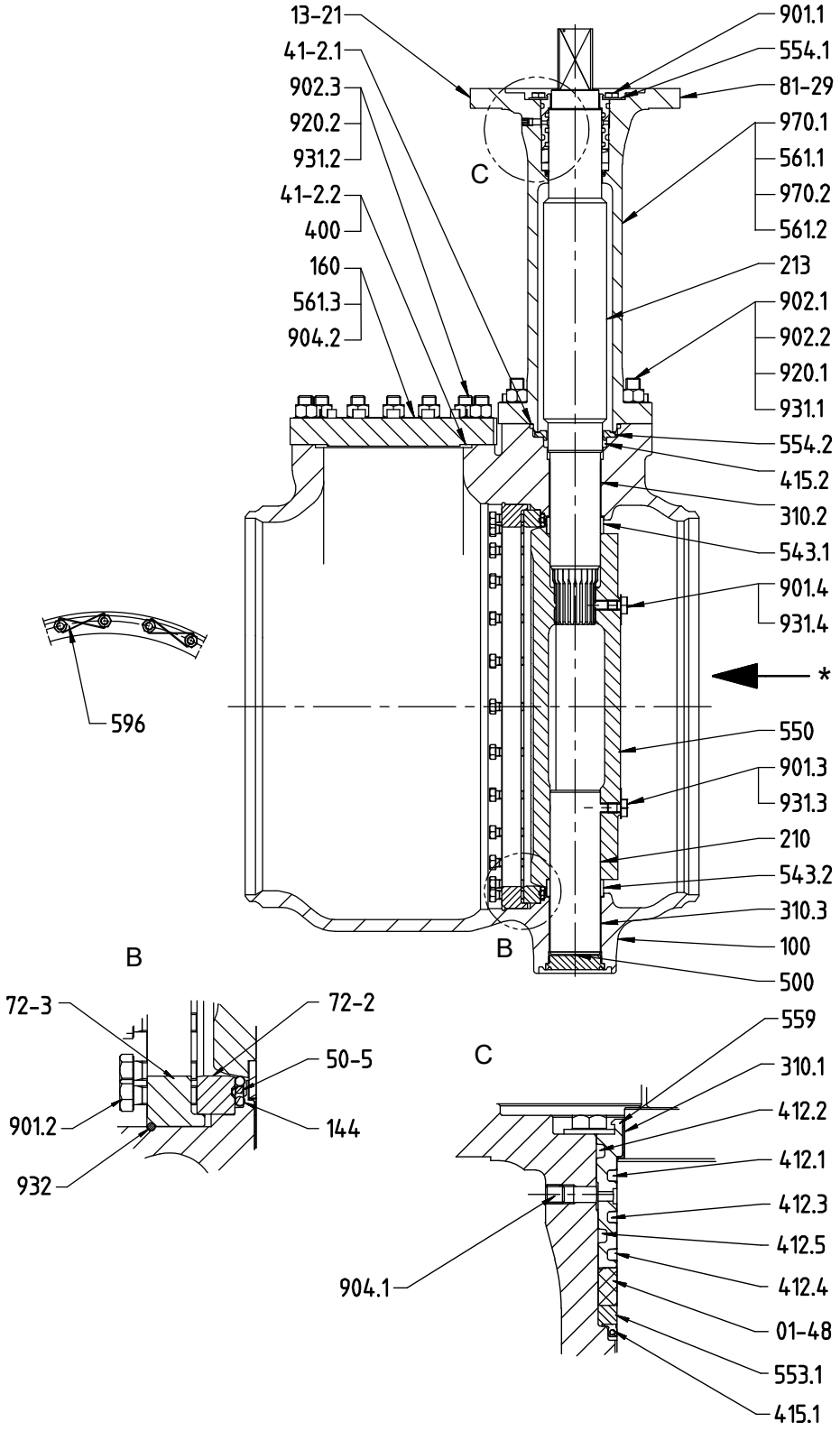

Fig. 13: Sectional drawing of TRIODIS 150 CRYO BWSE - DN 450-600 (18-24 inch)

* Preferred flow direction

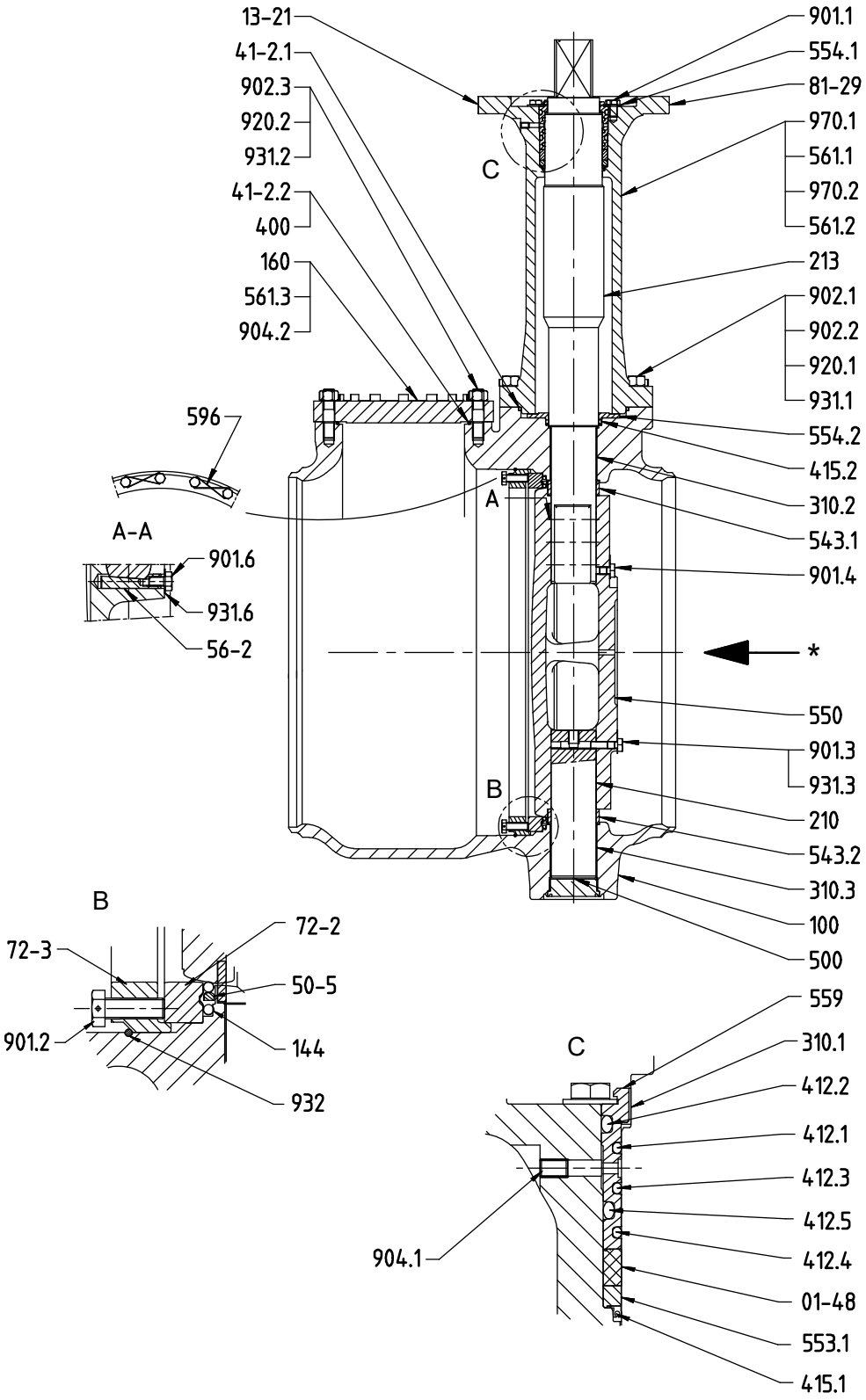

Fig. 14: Sectional drawing of TRIODIS 150 CRYO BWSE - DN 650-700 (26-28 inch)

* Preferred flow direction

8465.53/04-EN

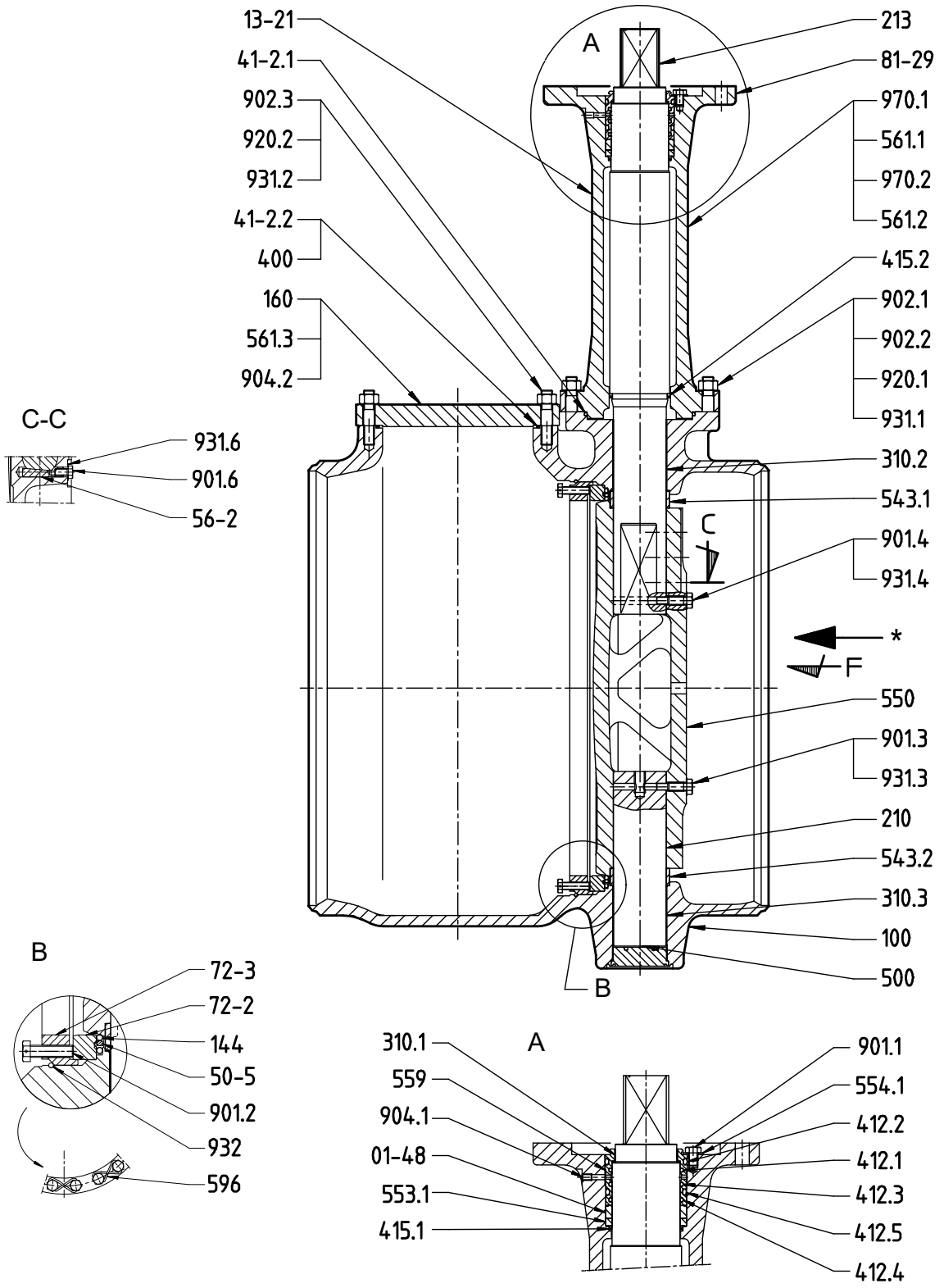

Fig. 15: Sectional drawing of TRIODIS 150 CRYO BWSE - DN 750-850 (30-34 inch)

* Preferred flow direction

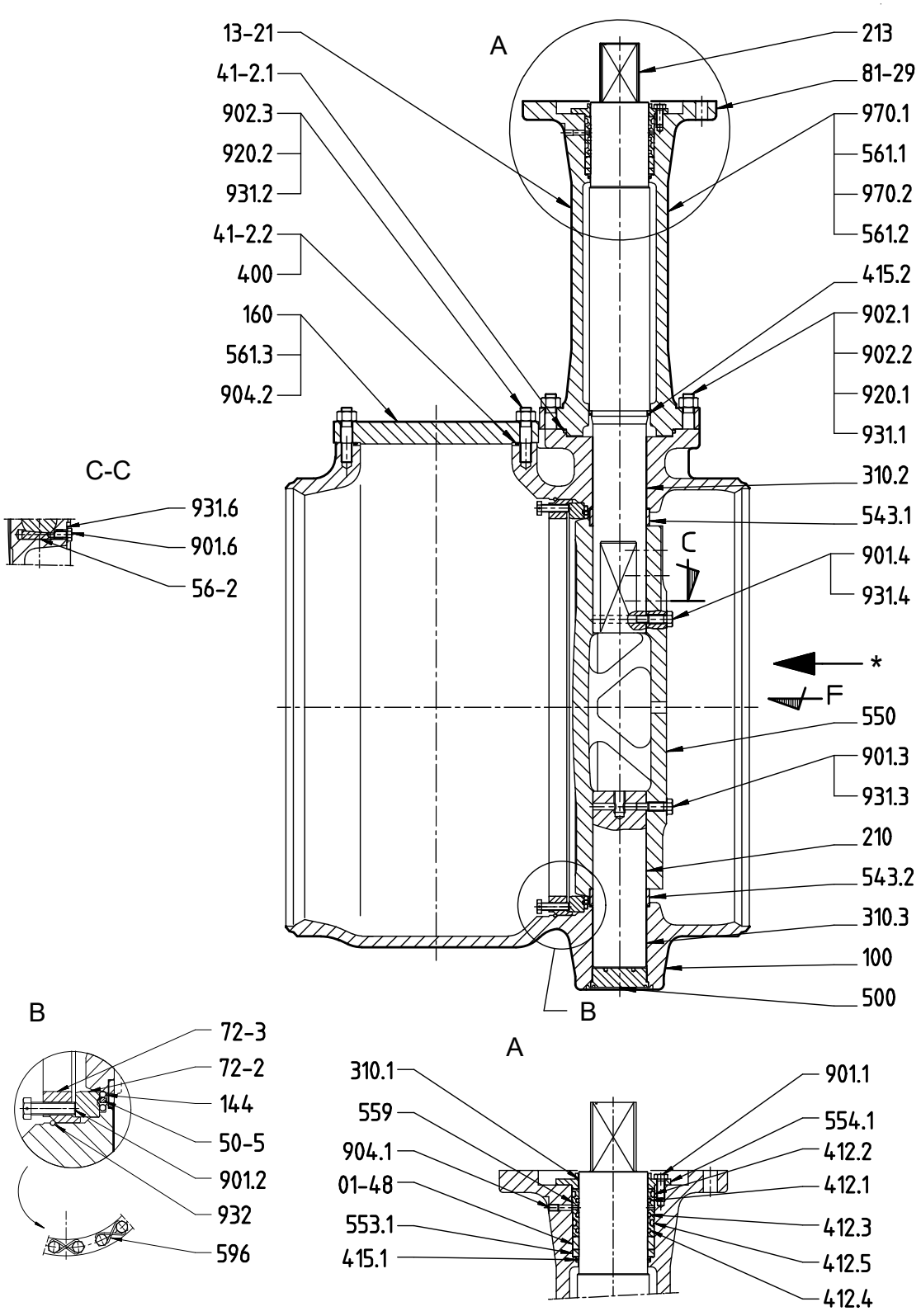

Fig. 16: Sectional drawing of TRIODIS 150 CRYO BWSE - DN 900-1100 (36-44 inch)

