

# APD<sup>®</sup>

## TECHNICAL DESCRIPTION AND INSTRUCTION FOR INSTALLATION, OPERATION AND MAINTENANCE

### GLOBE VALVE

V40.2

V46.2

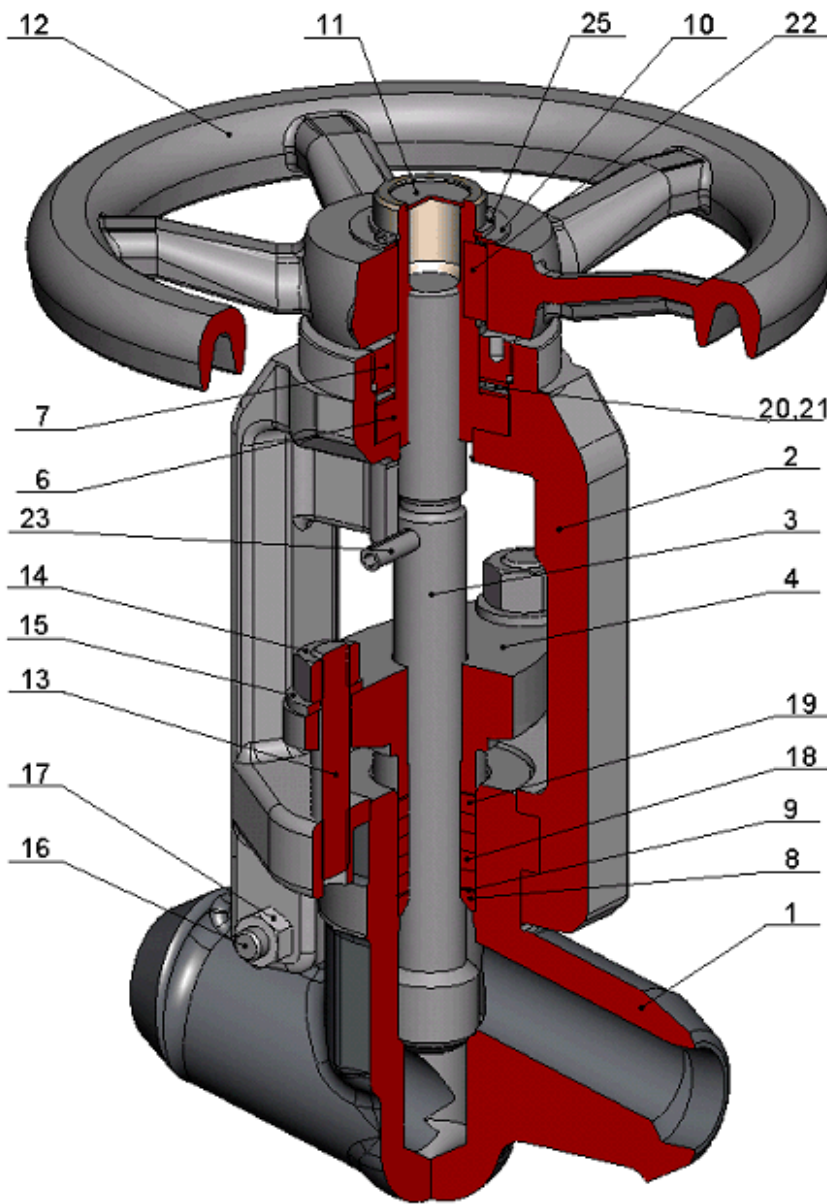
DN 10 – 50    PN 63 – 500

9975.338

**CONTENT:**

1. TECHNICAL DESCRIPTION .....	3
2. APPLICATION .....	13
3. SURFACE PROTECTION .....	14
4. MARKING .....	14
5. SAFETY INSTRUCTIONS .....	14
6. WARRANTIES .....	14
7. PACKING AND TRANSPORT .....	15
8. STORAGE .....	15
9. MOUNTING INSTRUCTIONS .....	15
10. VALVE OPERATING – PUTTING INTO OPERATION .....	16
11. REPAIRS .....	16
12. MAINTENANCE .....	17
13. REASSEMBLING .....	18
14. TESTING .....	19
15. VALVE SERVICE .....	19

