TECHNICAL DATA SHEET

GHP

HIGH PRESSURE GATE VALVE

TERMOVENT since1963 SC

TECHNICAL DATA SHEET

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 and bonnet
- 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 temperature 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

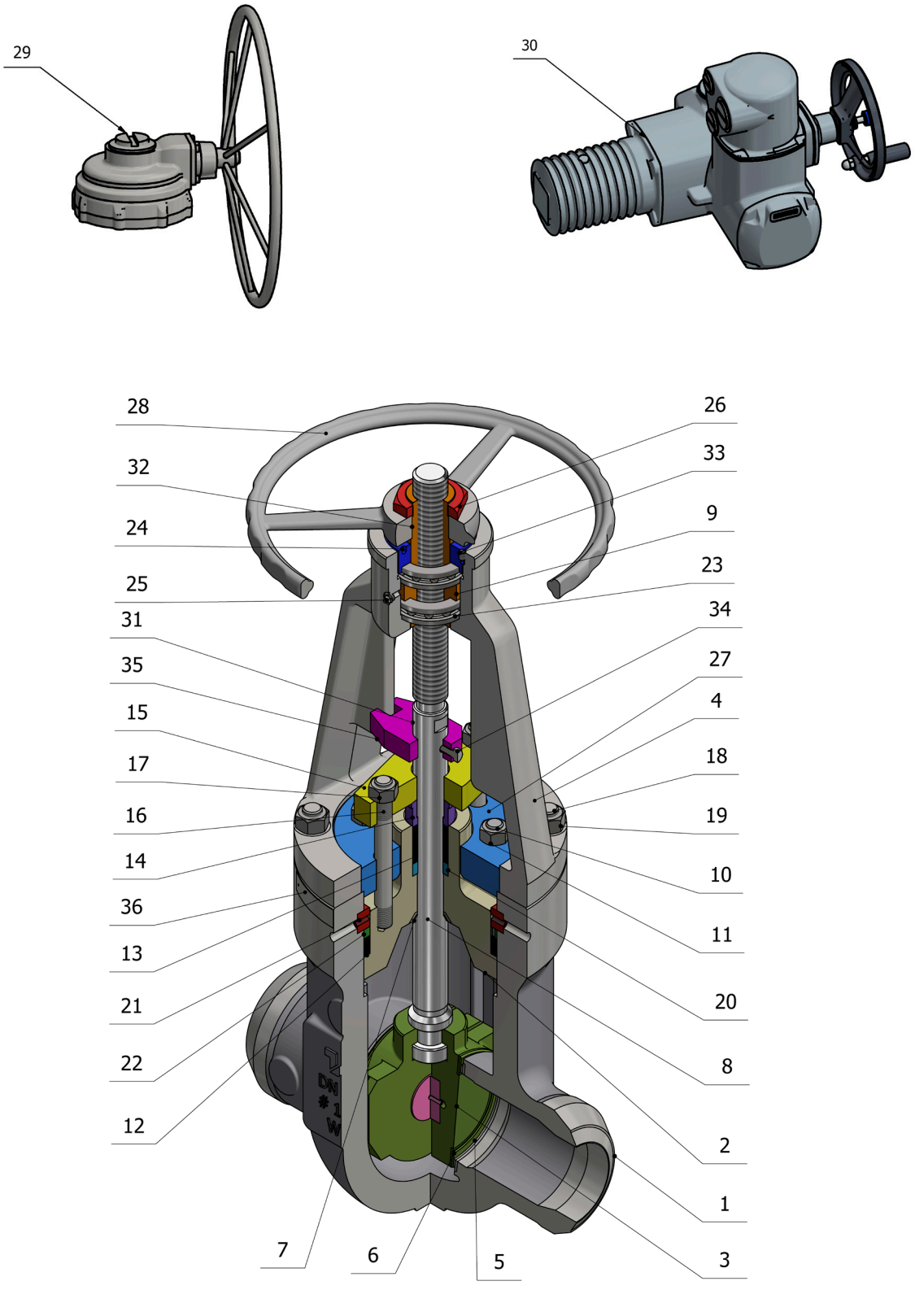


Figure A.1 Parts

List of materials **Table A.1**

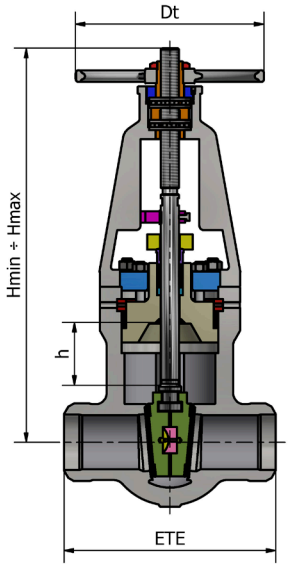
Parts	Name		Material Group acc. to ASME B16.34 or EN 12516-1				
1	Body [1]	Cast parts Forged parts	WCB or 1.0619 A105 or 1.0460	WC1 or 1.5419 F1 or 1.5415	WC6 or 1.7357 F11Cl.2 or 1.7335	WC9 or 1.7379 F22Cl.3 or 1.7383	C12A or 1.4955 F91 or 1.4903
2	Bonnet [1]						
3	Wedge [1]						
4	Yoke		WCB or 1.0619		WC6 or 1.7357		
5	Body overlay [2]		Hard-Faced 13Cr or Stellite™				
6	Wedge overlay [2]						
7	Backseat overlay [2]						
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[3]			
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[3]			
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[3]			