* Preferred flow direction

8465.53/04-EN

Table 14: List of common parts

Part No.	Description	DN	Materials	KSB code
01-48[10)]	Packing	100-1100	Graphite, expanded	
13-21	Extension	100-1100	Stainless steel ASTM A 351 Gr. CF8M / 1.4408	
41-2.1[11)]	Static sealing element	100-1100	Nickel	
41-2.2[12)]	Joint ring	100-1100	Copper	
50-5[12)]	Compression ring	100-1100	Stainless steel ASTM A638 Gr. 660	
56-2	Taper pin	650-1100	Stainless steel 1.4980	
72-2	Retaining flange	100-1100	Stainless steel Z3 CND 17-11-02 / 316L	
72-3	Retaining flange	100-1100	Stainless steel Z3 CND 17-11-02 / 316L	
81-29	Earth terminal	100-1100	Steel	
100	Body	100-1100	Stainless steel ASTM A 351 Gr. CF3M / 1.4409	6
144[12)]	Metal seat	100-1100	Stainless steel AISI 316L	IX
			Copper	Cu
160	Cover	100-1100	Stainless steel ASTM A240 Gr. 316L / 1.4404	
210	Shaft	300-1100	Stainless steel ASTM A479 Gr. 316L	6
213	Actuating shaft	100-1100	Stainless steel ASTM A479 Gr. 316L 10 bar max.	6
			Stainless steel ASTM A638 Gr. 660	6f
			Stainless steel ASTM A479 Gr. XM19	6r
310.1[10)]	Plain bearing	100-1100	Stainless steel + PTFE	
310.2	Plain bearing	100-1100	Stainless steel + PTFE	
310.3	Plain bearing	100-1100	Stainless steel + PTFE	
400[12)]	Gasket	100-1100	PTFE	
412.1[10)]	O-ring	100-1100	Nitrile HC	
412.2[10)]	O-ring	100-1100	Nitrile HC	
412.3[10)]	O-ring	100-1100	Nitrile HC	
412.4[10)]	O-ring	100-1100	Nitrile HC	
412.5[10)]	O-ring	100-1100	Nitrile HC	
415.1[10)]	Lip seal [13)]	100-1100	PTFE + Elgiloy	
415.2[11)]	Lip seal [13)]	100-1100	PTFE + Elgiloy	
500	Anti-static ring	100-1100	Stainless steel 1.4310	
543.1	Spacer bush	100-1100	Stainless steel Z3 CND 17-11-02 / 316L	
543.2	Spacer bush	100-1100	Stainless steel Z3 CND 17-11-02 / 316L	
550	Valve disc	100-1100	Stainless steel ASTM A 351 Gr. CF8M / 1.4408 with hard chrome plated sealing edge	6
			Stainless steel ASTM A 351 Gr. CF8M / 1.4408 with stellited sealing edge	6s
553.1	Thrust insert	100-1100	Stainless steel 1.4404	
554.1	Washer	100-1100	Stainless steel 1.4404	
554.2	Washer	200-250	Stainless steel 1.4404	
559	Seal retainer	100-1100	Stainless steel Z3 CND 17-11-02 / 316L	
561.1	Half round head grooved pin	100-1100	Stainless steel	
561.2	Grooved pin	100-1100	Stainless steel	
561.3	Grooved pin	450-1100	Stainless steel	
596[12)]	Wire	100-1100	Stainless steel 1.4404	
901.1	Hexagon head bolt	100-1100	Stainless steel A4	
901.2	Hexagon head bolt	100-1100	Stainless steel A4	
901.3	Hexagon head bolt	100-1100	Stainless steel 1.4980	
901.4	Hexagon head bolt	100-1100	Stainless steel A4	
901.6	Hexagon head bolt	650-1100	Stainless steel A4	
902.1	Stud	100-1100	Stainless steel ASTM A320 Gr. B8M Cl. 2	
902.2	Stud	100-1100	Stainless steel ASTM A320 Gr. B8M Cl. 2	
902.3	Stud	100-1100	Stainless steel ASTM A320 Gr. B8M Cl. 2	
904	Grub screw	100-150	Stainless steel A4	

10 Part from shaft seal spare parts kit
11 Part from extension spare parts kit
12 Part from cover spare parts kit
13 Standard for marine applications / optional for other applications

Part No.	Description	DN	Materials	KSB code
904.1	Grub screw	200-1100	Stainless steel A4	
904.2	Grub screw	200-1100	Stainless steel A4	
920.1	Nut	100-1100	Stainless steel A4	
920.2	Hexagon nut	100-1100	Stainless steel A4	
920.3	Hexagon nut	100-250	Stainless steel A4	
920.4	Hexagon nut	100-250	Stainless steel A4	
930.1	Lock washer	100-250	Stainless steel 1.4404	
930.2	Lock washer	100-250	Stainless steel 1.4404	
930.3	Lock washer	100-250	Stainless steel 1.4404	
930.4	Lock washer	100-250	Stainless steel 1.4404	
930.5	Lock washer	100-150	Stainless steel 1.4404	
931	Lock washer	100-150	Stainless steel AISI 316L	
931.1[11)]	Lock washer	200-1100	Stainless steel AISI 316L	
931.2[12)]	Lock washer	200-1100	Stainless steel 1.4404	
931.3	Lock washer	300-1100	Stainless steel 1.4404	
931.4	Lock washer	300-1100	Stainless steel 1.4404	
931.6	Lock washer	650-1100	Stainless steel 1.4404	
932	Internal circlip	100-1100	Stainless steel 316L	
970.1	Name plate	100-1100	Stainless steel	
970.2	Name plate	100-1100	Stainless steel	

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Flanged body (T7)

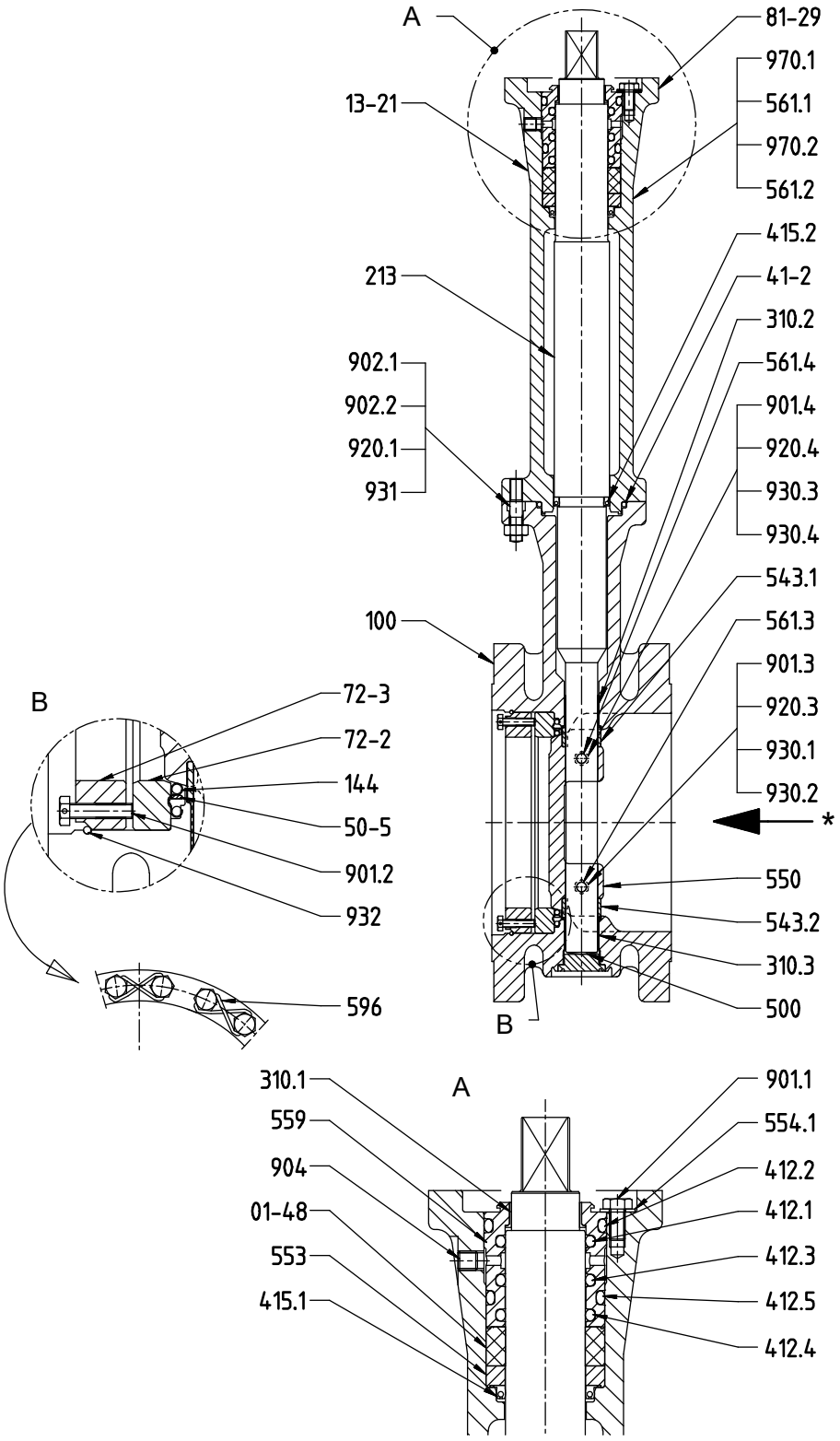

Fig. 17: Sectional drawing of TRIODIS 150 CRYO T7 - DN 80-150 (3-6 inch)

* Preferred flow direction

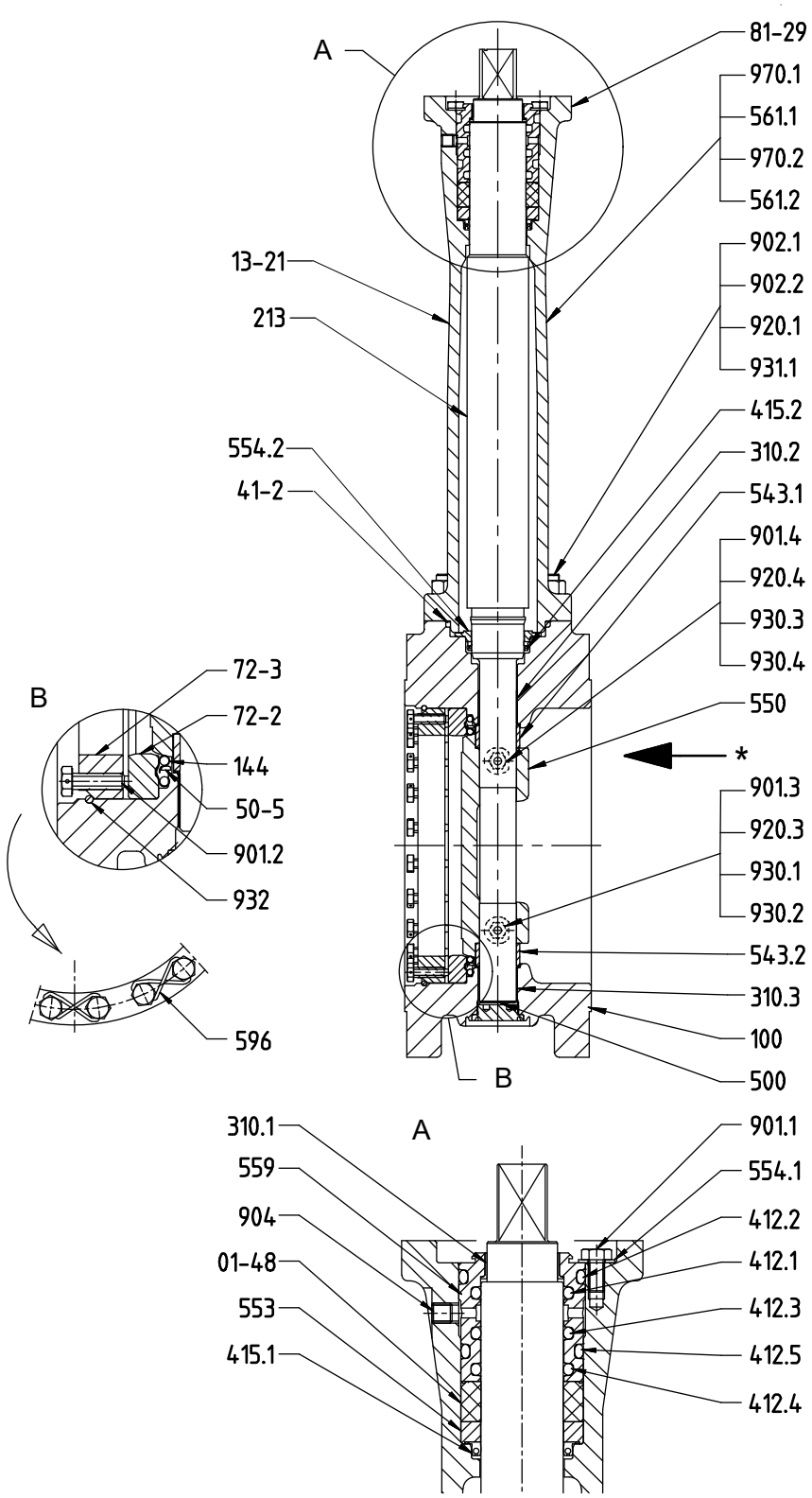

Fig. 18: Sectional drawing of TRIODIS 150 CRYO T7 - DN 200-250 (8-10 inch)

