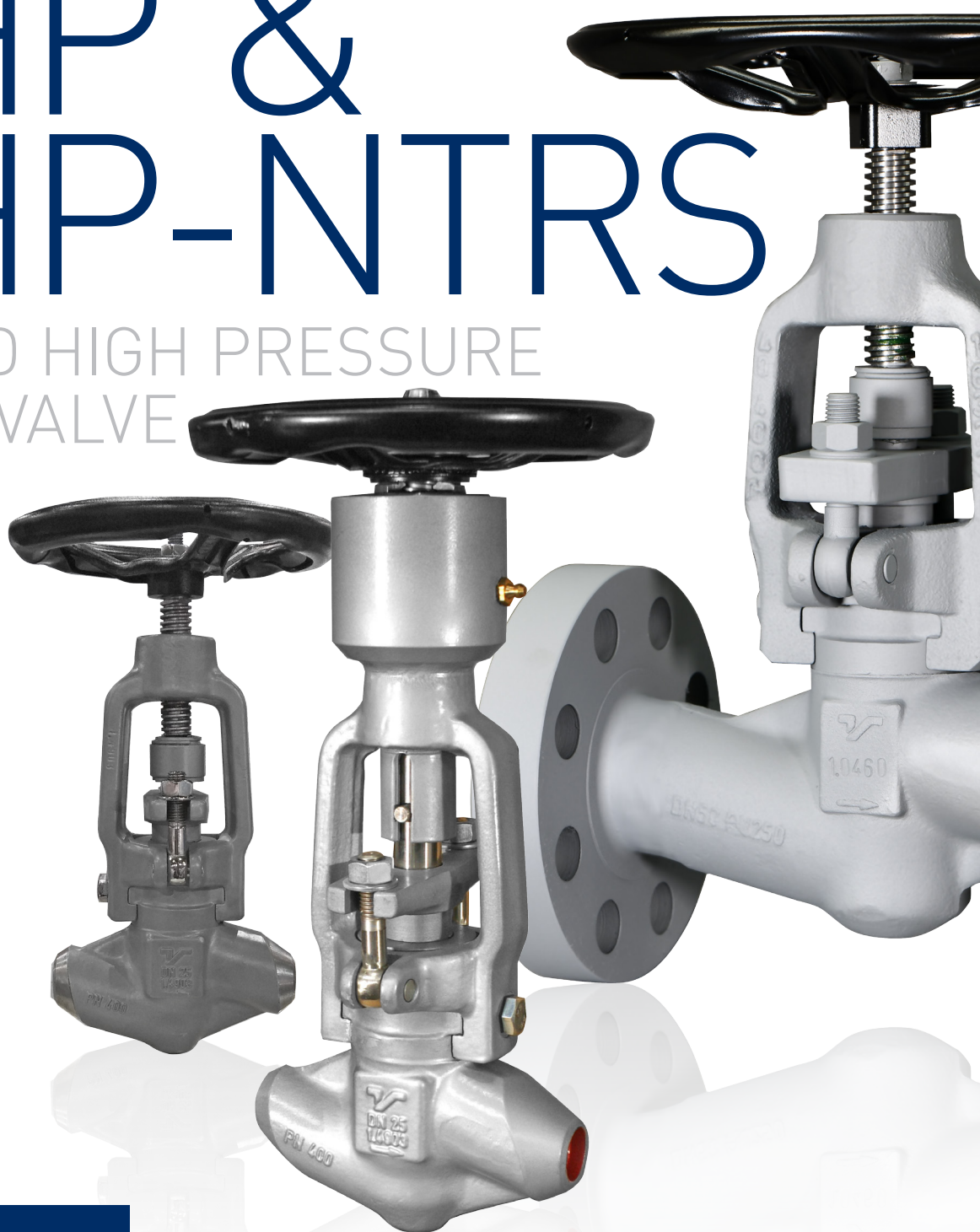


TERMOVENT SC SERBIA // INDUSTRIAL VALVES

VHP & VHP-NTRS

FORGED HIGH PRESSURE
GLOBE VALVE



TERMOVENT
since 1963 **SC**

CONTENTS

Page

I Technical data sheets

1. General Features	5
2. Parts & Materials	6
2.1 Parts & Materials VHP Type	6
2.2 Parts & Materials VHP-NTRS Type.....	8
3. Standards & Dimensions	10
4. Butt Welding Ends Desing	12
4.1 Butt Welding Ends according to EN 12627	12
4.2 Butt Welding Ends according to ASME B16.25.....	12
5. Optional Executions	13
6. Pressure & Temperature Ratings	14
6.1 Pressure/Temperature Ratings for EN Materials.....	14
6.2 Pressure/Temperature Ratings for ASTM Materials.....	15
7. Marking & Labeling	16
7.1 Marking	16
7.1.1 Additional Marking	16
7.2 Labeling	17
8. Surface Protection	17
9. Packaging	17

II Instructions for Installation, Operation & maintenance

10. Instructions for installation, Operation & Maintenance	19
10.1 General Safety Information	19
10.2 Storage and Handling	19
10.2.1 Recommended Storage Facilities	19
10.2.2 Storage Inspection	19
10.2.3 Handling Requirements	20
10.3 Installation and Start-up	21
10.4 Usage & Maintenance	22
10.5 Service & Repair	23
10.5.1 VHP Stem Packing Rings Replacement	24
10.5.2 VHP-NTRS Stem Packing Rings Replacement	25
10.6 Possible Malfunctions & Solutions	26
10.7 Guarantee	26

III Purchase Guidance

11. RFQ Form	
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I TECHNICAL DATA SHEETS

1. GENERAL FEATURES

Forged High Pressure Globe Valves

VHP Type – Rising Stem

VHP-NTRS Type – Non Turning Rising Stem

DN 10 (NPS 3/8") ÷ DN 65 (NPS 2 1/2")

PN 250 ÷ PN 400

Class 1500 ÷ Class 2500

Design

- T-pattern globe type
- Closed-Die-Forged body
- Pressure seal design
- Rising stem (RS), outside screw and yoke (OS&Y)
- Non turning rising stem (NTRS)
- Hard faced seats

Applications

- The main purpose of the VHP & VHP-NTRS are to isolate fluid flow through 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

- PN 250 ÷ PN 400
- Class 1500 ÷ Class 2500
- Temperatures up to 600°C
- p/t according to EN 12516-1 or ASME B16.34

Materials

- Carbon, low alloys and heat resistant alloys

Advantages

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

Options

- Electric actuator
- Pneumatic actuator
- Spring loaded stuffing box (SLSB)
- Locking devices
- Disassembling disc
- Y type
- Angle type
- Flanged or weld ends according to other Standards and Norms.