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 shell be min. 50 HB
[3] Over 500°C

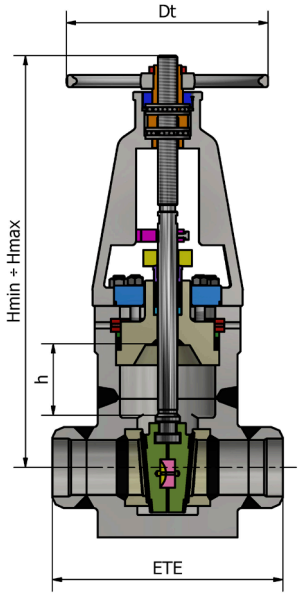
3. STANDARDS & DIMENSIONS

Standards **Table A.2**

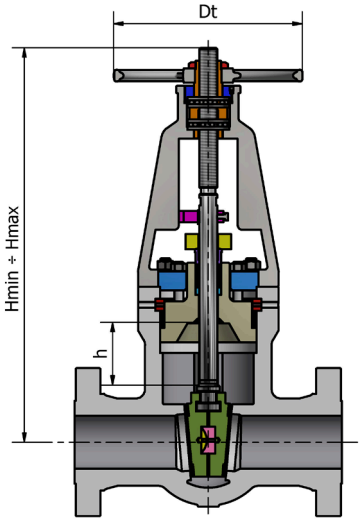
GHP	Class 900 ÷ Class 2500 (PN 160 ÷ PN 400)
General design	ASME B16.34 and EN 12516
Wall thickness	ASME B16.34 and EN 12516
Pressure / temperature rating	ASME B16.34 or EN 12516
FTF and ETE according to	ASME B16.10 or EN 558/EN 12982
Flanged Ends according to	ASME B16.5 or EN 1092-1
Welding Ends according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



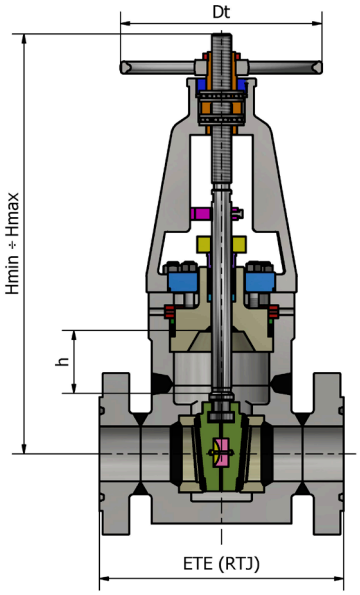
GHP with welding ends - CAST



GHP with welding ends – FORGED



GHP with flanged ends - CAST



GHP with flanged ends - FORGED

Figure A.2 Dimensions

[GHP] Dimensions **Table A.3**

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**		**m^3/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

- Weight without actuators
- 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