* Preferred flow direction

8465.53/04-EN

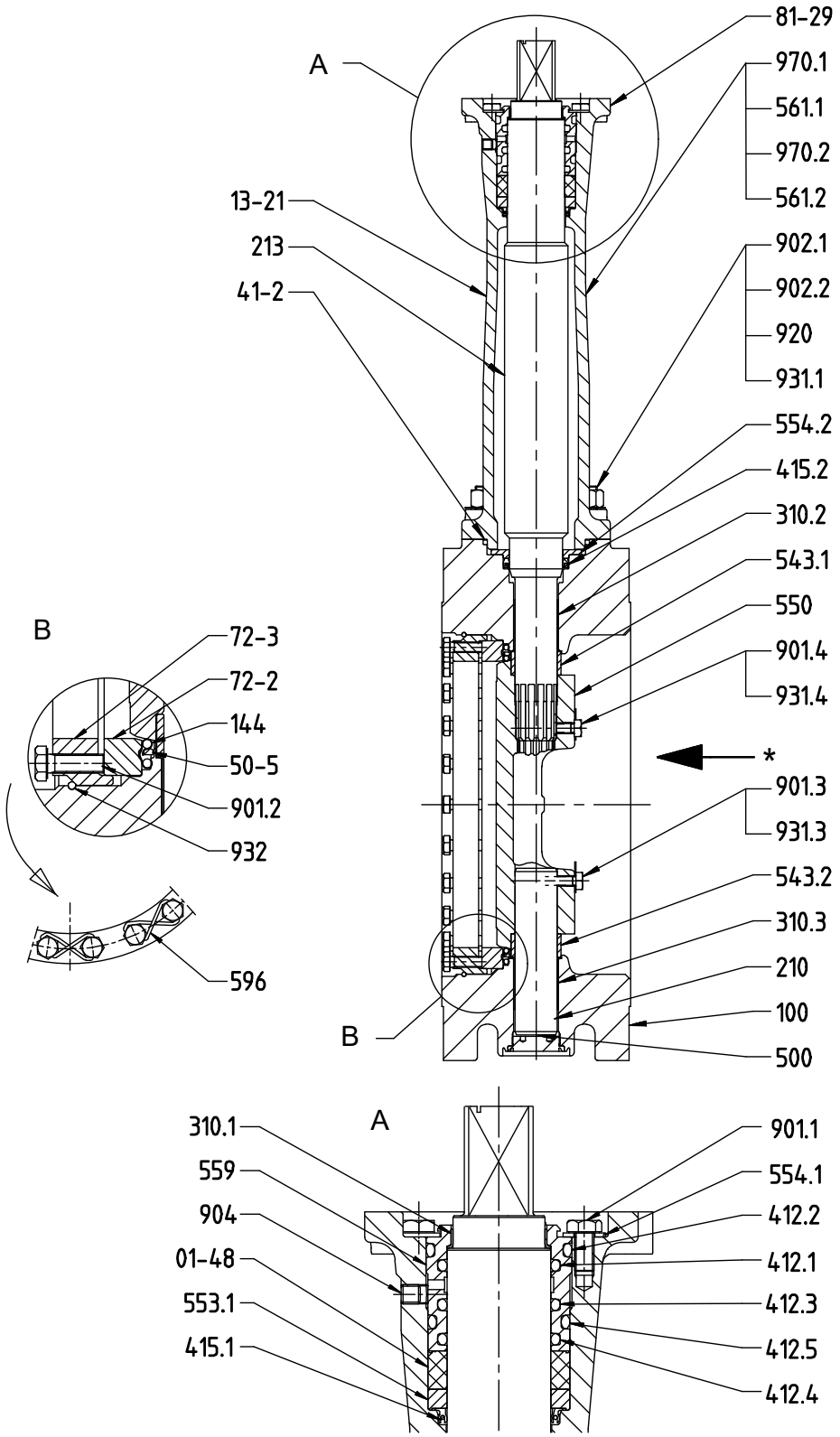

Fig. 19: Sectional drawing of TRIODIS 150 CRYO T7 - DN 300-400 (12-16 inch)

* Preferred flow direction

8465.53/04-EN

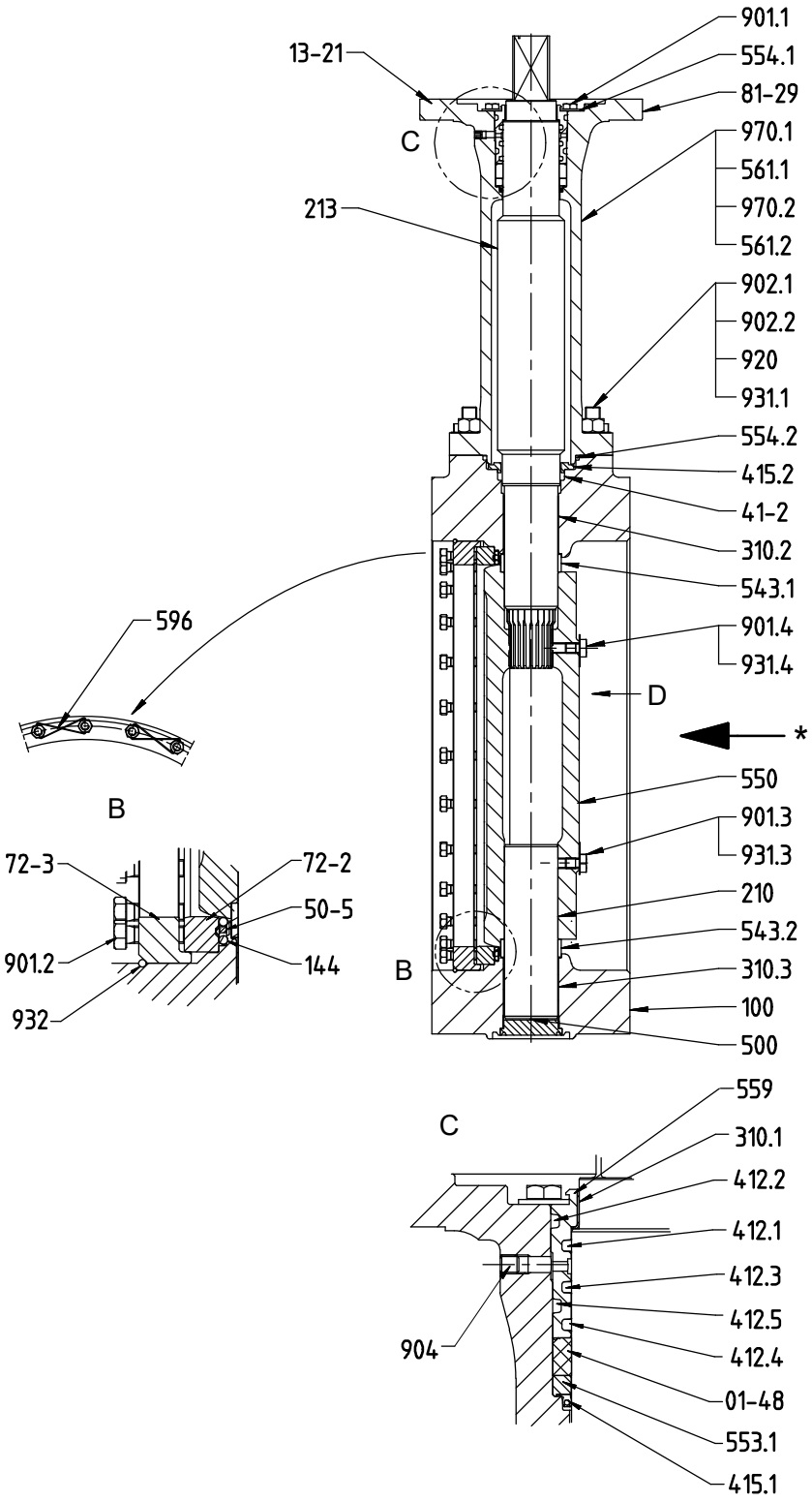

Fig. 20: Sectional drawing of TRIODIS 150 CRYO T7 - DN 450-600 (18-24 inch)

* Preferred flow direction

8465.53/04-EN

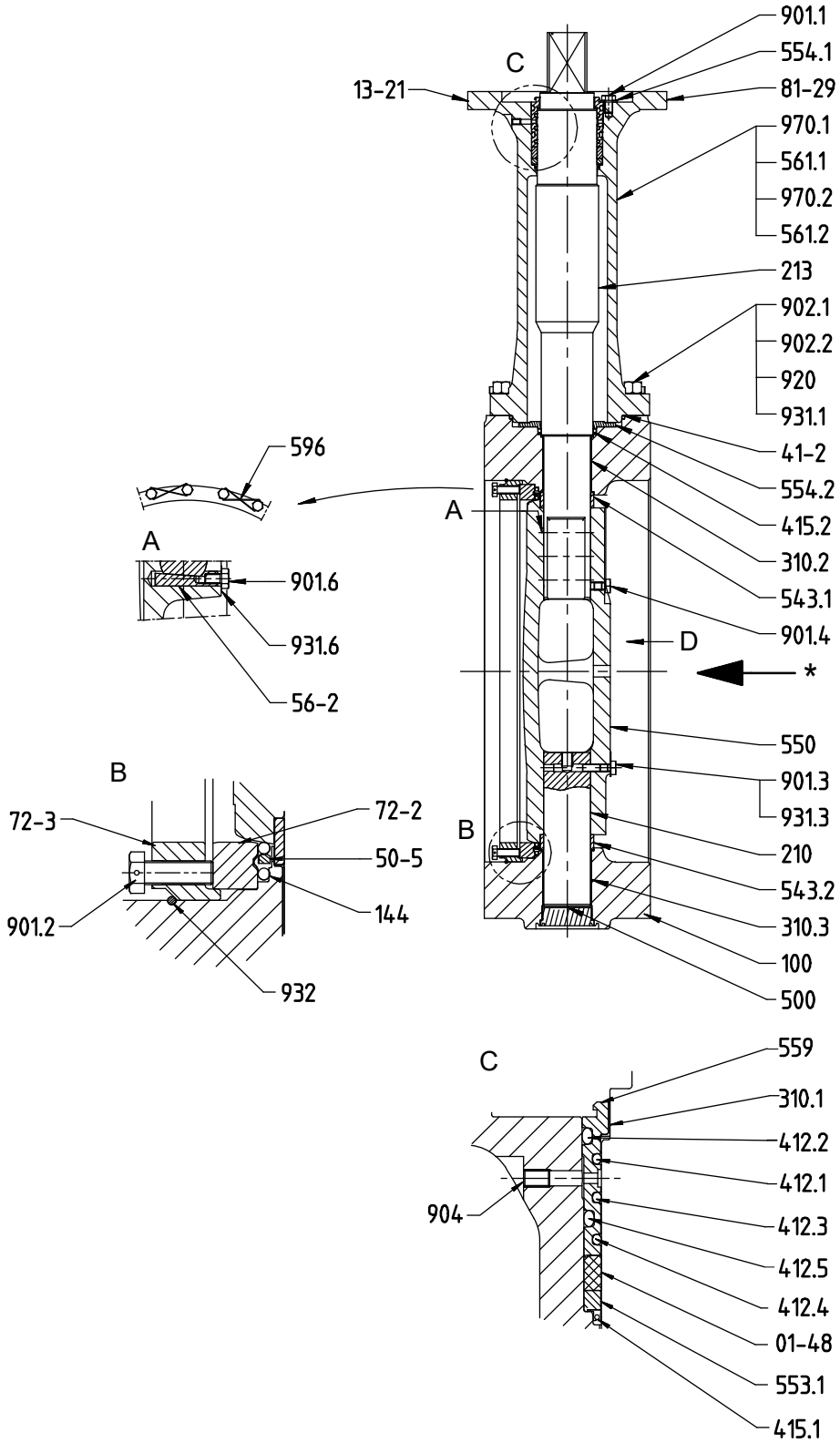

Fig. 21: Sectional drawing of TRIODIS 150 CRYO T7 - DN 650-700 (26-28 inch)