Testing

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

2. PARTS & MATERIALS

2.1 Parts & Materials VHP type

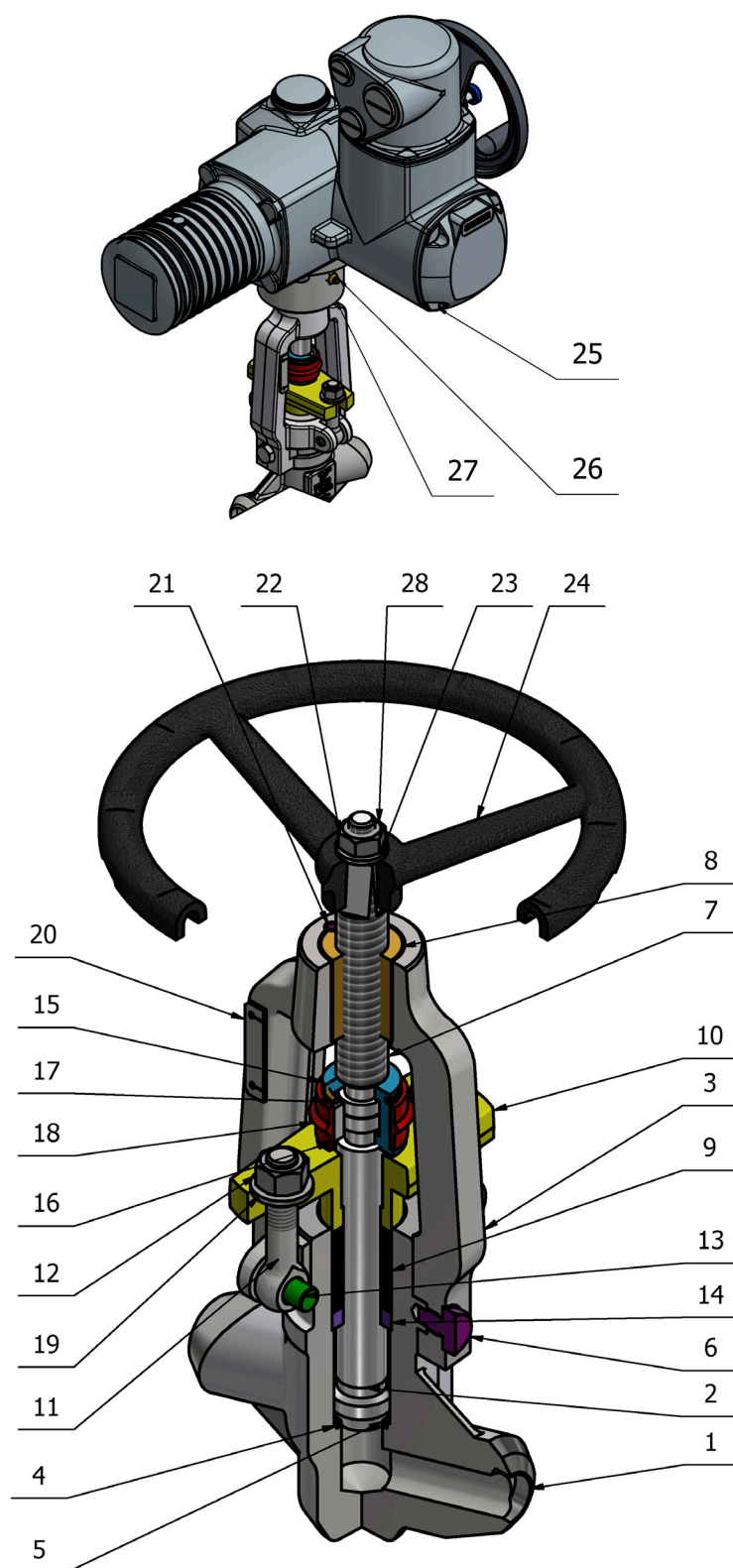


Figure B.1 – Parts VHP type

List of materials

Table B.1

Parts	Name		Material Group acc. to EN 12516-1 or ASME B16.34				
1	Body ⁽¹⁾	EN 12516-1	1.0460	1.5415	1.7335	1.7383	1.4903
		ASME B16.34	A105	F1	F11 Cl.2	F22 Cl.3	F91
2	Disc		1.4122 / 1.4923 ⁽³⁾				
3	Bonnet ⁽¹⁾	EN 12516-1	1.0619		1.7357		
		ASME B16.34	WCB		WC6		
4	Body seat ⁽²⁾		Hard Faced 13Cr or Stellite™				
5	Disc seat ⁽²⁾						
6	Bolt		1.7225				
7	Stem		1.4021				
8	Stem nut		1.0715 / Cu-Alloy				
9	Stem packing rings		graphite with corrosion inhibitor				
10	Gland		1.0460				
11	Gland bolts		A193 B7 / 1.7225				
12	Gland nuts		A194 2H / 1.1191				
13	Pin		steel				
14	Ring		hardened 1.4021 / 1.4122 / 1.4923 ⁽³⁾				
15	Coupling		1.7225				
16	Segment		1.1191				
17	Safety ring		1.7225				
18	Position indicator		1.1191				
19	Washers		steel				
20	Scale		steel				
21	Spring type pin		steel				
22	Handwheel nut		1.1191				
23	Washer		steel				
24	Handwheel		epoxy coated steel				
25	Electric actuator		commercial				
26	Grease injector		Cu-Alloy / steel				
27	Carrier		1.1191				
28	Nameplate		stainless steel				

TM trademark materials

(1) Other materials available acc. to EN standard and ASTM specifications

(2) Hardness differential between the body and disc seating surfaces shall be min. 50 HB

