

TERMOVENT SC SERBIA // INDUSTRIAL VALVES

GHP

HIGH PRESSURE
GATE VALVE



TERMOVENT
since 1963 SC

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I TECHNICAL DATA SHEETS

1. GENERAL FEATURES

High-Pressure Gate Valves [GHP]

NPS 2"(DN 50) ÷ NPS 16"(DN 400)
Class 900 ÷ Class 2500
PN 160 ÷ PN 400

Design

- Closed-Die-Forged, welded or cast body
- Pressure seal design
- Rising stem (RS), outside screw and yoke (OS&Y)
- Split or Parallel slide Wedge
- Hard-faced seats

Applications

- The main purpose of the GHP is to isolate fluid flow through the pipeline for Power plant, Chemical, Petrochemical, Refining, water supply and other

Media

- Water, steam, gas, oil and other non-aggressive media

Pressure and temperature ratings

- Class 900 ÷ Class 2500
- PN 160 ÷ PN 400
- Temperatures up to 600°C
- p/t according to ASME B16.34 or EN 12516-1

Materials

- Carbon, low alloys and heat-resistant alloys

Advantages

- Long service life
- Respect for emission standards
- Easy handling and maintenance

Options

- Electric actuator
- Pneumatic actuator
- Position indicator
- Limit switches
- Locking devices
- Chainwheel
- Spring loaded stuffing box (SLSB)
- With a by-pass valve
- With equalizing pipe and by-pass valves
- With equalizing pipe to the 3rd chamber
- With a hole in the wedge
- With closed nozzle for safety valve
- Flanged or welded ends according to other Standards and Norms.

Testing

- Every produced gate valve shall be tested according to API 598 or EN 12266

2. PARTS & MATERIALS

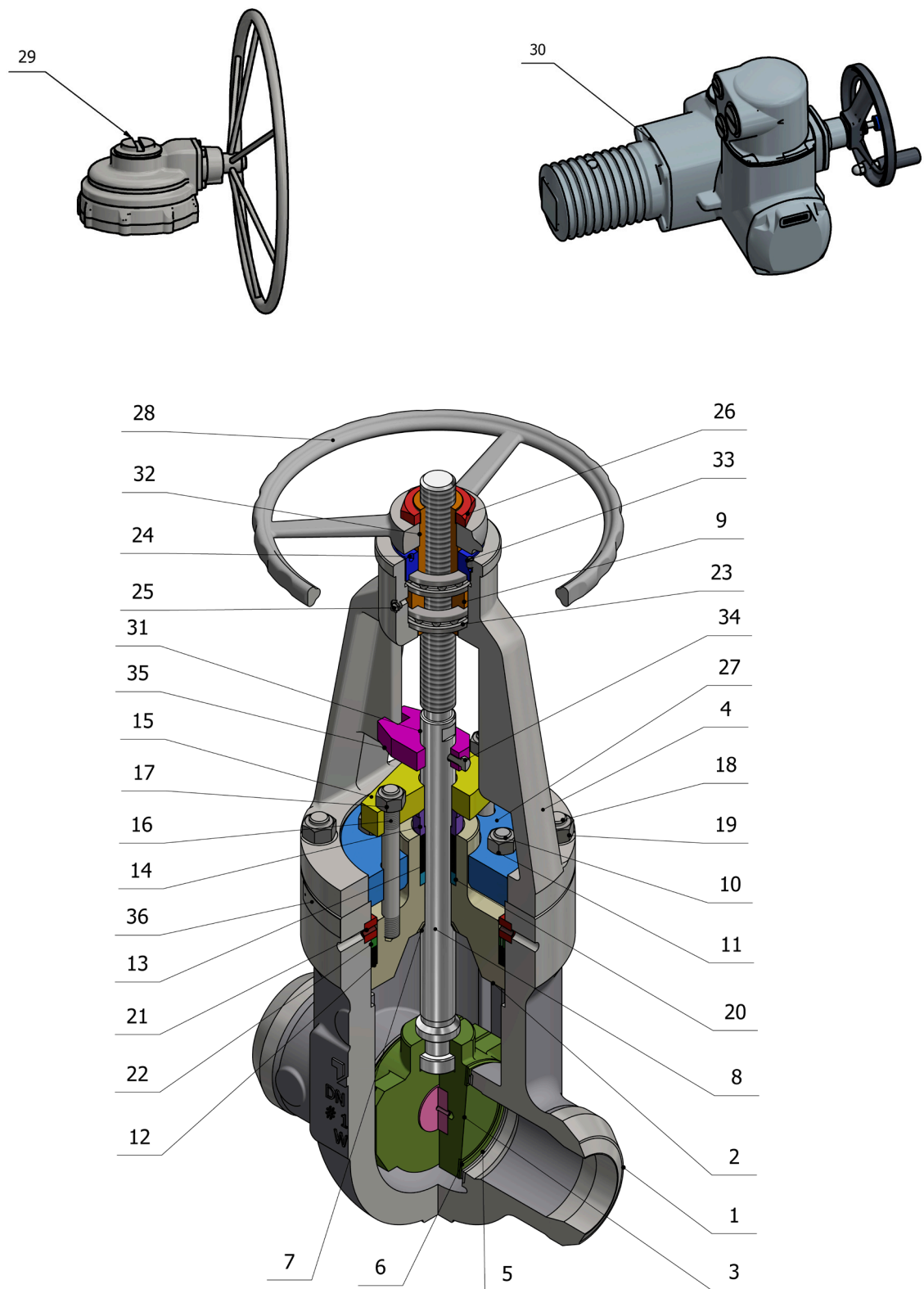


Figure A.1 Parts

List of materials

Table A.1

Parts	Name		Material Group acc. to ASME B16.34 or EN 12516-1				
1	Body ⁽¹⁾	Cast parts Forged parts	WCB or 1.0619	WC1 or 1.5419	WC6 or 1.7357	WC9 or 1.7379	C12A or 1.4955
2	Bonnet ⁽¹⁾		A105 or 1.0460	F1 or 1.5415	F11Cl.2 or 1.7335	F22Cl.3 or 1.7383	F91 or 1.4903
3	Wedge ⁽¹⁾						
4	Yoke		WCB or 1.0619		WC6 or 1.7357		
5	Body overlay ⁽²⁾		Hard-Faced 13Cr or Stellite™				
6	Wedge overlay ⁽²⁾						
7	Backseat						
8	Stem		1.4021	1.4122 / 1.4923 ⁽³⁾			
9	Stem nut		1.0715 / Cu-Alloy				
10	Stud bolts		A193 B7 or 1.7225	A193 B16 or 1.7709/ 1.4913 ⁽⁴⁾			
11	Nuts		A194 2H or 1.1191	A194 7 or 1.7709			
12	Bonnet packing rings		graphite with corrosion inhibitor				
13	Stem packing rings		graphite with corrosion inhibitor				
14	Packing gland		1.4021 / 1.4122				
15	Gland flange		1.0425				
16	Gland bolts		A193 B7 or 1.7225	A193 B16 or 1.7709/ 1.4913 ⁽⁴⁾			
17	Gland nuts		A194 2H or 1.1191	A194 7 or 1.7709			
18	Stud bolts		A193 B7 or 1.7225	A193 B16 or 1.7709/ 1.4913 ⁽⁴⁾			
19	Nuts		A194 2H or 1.1191	A194 7 or 1.7709			
20	Ring		hardened 1.4021 / 1.4122 / 1.4923 ⁽³⁾				
21	Segment ring		A105 or 1.0460	F1 or 1.5415	F11 Cl.2 or 1.7335	F22 Cl.3 or 1.7383	F91 or 1.4903
22	Bonnet metal ring		A105 or 1.0460	F1 or 1.5415	F11 Cl.2 or 1.7335	F22 Cl.3 or 1.7383	F91 or 1.4903
23	Bearings		axial				
24	Cover bearing		1.1191				
25	Grease injector		Cu-Alloy / steel				
26	Handwheel nut		1.1191				
27	Clamping lid		1.0425				
28	Handwheel		steel				
29	Gearbox		commercial				
30	Electric actuator		commercial				
31	Stem key		1.1191				
32	Stem nut key		1.1191				
33	Slotted set screw		steel				
34	Screw		steel				
35	Stem plate		1.0425				
36	Nameplate		stainless steel				

TM trademark materials

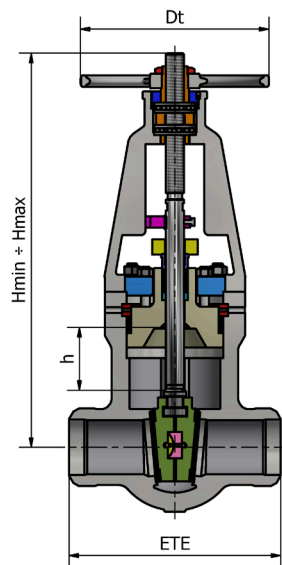
⁽¹⁾ Other materials available acc. to ASTM specifications and EN standard⁽²⁾ Hardness differential between the body and wedge seating surfaces shall be min. 50 HB⁽³⁾ Over 500°C⁽⁴⁾ Over 500°C