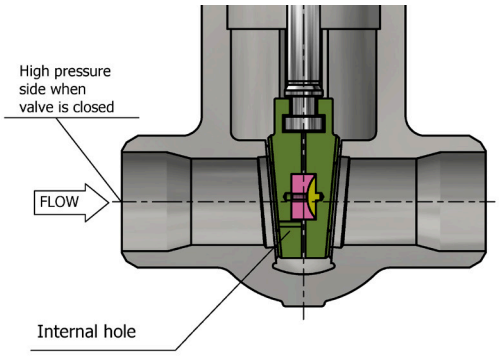


Figure A.3 With a hole in the wedge

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

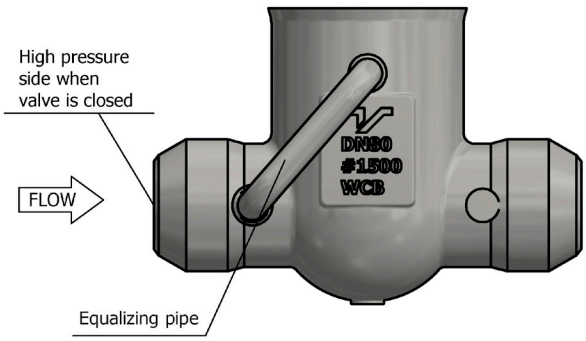


Figure A.4 With equalizing pipe

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

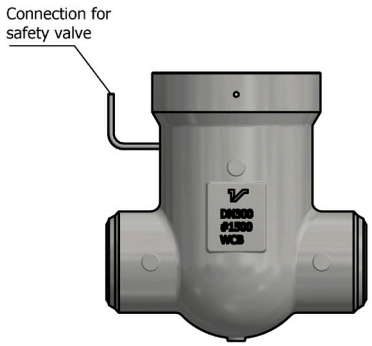


Figure A.5 With closed nozzle for safety valve

- **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).

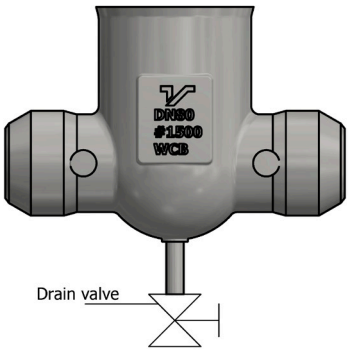


Figure A.6 With drain valve

- **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

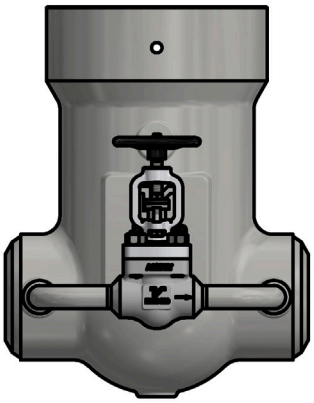


Figure A.7 With By-pass valve

- **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

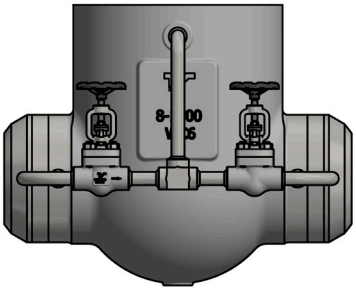


Figure A.8 With double by-pass & equalizing pipe

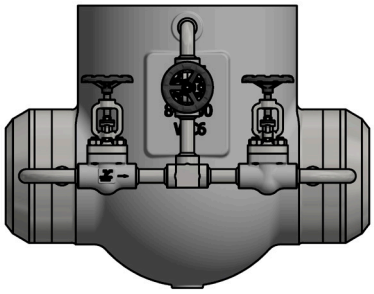


Figure A.9 With double by-pass & equalizing pipe with a valve

- 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 Termovent SC Wedge Design