(3) Over 500°C

2.2 Parts & Materials VHP – NTRS type

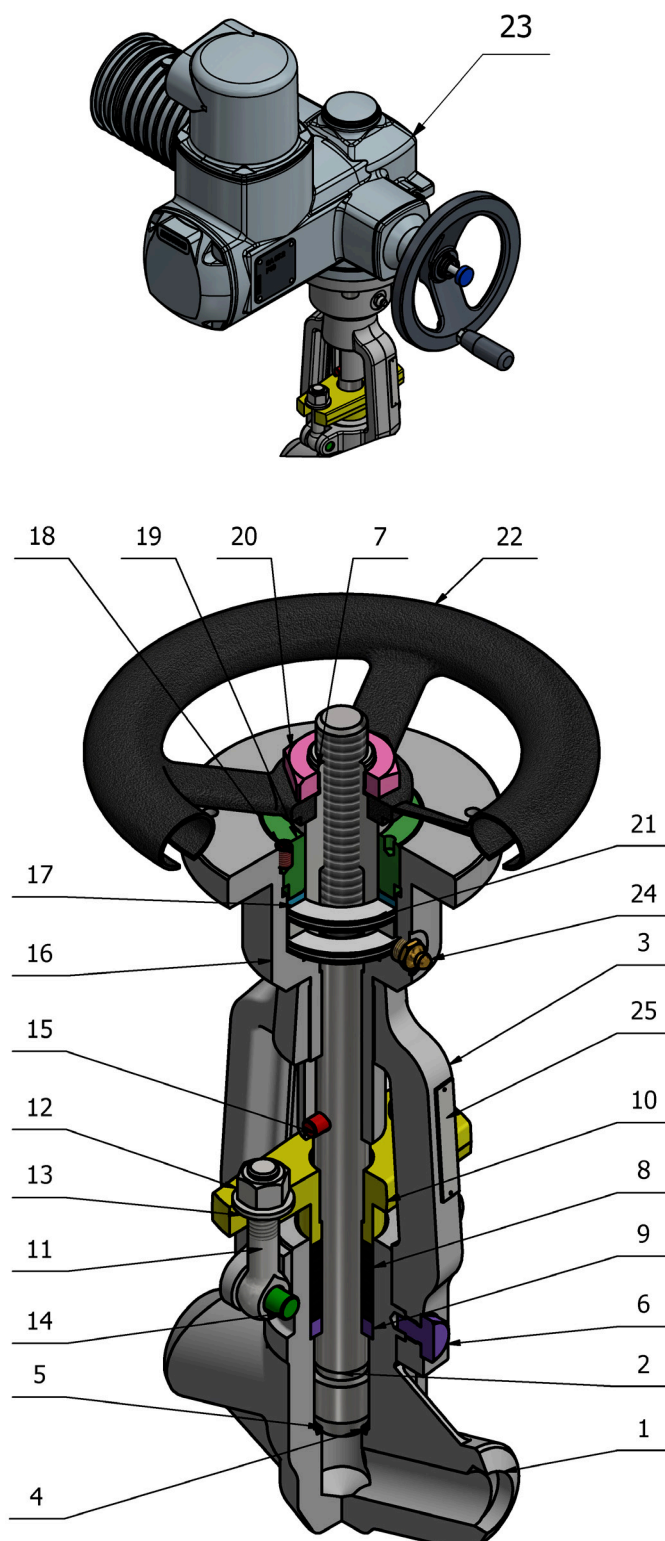


Figure B.2 – Parts VHP-NTRS type

List of materials

Table B.2

Parts	Name		Material Group acc. to EN 12516-1 or ASME B16.34				
1	Body ⁽¹⁾	EN 12516-1	1.0460	1.5415	1.7335	1.7383	1.4903
		ASME B16.34	A105	F1	F11 Cl.2	F22 Cl.3	F91
2	Disc - Stem		1.4021 / 1.4122 / 1.4923 ⁽³⁾				
3	Bonnet ⁽¹⁾	EN 12516-1	1.0619		1.7357		
		ASME B16.34	WCB		WC6		
4	Body seat ⁽²⁾		Hard Faced 13Cr or Stellite™				
5	Disc seat ⁽²⁾						
6	Bolt		1.7225				
7	Stem nut		1.0715 / Cu-Alloy				
8	Stem packing rings		graphite with corrosion inhibitor				
9	Ring		hardened 1.4021 / 1.4122 / 1.4923 ⁽³⁾				
10	Gland		1.0460				
11	Gland bolts		A193 B7 / 1.7225				
12	Gland nuts		A194 2H / 1.1191				
13	Washers		steel				
14	Pin		steel				
15	Position indicator		1.7225				
16	Carrier		1.1191				
17	Bearing ring		1.4021				
18	Slotted set screw		steel				
19	Cover bearing		1.1191				
20	Handwheel nut		1.1191				
21	Bearings		needle				
22	Handwheel		epoxy coated steel				
23	Electric actuator		commercial				
24	Grease injector		Cu-Alloy / steel				
25	Nameplate		stainless steel				

TM trademark materials

(1) Other materials available acc. to EN standard and ASTM specifications

(2) Hardness differential between the body and disc seating surfaces shall be min. 50 HB

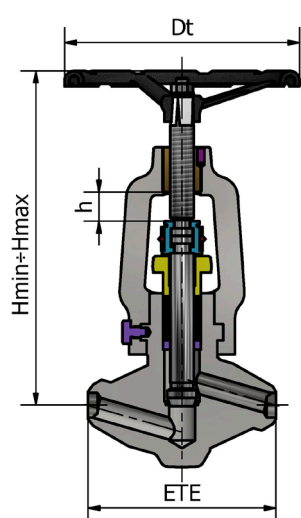
(3) Over 500°C

3. STANDARDS & DIMENSIONS

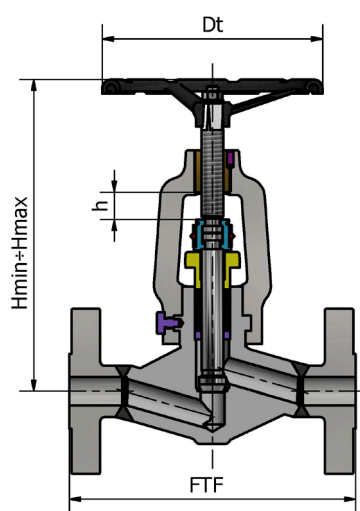
Standards

Table B.3

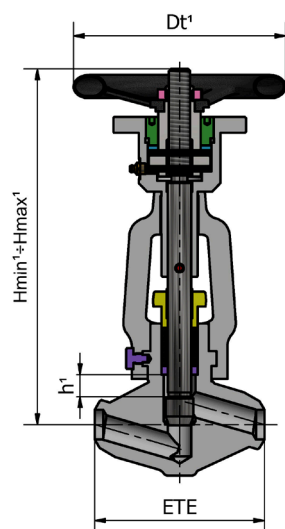
VHP & VHP-NTRS	PN 250 ÷ PN 400 (Class 1500 ÷ Class 2500)
General design	EN 12516 and ASME B16.34
Wall thickness	EN 12516 and ASME B16.34
Pressure / temperature rating	EN 12516 and ASME B16.34
FTF and ETE according to	Manufacturer standard, EN 558 or ASME B16.10
Flanged Ends according to	EN 1092-1 or ASME B16.5
Welding Ends according to	EN 12627 or ASME B16.25