3. STANDARDS & DIMENSIONS

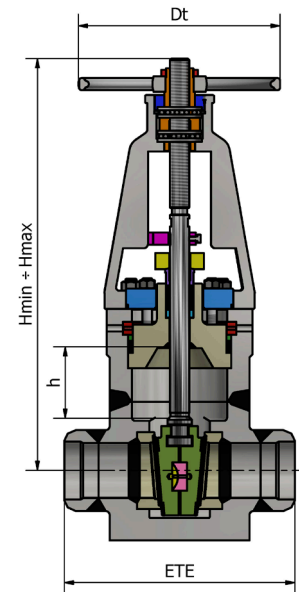
Standards

Table A.2

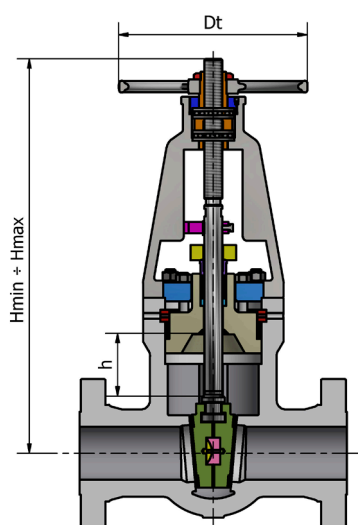
GHP	Class 900 ÷ Class 2500 (PN 160 ÷ PN 400)
General design	ASME B16.34 and EN 12516
Wall thickness	ASME B16.34 and EN 12516
Pressure / temperature rating	ASME B16.34 or EN 12516
FTF and ETE according to	ASME B16.10 or EN 558/EN 12982
Flanged Ends according to	ASME B16.5 or EN 1092-1
Welding Ends according to	ASME B16.25 or EN 12627



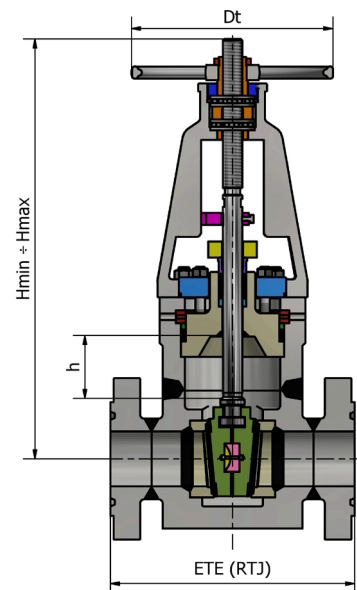
GHP with welding ends - CAST



GHP with welding ends – FORGED



GHP with flanged ends - CAST



GHP with flanged ends - FORGED

Figure A.2 Dimensions

Pressure Class (Nominal Pressure)	Nominal pipe size (Diameter Nominal)	End - To – End	Face - To – Face (RF)	End-To-End (RTJ)	Centre-to- top (close)		Centre-to-top (open) (Gearbox)	Handwheel	Stroke	Connection flange ISO 5210	Kvs	Weight	
Class (PN)	NPS (DN)	ETE	FTF	ETE	Hmin		Hmax	D _t	h		m³/h	ETE	FTF
		mm										kg	
Class 900 (PN 160) Cast and Forged	2” (50)	368		371	555	630	300	75	F10-B1	290	47	68	
	2 ½” (65)	419		422	638	716	400	78	F10-B1	420	78	100	
	3” (80)	381		384	735	835	400	100	F10-B1	683	107	141	
	4” (100)	356	457	460	798	913	400	115	F14-B1	1242	137	179	
	6” (150)	508	610	613	1100	1270	500	170	F14-B1	2745	403	528	
	8” (200)	660	737	740	1273	1493	630	220	F16-B1	4666	698	833	
	10” (250)	787	838	841	1875		gearbox	274	F14-B3	7283	1193	1444	
	12” (300)	914	965	968	2045		gearbox	320	F14-B3	10254	1430	1630	
Class 1500 (PN 250) Cast and Forged	2” (50)	368		371	555	618	300	63	F10-B1	290	47	68	
	2 ½” (65)	419		422	638	715	400	77	F10-C	420	78	100	
	3” (80)	470		473	753	848	400	95	F14-B1	628	124	170	
	4” (100)	406	546	549	827	942	400	115	F14-B1	1086	159	228	
	6” (150)	559	705	711	1322		gearbox	170	F14-B3	2392	438	574	
	8” (200)	711	832	842	1566		gearbox	220	F14-B3	4065	731	929	
	10” (250)	864	991	1001	1936		gearbox	274	F14-B3	6510	1388	1645	
	12” (300)	991	1130	1146	2131		gearbox	320	F16-B3	8921	1958	2520	
	14” (350)	1067	1257	1276	2316		gearbox	380	F16-B3	10725	2028	2865	
	16” (400)	1194	1384	1406	2541		gearbox	425	F16-B3	14020	3557	4145	
Class 2500 (PN 400) Cast and Forged	2” (50)	451		354	507	562	300	55	F10-B1	187	65	94	
	2 ½” (65)	508		514	622	702	400	80	F14-B1	290	97	141	
	3” (80)	578		584	735	830	500	95	F14-B1	421	130	178	
	4” (100)	457	673	683	806	931	500	125	F14-B1	685	225	360	
	6” (150)	610	914	927	1320		gearbox	170	F14-B3	2173	581	771	
	8” (200)	762	1022	1038	1616		gearbox	220	F14-B3	2741	1164	1540	
	10” (250)	914	1270	1292	1972		gearbox	285	F16-B3	4353	2330	3030	
	12” (300)	1041	1422	1444	2285		gearbox	320	F16-B3	6167	3860	5404	

- Technical data for valves over PN 400 on request.

- Depending on the executions dimensions and weights are subject to modification.

4. OVER PRESSURIZATION, PRESSURE LOCKING & THERMAL BINDING PROCESS CONDITIONS

In case when GHP in the closed position the temperature of the fluid (mainly water) increase in the chamber above the wedge impermissibly high pressure can occur. To prevent failure or damage of pressure-relating parts gate valves should be equipped with some of the presented constructive solutions:

4.1 Solutions for Over-Pressurization & Pressure Locking

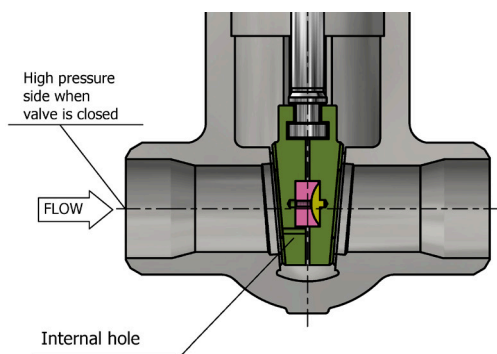


Figure A.3 With a hole in the wedge

- **One Side Wedge Hole** connecting the body cavity to the high-pressure side of the valve

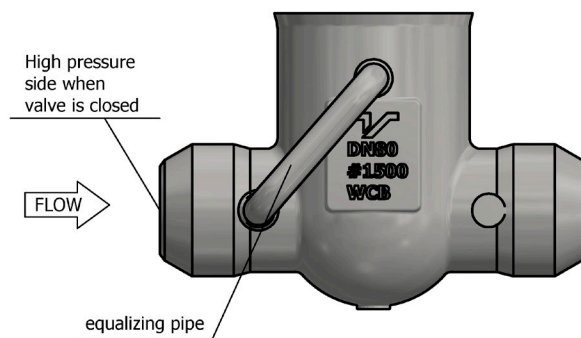


Figure A.4 With equalizing pipe

- **Equalizing Pipe** connecting the body cavity to the high-pressure side of the valve

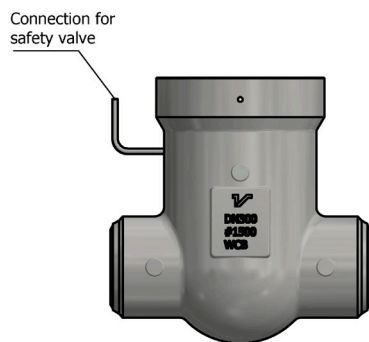


Figure A.5 With closed nozzle for safety valve

- **With closed nozzle for safety valve**
Safety valve connecting the body cavity to the atmosphere. The discharge of this valve must be made to a safe location (safety valve is not scope of delivery)

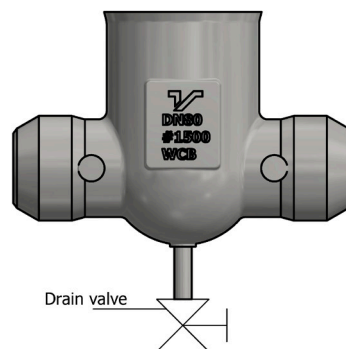


Figure A.6 With drain valve

- **With a drain valve** connecting the body cavity to the atmosphere. The discharge of this valve must be made to a safe location.