* Preferred flow direction

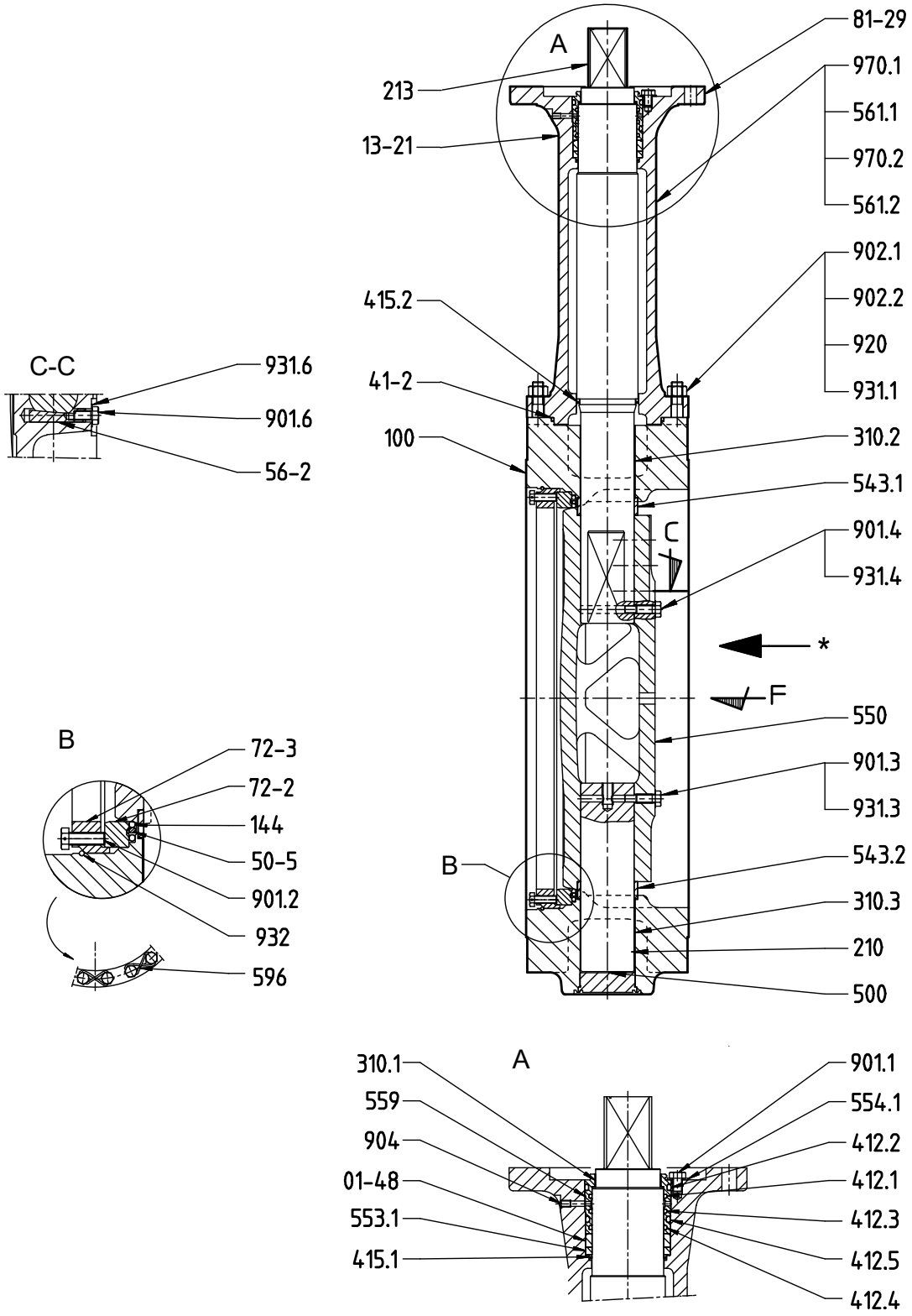

Fig. 22: Sectional drawing of TRIODIS 150 CRYO T7 - DN 750-850 (30-34 inch)

* Preferred flow direction

8465.53/04-EN

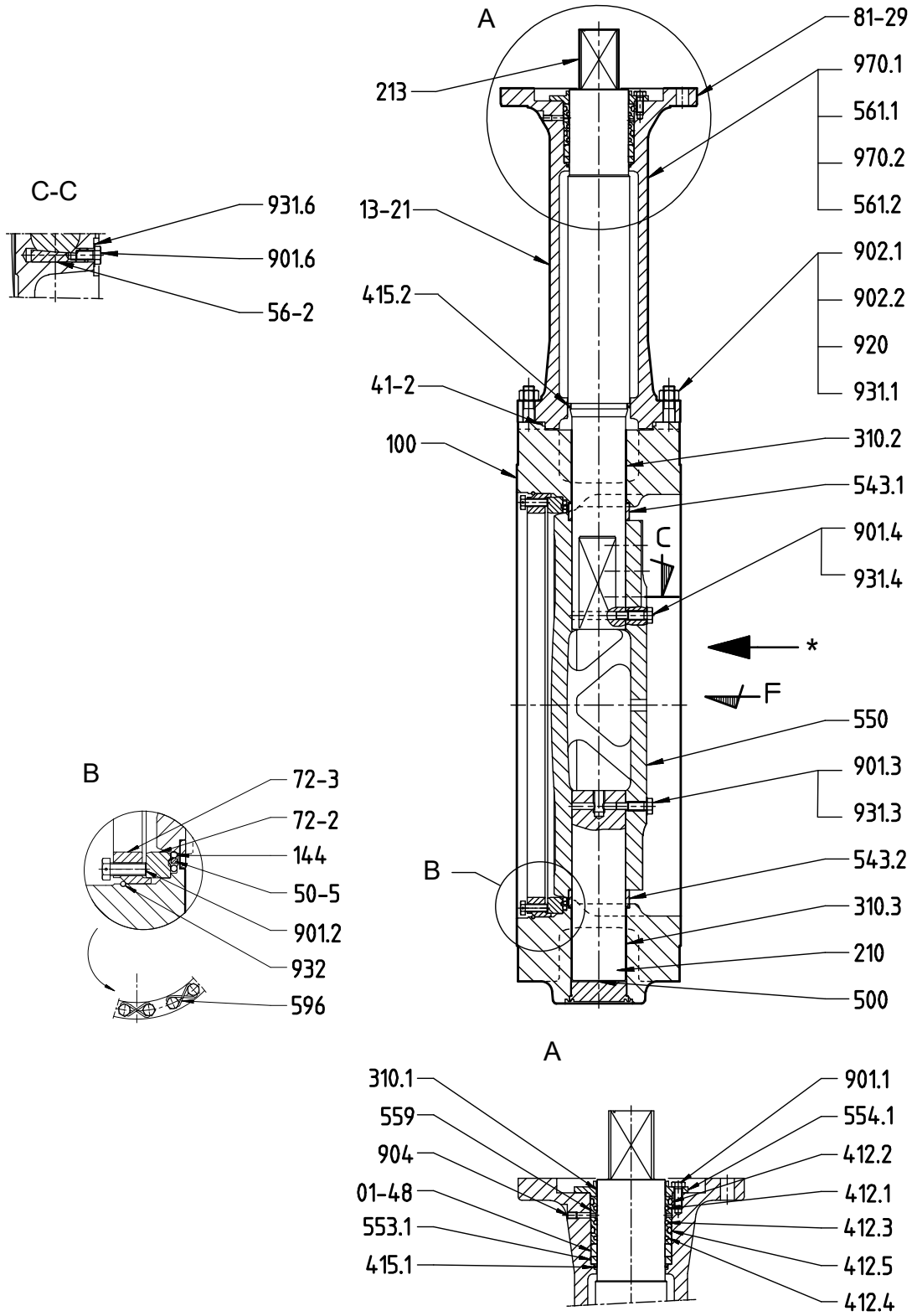

Fig. 23: Sectional drawing of TRIODIS 150 CRYO T7 - DN 900-1200 (36-48 inch)

* Preferred flow direction

8465.53/04-EN

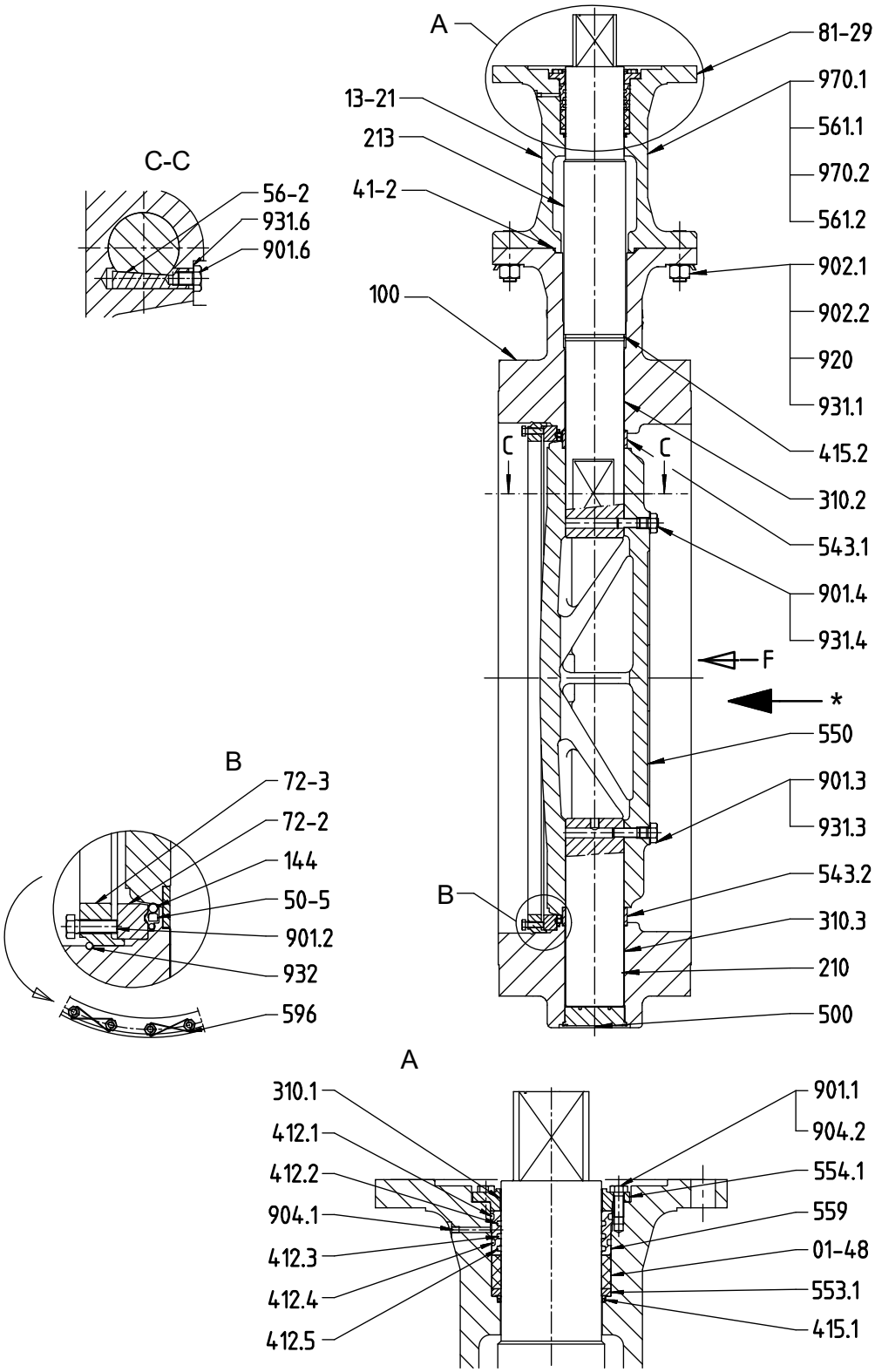

Fig. 24: Sectional drawing of TRIODIS 150 CRYO T7 - DN 1400-1450 (56-58 inch)

* Preferred flow direction

8465.53/04-EN

Table 15: List of common parts

Part No.	Description	DN	Materials	KSB code
01-48[14)]	Packing	80-1450	Graphite, expanded	
13-21	Extension	80-1450	Stainless steel ASTM A 351 Gr. CF8M / 1.4408	
41-2[15)]	Static sealing element	80-1450	Nickel	
50-5[16)]	Compression ring	80-1450	Stainless steel ASTM A638 Gr. 660	
56-2	Taper pin	650-1450	Stainless steel 1.4980	
72-2	Retaining flange	80-1450	Stainless steel Z3 CND 17-11-02 / 316L	
72-3	Retaining flange	80-1450	Stainless steel Z3 CND 17-11-02 / 316L	
81-29	Earth terminal	80-1450	Steel	
100	Body	80-1450	Stainless steel ASTM A 351 Gr. CF3M / 1.4409	6
144[16)]	Metal seat	80-1450	Stainless steel AISI 316L	IX
			Copper	Cu
210	Shaft	300-1450	Stainless steel ASTM A479 Gr. 316L	6
213	Actuating shaft	80-1450	Stainless steel ASTM A479 Gr. 316L 10 bar max.	6
			Stainless steel ASTM A638 Gr. 660	6f
			Stainless steel ASTM A479 Gr. XM19	6r
310.1[14)]	Plain bearing	80-1450	Stainless steel + PTFE	
310.2[17)]	Plain bearing	80-1450	Stainless steel + PTFE	
310.3[17)]	Plain bearing	80-1450	Stainless steel + PTFE	
412.1[14)]	O-ring	80-1450	Nitrile HC	
412.2[14)]	O-ring	80-1450	Nitrile HC	
412.3[14)]	O-ring	80-1450	Nitrile HC	
412.4[14)]	O-ring	80-1450	Nitrile HC	
412.5[14)]	O-ring	80-1450	Nitrile HC	
415.1[14)]	Lip seal [18)]	80-1450	PTFE + Elgiloy	
415.2[15)]	Lip seal [18)]	80-1450	PTFE + Elgiloy	
500	Anti-static ring	80-1450	Stainless steel 1.4310	
543.1	Spacer bush	80-1450	Stainless steel Z3 CND 17-11-02 / 316L	
543.2	Spacer bush	80-1450	Stainless steel Z3 CND 17-11-02 / 316L	
550	Valve disc	80-1450	Stainless steel ASTM A 351 Gr. CF8M / 1.4408 with hard chrome plated sealing edge	6
			Stainless steel ASTM A 351 Gr. CF8M / 1.4408 with stellited sealing edge	6s
553.1	Thrust insert	80-1450	Stainless steel 1.4404	
554.1	Washer	80-1450	Stainless steel 1.4404	
554.2	Washer	200-700	Stainless steel 1.4404	
559	Seal retainer	80-1450	Stainless steel	
561.1	Half round head grooved pin	80-1450	Stainless steel	
561.2	Grooved pin	80-1450	Stainless steel	
561.3	Grooved pin	80-150	Stainless steel	
561.4	Grooved pin	80-150	Stainless steel	
596[16)]	Wire	80-1450	Stainless steel 1.4404	
901.1	Hexagon head bolt	80-1450	Stainless steel A4	
901.2	Hexagon head bolt	80-1450	Stainless steel A4	
901.3	Hexagon head bolt	80-1450	Stainless steel 1.4980	
901.4	Hexagon head bolt	80-1450	Stainless steel A4	
901.6	Hexagon head bolt	650-1450	Stainless steel A4	
902.1	Stud	80-1450	Stainless steel ASTM A320 Gr. B8M Cl. 2	
902.2	Stud	80-1450	Stainless steel ASTM A320 Gr. B8M Cl. 2	
904	Grub screw	80-1200	Stainless steel A4	
904.1	Grub screw	1400-1450	Stainless steel A4	
904.2	Grub screw	1400-1450	Stainless steel A4	