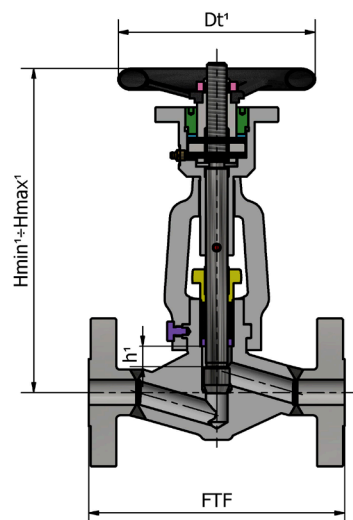
VHP type with welding ends



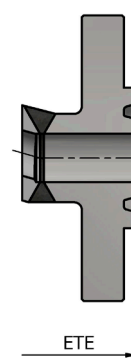
VHP type with flanged ends
(Raised Face)



VHP-NTRS type with welding ends



VHP-NTRS type with flanged ends
(Raised Face)



VHP & VHP-NTRS type with
flanged ends (Ring Joint)

Figure B.3 – Dimensions VHP & VHP-NTRS type

[VHP & VHP-NTRS] Dimensions

Table B.4

Nominal Pressure (Pressure Class)	Diameter Nominal (Nominal pipe size)	End - To – End	Face - To – Face (RF)	End-To-End (RTJ)	Centre-to -top (close-open) VHP	Centre-to -top (close-open) VHP-NTRS	Handwheel	Stroke	Connection flange ISO 5210	Kvs	Mass	
PN / Class	DN (NPS)	ETE	FTF	ETE	Hmin / Hmax	Hmin ¹ / Hmax ¹	Dt / Dt ¹	h / h ¹		m³/h	ETE	FTF
		mm									Kg	
PN 250	10	110	230	-	182 / 192	211 / 221	100 / 150	10	F10-B1	1,6	1,5	5,5
	15	160	230	-	251 / 275	308 / 323	150 / 200	24 / 15	F10-B1	4	5	10
	20	160	-	-	251 / 275	308 / 323	150 / 200	24 / 15	F10-B1	6	5	-
	25	160	260	-	293 / 316	330 / 346	200	23 / 16	F10-B1	9	8,5	15
	32	210	-	-	352 / 376	386 / 406	300	24 / 20	F10-B1	16	19	-
	40	260	300	-	352 / 376	386 / 406	300	24 / 20	F10-B1	17	24	37
	50	260	350	-	352 / 376	386 / 406	300	24 / 20	F10-B1	17	24	40
	65	300	400	-	411 / 438	470 / 492	400	27 / 22	F14-B1	29	39	65
PN 320	10	110	230	-	182 / 192	211 / 221	100 / 150	10	F10-B1	1,6	1,5	5,5
	15	160	230	-	251 / 275	308 / 323	150 / 200	24 / 15	F10-B1	6	5	10
	20	160	-	-	251 / 275	308 / 323	150 / 200	24 / 15	F10-B1	6	5	-
	25	160	260	-	293 / 316	330 / 346	200	23 / 16	F10-B1	9	8,5	18
	32	210	-	-	352 / 376	386 / 406	300	24 / 20	F10-B1	16	19	-
	40	260	300	-	352 / 376	386 / 406	300	24 / 20	F10-B1	17	24	41
	50	300	350	-	411 / 438	470 / 492	400	27 / 22	F14-B1	29	39	60
PN 400	10	110	230	-	182 / 192	211 / 221	100 / 150	10	F10-B1	1,6	1,5	6,5
	15	160	230	-	251 / 275	308 / 323	150 / 200	24 / 15	F10-B1	6	5	12
	20	160	-	-	251 / 275	308 / 323	150 / 200	24 / 15	F10-B1	6	5	-
	25	160	260	-	293 / 316	330 / 346	200	23 / 16	F10-B1	9	8,5	23
	32	210	-	-	352 / 376	386 / 406	300	24 / 20	F10-B1	16	19	-
	40	260	300	-	352 / 376	386 / 406	300	24 / 20	F10-B1	17	24	52
	50	300	350	-	411 / 438	470 / 492	400	27 / 22	F14-B1	29	39	67
Class 1500	10 (3/8")	110	-		182 / 192	211 / 221	100 / 150	10	F10-B1	1,6	1,5	-
	15 (1/2")	160	216		251 / 275	308 / 323	150 / 200	24 / 15	F10-B1	6	5	9
	20 (3/4")	160	229		251 / 275	308 / 323	150 / 200	24 / 15	F10-B1	6	5	11
	25 (1")	160	254		293 / 316	330 / 346	200	23 / 16	F10-B1	9	8,5	15,5
	32 (1 ¼")	210	279		352 / 376	386 / 406	300	24 / 20	F10-B1	16	19	28
	40 (1 ½")	260	305		352 / 376	386 / 406	300	24 / 20	F10-B1	17	24	37
	50 (2")	260	368	371	352 / 376	386 / 406	300	24 / 20	F10-B1	17	24	47
	65 (2 ½")	300	419	422	411 / 438	470 / 492	400	27 / 22	F14-B1	29	39	72
Class 2500	10 (3/8")	110	-		182 / 192	211 / 221	100 / 150	10	F10-B1	1,6	1,5	-
	15 (1/2")	160	264		251 / 275	308 / 323	150 / 200	24 / 15	F10-B1	6	5	11
	20 (3/4")	160	273		251 / 275	308 / 323	150 / 200	24 / 15	F10-B1	6	5	13
	25 (1")	160	308		293 / 316	330 / 346	200	23 / 16	F10-B1	9	8,5	18,5
	32 (1 ¼")	210	349	352	352 / 376	386 / 406	300	24 / 20	F10-B1	16	19	34
	40 (1 ½")	260	384	387	352 / 376	386 / 406	300	24 / 20	F10-B1	17	24	43
	50 (2")	300	451	454	411 / 438	470 / 492	400	27 / 22	F14-B1	29	39	74

- Technical data for valves over PN 400 on request.

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

4. BUTT WELDING ENDS DESIGN

Symbols

Table B.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

4.1 Butt Welding Ends according to EN 12627

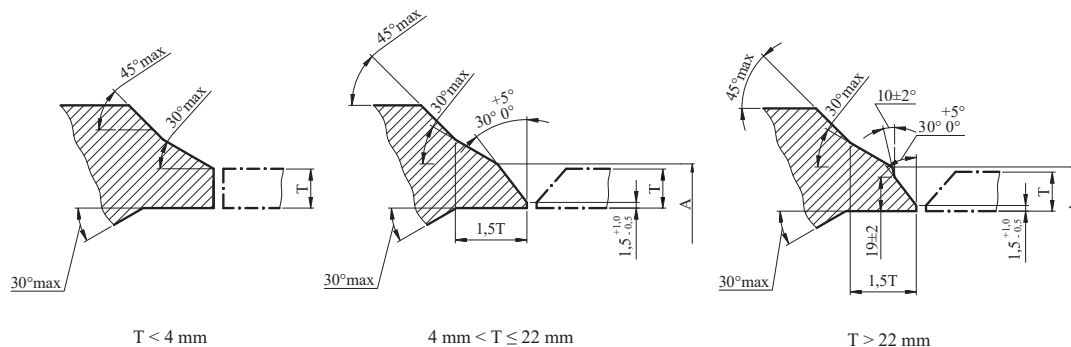


Figure B.4 - Form of the butt welding ends

Dimensions and tolerance of outside diameter

Table B.6

DN	DN 10	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	DN 65
A (mm)	18	22	28	35	44	50	62	78
Tolerance (mm)	+2,5 -1		+2,5 -1,5		+2,5 -2,0			