4.2 Solutions for Thermal Binding

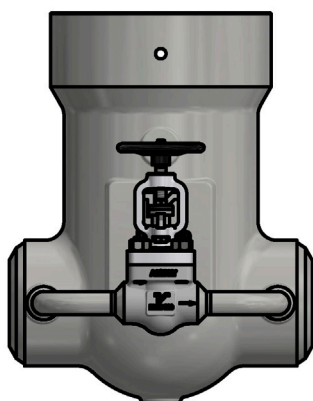


Figure A.7 With By-pass valve

- **By-pass valve** in addition to equalizing pressure differential across the wedge, will allow warm up of both sides of the wedge.
- After reaching the operating parameters By-pass valve on opened GHP, should be closed.
- After closing a GHP, back up the stem (1/8 turn). This will give room for dimensional changes due to temperature variation. This is only applicable for manually operated valves or on electric actuator-operated valves (by handwheel).
- Adequate supports can reduce the thermal binding problem by reducing pipe stresses
- Parallel slide GHP is not subjected to thermal binding. If parallel slide GHP is selected as a possible solution for thermal binding, it is very important to know that such a valve: subject to pressure lock, higher seat wear and poor sealing under low pressure.

4.3 Combined Effects of Over-Pressurization, Pressure Locking and Thermal Binding

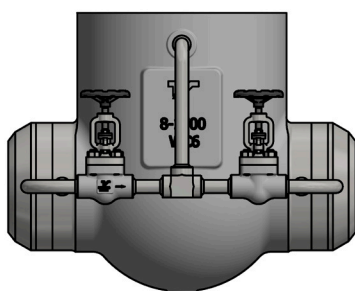


Figure A.8 With double by-pass & equalizing pipe

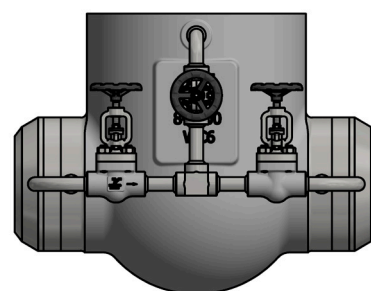


Figure A.9 With double by-pass & equalizing pipe with a valve

- After reaching the operating parameters By-pass valves on the pressurized side of closed GHP should be in open position. When GHP is opened By-pass valves should be closed.

4.4 By-pass Valve Size Selection

When by-pass valves are required for Section 4.2 *Solutions for Thermal Binding* or Section 4.3 *Combined Effects of Over-Pressurization, Pressure Locking and Thermal Binding* they shall be in accordance with Table A.4

Table A.4

Valve nominal size	By-pass nominal size
NPS (DN)	NPS (DN)
2" (50) ≤ 4" (100)	1/2" (15)
5" (125) ≤ 8" (200)	3/4" (20)
10" (250) ≤ 16" (400)	1" (25)

5. WEDGE DESIGNS

5.1 Standard Tervovent SC Wedge Design

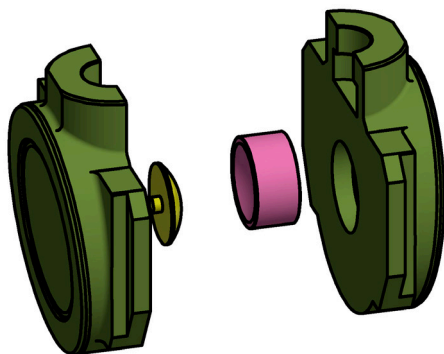


Figure A.10 Split wedge

Split Wedge

This kind of wedge has a flexibility that allows to compensate distortions in the valve seat caused by piping loads, pressure and temperature variations within normal closure torques and stress limits.

5.2 Optional Wedge Design

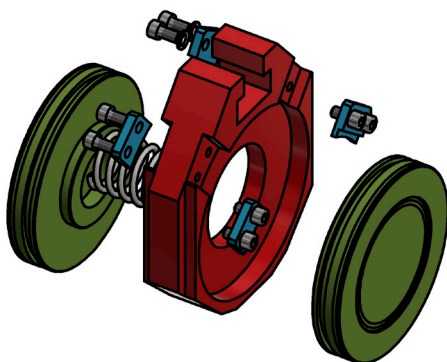


Figure A.11 Parallel slide wedge

Parallel Slides Wedge

Manufactured with two parallel wedge plates, each one sliding over its own seat. This kind of gate valve relies on the upstream pressure actuating on the downstream wedge to assure a good sealing. There is no wedging or extra load on the seats allowing a smaller actuator torque. On the other hand, is a disadvantage the seat wear caused by the sliding wedge plate during actuation.

6. LOW EMISSION DESIGN

6.1 Standard Stem Packing or Live-Loading Design

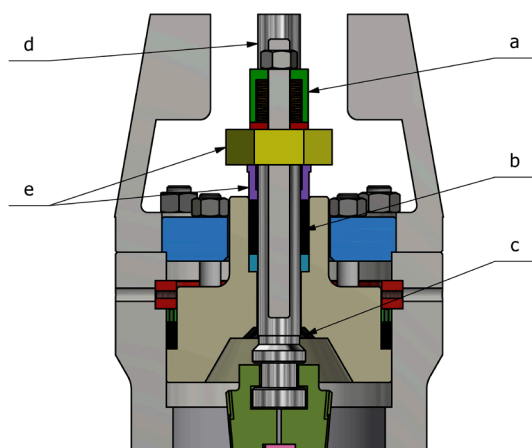


Figure A.12 Stem seal

- a. **Spring-loaded stuffing box *SLSB* (optional)**
– Two sets of springs maintain a minimum permanent packing stress. Live Loading keeps the stem tight for long periods without maintenance
- b. **Pre-compressed rings** – Each braided graphite ring is preformed and compressed during assembly to ensure optimal sealing
- c. **Backseat** – Cone-in-cone design eliminates problems with over torque
- d. **Non-rotating stem** – close roundness and straightness tolerances, as well as packing chamber superior surface finish, assure effective sealing
- e. **Heavy two-piece gland**

7. BUTT WELDING ENDS DESIGN

Symbols

Table A.5

A	- outside diameter of the Valve butt welding end in mm
B	- outside diameter of the Pipe butt welding end in mm
T	- wall thickness of the pipe in mm

7.1 Butt Welding Ends according to ASME B16.25

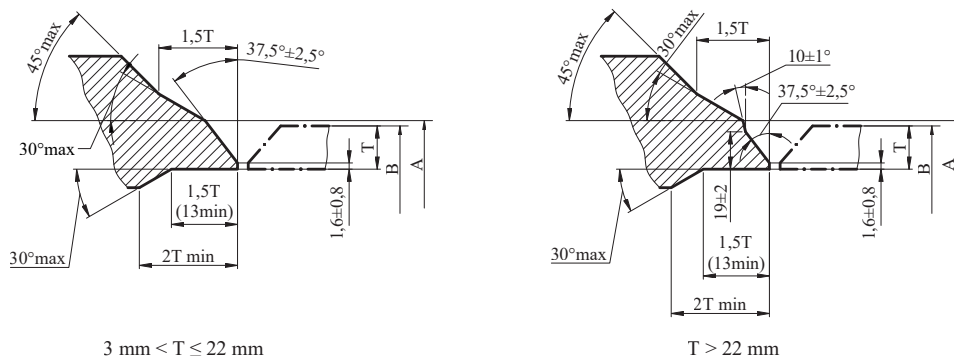


Figure A.13 - Form of the butt welding ends

Dimensions

Table A.6

DN (NPS)	B	A	T											
			Sch. 20	Sch. 30	Sch. Std	Sch. 40	Sch. 60	Sch. XS	Sch. 80	Sch. 100	Sch. 120	Sch. 140	Sch. 160	Sch. XXS
50(2)	60,3	---	---	3,18	3,91	3,91	---	5,54	5,53	---	---	---	8,74	11,07
65(2 ½)	73,0	75	---	4,78	5,16	5,16	---	7,01	7,01	---	---	---	9,53	14,02
80(3)	88,9	91	---	4,78	5,49	5,49	---	7,62	7,62	---	---	---	11,13	15,24
100(4)	114,3	117	---	4,78	6,02	6,02	---	8,56	8,55	---	11,13	---	13,49	17,12
150(6)	168,3	172	---	---	7,11	7,11	---	10,97	10,97	---	14,27	---	18,26	21,95
200(8)	219,1	223	6,35	7,04	8,18	8,18	10,31	12,70	12,7	15,09	18,26	20,62	23,01	22,22
250(10)	273,0	278	6,35	7,8	9,27	9,27	12,7	12,70	15,08	18,26	21,44	25,4	28,58	25,40
300(12)	323,8	329	6,35	8,38	9,52	10,31	14,27	12,70	17,47	21,44	25,4	28,57	33,32	---
350(14)	355,6	362	7,92	9,52	9,52	11,12	15,08	12,70	19,05	23,83	27,76	31,75	35,71	---
400(16)	406,4	413	7,92	9,52	9,52	12,7	16,66	12,70	21,43	26,19	30,94	36,52	40,46	---