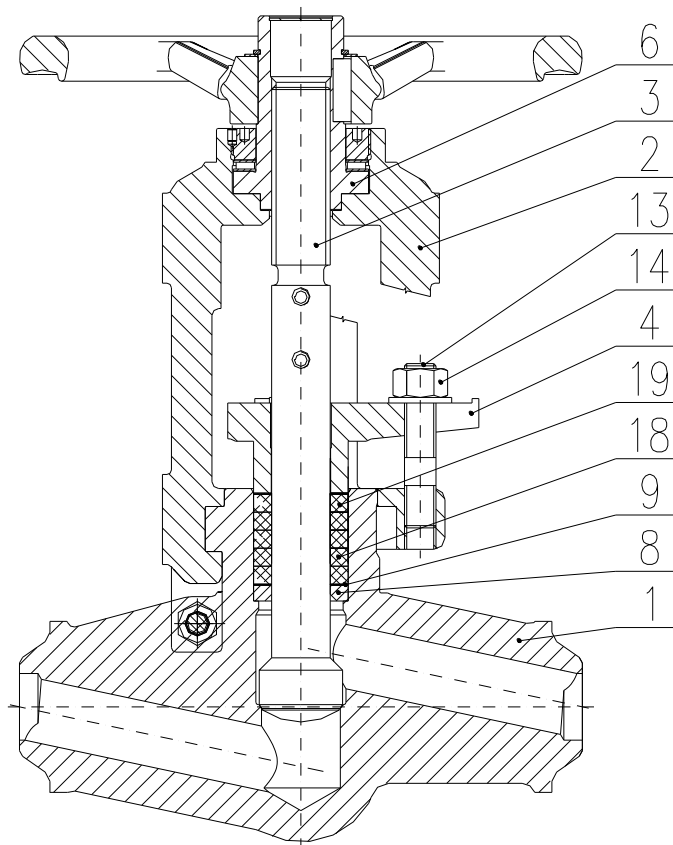
**1. TECHNICAL DESCRIPTION**



Pos	Part
1	Body
2	Yoke
3	Stem
4	Gland-neck busch
6	Spindle nut
7	Screw ring
8	Ring
9	Gasket

Pos	Part
10	Washer
11	Cover
12	Handwheel
13	Bolt
14	Nut
15	Washer
16	Bolt
17	Nut

Pos.	Part
18	Packing
19	Packing
20	Washer AS
21	Bearing AS
22	Spring
23	Position indicator



Pos.	Part	Material									
		1.0460 11416	1.5415	1.7335	1.7383 1.7380	1.7715 15128	1.4903	A182 F92	F316 Ti	1.4571 <sup>1)</sup> (A182- F316Ti)	1.4571 <sup>2)</sup> (A182- F316Ti)
1	Body										
	Body seats	13Cr	Stellite 6								
2	Yoke	1.7379	1.7379							1.4408	
3	Stem	1.4021	1.4923							1.4571	
	Stem seats	harden	Stellite 6								
4	Gland-neck bush	1.7383							1.4408		
6	Threaded bush	1.0503							2.0936		
8	Ring	1.4136									
9	Gasket	CrNi- Graphite with plate									
13	Bolt	21CrMoV5-7							A2-70		
14	Nut	25CrMo4							A2		
18	Packing	Pressed graphite									
19	Packing	Braided graphite									

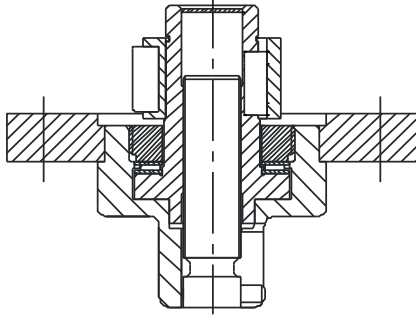
1) Application over 400 °C only for medium, which does not cause the intercrystalline corrosion.

2) Application for temperature from - 196 °C to +400 °C; Material variant 2

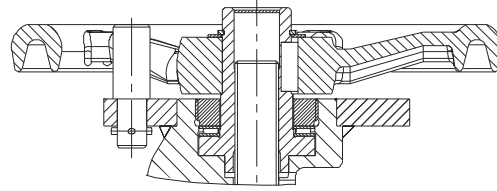
<b>Pos.</b>	<b>Part</b>	<b>Material</b>	
1	Body	A350 LF2	A350 LF2
	Body seats	13Cr	13Cr
2	Yoke	A216WCB	A216WCB, 1.4408
3	Stem	410T	X20Cr13 (1.4021)
	Stem seats	kaleno	
4	Gland-neck busch	11CrMo9-10 (1.7383)	
6	Threaded bush	C45 (1.0503)	
8	Ring	GX70CrMo29-2 (1.4136)	
9	Gasket	CrNi-ocel grafit	
13	Bolt	B7	A2-70
14	Nut	2H	A2-70
18	Packing	grafit pletený	
19	Packing	grafit	