14 Part from shaft seal spare parts kit
15 Part from extension spare parts kit
16 Part from cover spare parts kit
17 Part from bearing spare parts kit
18 Standard for marine applications / optional for other applications

Part No.	Description	DN	Materials	KSB code
920	Nut	300-1450	Stainless steel A4	
920.1	Nut	80-250	Stainless steel A4	
920.2	Nut	80-250	Stainless steel A4	
920.4	Nut	80-250	Stainless steel A4	
930.1[15)17)]	Lock washer	80-250	Stainless steel 1.4404	
930.2[15)17)]	Lock washer	80-250	Stainless steel 1.4404	
930.3[15)17)]	Lock washer	80-250	Stainless steel 1.4404	
930.4[15)17)]	Lock washer	80-250	Stainless steel 1.4404	
931	Lock washer	80-150	Stainless steel AISI 316L	
931.1[15)17)]	Lock washer	200-1450	Stainless steel AISI 316L	
931.3	Lock washer	300-1450	Stainless steel 1.4404	
931.4	Lock washer	300-1450	Stainless steel 1.4404	
931.6	Lock washer	650-1450	Stainless steel 1.4404	
932	Internal circlip	80-1450	Stainless steel 316L	
970.1	Name plate	80-1450	Stainless steel	
970.2	Name plate	80-1450	Stainless steel	

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Dimensions and weights

Wafer-type body with flat faces – T1 (TRIODIS 150 MT)

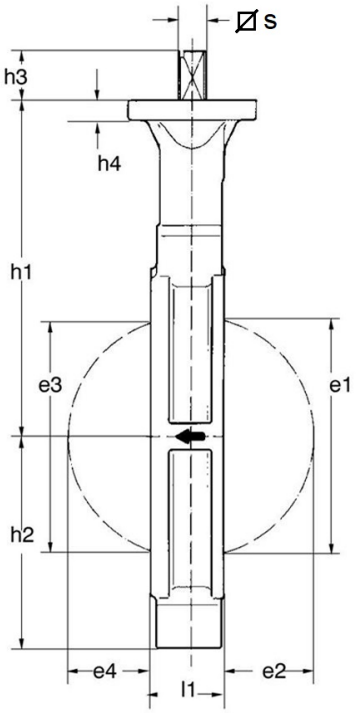

Fig. 25: Sectional drawing of TRIODIS 150 MT - T1

Table 16: Dimensions [mm] and weights [kg]

DN	NPS	Face-to-face length	h1	h2	Top flange to ISO 5211		Square shaft end		Valve disc open				
	[inch]	l1			No.	h4	⌀ s	h3	e1	e2	e3	e4	[kg]
50	2	43	175	54	F07	16	L14	20	36	9	-	-	5
65	2½	46	190	67	F07	16	L14	20	49	13	13	1	6
80	3	48	205	74	F07	16	L14	20	62	18	38	6	7
100	4	54	225	90	F07	16	L14	20	81	24	67	17	9,5
125	5	56	240	102	F07	16	L17	20	103	33	91	23	12
150	6	56	250	120	F10	18	L19	35	131	48	117	33	17
200	8	60	290	151	F10	18	L22	40	177	70	163	51	24
250	10	68	325	182	F12	20	L27	40	226	91	212	70	36
300	12	78	375	237	F14	22	L30	55	266	106	254	87	58
350	14	78	405	274	F14	22	L36	58	309	123	297	103	79
400	16	102	440	300	F16	26	L40	76,5	360	145	346	121	110
450	18	114	475	329	F16	26	L46	75	420	169	408	147	146
500	20	127	510	355	F25	30	L50	85	456	182	444	160	188
600	24	154	585	449	F25	30	L55	85	546	213	537	197	293

Table 17: Face-to-face length

The face-to-face lengths of TRIODIS 150 MT valves with wafer-type body with flat faces meet the requirements of EN 558-1, API 609 Table 2 Class 150 and ISO 5752-20. Exception:

- DN 350: ISO 5752-20 is replaced by ISO 5752-25

Full-lug body – T4 (TRIODIS 150 MT)

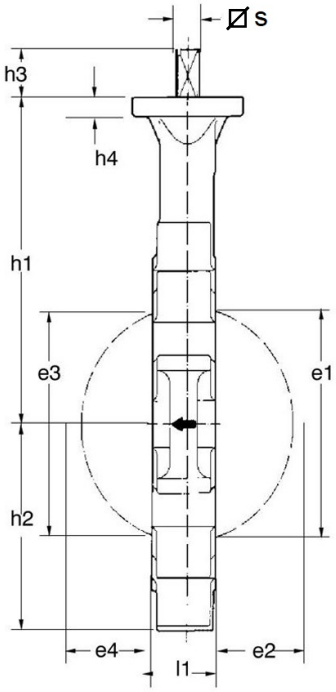

Fig. 26: Sectional drawing of TRIODIS 150 MT - T4

Table 18: Dimensions [mm] and weights [kg]

DN	NPS	Face-to-face length	h1	h2	Top flange to ISO 5211		Square shaft end		Valve disc open				
		l1			No.	h4	⌀ s	h3	e1	e2	e3	e4	[kg]
50	2	43	175	60	F07	16	L14	20	36	9	-	-	6,5
65	2½	46	190	67	F07	16	L14	20	49	13	13	1	7,5
65	2½	46	190	85	F07	16	L14	20	49	13	13	1	9
80	3	48	205	74	F07	16	L14	20	62	18	38	6	9
80	3	48	205	94	F07	16	L14	20	62	18	38	6	10
100	4	52	225	105	F07	16	L14	20	81	24	67	17	11,2
125	5	56	240	123	F07	16	L17	20	103	33	91	23	15,4
150	6	56	250	135	F10	18	L19	35	131	48	117	33	18,5
200	8	60	290	155	F10	18	L22	40	177	70	163	51	30
250	10	68	325	202	F12	20	L27	40	226	91	212	70	48
300	12	78	375	237	F14	22	L30	55	266	106	254	87	70
350	14	78	405	274	F14	22	L36	58	309	123	297	103	108
400	16	102	440	300	F16	26	L40	76,5	360	145	346	121	130
450	18	114	475	329	F16	26	L46	75	420	169	408	147	207
500	20	127	510	356	F25	30	L50	85	456	182	444	160	237
600	24	154	585	449	F25	30	L55	85	546	213	537	197	363

Table 19: Face-to-face length

The face-to-face lengths of TRIODIS 150 MT valves with full-lug body meet the requirements of EN 558-1, API 609 Table 2 Class 150 and ISO 5752-20. Exception:

- DN 350: ISO 5752-20 is replaced by ISO 5752-25

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Flanged body – T7 (TRIODIS 150 MT)

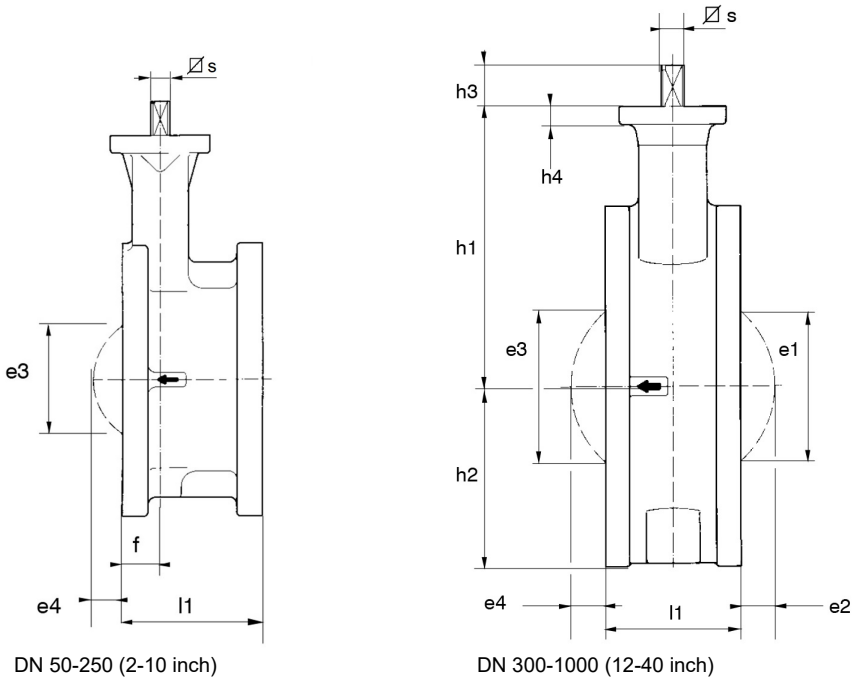

Fig. 27: Sectional drawing of TRIODIS 150 MT - T7

Table 20: Dimensions [mm] and weights [kg]

DN	NPS	Face-to-face length	f	h1	h2	Top flange to ISO 5211		Square shaft end		Valve disc open				
		l1				No.	h4	⌀s	h3	e1	e2	e3	e4	[kg]
50	2	108	28,5	175	76	F07	16	L14	20	-	-	-	-	10
65	2½	112	33,5	190	89	F07	16	L14	20	-	-	-	-	13
80	3	114	33,5	205	95	F07	16	L14	20	-	-	18	2	16
100	4	127	36,0	225	115	F07	16	L14	20	-	-	52	8	23,5
125	5	140	38,0	240	127	F07	16	L17	20	-	-	81	17	27,5
150	6	140	38,0	250	140	F10	18	L19	35	-	-	112	29	32
200	8	152	42,5	290	172	F10	18	L22	40	-	-	158	46	52
250	10	165	46,5	325	203	F12	20	L27	40	27	1	208	65	73
300	12	178	-	375	242	F14	22	L30	55	214	52	197	42	115
350	14	190	-	405	274	F14	22	L36	58	263	70	245	58	147
400	16	216	-	440	300	F16	26	L40	76,5	306	82	289	70	207
450	18	222	-	475	329	F16	26	L46	75	376	111	359	97	243
500	20	229	-	510	356	F25	30	L50	85	417	128	399	112	335
600	24	267	-	585	449	F25	30	L55	85	505	157	487	141	463

Table 21: Face-to-face length

The face-to-face lengths of TRIODIS 150 MT valves with flanged body meet the requirements of EN 558-1 and ISO 5752-13.

Body with butt weld ends – BW (TRIODIS 150 CRYO)

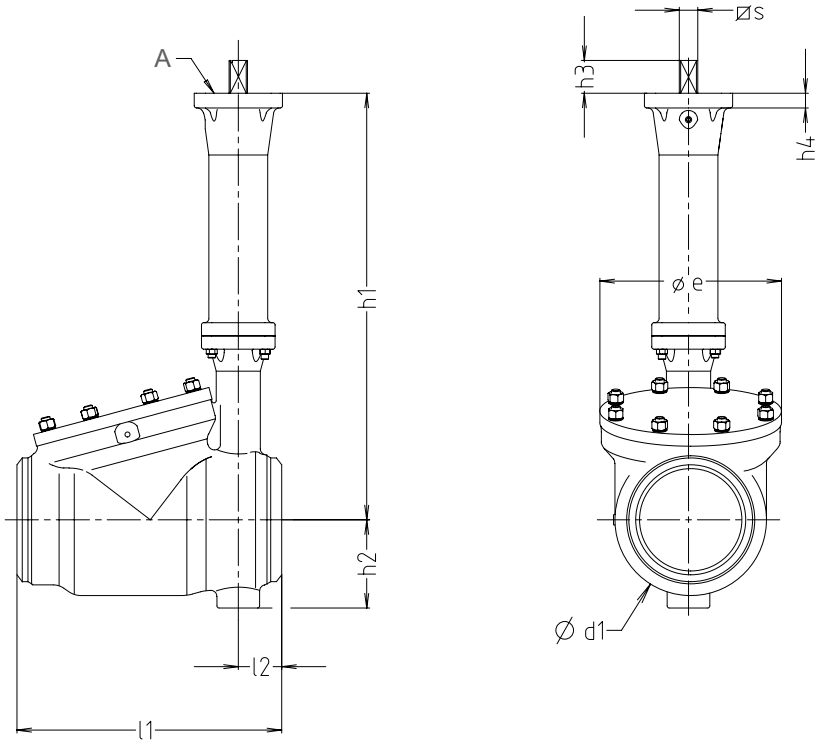

Fig. 28: Sectional drawings of TRIODIS 150 CRYO - BW - DN 100-150 (4-6 inch)
A: Top flange to ISO 5211

Table 22: Dimensions [mm] and weights [kg] for DN 100-150

DN	NPS	d1	Face-to-face length	h1	h2	l2	e	Top flange to ISO 5211		Square shaft end ⌀ s			h3	
	[inch]		l1					No.	h4	6[(1)]	6r	6f		[kg]
100	4	160	300	530	90	57	194	F10	18	L14	L14	L14	24	35
125	5	160	300	530	90	52	194	F10	18	L14	L14	L14	24	38
150	6	206	360	580	120	60	247	F10	18	L19	L19	L19	29	60