7.2 Butt Welding Ends according to EN 12627

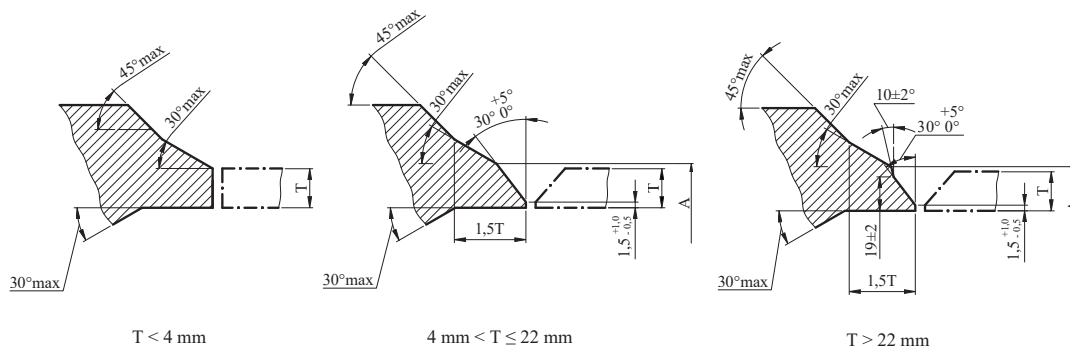


Figure A.14 - Form of the butt welding ends

Dimensions and tolerance of outside diameter

Table A.7

DN	DN 50	DN 65	DN 80	DN 100	DN 150	DN 200	DN 250	DN 300	DN 350	DN 400
A (mm)	62	78	91	117	172	223	278	329	362	413
Tolerance (mm)	+2,5 -2,0		+2,5 -2,5		+4,0 -2,5					

8. PRESSURE & TEMPERATURE RATINGS

8.1 Pressure/Temperature ratings for ASTM materials

Pressure (bar) / Temperature (°C) ratings according to ASME B16.34

Table A.8

Materials	Class	-29÷38	50	100	150	200	250	300	325	350	375	400	425	450	470	500	538	550	595	600
WCB A105	900	153,2	150,4	139,8	135,2	131,4	125,8	119,5	116,1	112,7	109,1	104,2	86,3							
	1500	255,3	250,6	233,0	225,4	219,0	209,7	199,1	193,6	187,8	181,8	173,6	143,8							
	2500	425,5	417,7	388,3	375,6	365,0	349,5	331,8	322,6	313,0	303,1	289,3	239,7							
WC1	900	144,1	142,4	136,0	131,8	127,6	122,3	116,1	112,7	109,2	104,9	97,9	81,9	64,8	50,6					
	1500	240,1	237,3	226,7	219,7	212,7	203,9	193,4	187,9	182,0	174,9	163,1	136,5	107,9	84,3					
	2500	400,1	395,6	377,8	366,1	354,4	339,8	322,4	313,1	303,3	291,4	271,9	227,5	179,9	140,4					
F1	900	144,1	144,1	143,8	142,0	137,4	133,5	128,6	124,0	120,7	116,5	109,8	105,1	101,4	96,2					
	1500	240,1	240,1	236,7	236,7	229,0	222,5	214,4	206,6	201,1	194,1	183,1	175,1	169,0	160,4					
	2500	400,1	400,1	399,5	394,5	381,7	370,9	357,1	344,3	335,3	323,2	304,9	291,6	281,8	267,3					
WC6 F11Cl.2	900	155,1	155,1	154,4	149,2	143,9	139,0	128,6	124,0	120,7	116,5	109,8	105,1	101,4	86,2	77,2	44,7	38,1	19,9	
	1500	258,6	258,6	257,4	248,7	239,8	231,8	214,4	206,6	201,1	194,1	183,1	175,1	169,0	160,4	128,6	74,5	63,5	33,2	
	2500	430,9	430,9	429,0	414,5	399,6	386,2	357,1	344,3	335,3	323,2	304,9	291,6	281,8	267,3	214,4	124,1	105,9	55,4	
WC9 F22Cl.3	900	155,1	155,1	154,6	150,6	145,8	139,0	128,6	124,0	120,7	116,5	109,8	105,1	101,4	96,2	84,7	55,3	46,9	22,8	
	1500	258,6	258,6	257,6	250,8	243,4	231,8	214,4	206,6	201,1	194,1	183,1	175,1	169,0	160,4	140,9	92,2	78,2	38,1	
	2500	430,9	430,9	429,4	418,2	405,4	386,2	357,1	344,3	335,3	323,2	304,9	291,6	281,8	267,3	235,0	153,7	130,3	42,9	
C12A F91	900	155,1	155,1	154,6	150,6	145,8	139,0	128,6	124,0	120,7	116,5	109,8	105,1	101,4	96,2	84,7	75,2	74,8	61,2	55,9
	1500	258,6	258,6	257,6	250,8	243,4	231,8	214,4	206,6	201,1	194,1	183,1	175,1	169,0	160,4	140,9	125,5	124,9	101,9	93,1
	2500	430,9	430,9	429,4	418,2	405,4	386,2	357,1	344,3	335,3	323,2	304,9	291,6	281,8	267,3	235,0	208,9	208,0	169,9	155,1

Note: Presented values belong to Standard Rating. For Special Class contact Termovent SC.

Pressure (bar)/Temperature (°C) ratings acc. to EN 12516-1

Table A.9

Materials	PN	-10	20	38	50	100	150	200	250	300	325	350	375	400	425	450	470	500	538	550	595	600
WCB A105	160	160,0	160,0	160,0	160,0	160,0	160,0	160,0	156,6	148,7	144,6	140,3	135,8	129,7	107,4							
	250	250,0	250,0	250,0	250,0	250,0	250,0	250,0	244,7	232,4	225,9	219,2	212,2	202,6	167,9							
	400	400,0	400,0	400,0	400,0	400,0	400,0	400,0	391,6	371,8	361,5	350,7	339,5	324,2	268,6							
WC1	160	160,0	160,0	160,0	160,0	160,0	160,0	158,9	152,3	144,5	140,4	135,9	130,6	121,8	102,0	80,6	56,2					
	250	250,0	250,0	250,0	250,0	250,0	250,0	248,2	238,0	225,7	219,3	212,4	204,1	190,3	159,3	126,0	87,7					
	400	400,0	400,0	400,0	400,0	400,0	400,0	397,1	380,7	361,2	350,9	339,8	326,5	304,6	254,9	201,5	140,4					
F1	160	160,0	160,0	160,0	160,0	160,0	160,0	160,0	160,0	160,0	154,3	150,2	144,9	136,6	130,7	126,2	119,8					
	250	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	241,0	234,7	226,3	213,4	204,1	197,2	187,2					
	400	400,0	400,0	400,0	400,0	400,0	400,0	400,0	400,0	400,0	385,7	375,5	362,1	341,4	326,6	315,6	299,5					
WC6 F11Cl.2	160	160,0	160,0	160,0	160,0	160,0	160,0	160,0	160,0	160,0	154,3	150,2	144,9	136,6	130,7	126,2	119,8	96,1	55,6	47,5	24,8	
	250	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	241,0	234,7	226,3	213,4	204,1	197,2	187,2	150,1	86,9	74,1	38,8	
	400	400,0	400,0	400,0	400,0	400,0	400,0	400,0	400,0	400,0	385,7	375,5	362,1	341,4	326,6	315,6	299,5	240,2	139,1	118,6	62,0	
WC9 F22Cl.3	160	160,0	160,0	160,0	160,0	160,0	160,0	160,0	160,0	160,0	154,3	150,2	144,9	136,6	130,7	126,2	119,8	105,3	68,9	58,4	28,4	
	250	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	241,0	234,7	226,3	213,4	204,1	197,2	187,2	164,5	107,6	91,2	44,4	
	400	400,0	400,0	400,0	400,0	400,0	400,0	400,0	400,0	400,0	385,7	375,5	362,1	341,4	326,6	315,6	299,5	263,3	172,2	146,0	71,1	
C12A F91	160	160,0	160,0	160,0	160,0	160,0	160,0	160,0	160,0	160,0	154,3	150,2	144,9	136,6	130,7	126,2	119,8	105,3	93,6	93,2	76,2	72,8
	250	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	241,0	234,7	226,3	213,4	204,1	197,2	187,2	164,5	146,2	145,6	119,0	113,8
	400	400,0	400,0	400,0	400,0	400,0	400,0	400,0	400,0	400,0	385,7	375,5	362,1	341,4	326,6	315,6	289,1	263,3	233,9	232,9	190,4	182,1

Note: Presented values belong to Standard Rating. For Special Class contact Termovent SC.