4.2 Butt Welding Ends according to ASME B16.25

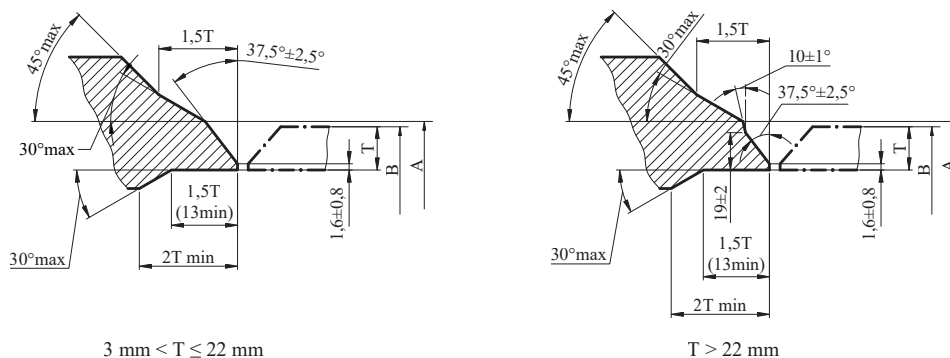


Figure B.5 - Form of the butt welding ends

Dimensions

Table B.7

DN (NPS)	B	A	T							
			Sch. 10	Sch. 30	Sch. Std	Sch. 40	Sch. XS	Sch. 80	Sch. 160	Sch. XXS
10(3/8)	17,1	---	1,65	1,85	2,31	2,31	3,20	3,20	---	---
15(1/2)	21,3	---	2,11	2,41	2,77	2,77	3,73	3,73	4,78	---
20(3/4)	26,6	---	2,11	2,41	2,87	2,87	3,91	3,91	5,56	7,82
25(1)	33,4	---	2,77	2,90	3,38	3,38	4,55	4,54	6,35	9,09
32(1 1/4)	42,2	---	2,77	2,97	3,56	3,55	4,85	4,85	6,35	9,70
40(1 1/2)	48,3	---	2,77	3,18	3,68	3,68	5,08	5,08	7,14	10,15
50(2)	60,3	---	2,77	3,18	3,91	3,91	5,54	5,54	8,74	11,07
65(2 1/2)	73,0	75	3,05	4,78	5,16	5,16	7,01	7,01	9,53	14,02

5. OPTIONAL EXECUTIONS

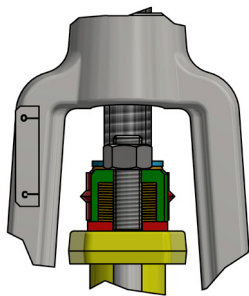


Figure B.6 - Spring Loaded Stuffing Box

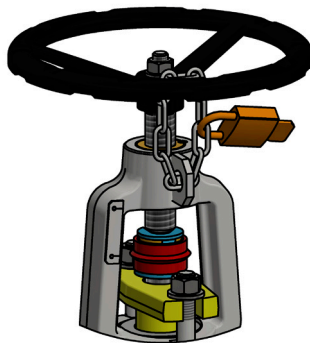


Figure B.7 - Locking Devices

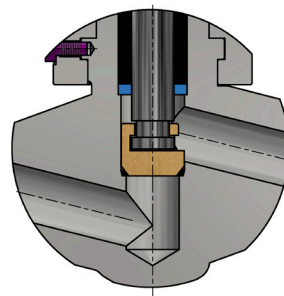


Figure B.8 - Disassembling Disc

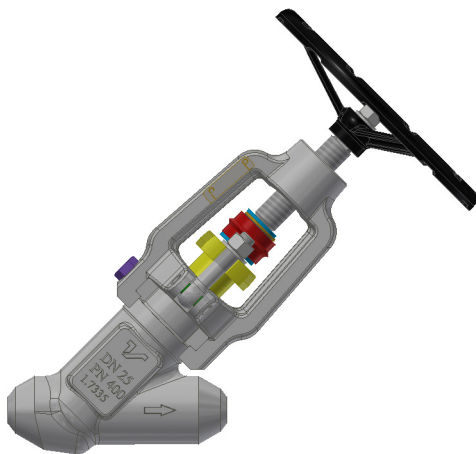


Figure B.9 - Y type (VHPY)

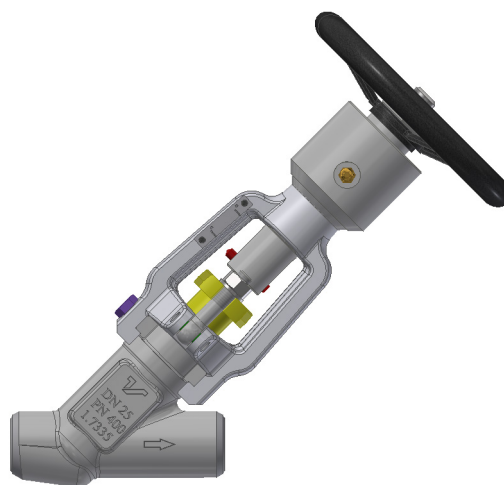


Figure B.10 - Y type (VHPY-NTRS)

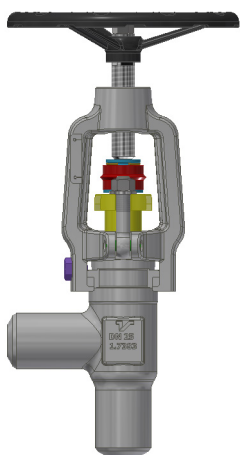


Figure B.11 - Angle type (VHPA)

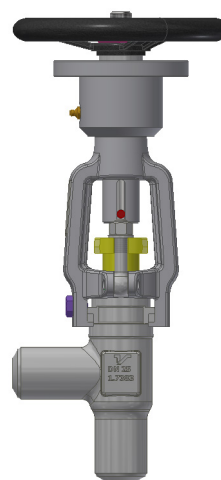


Figure B.12 - Angle type (VHPA-NTRS)