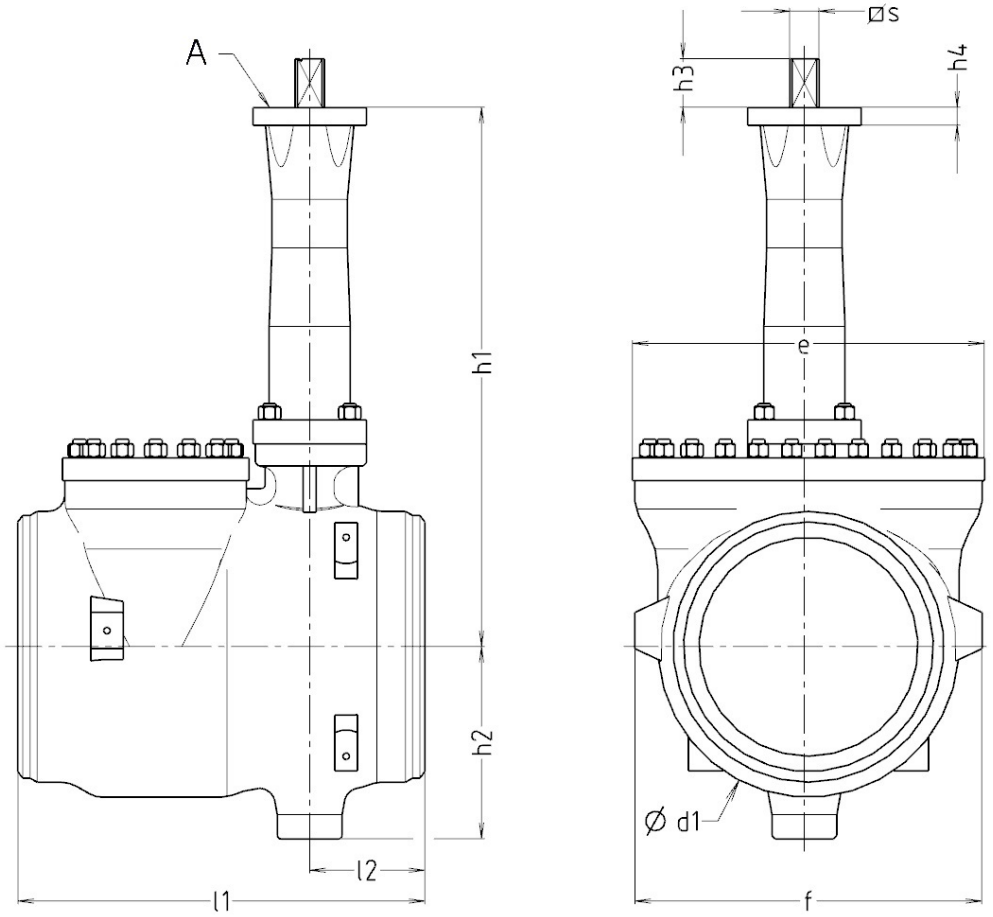

Fig. 29: Sectional drawings of TRIODIS 150 CRYO - BW - DN 200-1050 (8-42 inch)
A: Top flange to ISO 5211

Table 23: Dimensions [mm] and weights [kg] for DN 200-1050

DN	NPS	d1	Face-to-face length	h1	h2	l2	e	f	Top flange to ISO 5211		Square shaft end ⌀ s			h3	
			l1						No.	h4	6[(1)]	6r	6f		[kg]
200	8	268	419	610	147	94	334	324	F12	18	L27	L27	L27	38	101
250	10	316	455	640	174	119	382	372	F12	18	L27	L27	L27	45	128
300	12	372	502	665	237	142	434	428	F14	22	L36	L36	L36	60	162
350	14	430	530	700	254	149	491	498	F14	22	L36	L36	L36	60	198
400	16	472	550	750	300	159	538	544	F16	26	L46	L46	L46	75,5	250
450	18	547	600	800	333	170	609	618	F16	26	L46	L46	L46	75,5	367
500	20	592	620	850	356	180	672	670	F25	28	L55	L55	L55	85	468
550	22	644	650	885	382	178	706	720	F25	28	L55	L55	L55	85	554
600	24	696	670	975	449	200	776	796	F25	28	L55	L55	L55	85	670
650	26	755	710	1020	454	187	826	854	F30	32	L75	L75	L75	104	694
700	28	800	795	1050	472	213	956	900	F30	32	L75	L75	L75	104	885
750	30	867	795	1100	512	213	956	964	F30	32	L75	L75	L75	104	1028
800	32	867	840	1100	512	235	956	980	F30	32	L75	L75	L75	104	1319
900	36	1013	900	1175	625	252	1064	1156	F35	35	L80	L80	L80	108	1540
950	38	1013	900	1175	625	252	1064	1156	F35	35	L80	L80	L80	108	1600
1000	40	1132	1150	1330	716	325	1210	1310	F40	44	L110	L110	L110	130	2210
1050	42	1179	1250	1355	728	370	1256	1360	F40	44	L110	L110	L110	130	2580

[(1)] Operating pressure limit applies. Contact KSB.

Flanged body - T7 (TRIODIS 150 CRYO)

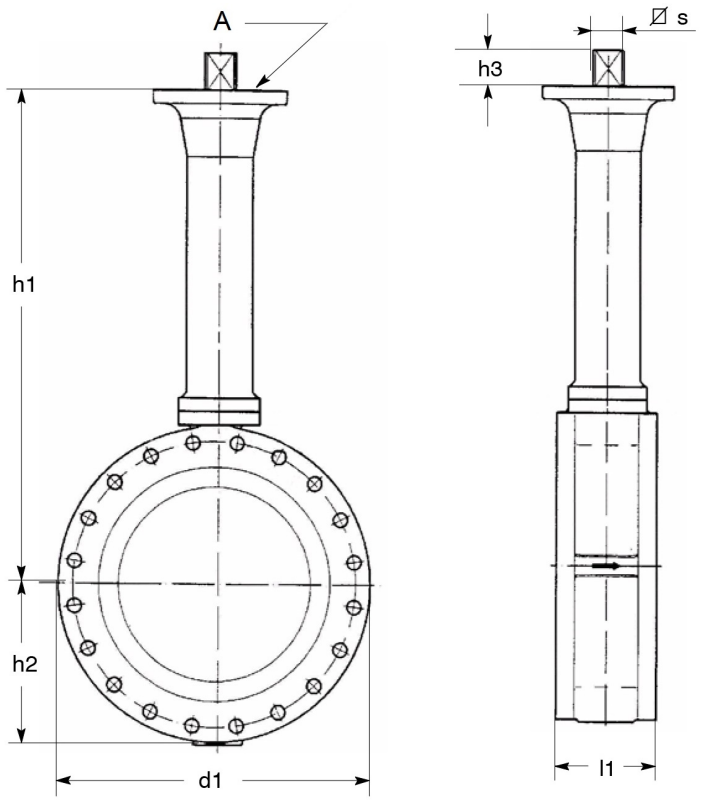

Fig. 30: Sectional drawings of TRIODIS 150 CRYO - T7

A: Top flange to ISO 5211

Table 24: Dimensions [mm] and weights [kg]

DN	NPS	d1 (2)	Face-to-face length	h1	h2	Top flange to ISO 5211		Square shaft end Ø s		h3	
			l1			No.	h4	6(1)	6f / 6r		[kg]
80	3	191	114	510	96	F10	18	L14	L14	24	20
100	4	229	127	530	115	F10	18	L14	L14	24	30
150	6	279	140	580	140	F10	20	L19	L19	29	35
200	8	343	152	610	172	F12	18	L27	L27	38	51
250	10	406	165	640	203	F12	18	L27	L27	45	95
300	12	483	178	665	242	F14	22	L36	L36	60	133
350	14	533	190	700	267	F14	22	L36	L36	60	147
400	16	597	216	750	300	F16	26	L46	L46	75,5	218
450	18	635	222	800	333	F16	26	L46	L46	75,5	242
500	20	699	229	850	356	F25	28	L55	L55	85	457
550	22	750	267	885	382	F25	28	L55	L55	85	472
600	24	826	267	975	449	F25	28	L55	L55	85	520
650	26	870	292	1020	454	F30	32	L75	L75	104	774
700	28	927	292	1050	472	F30	32	L75	L75	104	1032
750	30	985	292	1100	532	F30	34	L75	L75	104	1153
800	32	1060	318	1135	547	F30	34	L75	L75	108	1274
900	36	1168	330	1175	591	F35	37	L80	L80	109	1736
1000	40	1290	410	1280	698	F40	44	L110	L110	130	2287
1050	42	1346	410	1440	705	F40	44	L110	L110	130	2621
1200	48	1511	470	1490	810	F40	44	L110	L110	130	3840
1400	56	1746	530	1680	960	F48	45	L120	L120	140	4200

(1): Operating pressure limit applies. Contact KSB.

(2): To MSS SP44 Class 150 or ASME B16.47 Series A Class 150 or ISO 7005 PN20

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Table 25: Face-to-face length

The dimensions of TRIODIS 150 CRYO valves with flanged body meet the requirements of EN 558-1 and ISO 5752-13.

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

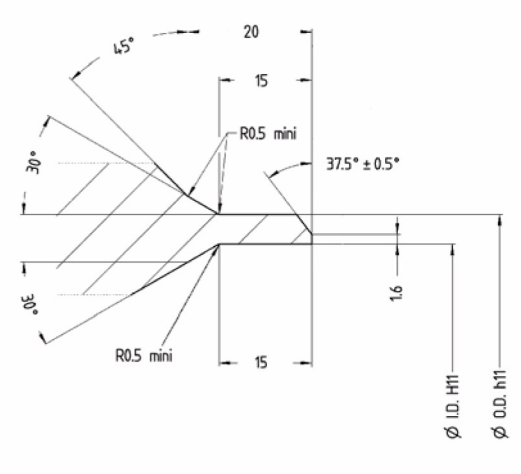

Table 26: Overview of butt weld end dimensions [mm]

DN	NPS	Outside diameter (OD)	Inside diameter (ID)				
	[inch]		Schedule 10S	Schedule 10	Schedule 40S	Schedule STD	Schedule XS
100	4	114,30	108,20		102,26		-
125	5	141,30	134,49		128,19		-
150	6	168,28	161,47		154,05		-
200	8	219,08	211,56		202,72		-
250	10	273,05	264,67		254,51		-
300	12	323,85	314,71		304,80		-
350	14	355,60	346,05	Contact KSB.	336,55		-
400	16	406,40	396,85		387,35		-
450	18	457,20	447,65		438,15		-
500	20	508,00	496,93		488,95		-
550	22	558,80	547,73		-	539,75	-
600	24	609,60	596,90		590,55		-
650	26	660,40	-	644,55	-	641,35	-
700	28	711,20	-	695,35	-	692,15	-
750	30	762,00	746,15		-	742,95	-
800	32	812,80	-	796,95	-	793,75	-
850	34	863,80	-	847,75	-	844,55	-
900	36	914,40	-	898,55	-	895,35	-
950	38	965,20	-	-	-	946,15	939,80
1000	40	1016,00	-	-	-	996,95	990,60
1050	42	1066,80	-	-	-	1047,75	1041,40
1100	44	1117,60	-	-	-	1098,55	1092,20

Line connections

TRIODIS 150 CRYO

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

Table 27: Flanged body with raised faces – T7 for TRIODIS 150 CRYO

DN	NPS	EN 1092-1			ASME		
	[inch]	PN 10	PN 16	PN 25	B16.5 Cl.150	B16.47 Cl.150 Series A	B16.47 Cl. 150 Series B
80	3	☎	☎	☎	✓	•	•
100	4	☎	☎	☎	✓	•	•
150	6	☎	☎	☎	✓	•	•
200	8	☎	☎	☎	✓	•	•
250	10	☎	☎	☎	✓	•	•
300	12	☎	☎	☎	✓	•	•
350	14	☎	☎	☎	✓	•	•
400	16	☎	☎	☎	✓	•	•
450	18	☎	☎	☎	✓	•	•
500	20	☎	☎	☎	✓	•	•
550	22	☎	☎	☎	✓	•	•
600	24	☎	☎	☎	✓	•	•
650	26	☎	☎	☎	•	✓	☎
700	28	☎	☎	☎	•	✓	☎
750	30	☎	☎	☎	•	✓	☎
800	32	☎	☎	☎	•	✓	☎
900	36	☎	☎	☎	•	✓	☎
1000	40	☎	☎	☎	•	✓	☎
1050	42	☎	☎	☎	•	✓	☎
1200	48	☎	☎	☎	•	✓	☎
1400	56	☎	☎	☎	•	✓	☎

Table 28: Symbols key

Symbol	Description	Symbol	Description
✓	Installation possible	•	Not available
☎	Contact KSB.		

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TRIODIS 150 MT

The valves can be installed between flanges in accordance with the following standards:
- EN 1092-1 PN10, PN16 and PN25
- ASME B16.5 Class 150
- JIS B2220 10K, 16K and 20K

Other connection options on request.

Note: The line connection to ISO 7005 PN20 is discontinued, line connections to ASME B16.5 Class 150 should preferably be used.