„Variants“

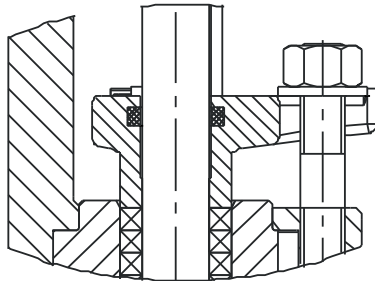
Attachment for E-actuator



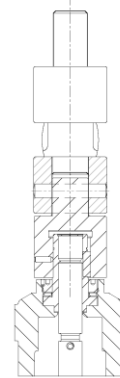
Locking device



Gland packing with scraper ring



remote control



**PRESSURE TEMPERATURE RATINGS**

Material	PN	Admissible operating pressure PS [bar] at operating temperature TS [°C]																
		-10	50	100	150	200	250	280	300	350	380	390	400	410	420	430	440	450
P250GH (C22.8) (1.0460) 11416	63	63	63	63	63	63	56,7	53,2	50,4	44,9	41,0	40,2	39,4	38,4	37,5	36,5	35,6	34,7
	100	100	100	100	100	100	90,0	84,5	80,0	71,3	65,0	63,8	62,5	61,0	59,5	58,0	56,5	55,0
	160	160	160	160	160	160	144	135	128	114	104	102	100	97,6	65,2	92,8	90,4	88,0
	250	250	250	250	250	250	225	212	200	178	163	159	156	153	149	145	141	138
	320	320	320	320	320	320	288	271	256	228	208	204	200	195	190	186	181	176
	400	400	400	400	400	400	360	340	320	285	260	255	250	244	238	232	226	220

Material	PN	Admissible operating pressure PS [bar] at operating temperature TS [°C]													
		-10	200	250	300	350	400	450	475	490	500	510	520	530	
16Mo3 (1.5415)	63	63	63	63	63	63	59	56,7	52,9	50,4	44,1	36,5	25,7	20,4	16,3
	100	100	100	100	100	100	94	90	84	80	70	58	40,8	32,4	25,8
	160	160	160	160	160	160	151	144	134	128	112	92,8	65,3	51,8	41,3
	250	250	250	250	250	250	238	225	210	200	175	145	102	81	64,5
	320	320	320	320	320	320	302	288	268,8	256	224	186	131	104	82,6
	400	400	400	400	400	400	379	360	336	320	280	232	163	130	103
	500	500	500	500	500	500	473	450	420	400	350	290	204	162	129

Material	PN	Admissible operating pressure PS [bar] at operating temperature TS [°C]																
		-10	200	250	300	350	400	450	475	490	500	510	520	530	540	550	570	
13CrMo4-5 (1.7335)	63	63	63	63	63	63	63	63	56,7	55,3	52,3	50,4	40,3	32,8	27,1	21,2	17,0	10,5
	100	100	100	100	100	100	100	100	90	87,8	83	80	64	52,0	43,0	33,6	27,0	16,6
	160	160	160	160	160	160	160	160	144	140	133	128	102	83,2	68,8	53,8	43,2	26,6
	250	250	250	250	250	250	250	250	225	220	208	200	160	130	108	84	67,5	41,5
	320	320	320	320	320	320	320	320	288	281	266	256	205	166	138	108	86,4	53,1
	400	400	400	400	400	400	400	400	360	351	332	320	256	208	172	134	108	66,4
500	500	500	500	500	500	500	500	450	439	415	400	320	260	215	168	135	83,0	

Material	PN	Admissible operating pressure PS [bar] at operating temperature TS [°C]																	
		-10	200	250	300	350	400	450	475	490	500	510	520	530	540	550	575	580	600
11CrMo9-10 (1.7383); 10CrMo9-10 (1.7380)	63	63	63	63	63	63	63	56,7	54,2	51,7	50,4	40,3	35,3	30,2	26,5	22,7	16,4	15,1	11,6
	100	100	100	100	100	100	100	90,0	86,0	82,0	80,0	64,0	56,0	48,0	42,0	36,0	26,0	24,0	18,4
	160	160	160	160	160	160	160	144	138	131	128	102	89,6	76,8	67,2	57,6	41,6	38,4	29,4
	250	250	250	250	250	250	250	225	215	205	200	160	140	120	105	90,0	65,0	60,0	46,0
	320	320	320	320	320	320	320	288	275	262	256	205	179	154	134	115	83,2	76,8	58,9
	400	400	400	400	400	400	400	360	344	328	320	256	224	192	168	144	104	96,0	73,6
500	500	500	500	500	500	500	450	430	410	400	320	280	240	210	180	130	120	92	
14MoV6-3 (1.7715); 15128 (ČSN415128)	63	63	63	56	50,4	40,3	40,3	40,3	40,3	40,3	40,3	40,3	40,3	40,3	40,3	31,5	31,5	31,5	
	100	100	100	89	80,0	64,0	64,0	64,0	64,0	64,0	64,0	64,0	64,0	64,0	64,0	50,0	50,0	50,0	
	160	160	160	143	128	102	102	102	102	102	102	102	102	102	102	102	80,0	80,0	80,0
	250	250	250	224	200	160	160	160	160	160	160	160	160	160	160	160	125	125	125
	320	320	320	287	256	205	205	205	205	205	205	205	205	205	205	205	160	160	160
	400	400	400	358	320	256	256	256	256	256	256	256	256	256	256	256	200	200	200
500	500	500	448	400	320	320	320	320	320	320	320	320	320	320	320	250	250	250	
X6CrNiMoTi17- 12-2 (1.4571) <sup>1)</sup> (A182-F316Ti)	63	63	61,7	57,9	54,9	53,3	51,4	50,1	50,1	49,9	49,9	49,9	49,6	49,6	49,4	49,1	48,6	40,3	35,3
	100	100	98,0	92,5	87,2	84,2	81,6	79,6	79,6	79,2	79,2	79,2	78,8	78,8	78,4	78,0	77,2	64,0	56,0
	160	160	157	148	140	135	131	127	127	127	127	127	126	126	125	125	124	102	89,6
	250	250	245	231	218	211	204	199	199	198	198	198	197	197	196	195	193	160	140
	320	320	314	293	279	270	261	255	255	253	253	253	252	248	236	228	193	160	140
	400	400	392	370	349	337	326	318	318	317	317	317	315	310	295	285	193	160	140