8.2 Pressure/Temperature ratings for EN materials

Pressure (bar)/Temperature (°C) ratings acc. to EN 12516-1

Table A.10

Materials	Class	-10	20	50	100	150	200	250	300	350	400	420	450	475	480	500	510	525	530	550	575	600
1.0460	900	148,1	148,1	139,6	120,3	114,2	108,0	98,7	89,5	83,3	77,1	70,6										
	1500	246,9	246,9	232,7	200,6	190,31	180,0	164,6	149,2	138,9	128,6	117,7										
	2500	411,4	411,4	387,8	334,3	317,1	300,0	274,3	248,5	231,4	214,3	196,2										
1.0619	900	148,1	148,1	139,6	120,3	114,2	108,0	98,7	89,5	83,3	77,1	70,6	47,3									
	1500	246,9	246,9	232,7	200,6	190,31	180,0	164,6	149,2	138,9	128,6	117,7	78,9									
	2500	411,4	411,4	387,8	334,3	317,1	300,0	274,3	248,5	231,4	214,3	196,2	131,4									
1.5419 1.5415	900	151,2	151,2	151,2	134,2	125,7	117,2	109,5	101,8	95,6	92,6	89,9	85,8	84,2	83,9	58,3	50,7	36,3	32,2			
	1500	252,0	252,0	252,0	223,7	209,6	195,5	182,6	169,7	159,4	154,3	149,8	143,0	140,4	139,9	97,2	84,6	60,6	53,7			
	2500	420,0	420,0	420,0	372,8	349,2	325,7	304,3	282,8	265,7	257,1	249,6	238,3	234,0	233,1	161,9	140,9	100,9	89,5			
1.7357 1.7335	900	155,1	155,1	155,1	154,6	150,5	145,9	138,9	128,5	119,7	109,7	105,9	101,4	94,9	92,9	80,2	71,7	59,0	54,7	33,6		
	1500	258,6	258,6	258,6	257,7	251,0	243,3	231,6	214,2	199,6	182,9	176,5	169,0	158,3	154,8	133,7	119,6	98,3	91,2	56,0		
	2500	430,9	430,9	430,9	429,4	418,2	405,4	386,0	357,0	332,5	304,7	294,2	281,6	263,7	258,0	222,8	199,2	163,8	152,0	93,3		
1.7379 1.7383	900	155,1	155,1	155,1	154,6	150,5	145,0	138,9	128,5	120,6	109,7	105,9	101,4	94,9	92,9	84,6	81,7	69,2	64,5	45,3	35,0	19,2
	1500	258,6	258,6	258,6	257,7	251,0	241,7	231,61	214,2	201,1	182,9	176,5	169,0	158,3	154,8	141,0	136,2	115,4	107,4	75,4	58,3	32,0
	2500	430,9	430,9	430,9	429,4	418,2	402,8	386,0	357,0	335,1	304,7	294,2	281,6	263,7	258,0	235,0	226,9	192,4	179,1	125,7	97,1	53,3
1.4955 1.4903	900	155,1	155,1	155,1	154,6	150,5	145,9	138,9	128,5	120,6	109,7	105,9	101,4	94,9	92,9	84,6	81,7	77,3	76,8	74,8	71,8	64,3
	1500	258,6	258,6	258,6	257,7	251,0	243,3	231,6	214,2	201,1	182,9	176,5	169,0	158,3	154,8	141,0	136,2	128,9	128,1	124,7	119,7	107,1
	2500	430,9	430,9	430,9	429,4	418,2	405,4	386,0	357,0	335,1	304,7	294,2	281,6	263,7	258,0	235,0	226,9	214,8	213,4	207,9	199,5	178,5

Note: Presented values belong to Standard Rating. For Special Class contact Termovent SC.

Pressure (bar)/Temperature (°C) ratings acc. to EN 12516-1

Table A.11

Materials	PN	-10	20	50	100	150	200	250	300	350	400	420	450	475	480	500	510	525	530	550	575	600
1.0460	160	160,0	160,0	1260,0	149,8	142,1	134,5	122,9	111,4	103,7	96,0	87,9										
	250	250,0	250,0	250,0	234,1	222,1	210,1	192,1	174,1	162,0	150,0	137,4										
	400	400,0	400,0	400,0	374,5	355,3	336,1	307,3	278,5	259,3	240,1	219,8										
1.0619	160	160,0	160,0	1260,0	149,8	142,1	134,5	122,9	111,4	103,7	96,0	87,9	58,9									
	250	250,0	250,0	250,0	234,1	222,1	210,1	192,1	174,1	162,0	150,0	137,4	92,0									
	400	400,0	400,0	400,0	374,5	355,3	336,1	307,3	278,5	259,3	240,1	219,8	207,7									
1.5419 1.5415	160	160,0	160,0	160,0	160,0	156,6	146,0	136,4	126,8	119,1	115,3	113,5	106,8	104,9	104,5	72,6	63,2	45,2	40,1			
	250	250,0	250,0	250,0	250,0	244,6	228,1	213,1	198,1	186,1	180,1	177,4	166,8	163,8	163,2	113,4	98,7	70,7	62,7			
	400	400,0	400,0	400,0	400,0	391,3	364,9	340,9	316,9	297,7	288,1	283,9	267,0	262,2	261,2	181,4	157,9	113,1	100,3			
1.7357 1.7335	160	160,0	160,0	160,0	160,0	160,0	160,0	160,0	160,0	149,1	136,6	131,8	126,2	118,2	115,6	99,9	89,3	73,4	67,1	41,8		
	250	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	232,9	213,4	206,0	197,2	184,7	180,7	156,0	139,5	114,7	104,8	65,4		
	400	400,0	400,0	400,0	400,0	400,0	400,0	400,0	400,0	372,6	341,4	329,6	315,6	295,5	289,1	249,7	223,2	183,5	167,7	104,6		
1.7379 1.7383	160	160,0	160,0	160,0	160,0	160,0	160,0	160,0	160,0	150,21	136,6	131,8	126,2	118,2	115,6	105,3	101,7	86,2	80,2	56,3	43,5	23,9
	250	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	234,7	213,4	206,0	197,2	184,7	180,7	164,5	158,9	134,7	125,4	88,0	68,0	37,3
	400	400,0	400,0	400,0	400,0	400,0	400,0	400,0	400,0	375,5	341,4	329,6	315,6	295,5	289,1	263,3	254,3	215,5	200,6	140,9	108,8	59,8
1.4955 1.4903	160	160,0	160,0	160,0	160,0	160,0	160,0	160,0	160,0	150,2	136,6	131,8	126,2	118,2	115,6	105,3	101,7	96,3	95,7	93,2	89,4	80,0
	250	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	234,7	213,4	206,0	197,23	184,7	180,7	164,5	158,9	150,4	149,5	145,6	139,7	125,0
	400	400,0	400,0	400,0	400,0	400,0	400,0	400,0	400,0	375,5	341,4	329,6	315,6	295,5	289,1	263,3	254,3	240,7	239,1	232,9	223,5	200,1

Note: Presented values belong to Standard Rating. For Special Class contact Termovent SC.

9. MARKING & LABELING

Gate valve shall be marked in accordance with general design specification and the requirements of standard EN 19 or ANSI/MSS SP-25-2018.

9.1 Marking

General marking of the valve

Table A.12

Item ^a	Subject		Marking	
			PN designed valves	Class designed valves
1	Product identification	Type	GHP	GHP
		Serial number	xxxx.xx.xx/xx	xxxx.xx.xx/xx
2	Nominal size		DN xxx	DN xxx
3	PN/Class designation		PN xxx	Class xxxx
4	Material		xxx	xxx
5	Cast (heat) identification		xxx	xxx
6	Arrow for flow direction		→	→
7	Manufacturer's name and registered trade details		Termovent SC Serbia	Termovent SC Serbia
8	Ring joint number		-	R xx
9	Maximum allowable temperature, T_{Smax}		xx °C or xx C	xx °C or xx C
	Minimum allowable temperature, T_{Smin}		xx °C or xx C	xx °C or xx C
10	Threaded end identification		R , R_c , R_p , G, NPT	R , R_c , R_p , G, NPT
			or other markings according to the relevant standard	or other markings according to the relevant standard
11	Maximum allowable pressure PS		xx bar	xx bar
12	Trim		xxx	xxx
13	Month / year of manufacturing		mm/yy	mm/yy

^a Other (additional) markings may be requested by the user or recommended by the manufacturer.

9.1.1 Additional Marking

Equipment that meets specific requirements for safety and operation in potentially explosive atmospheres should be marked with an additional mark as follows:



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.



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) and category 3 (zone 2+22) to ATEX 2014/34/EU.

9.2 Labeling

Valve information can be found on the valve body, and the typical valve nameplate is shown on Figure A.15.

 <i>Additional marking</i>	TYPE		DN/NPS		PN/Class	
	Body		PS/TS			
	Trim					
	S/N No.		Date			

Figure A.15

TYPE	Type of valve
DN / NPS	Nominal valve size
PN / Class	Pressure
Body	Material
PS / TS	Pressure-temperature rating
S / N No.	Series Number
Date	Manufacture Date
Additional marking	As per 9.1.1

10. SURFACE PROTECTION *

The supplied valves are already protected against corrosion with a manufacturer-standard paint system. The protective paint system meets the requirements of ISO 12944 for corrosion category C3-M.