Table 29: Wafer-type body with flat faces – T1 for TRIODIS 150 MT Class 150

DN	NPS	EN 1092-1			ASME	ISO 7005	JIS B2220		
	[inch]	PN 10	PN 16	PN 25	B16.5 Class150	PN 20	10K	16K	20K
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	✓	✓	✓	✓	✓	✓	✓	✓
600	24	✓	✓	✓	✓	✓	✓	✓	✓

Table 30: Full-lug body – T4 for TRIODIS 150 MT Class 150

DN	NPS	EN 1092-1			ASME	ISO 7005	JIS B2220		
	[inch]	PN 10	PN 16	PN 25	B16.5 Class150	PN 20	10K	16K	20K
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	✓	✓	✓	✓	✓	✓	✓	✓
600	24	✓	✓	✓	✓	✓	•	•	•

Table 31: Flanged body with raised faces – T7 for TRIODIS 150 MT Class 150

DN	NPS	EN 1092-1			ASME	ISO 7005	JIS B2220		
	[inch]	PN 10	PN 16	PN 25	B16.5 Class150	PN 20	10K	16K	20K
50	2	✓	✓	✓	✓	✓	✓	✓	✓
65	2½	✓	✓	✓	✓	✓	✓	✓	✓
80	3	✓	✓	✓	✓	✓	✓	✓	✓
100	4	✓	✓	✓	✓	✓	✓	✓	✓
125	5	✓	✓	•	✓	✓	✓	•	•
150	6	✓	✓	•	✓	✓	✓	•	•
200	8	✓	✓	•	✓	✓	✓	✓	✓
250	10	✓	✓	•	✓	✓	✓	•	•
300	12	✓	✓	✓	✓	✓	✓	✓	✓
350	14	✓	✓	•	✓	✓	✓	✓	✓
400	16	✓	✓	✓	✓	✓	✓	✓	✓

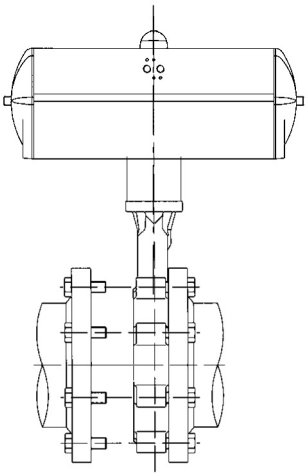
DN	NPS	EN 1092-1			ASME	ISO 7005	JIS B2220		
	[inch]	PN 10	PN 16	PN 25	B16.5 Class150	PN 20	10K	16K	20K
450	18	✓	✓	✓	✓	✓	✓	•	•
500	20	✓	✓	•	✓	✓	✓	•	•
600	24	✓	✓	✓	✓	✓	✓	✓	✓

Table 32: Symbols key

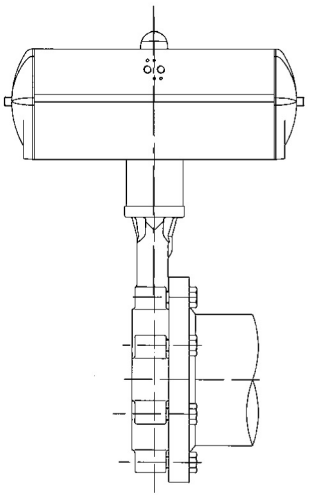
Symbol	Description	Symbol	Description
✓	Installation possible	•	Not available

Installation information

Dead-end service and downstream dismantling



Downstream dismantling

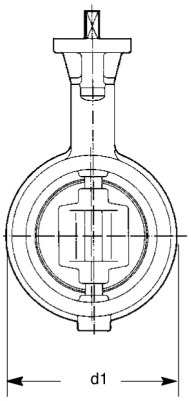


Dead-end service

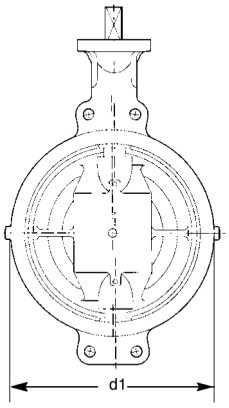
For more details on installation please refer to operating instructions 8613.81.

Bolting

Bolting for wafer-type body with flat faces – T1



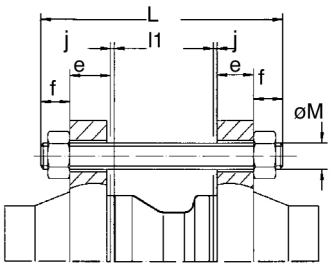
Drawing of TRIODIS 150 T1 DN 100



Drawing of TRIODIS 150 T1 DN 300

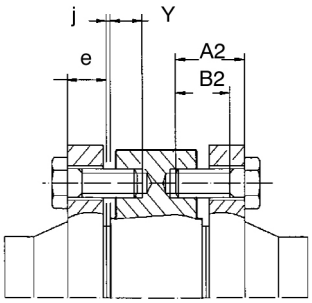
The drawings do not indicate the exact product design (number of tapped lugs/clearance holes).

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



Sectional drawing of T1 body bolting with tie bolt

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



Sectional drawing of T1 body bolting with bolts

Length of bolts at shaft passage
A2 max = e + Y + j

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

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

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Table 33: Dimensions [mm] for wafer-type body with flat faces T1 – line connections to EN 1092-1 PN 10, PN 16 and PN 25

DN	NPS	d1	l1	EN 1092-1 PN 10					EN 1092-1 PN 16					EN 1092-1 PN 25				
				Ø M	Tie bolt[19]		Bolt A2		Ø M	Tie bolt[19]		Bolt A2		Ø M	Tie bolt[19]		Bolt A2	
					f	Qty	Y	Qty[20]		f	Qty	Y	Qty[20]		f	Qty	Y	Qty[20]
50	2	105	43	M16	20	4	-	-	M16	20	4	-	-	M16	20	4	-	-
65	2½	124	46	M16	20	4/8	-	-	M16	20	4/8	-	-	M16	20	8	-	-
80	3	144	50	M16	20	8	-	-	M16	20	8	-	-	M16	20	8	-	-
100	4	164	52	M16	20	8	-	-	M16	20	8	-	-	M20	24	8	-	-
125	5	194	56	M16	20	8	-	-	M16	20	8	-	-	M24	29	8	-	-
150	6	219	56	M20	24	8	-	-	M20	24	8	-	-	M24	29	8	-	-
200	8	275	60	M20	24	8	-	-	M20	24	12	-	-	M24	29	12	-	-
250	10	330	68	M20	24	12	-	-	M24	29	12	-	-	M27	32	12	-	-
300	12	376	78	M20	24	12	-	-	M24	29	12	-	-	M27	32	12	26	4
350	14	413	92	M20	24	12	33	4	M24	29	12	33	4	M30	35	12	27	4
400	16	470	102	M24	29	12	44	4	M27	32	12	44	4	M33	38	12	44	4
450	18	530	114	M24	29	16	24	4	M27	32	16	24	4	M33	39	16	22	4
500	20	572	127	M24	29	16	32	4	M30	35	16	31	4	M33	38	16	31	4
600	24	680	154	M27	32	16	43	4	M33	38	16	48	4	M36	42	16	47	4

Table 34: Dimensions [mm] for wafer-type body with flat faces T1 – line connections to ISO 7005 PN 20 and ASME B16.5 Class 150

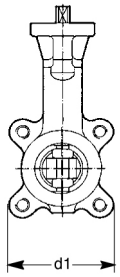
DN	NPS	d1	l1	ISO 7005 PN 20					ASME B16.5 Class 150				
				Ø M	Tie bolt[19]		Bolt A2		UN/ UNC[21]	Tie bolt[19]		Bolt A2	
					f	Qty	Y	Qty[20]		f	Qty	Y	Qty[20]
50	2	105	43	M16	20	4	-	-	5/8"	20	4	-	-
65	2½	124	46	M16	20	4	-	-	5/8"	20	4	-	-
80	3	144	50	M16	20	4	-	-	5/8"	20	4	-	-
100	4	164	52	M16	20	8	-	-	5/8"	20	8	-	-
125	5	194	56	M20	24	8	-	-	3/4"	24	8	-	-
150	6	219	56	M20	24	8	-	-	3/4"	24	8	-	-
200	8	275	60	M20	24	8	-	-	3/4"	24	8	-	-
250	10	330	68	M24	29	12	-	-	7/8"	29	12	-	-
300	12	376	78	M24	29	12	-	-	7/8"	29	12	-	-
350	14	413	92	M27	27	12	-	-	1"	32	12	-	-
400	16	470	102	M27	27	12	44	4	1"	32	12	44	4
450	18	530	114	M30	31	12	40	4	1"1/8	35	12	40	4
500	20	572	127	M30	31	16	31	4	1"1/8	35	16	31	4
600	24	680	154	M33	34	16	47	4	1"1/4	38	16	47	4

Table 35: Dimensions [mm] for wafer-type body with flat faces T1 – line connections to JIS B2220 10K, 16K and 20K

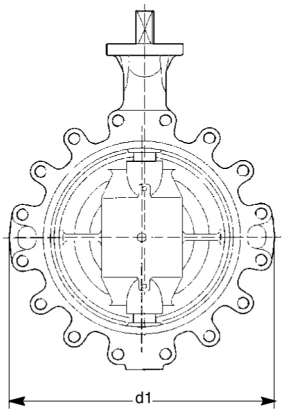
DN	NPS	d1	l1	JIS B2220 10K					JIS B2220 16K and 20K				
				Ø M	Tie bolt[19]		Bolt A2		Ø M	Tie bolt[19]		Bolt A2	
					f	Qty	Y	Qty[20]		f	Qty	Y	Qty[20]
50	2	105	43	M16	20	4	-	-	-	-	-	-	-
65	2½	124	46	M16	20	4	-	-	M16	20	8	-	-
80	3	144	50	M16	20	8	-	-	M20	24	8	-	-
100	4	164	52	M16	20	8	-	-	M20	24	8	-	-
125	5	194	56	M20	24	8	-	-	M22	26	8	-	-
150	6	219	56	M20	24	8	-	-	M22	26	12	27	4
200	8	275	60	M20	24	12	-	-	M22	26	12	-	-
250	10	330	68	M22	26	12	-	-	M24	29	12	-	-
300	12	376	78	M22	26	12	24	4	M24	29	12	26	4
350	14	413	92	M22	26	12	39	4	M30x3	35	12	41	4
400	16	470	102	M24	29	12	42	4	M30x3	35	12	44	4
450	18	530	114	M24	29	16	24	4	M30x3	35	16	24	4
500	20	572	127	M24	29	16	32	4	M30x3	35	16	32	4
600	24	680	154	M30	35	20	37	4	M36x3	42	20	36	4

19 Quantity of nuts = quantity of tie bolts x 2
20 Number of bolts per side
21 For bolts < 1", only UNC

Bolting for full-lug body – T4



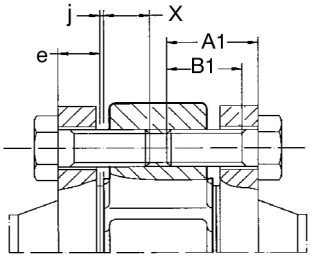
Drawing of TRIODIS 150 T4 DN 65



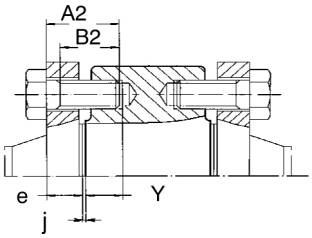
Drawing of TRIODIS 150 T4 DN 450

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.



Sectional drawing of T4 body bolting with bolts through tapped lugs



Sectional drawing of T4 body bolting with bolts at shaft passage

Bolt length for tapped lugs

A1 max = e + X + j

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

Length of bolts at stem 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

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Table 36: Dimensions [mm] for full-lug body T4 – line connection to EN 1092-1 PN 10, PN 16 and PN 25

DN	NPS	d1	EN 1092-1 PN 10					EN 1092-1 PN 16					EN 1092-1 PN 25				
			Ø M	Bolt A1		Bolt A2		Ø M	Bolt A1		Bolt A2		Ø M	Bolt A1		Bolt A2	
				X	Qty	Y	Qty		X	Qty	Y	Qty		X	Qty	Y	Qty
50	2	120	M16	20	4	-	-	M16	20	4	-	-	M16	20	4	-	-
65	2½	130	M16	20	4	-	-	M16	20	4	-	-	-	-	-	-	-
65	2½	174	M16	20	8	-	-	M16	20	8	-		M16	20	8	-	-
80	3	188	M16	21	8	-	-	M16	21	8	-	-	M16	21	8	-	-
100	4	210	M16	21	8	-	-	M16	21	8	-	-	M20	26	8	-	-
125	5	246	M16	20	8	-	-	M16	20	8	-	-	M24	27	8	-	-
150	6	270	M20	24	8	-	-	M20	24	8	-	-	M24	27	8	-	-
200	8	310	M20	26	8	-	-	-	-	-	-	-	-	-	-	-	-
200	8	340	-	-	-	-	-	M20	26	12	-	-	M24	29	12	-	-
250	10	417	M20	26	12	-	-	M24	30	12			M27	33	12	-	-
300	12	478	M20	26	12	-	-	M24	30	8	35	4	-	-	-	-	-
300	12	476	-	-	-	-	-	-	-	-	-	-	M27	33	12	26	4
350	14	542	M20	37	16	-	-	M24	37	16	-	-	M30	42	16	-	-
400	16	606	M24	42	16	-	-	M27	44	16	-	-	M33	44	16	-	-
450	18	657	M24	40	16	24	4	M27	44	16	24	4	M33	39	16	22	4
500	20	716	M24	42	16	32	4	M30	51	16	31	4	M33	55	16	31	4
600	24	834	M27	43	20	-	-	M33	52	16	48	4	M36	57	16	47	4

Table 37: Dimensions [mm] for full-lug body T4 – line connection to ISO 7005 PN 20 and ASME B16.5 Class 150

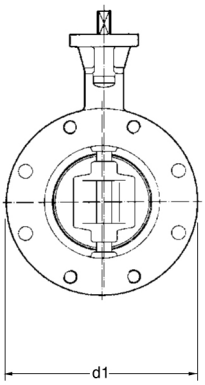
DN	NPS	d1	ISO 7005 PN 20					ASME B16.5 Class 150				
			Ø M	Bolt A1		Bolt A2		UN/UNC	Bolt A1		Bolt A2	
				X	Qty	Y	Qty		X	Qty	X	Qty
50	2	120	M16	20	4	-	-	5/8"	20	4	-	-
65	2½	130	M16	20	4	-	-	5/8"	20	4	-	-
80	3	188	M16	21	4	-	-	5/8"	21	4	-	-
100	4	210	M16	21	8	-	-	5/8"	21	8	-	-
125	5	246	M20	25	8	-	-	3/4"	25	8	-	-
150	6	270	M20	24	8	-	-	3/4"	24	8	-	-
200	8	310	M20	26	8	-	-	3/4"	26	8	-	-
250	10	417	M24	30	12	-	-	7/8"	30	12	-	-
300	12	478	M24	26	12	-	-	7/8"	26	12	-	-
350	14	523	M27	39	12	-	-	1"	39	12	-	-
400	16	606	M27	44	16	-	-	1"	44	16	-	-
450	18	630	M30	51	12	40	4	1"1/8	51	12	40	4
500	20	716	M30	51	16	31	4	1"1/8	51	16	31	4
600	24	834	M33	52	16	47	4	1"1/4	52	16	47	4