6. 6. PRESSURE & TEMPERATURE RATINGS

6.1 Pressure/Temperature ratings for EN materials

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

Table B.8

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	250	250,0	250,0	250,0	234,1	222,1	210,1	192,1	174,1	162,0	150,0	137,4										
	320	320,0	320,0	320,0	299,6	284,2	268,9	245,8	222,8	207,4	192,1	175,8										
	400	400,0	400,0	400,0	374,5	355,3	336,1	307,3	278,5	259,3	240,1	219,8										
1.5415	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			
	320	320,0	320,0	320,0	320,0	313,1	292,0	272,8	253,6	238,2	230,5	227,1	213,6	209,8	209,0	145,1	126,4	90,5	80,2			
	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			
1.7335	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			
	320	320,0	320,0	320,0	320,0	320,0	320,0	320,0	320,0	298,1	273,1	263,9	252,5	236,4	231,3	199,8	178,6	146,8	83,7			
	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		
1.7383	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
	320	320,0	320,0	320,0	320,0	320,0	320,0	320,0	320,0	300,4	273,1	263,7	252,5	236,4	231,3	210,6	203,4	174,2	160,5	112,7	87,0	47,8
	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
1.4903	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
	320	320,0	320,0	320,0	320,0	320,0	320,0	320,0	320,0	300,4	273,2	263,7	252,5	236,5	231,3	210,7	203,4	192,6	191,3	186,3	177,8	160,1
	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 Tervovent SC.

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

Table B.9

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	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										
1.5415	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			
1.7335	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		
1.7383	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
1.4903	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 Tervovent SC.

6.2 Pressure/Temperature ratings for ASTM materials

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

Table B.10

Materials	PN	-10	20	38	50	100	150	200	250	300	325	350	375	400	425	450	470	500	538	550	595	600
A105	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							
	320	320,0	320,0	320,0	320,0	320,0	320,0	320,0	313,3	297,4	289,2	280,6	271,6	259,4	214,9							
	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							
F1	250	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						
	320	320,0	320,0	320,0	320,0	320,0	320,0	320,0	320,0	308,6	300,4	289,7	273,2	261,3	252,5	239,7						
	400	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						
F11Cl.2	250	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		
	320	320,0	320,0	320,0	320,0	320,0	320,0	320,0	320,0	308,6	300,4	289,7	273,1	261,3	252,5	239,6	192,2	111,3	94,9	49,6		
	400	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		
F22Cl.3	250	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		
	320	320,0	320,0	320,0	320,0	320,0	320,0	320,0	320,0	308,6	300,4	289,7	273,1	261,3	252,5	239,6	210,6	137,8	116,8	56,9		
	400	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		
F91	250	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	
	320	320,0	320,0	320,0	320,0	320,0	320,0	320,0	320,0	308,6	300,4	289,7	272,9	261,3	252,5	239,6	210,6	187,1	186,3	152,3	145,7	
	400	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.

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

Table B.11

Materials	Class	-29+38	50	100	150	200	250	300	325	350	375	400	425	450	470	500	538	550	595	600
A105	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							
F1	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					
F11Cl.2	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	
F22Cl.3	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	
F91	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.

7. MARKING & LABELING

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

7.1 Marking

General marking of the valve

Table B.12

Item ^a	Subject		Marking	
			PN designed valves	Class designed valves
1	Product identification	Type	VHP & VHP-NTRS	VHP & VHP-NTRS
		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	Heat batch 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.

7.1.1 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.

7.2 Labeling

Valve information can be found on the valve body, and the typical valve nameplate is shown on the Figure B.13.

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

Figure B.13

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 7.1.1

8. 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.*

9. 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

10. INSTRUCTIONS for INSTALLATION, OPERATION & MAINTENANCE

10.1 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 VHP & VHP-NTRS during the period of use should be fully trained for the correct/optimal performance of these tasks. If VHP & VHP-NTRS are 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 B.8, Table B.9 and Table B.10 according to EN 12516-1 and Table B.11 according to ASME B16.34. Under no circumstances should the valves be operated under conditions outside these tables.
- Before the service or reinstallation of the VHP & VHP-NTRS, the plant or installation should be taken out of operation (pressure 0 bar, 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.

10.2 Storage & handling

VHP & VHP-NTRS are delivered in their disc in closed position with protective covers on their ends. During storage period protective covers shall not be removed.

10.2.1 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.

10.2.2 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

10.2.3 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 B.14).
- Do not lift VHP & VHP-NTRS via the handwheel (Figure B.15).
- If possible, lift VHP & VHP-NTRS via bonnet (Figure B.16).
- 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.

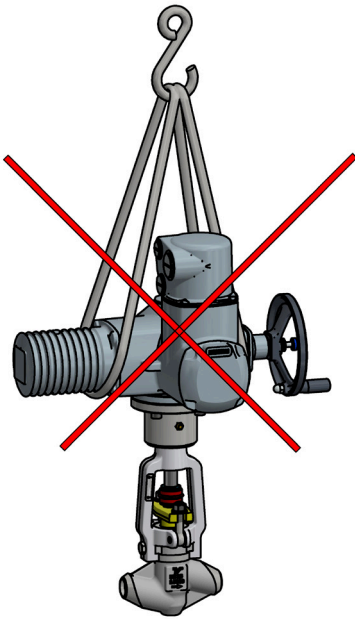


Figure B.14

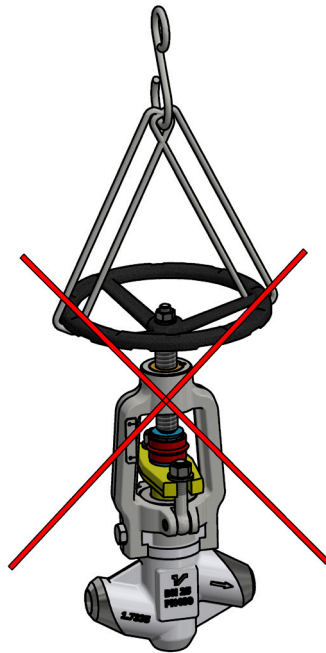


Figure B.15

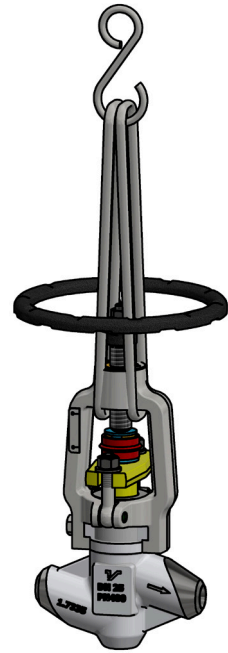


Figure B.16



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.
-

10.3 Installation & Start-up

- VHP & VHP-NTRS are delivered with their disc 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 the instructions given by the manufacturer of the gaskets.
- VHP & VHP-NTRS with flanged ends shall be installed in a slightly open to fully open position.
- VHP & VHP-NTRS with welding ends should be welded on the pipeline in the **CLOSED** 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.
- It is important to take care about the flow direction at the time of installation. The flow direction is indicated with the arrow mark on the body of the valve.
- 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 VHP & VHP-NTRS (opening/closing).
- Recommendation: VHP & VHP-NTRS should be installed with a minimum of 5x nominal diameter of straight pipeline in front of and behind the VHP & VHP-NTRS.