** Note: At the customer's request, a special surface protection and color different from the standard can be applied.*

11. PACKAGING

Termovent SC products are packed in standard boxes to ensure safe transport by truck to their destination. The standard packaging includes boxes made of OSB-3 panels fixed on a heat-treated wooden pallet and further protected by outer nylon foil. It's important to note that standard crates are not stackable. However, upon request, the packaging can be customized to meet specific customer requirements, such as stackable or sea-worthy packaging.

II INSTRUCTIONS for INSTALLATION, OPERATION & MAINTENANCE

12. INSTRUCTIONS for INSTALLATION, OPERATION & MAINTENANCE

12.1 General safety information

- Instructions for installation, start-up and maintenance during the period of exploitation of valves manufactured by TERMOVENT SC should be used as a manual intended for all personnel directly or indirectly involved in dealing with the products.
- Operators in charge of installation, operation and maintenance of GHP during the period of use should be fully trained for the correct/optimal performance of these tasks. If GHP is equipped with mechanical actuators, the operator should be trained for the adequate operation of such valves.
- Information about temperatures and allowable working pressures are shown in Table A.8 according to ASME B16.34 and Table A.9, Table A.10 and Table A.11 according to EN 12516-1. Under no circumstances should the valves be operated under conditions outside these tables.
- Before the service or reinstallation of the GHP, the plant or installation should be taken out of operation (zero pressure, temperature of valves should be the same temperature as the environment).
- Because valves in working conditions have hot parts (handwheel, body and bonnet) and may cause burns, the operator is required to undertake all necessary precautions to avoid this by using protective equipment.
- These products are recyclable. No ecological hazard is anticipated with the disposal of these products providing due care is taken.

12.2 Storage & handling

GHP are delivered in their wedge in the closed position with protective covers on their ends. During the storage period, protective covers shall not be removed.

12.2.1 Recommended storage conditions

- Storage conditions shall be: ambient temperature between +10°C and +35°C and the humidity up to 85%
- The valves must be stored in closed, clean, dry and ventilated storage facilities.
- Do not store the valves outside.
- Store the valves in their original shipped packaging.
- Protect the valve from contact with solvents, lubricants, fuels or other chemicals.
- Store the valve in vibration-free conditions.
- Valve should be taken out of crates or removed from the covering of a pallet just before installation.
- Spare parts such as soft sealing elements, plastic or lubricants should be stored in a dry place at room temperature protected from light.

12.2.2 Storage inspection

- Periodical inspection should be performed on all stored valves. At the minimum, all valves should be inspected every 3-4 months for dirt, moisture or any other type of contamination. If any of this is found the valves are to be thoroughly cleaned and dried.
- Slight external rusting may occur on valves. This will not affect their performance.
- If valves are stored for more than 6 months we recommend the following:
 - ➔ Valves should be cycled open to close 2-3 times every 6 months to keep packing from adhering to the stem and help lubricate the stem and stem nut.
 - ➔ Preservation of inner surfaces, inner parts, stem, flange facing, butt welding ends and threads shall be repeated every 6 months with appropriate corrosion preventive coating

12.2.3 Handling requirements

- For valve handling and/or lifting the lifting equipment must be sized and selected while taking into consideration the valve weight indicated on the packing list.
- Do not use the lifting points located on the actuator (Figure A.16).
- Do not lift GHP via the handwheel (Figure A.17).
- If possible, lift GHP via the lifting lugs or yoke (Figure A.18 or Figure A.19).
- Caution must be taken during the handling to avoid that this equipment passing over the workers' heads.
- For valve handling or lifting, the lifting equipment must be sized and selected while taking or over any other place where a possible fall could cause damage.

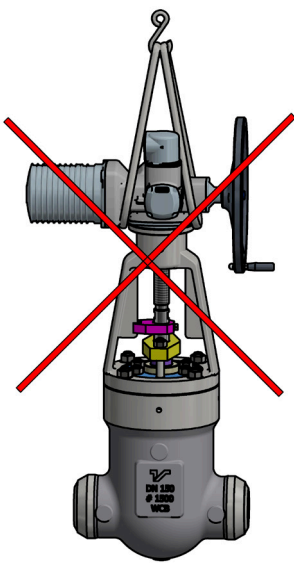


Figure A.16

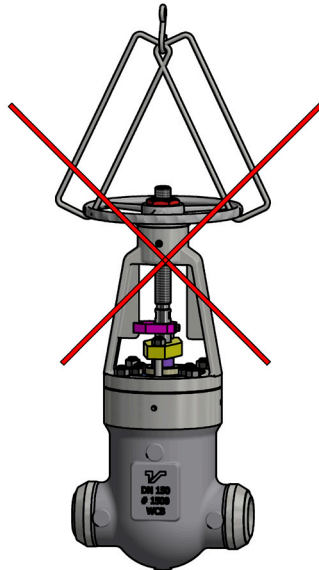


Figure A.17

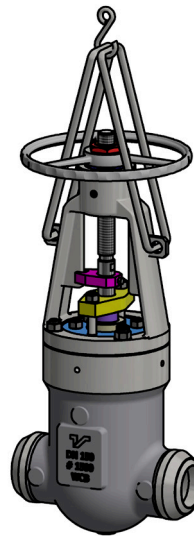


Figure A.18

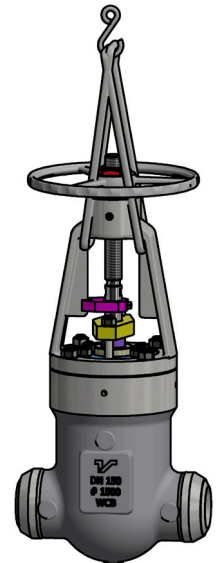


Figure A.19



WARNING!!!

- Lifting and handling must be performed by qualified personnel only.
 - You must not remove the protection covers from the valve connection ends.
 - Store the valves in the 'closed' position.
 - You must not lift the valves using the connection flange holes, handwheel or actuators.
-

12.3 Installation & Start-up

- GHP are delivered with their wedge in the closed position, and they are ready for use. After the removal of the protection covers it is necessary to thoroughly clean inside the valve with compressed air without first opening the valve.
- Do not disassemble or modify a valve in any way prior to installation. This will void the factory warranty if it occurs.
- Closure of the valve is performed by turning the handwheel in a CW (clockwise) direction. On the handwheel there is an arrow and the letter "C" indicating the closing direction, and another arrow and the letter "O" indicating the opening direction.
- When installing valves with flanged ends it is necessary to take into consideration the selection of adequate bolt material and the appropriate type of gasket depending on the type of working fluid, pressure, temperature, and the type of flange facing. It is necessary to install gaskets strictly in accordance with instructions given by the manufacturer of the gaskets.
- GHP with flanged ends shall be installed in a slightly open to fully open position.
- GHP with welding ends up to DN 100 (4") should be welded on the pipeline in the **CLOSED** position.
- GHP with welding ends over DN 100(4") shall be welded on pipeline in **OPEN** position.
- Welding must be performed by an expert and with appropriate WPS.
- After welding, if necessary, local normalization should be performed and the inside of the pipeline should be cleaned to remove possible welding remains.
- At the moment of installation, the influence of pipeline load on the valve should be reduced. The same also applies to temperature oscillation, hydraulic impact and similar. The valve should not be used as a support for a pipeline.
- When installing the GHP equipped with an overpressure safety device (described in Section 4.1), you must take into consideration the permitted flow direction. Allowed flow direction is defined by the arrow located on the GHP body.
- Manually operated gate valves should be relieved of maximum seating force when the gate valve wedge is closed. Relieving of the force shall be provided by moving the handwheel CCW (counterclockwise) to the open position by ¼ of a turn. Regarding this action, contact between the stem and wedge will be disengaged. The described action will prevent damage to the seating surfaces caused by excessive thermal stem expansion.
- We recommend installation of GHP with stem in vertical position. GHP could be installed with the stem in a horizontal position but for vertical pipelines. We do not recommend the installation of GHP over DN 150 (6") with a horizontal stem on the horizontal pipelines.
- After the installation, start-up and operating parameters are set, it is possible to detect a leakage on the stem packing. In this case, it is necessary to tighten the gland nuts equally. The tightness should not go beyond more than necessary to allow comfortable manipulation of GHP (opening/closing).
- Recommendation: GHP should be installed with a minimum of 5x nominal diameter of straight pipeline in front of and behind the GHP.



WARNING!!!

-
- ➔ Do not disassemble or modify a valve in any way prior to installation. This will void the factory warranty if it occurs.
 - ➔ Before installation, the impurities should be removed from the pipeline or from the appliance.
 - ➔ Remove protecting covers from the valve ends, degrease and clean the inside of the valve, and in case of a flanged connection, carefully clean the sealing surfaces.
 - ➔ During the installation, check if there is enough space for normal and safe manipulation.
 - ➔ Installation of valves with an overpressure safety device (Section 4.1) must be in accordance with the allowed flow direction.
 - ➔ The valve should not be used as support for a pipeline.
-

12.4 Usage & maintenance

- The gate stem packing should be the subject of particular attention as it is important for the qualitative maintenance of tightness and shall be checked every 3 months. If leakage at the stem packing is detected, the gland nuts should be tightened slowly (Figure A.20). Torque for tightness gland nuts shown in Table A.13. When gland nuts are tightened, if the gland falls down more than twice the packing ring height, new packing rings should be added to the stem packing.