Material	PN	Admissible operating pressure PS [bar] at operating temperature TS [°C]																			
		-10	200	250	300	350	400	450	480	490	500	510	520	530	540	550	560	570	580	590	600
X10CrMoVNb 9-1 (P91) (1.4903) <sup>3)</sup>	63	69,3	69,3	69,3	69,3	69,3	69,3	63,0	63,0	63,0	63,0	61,7	60,5	59,2	58,0	52,9	50,8	49,1	40,1	37,3	35,4
	100	110	110	110	110	110	110	100	100	100	100	98,0	96,0	94,0	92,0	84,0	80,6	78,0	63,6	59,2	56,2
	160	176	176	176	176	176	176	160	160	160	160	157	154	150	147	134	129	125	102	94,7	89,9
	250	275	275	275	275	275	275	250	250	250	250	245	240	235	230	210	202	195	159	148	141
	320	352	352	352	352	352	352	320	320	320	320	314	307	301	294	269	258	250	204	189	180
	400	440	440	440	440	440	440	400	400	400	400	392	384	376	368	336	322	312	254	236	224
500	550	550	550	550	550	550	500	500	500	500	490	480	470	460	420	403	390	318	296	281	

Material	PN	Admissible operating pressure PS [bar] at operating temperature TS [°C]						
		-196	20	100	200	300	350	400
X6CrNiMoTi17- 12-2 (1.4571) <sup>2)</sup> (A182-F316Ti)	63	63,0	63,0	60,5	51,7	42,8	40,3	37,8
	100	100	100	96,0	82,0	68,0	64,0	60,0
	160	160	160	154	131	109	102	96,0
	250	250	250	240	205	170	160	150

1) Application over 400 °C only for medium, which does not cause the intercrystalline corrosion.

2) Application for temperature from - 196 °C to +400 °C; Material variant 2 (thereinafter)

Material	PN	Admissible operating pressure PS [bar] at operating temperature TS [°C]												
		-46	50	100	150	200	250	300	350	380	390	400	425	
A350 LF2	63	63	63	63	63	63	63	63	56,7	50,4	44,9	41	40,2	35,6
	100	100	100	100	100	100	100	100	90	80	71,3	65	63,8	56,5
	160	160	160	160	160	160	160	160	144	128	114	104	102	90,4
	250	250	250	250	250	250	250	250	225	200	178,1	162,5	159,4	141,3
	320	320	320	320	320	320	320	320	288	256	228	208	204	180,8
	400	400	400	400	400	400	400	400	360	320	285	260	255	226