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.
 - ➔ During the installation take care about the flow direction.
 - ➔ The valve should not be used as support for a pipeline.
-

10.4 Usage & maintenance

- The globe valve 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 B.17). Torque for tightness gland nuts shown in Table B.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 B.13

	M10	M12	M16
Torque /Nm/	15÷40	26÷65	64÷150

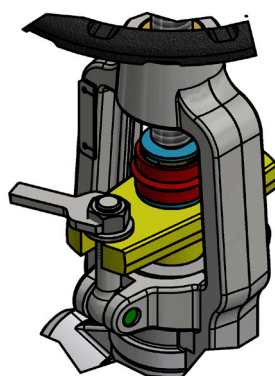


Figure B.17 – Stem packing gland tightening

- 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 B.18. Packing rings replacement is shown in Figure B.19 with a general note that every next packing ring must be rotated relative to the previous one (not less than 90°).



Figure B.18 – Stem packing ring



Figure B.19

- For VHP lubrication of thread between stem (Pos.7 – Figure B.1) / stem nut (Pos.8 – Figure B.1) is highly important. To lubricate the bearings electric-operated valves, we suggest using quality-level grease, as shown in the following Table B.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.26 – Figure B.1) on the carrier (Pos.27 – Figure B.1).
- For VHP-NTRS lubrication of thread between stem (Pos.2 – Figure B.2) / stem nut (Pos.7 – Figure B.2) is highly important. To lubricate the bearings (Pos.21 – Figure B.2) on manual or electric-operated valves, we suggest using quality-level grease, as shown in the following Table B.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.24 – Figure B.2) on the carrier (Pos.16 – Figure B.2).
- 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 and bushing should be lubricated depending on how frequently they are used every 3 months. For the lubrication of the actuator (Pos.23 – Figure B.1 and Pos. 23 – Figure B.2) it is necessary to remove the protective tube then grease the stem (Pos.7 – Figure B.1 and Pos.2 – Figure B.2) and return the protective tube. Some of the lubricants we use for lubrication are in Table B.14

Table B.14

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

- VHP & VHP-NTRS delivered with an actuator is adjusted for proper work. VHP & VHP-NTRS delivered with connection for later build on it the electric actuator must be adjusted. The closing of VHP & VHP-NTRS 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, VHP & VHP-NTRS 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.
 - VHP & VHP-NTRS cannot be used for flow control.
 - A Strainer being installed before the valve will increase its reliability and proper working.
-

10.5 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 VHP & VHP-NTRS standard spare part is stem packing rings.
- Contact “TERMOVENT SC” if You need other spare parts like a Stem, Disc, Stem nut, etc.
- Every VHP & VHP-NTRS 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 stem packing should be with high precautions because they could contain stainless steel wire which can cause severe injuries.
-

10.5.1 VHP 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).
- ➔ VHP must be completely opened.

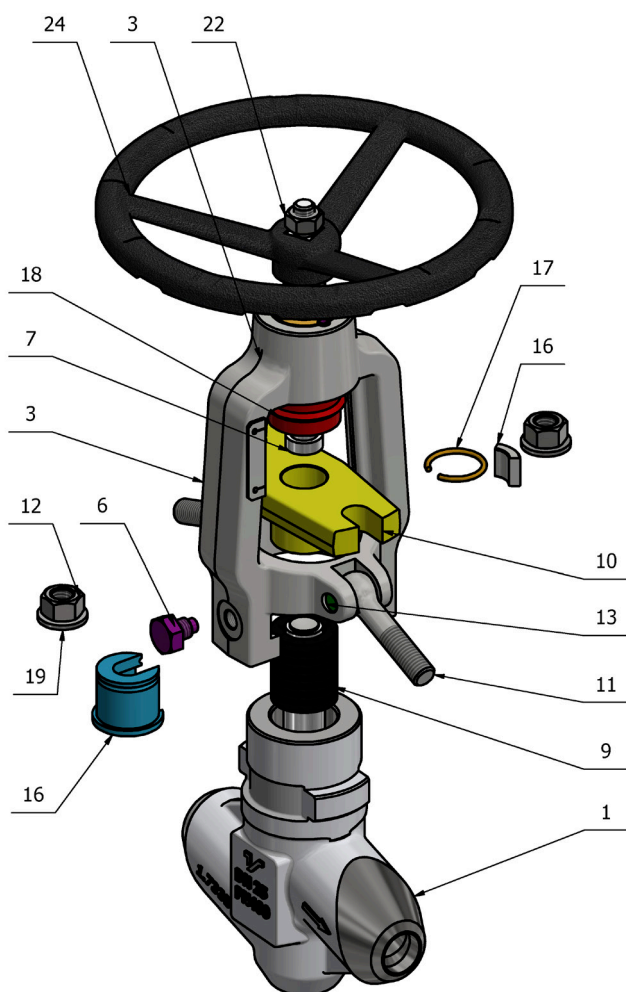


Figure B.20 – VHP Stem packing rings replacement

Disassembling

- Step 1** › Unscrew bolt (Pos.6)
- Step 2** › Unscrew gland nuts (Pos.12)
- Step 3** › Take out gland nuts (Pos.12) and washers (Pos.19)
- Step 4** › Rotate bonnet (Pos.3) and gland (Pos.10) together for 90°
- Step 5** › Take out safety ring (Pos.17)
- Step 6** › Lift upwards position indicator (Pos.18)
- Step 7** › Take out segment (Pos.16)
- Step 8** › Take out coupling (Pos.15)
- Step 9** › Lift upwards bonnet (Pos.3) together with following parts from the body (Pos.1):
 - › stem (Pos.7)
 - › gland (Pos.10)
 - › gland bolts (Pos.11)
 - › pin (Pos.13)
 - › handwheel (Pos.24)
 - › handwheel nut (Pos.22)
- Step 10** › Remove old stem packing ring (Pos.9)
- Step 11** › The packing chamber shall be cleaned

Assembling

- Step 1** › In cleaned chamber put new stem packing rings (Pos.9)
- Step 2** › Put down bonnet (Pos.3) to the body (Pos.1)
- Step 3** › Lift upwards position indicator (Pos.18)
- Step 4** › Put back coupling (Pos.15), segment (Pos.16) and safety ring (Pos.17)
- Step 5** › Put down position indicator (Pos.18)
- Step 6** › Rotate bonnet (Pos.3) and gland (Pos.10) together for 90°
- Step 7** › Put back and screw bolt (Pos.6)
- Step 8** › Put back washers (Pos.13)
- Step 9** › Put back and screw gland bolts (Pos.12)
- Step 10** › Tighten nuts according to Table B.13