Table A.13

	M10	M12	M14	M16	M18	M20	M24	M27	M30	M33	M36
Torque /Nm/	15÷40	26÷65	42÷100	64÷150	100÷175	125÷300	210÷500	305÷730	410÷1000	550÷1350	710÷1720

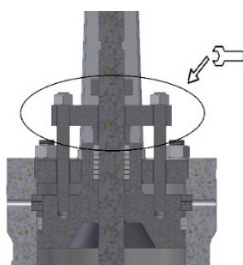


Figure A.20 – Stem packing gland tightening

- Stem packing must be replaced, depending on the working conditions and maintenance level, during packing replacement, special care must be taken to remove all old packing from the packing chamber. The preparation of new packing rings is shown in Figure A.21. Packing rings replacement is shown in Figure A.22 with a general note that every next packing ring must be rotated relative to the previous one (not less than 90°).



Figure A.21 – Stem packing ring



Figure A.22

- Lubrication of thread between stem (Pos.8 – Figure A.1) / stem nut (Pos.9 – Figure A.1) is highly important. To lubricate the bearings (Pos.23 – Figure A.1) on manual, gearbox or electric-operated valves, we suggest using quality-level grease, as shown in the following Table A.14. Lubrication shall be performed every month, or twice a year if they are rarely used. Valves used in high-temperature applications, use appropriate lubricants to support the temperature range. Lubrication is performed with lubrication nipples (Pos.25 – Figure A.1) on the yoke (Pos.4 – Figure A.1).
- It is recommended to replace the grease in bushes during every general overhaul or during the pipeline revision. The type of grease depends on the temperature in the plant. Remote controls, bushings and gearboxes should be lubricated depending on how frequently they are used, every 3 months. For the lubrication of the actuator (Pos.30 – Figure A.1) and (Pos.29 – Figure A.1) it is necessary to remove the protective tube then grease the stem (Pos.8 – Figure A.1) and return the protective tube. Some of the lubricants we use for lubrication are in the Table A.14

Table A.14

Manufacturer	Quality level
AGIP, SHELL, MOBIL, TOTAL	ISO 6743-9: L-X CCHA 2 / DIN 51 502: K 2K-30

- GHP delivered with an actuator is adjusted for proper work. GHP delivered with connection for later build on it the electric actuator must be adjusted. The closing of GHP should be adjusted by the torque switch and the opening by the limit switch. The torque and limit switch settings must be in accordance with the instructions from “TERMOVENT SC”.



WARNING!!!

- During usage, GHP must be completely in an open or closed position.
- Valve opening and closing by handwheel should be done without the use of auxiliary means such as a rod or similar.
- GHP cannot be used for flow control.
- A Strainer being installed before the valve will increase its reliability and proper working.

12.5 Service & Repair

- Only authorized persons should perform service and repair with appropriate tools and, if possible, use original spare parts. Personal protection should be applied in accordance with valid regulations and legalizations.
- Using the wrong or defective spare parts may pose a hazard for personnel, or result in damage, malfunctions or even total failure.
- For GHP standard spare parts are Bonnet and Stem packing.
- Contact “TERMOVENTSC” if You need other spare parts like a Stem, Wedge, Stem nut, etc.
- Every GHP serviced or repaired should be subject to all necessary tests usually performed for a newly produced valve.



WARNING!!!

-
- ➔ Before the service or reinstallation of the valves, the plant or installation should be taken out of operation (pressure 0 bar, temperature of valves should be the same temperature as the environment).
 - ➔ Manipulation with body and stem packing should be with high precautions because they could contain stainless steel wire which can cause severe injuries.
-

12.5.1 Stem packing rings replacement

Only authorized persons should perform service and repair with appropriate tools and, if possible, using original spare parts. Personal protection should be applied in accordance with valid regulations and legalizations.

Requirements before disassembling:

- ➔ The plant or installation should be taken out of operation (pressure 0 bar, temperature of valves should be the same temperature as the environment).
- ➔ GHP must be completely opened.

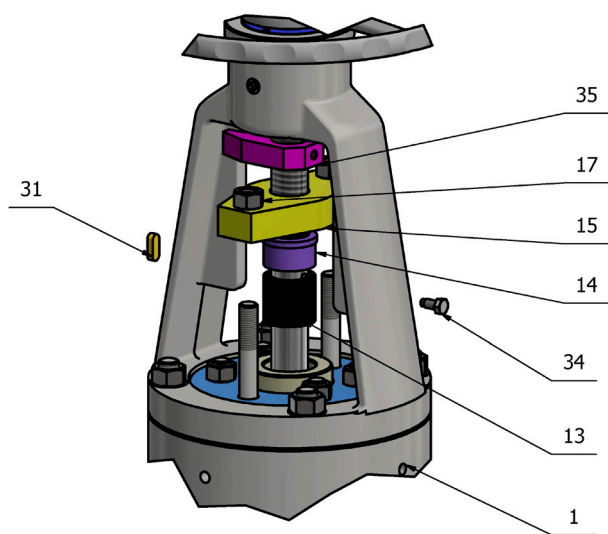


Figure A.23 –Stem packing rings replacement

Disassembling

-
- Step 1** › Unscrew gland nuts (Pos.17)
 - Step 2** › Remove screw (Pos.34)
 - Step 3** › Lift upwards stem plate (Pos.35)
 - Step 4** › Remove stem key (Pos.31)
 - Step 5** › Lift upwards gland flange (Pos.15)
 - Step 6** › Lift upwards packing gland (Pos.14)
 - Step 7** › Take out stem packing rings (Pos.13). All stem packing rings shall be removed (Pos.13)
 - Step 8** › The packing chamber shall be cleaned

Assembling

-
- Step 1** › The packing chamber shall be filled with new stem packing rings (Pos.13)
 - Step 2** › Put down packing gland (Pos.14)
 - Step 3** › Put down gland flange (Pos.15)
 - Step 4** › Put back and tighten gland nuts (Pos.17)
 - Step 5** › Put back stem key (Pos.31)
 - Step 6** › Put down the stem plate (Pos.35)
 - Step 7** › Tighten Screw (Pos.34)

12.5.2 Bonnet packing rings replacement

Only authorized persons should perform service and repair with appropriate tools and, if possible, use original spare parts. Personal protection should be applied in accordance with valid regulations and legalizations.

Requirements before disassembling:

- ➔ The plant or installation should be taken out of operation (pressure 0 bar, temperature of valves should be the same temperature as the environment).
- ➔ GHP must be closed.