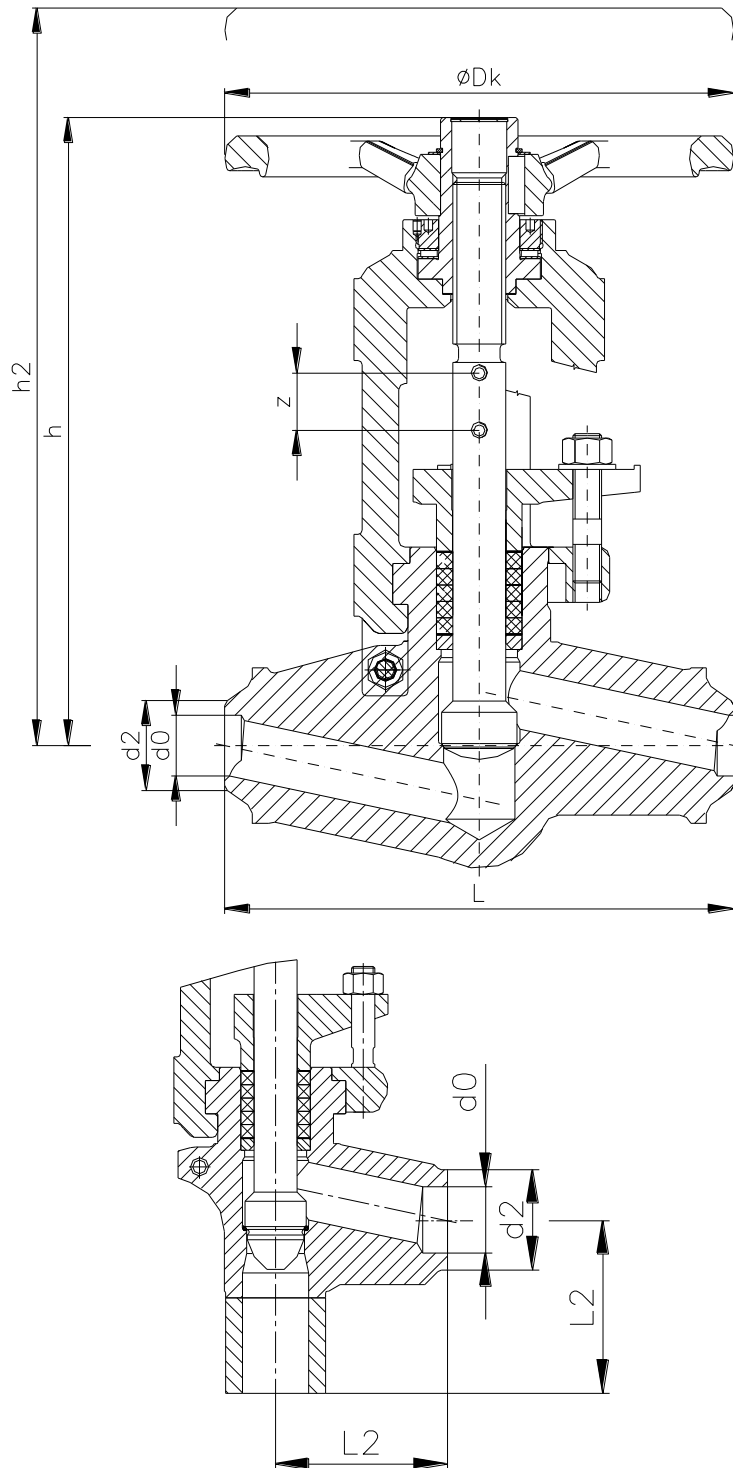
Material	PN	Admissible operating pressure PS [bar] at operating temperature TS [°C]															
		100	200	300	400	450	475	490	500	510	520	530	540	550	575	580	600
F316 Ti F304	63	57	56	49	46	45	45	45	45	45	45	45	44	44	44	36	32
	100	90	88	78	73	72	72	71	71	71	71	71	71	70	69	58	50
	160	144	141	126	118	115	115	114	114	114	113	113	113	112	111	92	81
	250	225	221	196	184	179	179	178	178	178	177	177	176	176	174	144	126
	320	288	282	251	235	229	229	228	228	228	227	223	212	205	174	144	126
	400	360	353	314	294	287	287	285	285	285	284	279	266	257	174	144	126

Material	PN	Admissible operating pressure PS [bar] at operating temperature TS [°C]																		
		20	425	450	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640	650
A182 F92	63	63	63	61,1	57,3	56,4	55,4	54,3	52,5	50	47,5	44	39,6	35,3	31,9	28,6	25,2	22,3	19,4	16,4
	100	100	100	97	91	89,6	88	86,2	83,4	79,4	75,4	69,8	62,8	56	50,6	45,4	40	35,4	30,8	26
	160	160	160	155	146	143	141	138	133	127	121	112	100	89,6	81	72,6	64	56,6	49,3	41,6
	250	250	250	243	228	224	220	216	209	199	189	175	157	140	127	114	100	88,5	77	65
	320	320	320	310	291	287	282	276	267	254	241	223	201	179	162	145	128	113	98,6	83,2
	400	400	400	388	364	358	352	345	334	318	302	279	251	224	202	182	160	142	123	104
	500	500	500	485	455	448	440	431	417	397	377	349	314	280	253	227	200	177	154	130

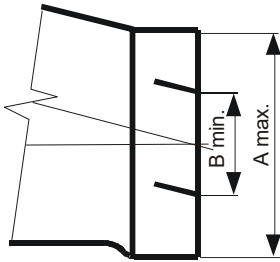


**Weld, socket weld and threaded ends**

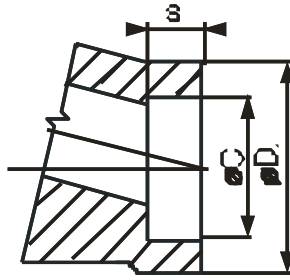
Face-to-face: acc. to tables  
 Weld ends: DIN 3239 – part 1  
 Groove form: DIN 2559-sheet 1 – Form 22  
 Socket weld end: B16.11, DIN 3239-2,  
 On your request: ČSN 13 1075, EN 12 627, Socket weld ends acc. to EN 12 760  
 and other within the  $B_{min}$ ,  $A_{min}$  dimensions