10.5.2 VHP-NTRS 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).
- ➔ VHP-NTRS must be completely opened.

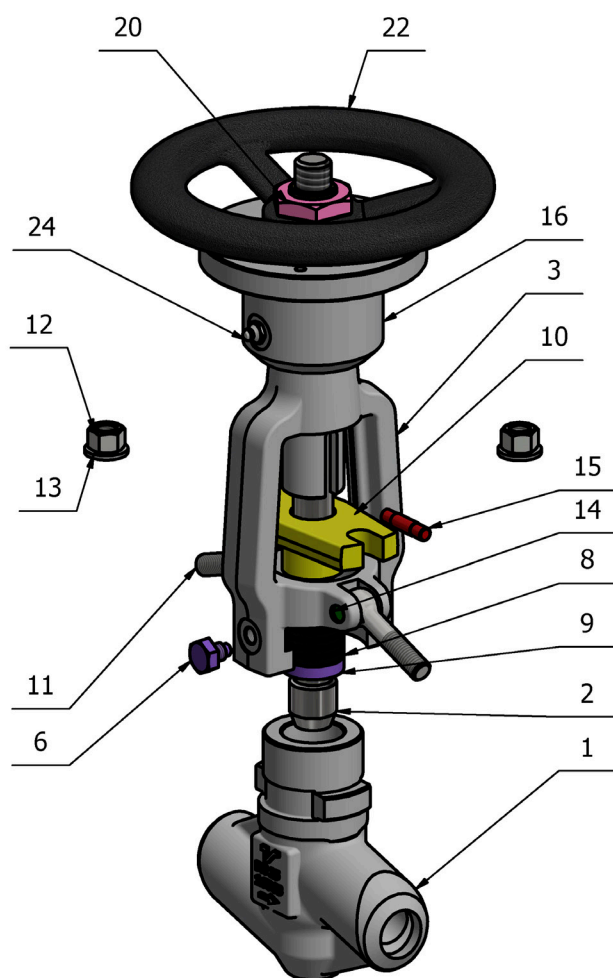


Figure B.21 – VHP-NTRS Stem packing rings replacement

Disassembling

- Step 1** › Unscrew bolt (Pos.6)
- Step 2** › Take out position indicator (Pos.15)
- Step 3** › Unscrew gland nuts (Pos.12)
- Step 4** › Take out gland nuts (Pos.12) and washers (Pos.13)
- Step 5** › Rotate bonnet (Pos.3) and gland (Pos.10) together for 90°
- Step 6** › Lift upwards bonnet (Pos.3) together with following parts from the body (Pos.1):
 - › disc-stem (Pos.2)
 - › stem packing rings (Pos.8)
 - › ring (Pos.9)
 - › gland (Pos.10)
 - › gland bolts (Pos.11)
 - › pin (Pos.14)
 - › carrier (Pos.16)
 - › handwheel nut (Pos.20)
 - › handwheel (Pos.22)
 - › grease injector (Pos.24)
- Step 7** › Remove old stem packing ring (Pos.8)
- Step 8** › The packing chamber shall be cleaned

Assembling

- Step 1** › In cleaned chamber put new stem packing rings (Pos.8)
- Step 2** › Put down bonnet (Pos.3) to the body (Pos.1)
- Step 3** › Rotate bonnet (Pos.3) and gland (Pos.10) together for 90°
- Step 4** › Put back and screw bolt (Pos.6)
- Step 5** › Put back position indicator (Pos.15)
- Step 6** › Put back washers (Pos.13)
- Step 7** › Put back and screw gland bolts (Pos.12)
- Step 8** › Tighten nuts according to Table B.13

10.6 Possible malfunctions & solutions

- During the period of usage of the installed high-pressure globe 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 B.15

Table B.15

Failure	Possible cause	Troubleshooting
Absence of flow	VHP & VHP-NTRS is in closed position	Open the VHP & VHP-NTRS completely with the handwheel (Pos.24 – Figure B.1 and Pos.22 – Figure B.2)
	VHP & VHP-NTRS is not completely open	Open the VHP & VHP-NTRS completely with the handwheel (Pos.24 – Figure B.1 and Pos.22 – Figure B.2)
	Protection covers are not removed	Remove protection covers from connection ends
Difficult manipulation	Dry stem /stem nut	Grease stem (Pos.7 – Figure B.1 and Pos.2 – Figure B.2) or stem nut (Pos.8 – Figure B.1 and Pos.7 – Figure B.2)
	Gland nuts are too tight	Slightly loosen Gland nuts (Pos.12 – Figure B.1 and Figure B.2) with precaution to preserve sealing of the stem packing rings (Pos.9 – Figure B.1 and Pos.8 – Figure B.2)
Leakage on stem packing	Gland nuts are not tightened	Tighten gland nuts (Pos.12 – Figure B.1 and Figure B.2)
	Stem packing rings are damaged	Completely open the globe 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.9 – Figure B.1 and Pos.8 – Figure B.2)
Leaking on seat	The working medium contains solid dirt particles	Clean the Valve thoroughly. We recommend the installation of a Strainer before the Globe Valve
	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.
The valve does not function	Limit switch (for optional electric or pneumatic) is defective	Have the limit switch checked. Prior to readjustment consult with Tervovent SC
	Torque switch (with optional electric or pneumatic) is defective	Have the torque switch checked. Prior to readjustment consult with Tervovent SC
Malfunction of the valve	Limit switch (for optional electric or pneumatic) is defective	Have the limit switch checked. Prior to readjustment consult with Tervovent SC
	Torque switch (with optional electric or pneumatic) is defective	Have the torque switch checked. Prior to readjustment consult with Tervovent SC

10.7 Guarantee

- Tervovent 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 agree 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
 - accident, disaster, neglect, misuse, improper handling.
 - application of excessive torque to the operating mechanism, presence of foreign matter.
 - the products are not being installed or maintained as required by instructions
 - modifications or repairs without manufacturer approval.
 - natural tears and wear caused by material ageing.

III PURCHASE GUIDE

11. 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				VHP & VHP-NTRS			
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		1500				2500	
PN		250		320		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	
Accessories							
Spring loaded stuffing box							
Locking devices							
Other							
Valve type							
T type	VHP		VHP-NTRS				
Y type	VHPY		VHPY-NTRS				
Angle type	VHPA		VHPA-NTRS				
Actuation type							
Handwheel							
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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