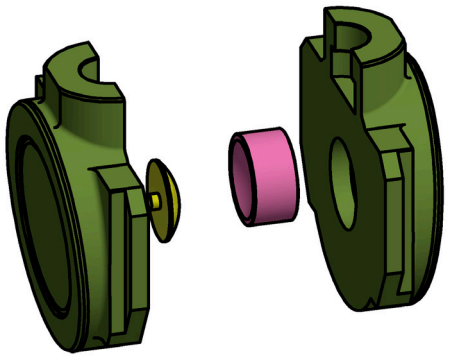


Figure A.10 Split wedge

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

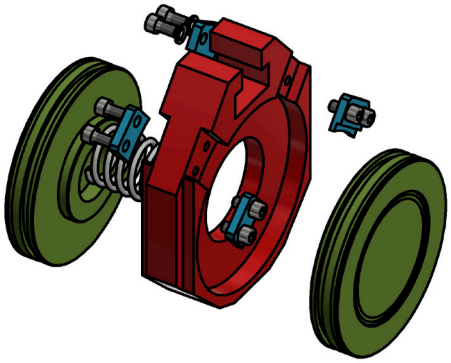


Figure A.11 Parallel slide wedge

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

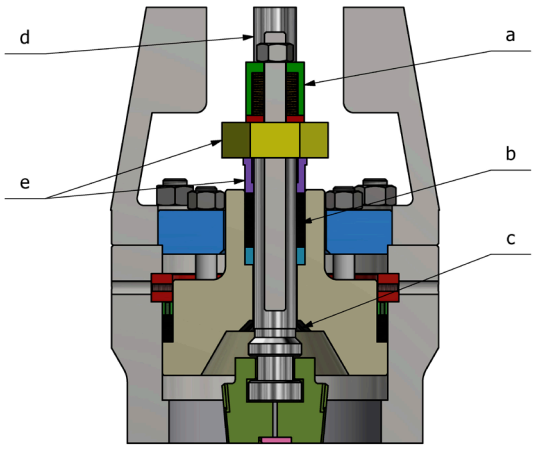


Figure A.12 Stem seal

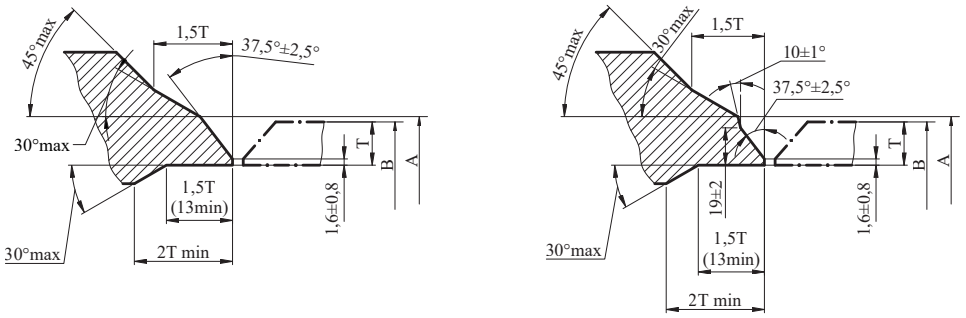
a. **Spring-loaded stuffing box *SLSB* (optional) –** Two sets of springs maintain a minimum permanent packing stress. Live Loading keeps the stem tight for long periods without maintenance
b. **Pre-compressed rings –** Each braided graphite ring is preformed and compressed during assembly to ensure 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



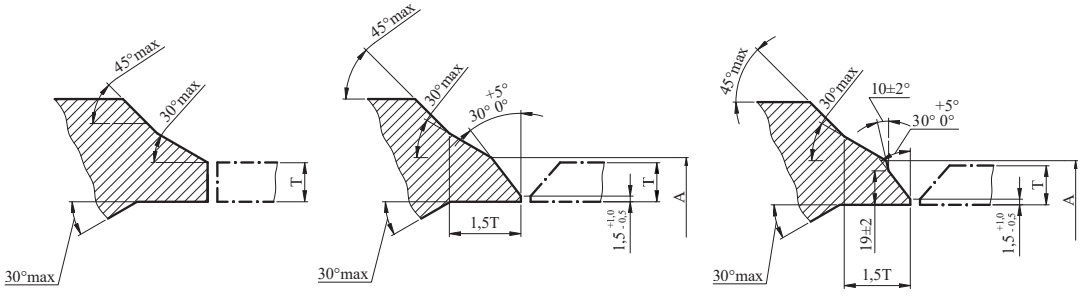
3 mm < T ≤ 22 mm T > 22 mm

Figure A.13 - Form of the butt welding ends

Dimensions of outside diameter and wall thickness **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



T < 4 mm 4 mm < T ≤ 22 mm T > 22 mm

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	206,61	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	226,31	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	Body material		xxx	xxx
5	Cast (heat) identification		xxx	xxx
6	Allowable flow direction arrow		→	→
7	Manufacturer's name and registered trade details		Termovent SC Serbia	Termovent SC Serbia
8	Ring joint number		-	R xx
9	Maximum allowable temperature, *TS*max		xx °C or xx C	xx °C or xx C
	Minimum allowable temperature, *TS*min		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 identification		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:

CE

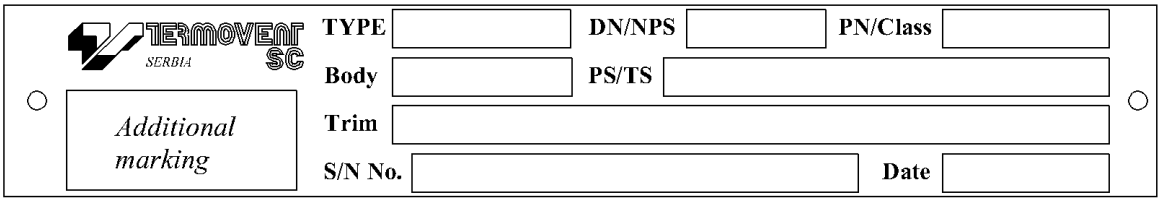
The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Groups 1 and 2.

Ex

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.



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

Figure A.15

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.

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