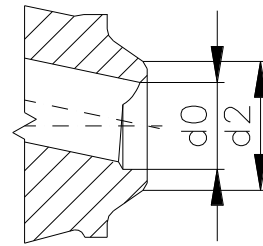
Butt - weld ends  
not machined



Socket weld ends



Butt - weld ends



Nominal pressure	Nominal size	Face-to-face (Angle pattern)	Centre-to-top	Disassembly height	Stroke	Centre-to-top (E-actuator)	Attachment for E-actuator ISO 5210	Hand wheel	Butt-weld ends acc. to DIN 3239-1 Groove forms acc. to DIN 2559-22				Socket weld ends to ASME B16.11, DIN 3239-2			Not machined butt weld ends		Weight approximately
									PN 63, 100		PN 160		PN 63 - 160			A <sub>max</sub>	B <sub>min</sub>	
DN	L	L2	h	h <sub>2</sub>	z	h <sub>3</sub>		øD <sub>k</sub>	d <sub>2</sub>	d <sub>0</sub>	d <sub>2</sub>	d <sub>0</sub>	øD <sub>1 -0,5</sub>	øC <sup>+0,2</sup>	b <sub>min</sub>	A <sub>max</sub>	B <sub>min</sub>	m [kg]
10	150	90	225	330	11	192	F10 B1	200	18	13,0	18	13,0	33	18	9,5	35	9	6,5
15	150	90	225	330	11	192	F10 B1	200	22	17,0	22	17,0	33	22	9,5	35	14	6,4
20	160	90	240	360	18	210	F10 B1	250	28	22,0	28	22,0	48	27,5	12,7	50	19	9,0
25	160	90	240	360	18	210	F10 B1	250	34	28,5	34	27,5	48	34,5	12,7	50	24	8,5
32	250	105	320	430	28	276	F14 B1	250	43	37,0	43	36,0	76	43	12,7	75	29	18,2
40	250	105	320	430	28	276	F14 B1	250	49	43,0	49	41,0	76	49	12,7	75	35	18,6
50	250	115	320	430	28	276	F14 B1	250	61	54,0	61	52,5	76	61	15,9	75	35	18,6

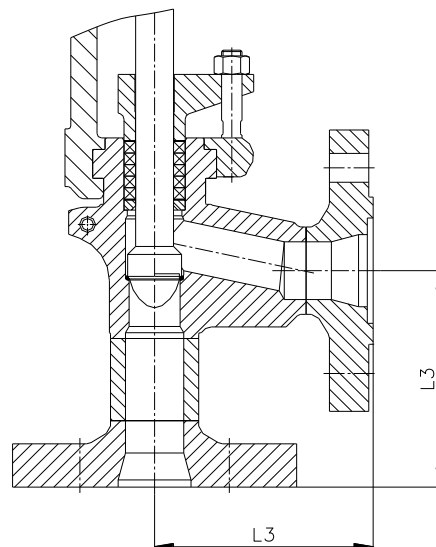
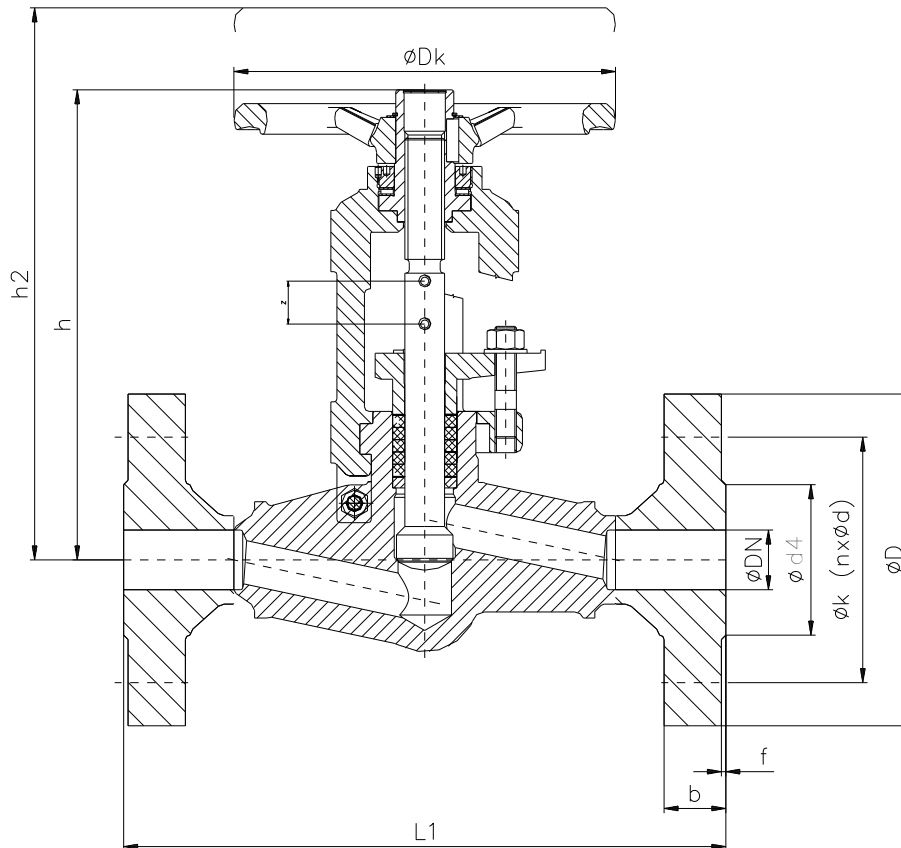
Nominal pressure	Nominal size	Face-to-face (Angle pattern)	Centre-to-top	Disassembly height	Stroke	Centre-to-top (E-actuator)	Attachment for E-actuator ISO 5210	Hand wheel	Butt-weld ends acc. to DIN 3239-1 Groove forms acc. to DIN 2559-22				Socket weld ends to ASME B16.11, DIN 3239-2			Not machined butt weld ends		Weight approximately
									PN 250		PN 320		PN 250 - 320			A <sub>max</sub>	B <sub>min</sub>	
DN	L	L2	h	h <sub>2</sub>	z	h <sub>3</sub>		øD <sub>k</sub>	d <sub>2</sub>	d <sub>0</sub>	d <sub>2</sub>	d <sub>0</sub>	øD <sub>1 -0,5</sub>	øC <sup>+0,2</sup>	b <sub>min</sub>	A <sub>max</sub>	B <sub>min</sub>	m [kg]
10	150	90	225	330	11	192	F10 B1	200	18	12	18	12,0	33	18	9,5	35	9	6,5
15	150	90	225	330	11	192	F10 B1	200	22	16	22	15,0	33	22	9,5	35	14	6,4
20	160	90	240	360	18	210	F10 B1	250	28	20	28	19,0	48	27,5	12,7	50	19	9,0
25	160	90	240	360	18	210	F10 B1	250	35	26,5	35	24,0	48	34,5	12,7	50	24	8,5
32	250	105	320	430	28	276	F14 B1	355	43	34	43	31	76	43	12,7	75	29	18,2
40	250	105	320	430	28	276	F14 B1	355	49	38,5	49	36,0	76	49	12,7	75	35	18,6
50	250	115	320	430	28	276	F14 B1	355	61	45	77	59,5	76	61	15,9	75	35	18,6