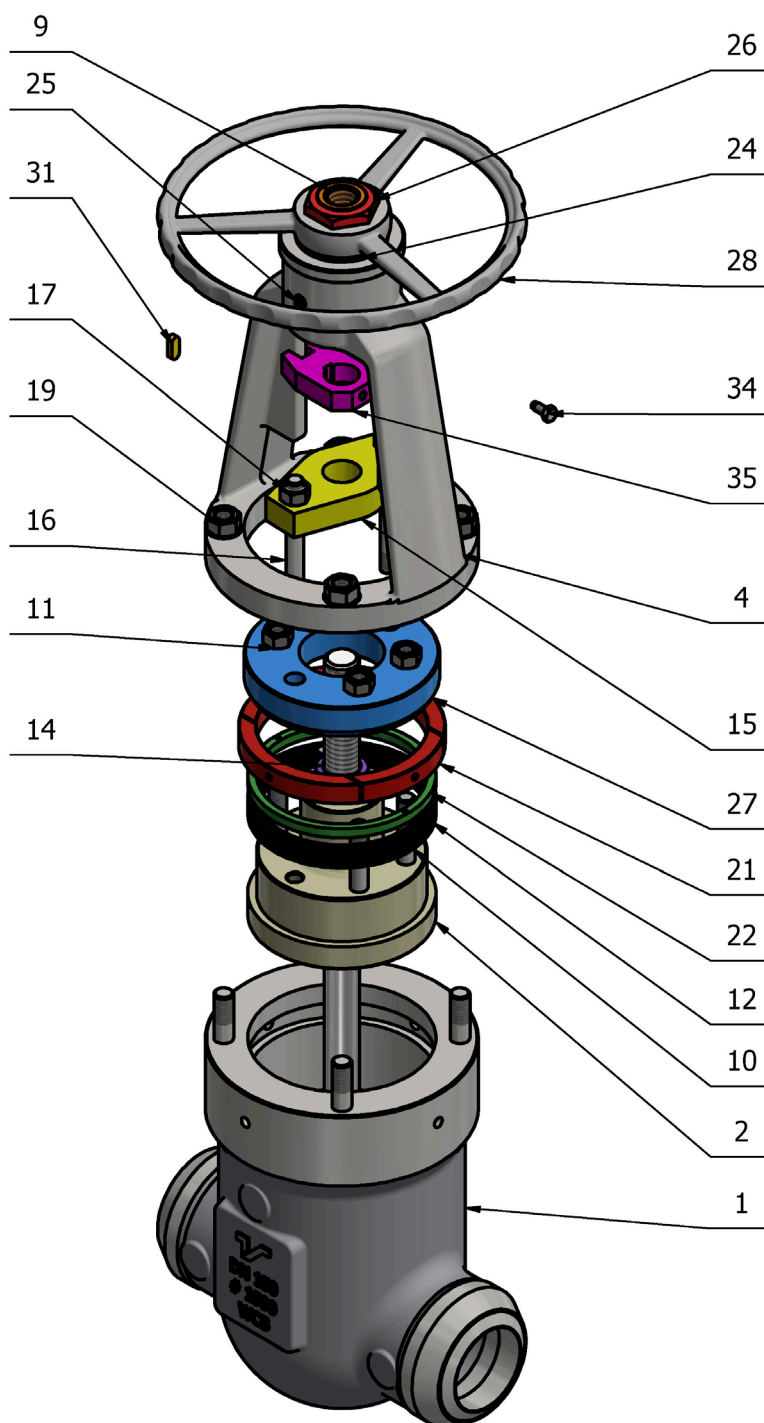


Figure A.24 –Bonnet packing rings replacement

Disassembling

- Step 1 ›** Attach the yoke (Pos.4) to the hoist using lifting straps
- Step 2 ›** Unscrew and remove nuts (Pos.19)
- Step 3 ›** Unscrew and remove the screw (Pos.34)
- Step 4 ›** Unscrew and remove gland nuts (Pos.17)
- Step 5 ›** Unscrew and remove gland bolts (Pos.16)
- Step 6 ›** Push up stem plate (Pos.35)
- Step 7 ›** Remove stem key (Pos.31)
- Step 8 ›** Move the handwheel (Pos.28) in CCW (counterclockwise) direction (opening direction).
- Step 9 ›** By turning the handwheel in the opening direction, remove the following parts from the body (Pos.1) as a single piece. These parts do not need to be disassembled to be removed from the gate valve.):
 - › handwheel nut (Pos.26)
 - › handwheel (Pos.28)
 - › yoke (Pos.4)
 - › cover bearing (Pos.24)
 - › stem nut (Pos.9)
 - › grease injector (Pos.25)
 - › stem plate (Pos.35)
 - › gland flange (Pos.15)
- Step 10 ›** Unscrew and remove nuts (Pos.11)
- Step 11 ›** Remove clamping lid (Pos.27) from the Body (Pos.1)
- Step 12 ›** Push down the bonnet (Pos.2) using a special tool (for a special tool You can contact Termovent SC)
- Step 13 ›** When the bonnet (Pos.2) is moved down segment rings (Pos.21) could be taken out
- Step 14 ›** Take out the bonnet (Pos.2) together with bonnet packing rings (Pos.12), bonnet metal ring (Pos.22), packing gland (Pos.14), stud bolts (Pos.10)
- Step 15 ›** Remove the bonnet metal ring (Pos.22)
- Step 16 ›** Take out bonnet packing rings (Pos.12). All bonnet packing rings (Pos.12) shall be removed.

Assembling

- Step 1 ›** Put on new bonnet packing rings (Pos.12)
- Step 2 ›** Put back bonnet metal ring (Pos.22)
- Step 3 ›** Put back bonnet (Pos.2) together with bonnet packing rings (Pos.12), bonnet metal ring (Pos.22), packing gland (Pos.14), stud bolts (Pos.10)
- Step 4 ›** Put back segment ring (Pos.21)
- Step 5 ›** Put back clamping lid (Pos.27)
- Step 6 ›** Put back and screw nuts (Pos.11)
- Step 7 ›** Put back the following positions all together in one piece:
 - › handwheel nut (Pos.26)
 - › handwheel (Pos.28)
 - › yoke (Pos.4)
 - › cover bearing (Pos.24)
 - › stem nut (Pos.9)
 - › grease injector (Pos.25)
 - › stem plate (Pos.35)
 - › gland flange (Pos.15)
- Step 8 ›** Put back stem key (Pos.31)
- Step 9 ›** Push up the stem plate (Pos.35) up to the place where the stem key is (Pos.31)
- Step 10 ›** Tighten screw (Pos.34)
- Step 11 ›** Put back and screw gland bolts (Pos.16)
- Step 12 ›** Put back and screw gland nuts (Pos.17)
- Step 13 ›** Put back and screw nuts (Pos.19)

12.6 Possible malfunctions and solutions

- During the period of usage of the installed high-pressure gate valve, malfunctions may occur. Only experts in the premises of the user should undertake repairs. The most common cause of malfunctions and how to overcome such situations is listed in Table A.15

Table A.15

Failure	Possible cause	Troubleshooting
Absence of flow	GHP is in closed position	Open the GHP completely with the handwheel (Pos.28)
	GHP is not completely open	Open the GHP completely with the handwheel (Pos.28)
	Protection covers are not removed	Remove protection covers from connection ends
Difficult manipulation	Dry stem /stem nut	Grease stem (Pos.8) or stem nut (Pos.9)
	Gland nuts are too tight	Slightly loosen Gland nuts (pos.17) with precaution to preserve sealing of the stem packing rings (Pos.13)
Leakage on stem packing	Gland nuts are not tightened	Tighten gland nuts (Pos.17)
	Stem packing rings are damaged	Completely open the gate valve, remove the worn stem packing and clean the chamber of the stem packing and install the new stem packing rings, the same or similar quality (Pos.13)
Leakage on bonnet packing	Bonnet nuts are not tightened	Tighten bonnet nuts (Pos.11).
	Bonnet packing rings are damaged	Disassemble the bonnet (Pos.2) and replace the bonnet packing rings (Pos.12) with new ones.
Leaking on seat	GHP is not completely closed	Turn the handwheel (Pos.28) in the direction indicated for closing without auxiliary means
	Mechanical damage of the seat or wedge	Grind the seats and, if necessary, have damaged components replaced. Check the actuator setting.
	The working medium contains solid dirt particles	Clean the Valve thoroughly. We recommend the installation of a Strainer before the Gate Valve
The valve does not function	The electric actuator does not function	Check the electric actuator as specified in the manufacturer's documentation.
	The pneumatic actuator does not function	Check the pneumatic actuator as specified in the manufacturer's documentation.
Malfunction of the valve	Limit switch (for optional electric or pneumatic) is defective	Have the limit switch checked. Prior to readjustment consult with Tervoent SC
	Torque switch (with optional electric or pneumatic) is defective	Have the torque switch checked. Prior to readjustment consult with Tervoent SC

12.7 Guarantee

- Termovent SC guarantee that each of its products free from defects and work properly for a period of eighteen (18) months from the date of installation or twenty-four (24) months from the date of shipment from the manufacturer, whichever comes first.
- Manufacturer agrees to repair or replace any product which is non-conforming to the Warranty due to defective workmanship or defective material of which the Warranty non-conformance customer notifies the manufacturer in writing during the Warranty Period.
- Warranty does not apply to products that have defects or failures resulting from
 - (a) accident, disaster, neglect, misuse, improper handling.
 - (b) application of excessive torque to the operating mechanism, presence of foreign matter.
 - (c) the products are not being installed or maintained as required by instructions
 - (d) modifications or repairs without manufacturer approval.
 - (e) natural tears and wear caused by material ageing.

III PURCHASE GUIDE

13. RFQ FORM

To better define the technical characteristics of the product, it is recommended to provide the following data and parameters when submitting an inquiry.:

RFQ - Form					GHP	
Service condition						
Fluid:				Fluid state:		
Flow:					m³/h	
Operating and design pressure	Operating		bar	Design		bar
Operating and design temperature	Operating		°C	Design		°C
Max. Shut Off pressure					bar	
Ambient temperature					°C	
Pressure rating						
Class		900		1500		2500
PN		160		250		400
Connection & Installation dimensions						
Installation dimension				mm		
Inlet and outlet pipe dimension	Inlet		mm	Outlet		mm
Butt welding ends		ASME B16.25		EN 12627		Other
Flanges		ASME B16.5		EN 1092-1		Other
Materials & Trim						
Body				Trim / internal parts		
Installation position						
Installation position		Vertical		Horizontal		Other
Over pressure devices						
With hole in the wedge						
With nozzle for safety valve						
With by-pass						
With double by-pass & equalizing pipe						
With double by-pass & equalizing pipe with valve						
With equalizing pipe						
Accessories						
With drain valve						
Spring loaded stuffing box						
Limit switches						

Other			
Actuation type			
Handwheel			
Gearbox			
Electric actuator		Closing time	sec
Pneumatic actuator		Closing time	sec
Accessories for actuator			
Testing			
Testing		Tightness Class	
Surface protection		Marking	
Surface protection		Marking	
Additional requirements			



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