Table 38: Dimensions [mm] for full-lug body T4 – line connection to JIS B2220 10K, 16K and 20K

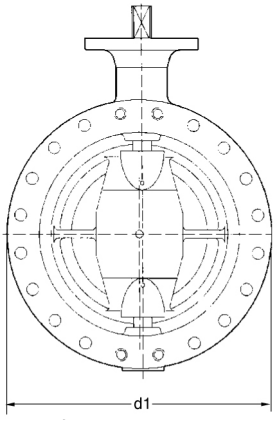
DN	NPS	d1	JIS B2220 10K					JIS B2220 16K and 20K				
			Ø M	Bolt A1		Bolt A2		Ø M	Bolt A1		Bolt A2	
				X	Qty	Y	Qty		X	Qty	X	Qty
50	2	120	M16	20	4	-	-	-	-	-	-	-
65	2½	130	M16	20	4	-	-	M16	20	8	-	-
65	2½	174	-	-	-	-	-	M20	24	8	-	-
80	3	188	M16	21	8	-	-	M20	26	8	-	-
100	4	210	M16	21	8	-	-	M22	27	8	-	-
125	5	246	M20	25	8	-	-	-	-	-	-	-
150	6	270	M20	24	8	-	-	-	-	-	-	-
200	8	310	-	-	-	-	-	M22	29	12	-	-
200	8	340	M20	39	12	-	-	M24	31	12	-	-
250	10	417	M22	32	12	-	-	-	-	-	-	-
300	12	478	-	-	-	-	-	M24	30	16	-	-
300	12	476	M22	24	16	-	-	-	-	-	-	-
350	14	523	-	-	-	-	-	M30x3	34	16	-	-
350	14	542	M22	36	16	-	-	M30x3	44	16	-	-
400	16	606	M24	42	16	-	-	-	-	-	-	-

DN	NPS	d1	JIS B2220 10K					JIS B2220 16K and 20K				
			Ø M	Bolt A1		Bolt A2		Ø M	Bolt A1		Bolt A2	
				X	Qty	Y	Qty		X	Qty	X	Qty
450	18	657	M24	40	16	24	4	M30x3	49	16	26	4
500	20	716	M24	42	16	32	4	M30x3	51	16	32	4
600	24	834	-	-	-	-	-	-	-	-	-	-

Bolting for flanged body – T7 – MT version



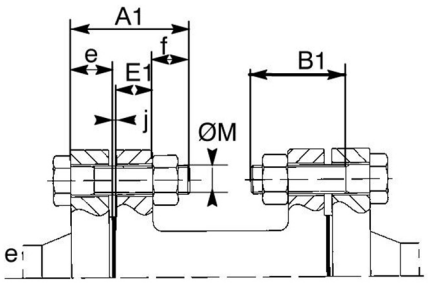
Drawing of TRIODIS 150 T7 DN 150



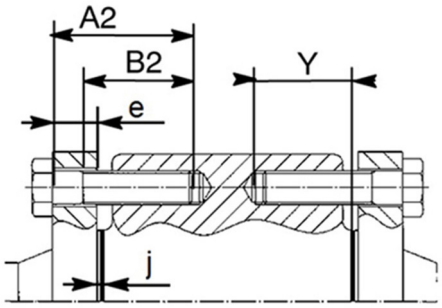
Drawing of TRIODIS 150 T7 DN 500

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.



Sectional drawing of T7 body bolting with bolts through the flanges



Sectional drawing of T7 body bolting with bolts at shaft passage

Bolt length for flanges

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

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

Length of bolts at shaft passage

A2 max = e + Y + j

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

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Table 39: Dimensions [mm] for flanged body T7 – line connections to EN 1092-1 PN 10, PN 16 and PN 25

DN	NPS	d1	E1	EN 1092-1 PN 10					EN 1092-1 PN 16					EN 1092-1 PN 25				
				Ø M	Bolt A1		Bolt A2		Ø M	Bolt A1		Bolt A2		Ø M	Bolt A1		Bolt A2	
					X	Qty	Y	Qty		X	Qty	Y	Qty		X	Qty	Y	Qty
50	2	152	22	M16	20	4	-	-	M16	20	4	-	-	M16	20	4	-	-
65	2½	178	22,5	M16	20	4	-	-	M16	20	4	-	-	-	-	-	-	-
65	2½	178	22,5	M16	20	4	24	4	M16	20	4	24	4	M16	20	4	24	4
80	3	190	27	M16	20	4	24	4	M16	20	4	24	4	M16	20	4	24	4
100	4	229	27	M16	20	4	24	4	M16	20	4	24	4	M20	24	4	24	4
125	5	254	27	M16	20	4	24	4	M16	20	4	24	4	-	-	-	-	-
150	6	279	28,5	M20	24	4	25	4	M20	24	4	25	4	-	-	-	-	-
200	8	343	31,5	M20	24	4	28	4	M20	24	8	28	4	-	-	-	-	-
250	10	406	33,5	M20	24	8	30	4	M24	29	8	30	4	-	-	-	-	-
300	12	483	35	M20	24	8	32	4	M24	29	8	32	4	M27	32	12	32	4
350	14	535	38	M20	24	12	35	4	M24	29	12	35	4	-	-	-	-	-
400	16	600	40	M24	29	12	37	4	M27	32	12	37	4	M33	38	12	37	4
450	18	635	42,5	M24	29	16	39	4	M27	32	16	39	4	M33	38	16	39	4
500	20	700	46	M24	29	16	42	4	M30	35	16	42	4	-	-	-	-	-
600	24	826	52	M27	32	16	48	4	M33	38	16	48	4	M36	42	16	48	4

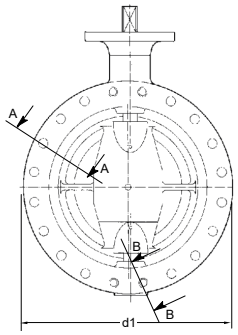
Table 40: Dimensions [mm] for flanged body T7 – line connections to ISO 7005 PN 20 and ASME B16.5 Class 150

DN	NPS	d1	E1	ISO 7005 PN 20					ASME B16.5 Class 150				
				Ø M	Bolt A1		Bolt A2		UN/UNC	Bolt A1		Bolt A2	
					X	Qty	Y	Qty		X	Qty	x	Qty
50	2	152	22	M16	20	4	-	-	5/8"	20	4	-	-
65	2½	178	22,5	M16	20	4	-	-	5/8"	20	4	-	-
80	3	190	27	M16	20	4	-	-	5/8"	20	4	-	-
100	4	229	27	M16	20	4	24	4	5/8"	20	4	24	4
125	5	254	27	M20	24	4	24	4	3/4"	24	4	24	4
150	6	279	28,5	M20	24	4	25	4	3/4"	24	4	25	4
200	8	343	31,5	M20	24	4	28	4	3/4"	24	4	28	4
250	10	406	33,5	M24	29	8	30	4	7/8"	29	8	30	4
300	12	483	35	M24	29	8	32	4	7/8"	29	8	32	4
350	14	535	38	M27	32	8	35	4	1"	32	8	35	4
400	16	600	40	M27	32	12	37	4	1"	32	12	37	4
450	18	635	42,5	M30	35	12	39	4	1"1/8	35	12	39	4
500	20	700	46	M30	35	16	42	4	1"1/8	35	16	42	4
600	24	826	52	M33	38	16	48	4	1"1/4	38	16	48	4

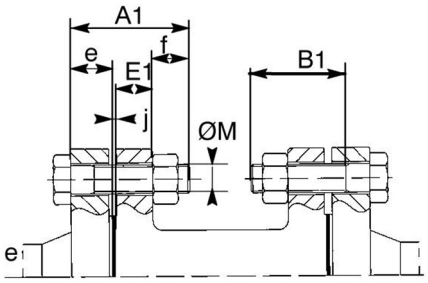
Table 41: Dimensions [mm] for flanged body T7 – line connections to JIS B2220 10K, 16K and 20K

DN	NPS	d1	E1	JIS B2220 10K					JIS B2220 16K and 20K				
				Ø M	Bolt A1		Bolt A2		Ø M	Bolt A1		Bolt A2	
					X	Qty	Y	Qty		X	Qty	X	Qty
50	2	152	22	M16	20	4	-	-	M16	20	4	19	4
65	2½	178	22,5	M16	20	4	-	-	M16	20	4	22	4
80	3	190	27	M16	20	8	-	-	M20	24	4	24	4
100	4	229	27	M16	20	4	4	24	M20	24	4	24	4
125	5	254	27	M20	24	4	4	24	-	-	-	-	-
150	6	279	28,5	M20	24	4	4	25	-	-	-	-	-
200	8	343	31,5	M20	24	8	4	28	M22	27	8	28	4
250	10	406	33,5	M22	27	8	4	30	-	-	-	-	-
300	12	483	35	M22	27	12	4	32	M24	29	12	32	4
350	14	535	38	M22	27	12	4	35	M30X3	35	12	35	4
400	16	600	40	M24	29	12	4	37	M30X3	35	12	37	4
450	18	635	42,5	M24	29	16	4	39	-	-	-	-	-
500	20	700	46	M24	29	16	4	42	-	-	-	-	-
600	24	826	52	M30	35	20	4	48	M36X3	42	20	48	4

Bolting for flanged body – T7 – CRYO version



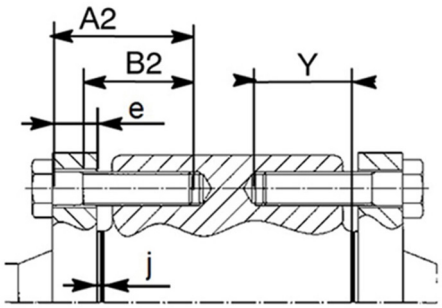
A - A



Bolt length for flanges
A1 max. = e + j + E1 max. + f

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

B - B



Bolt length at shaft passage
A2 max. = e + Y + j

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

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.

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Table 42: Dimensions [mm] flanged body T7 – line connection to ISO 7005 PN 20, ASME B16.5, ASME B16.47 Series A and MSS SP 44 Class 150

DN	NPS	d1	E1	ISO 7005 PN 20				ASME B16.5 / ASME B16.47 Series A / MSS SP 44 Class 150			
				Ø M	Bolt A1	Bolt A2		UN/UNC	Bolt A1	Bolt A2	
					Qty	Y	Qty		Qty	Y	Qty
80	3	191	26,9	M16	4	-	-	5/8"	4	-	4
100	4	229	26,9	M16	4	24	4	5/8"	4	24	4
150	6	279	28,5	M20	4	25	4	3/4"	4	25	4
200	8	343	31,3	M20	4	28	4	3/4"	4	28	4
250	10	406	33	M24	8	30	4	7/8"	8	30	4
300	12	483	334,8	M24	8	32	4	7/8"	8	32	4
350	14	533	38	M27	8	35	4	1"	8	35	4
400	16	597	39,6	M27	12	22	4	1"	12	22	4
450	18	635	42,7	M30	12	24	4	1" 1/8	12	24	4
500	20	699	46,8	M30	16	26	4	1" 1/8	16	26	4
550	22	750	50,5	M33	16	28,5	4	1" 1/4	16	28,5	4
600	24	826	52	M33	16	28,5	4	1" 1/4	16	28,5	4
650	26	870	73,0	M33	20	46,5	4	1" 1/4	20	46,5	4
700	28	927	75,8	M33	20	47	8	1" 1/4	20	47	8
750	30	985	79	M33	20	50	8	1" 1/4	20	50	8
800	32	1060	85,5	M39	20	58	8	1" 1/2	20	58	8
900	36	1168	95,0	M39	24	58	8	1" 1/2	24	58	8
1000	40	1290	95	M39	28	58	8	1" 1/2	28	58	8
1050	42	1346	102	M39	28	58	8	1" 1/2	28	58	8
1200	48	1511	113	M39	36	58	8	1" 1/2	36	58	8
1400	56	1746	129	M45	40	69	8	1" 3/4	40	69	8

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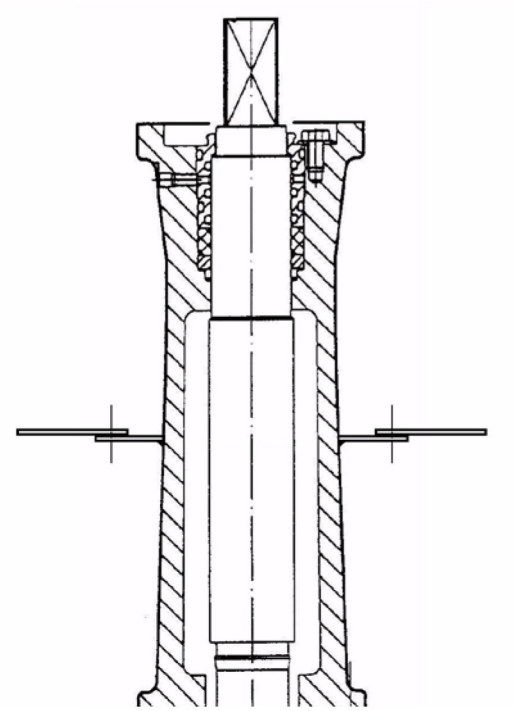
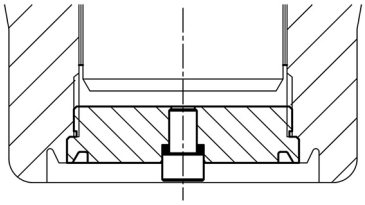
Option

Insulating plate (drip plate)



Vent plug (DN ≥ 8 in.)



2023-06-05

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