Nominal pressure	Nominal size	Face-to-face (Angle pattern)	Centre-to-top	Disassembly height	Stroke	Centre-to-top (E-actuator)	Attachment for E-actuator ISO 5210	Hand wheel	Butt-weld ends acc. to DIN 3239-1 Groove forms acc. to DIN 2559-22				Not machined butt weld ends		Weight approximately
									PN 400		PN 500		A <sub>max</sub>	B <sub>min</sub>	
DN	L	L2	h	h <sub>2</sub>	z	h <sub>3</sub>		øD <sub>k</sub>	d <sub>2</sub>	d <sub>0</sub>	d <sub>2</sub>	d <sub>0</sub>	A <sub>max</sub>	B <sub>min</sub>	m [kg]
10	150	90	225	330	11	192	F10 B1	250	18	10	22	11,5	35	9	7,2
15	150	90	225	330	11	192	F10 B1	250	28	17	33	16,5	35	14	7,1
20	160	90	240	360	18	210	F10 B1	250	34	19,5	38	20,5	48	18	9,1
25	160	90	240	360	18	210	F10 B1	250	44	28	48	23,5	48	22	9,0
32	250	105	320	430	28	276	F14 B1	355	*)	*)	*)	*)	78	30	19,8
40	250	105	320	430	28	276	F14 B1	355	61	39	76	42	78	32	19,0
50	250	115	320	430	28	276	F14 B1	355	76	49	**)	**)	78	38	19,0

\*) on your request; \*\*) only within the dimensions Amax and Bmin; d<sub>0</sub> = d<sub>p</sub> to DIN 3239

**Flanged**

Face-to-face dimensions: acc. to the tables  
 Flanges: EN1092-1, (DIN 2501/1972)  
 Raised face: EN1092-1 – Form B1, (DIN 2526/1975 – Form E)  
 Design variants on request: ČSN 13 1160, and other  
 Flanges design on request: grooved form EN 1092-1 – Form C or Form D (previously  
 DIN 2512/1975 – Form F or Form N), recessed or spigot EN  
 1092-1 – Form E or Form F (previously DIN 2513/1966 –  
 Form V13 eor Form R13), lens shaped joint type DIN 2698



Nominal size	Face-to-face dimension	Face-to-face dimension Angle pattern	PN 63							PN 100						
			Number of holes	Hole diameter	Bolt circle	Flanges diameter	Flange thickness	Raised face	Weight approx.	Number of holes	Hole diameter	Bolt circle	Flanges diameter	Flange thickness	Raised face	Weight approx.
DN	L1	L3	n	ød	øk	øD	b	ød <sub>4</sub> xf	m [kg]	n	ød	øk	øD	b	ød <sub>4</sub> xf	m [kg]
10	230	105	4	14	70	100	20	40x2	10,0	4	14	70	100	20	40x2	10,0
15	230	105	4	14	75	105	20	45x2	10,9	4	14	75	105	20	45x2	10,9
20	260	115	4	18	90	130	22	58x2	14,0	4	18	90	130	22	58x2	14,0
25	260	115	4	18	100	140	24	68x2	14,5	4	18	100	140	24	68x2	14,5
32	390	130	4	22	110	155	24	78x2	27,0	4	22	110	155	24	78x2	27,0
40	390	130	4	22	125	170	26	88x3	29,0	4	22	125	170	26	88x3	29,0
50	390	150	4	22	135	180	26	102x3	31,0	4	22	135	180	28	102x3	31,0

Nominal size	Face-to-face dimension	PN160	PN250	PN 160							PN 250						
		Face-to-face dimension	Face-to-face dimension	Number of holes	Hole diameter	Bolt circle	Flanges diameter	Flange thickness	Raised face	Weight approx.	Number of holes	Hole diameter	Bolt circle	Flanges diameter	Flange thickness	Raised face	Weight approx.
DN	L1	L3	L3	n	ød	øk	øD	b	ød <sub>4</sub> xf	m [kg]	n	ød	øk	øD	b	ød <sub>4</sub> xf	m [kg]
10	230	105	115	4	14	70	100	20	40x2	10,0	4	18	85	125	24	40x2	10,0
15	230	105	115	4	14	75	105	20	45x2	10,9	4	18	90	130	26	45x2	10,9
25	260	115	130	4	18	100	140	24	68x2	14,5	4	22	105	150	28	68x2	14,5
40	390	130	150	4	22	125	170	28	88x3	29,0	4	26	135	185	34	88x3	29,0
50	390	150	175	4	26	145	195	30	102x3	31,0	8	26	150	200	38	102x3	31,0

Nominal size	Face-to-face dimension	Face-to-face dimension Angle pattern	PN 320							PN 400						
			Number of holes	Hole diameter	Bolt circle	Flanges diameter	Flange thickness	Raised face	Weight approx.	Number of holes	Hole diameter	Bolt circle	Flanges diameter	Flange thickness	Raised face	Weight approx.
DN	L1	L3	n	ød	øk	øD	b	ød <sub>4</sub> xf	m [kg]	n	ød	øk	øD	b	ød <sub>4</sub> xf	m [kg]
10	230	115	4	18	85	125	24	40x2	10,0	4	18	85	125	28	40x2	10,0
15	230	115	4	18	90	130	26	45x2	10,9	4	22	100	145	30	45x2	10,9
25	260	130	4	22	115	160	34	68x2	17,5	4	26	130	180	38	68x2	17,5
40	390	150	4	26	145	195	38	88x3	32,0	4	30	165	220	48	88x3	32,0
50	390	175	8	26	160	210	42	102x3	36,0	8	30	180	235	52	102x3	36,0

**Stop moments**

DN	PN	Max. operating pressure Pp (MPa) at 20°C	gyroscopic moment on full of hydraulic gradient [Nm] Pp	gyroscopic moment gland nuts [Nm]
10, 15	63	<b>6,3</b>	<b>8</b>	<b>35</b>
	100	<b>10</b>	<b>12</b>	
	160	<b>16</b>	<b>18</b>	
	250	<b>25</b>	<b>27</b>	
	320	<b>32</b>	<b>33</b>	
	400	<b>40</b>	<b>55</b>	
	500	<b>50</b>	<b>70</b>	
20, 25	63	<b>6,3</b>	<b>16</b>	<b>45</b>
	100	<b>10</b>	<b>25</b>	
	160	<b>16</b>	<b>37</b>	
	250	<b>25</b>	<b>56</b>	
	320	<b>32</b>	<b>70</b>	
	400	<b>40</b>	<b>90</b>	
	500	<b>50</b>	<b>120</b>	
32, 40, 50	63	<b>6,3</b>	<b>46</b>	<b>90</b>
	100	<b>10</b>	<b>74</b>	
	160	<b>16</b>	<b>108</b>	
	250	<b>25</b>	<b>166</b>	
	320	<b>32</b>	<b>209</b>	
	400	<b>40</b>	<b>260</b>	
	500	<b>50</b>	<b>320</b>	

The fittings are manufactured as direct weld-on- or flange-type fittings, with the working medium flows under the taper plug in direction of the arrow stamped on the body of fitting. Flanges and weld-on ends complies with the above mentioned standards. The stem of valve is gasketed by graphite packing. Rising stem is operated by handwheel or E-actuator. Globe valves are dimensioned for operating in opened or closed stage. On request valves can be delivered with:

- throttle or regulating disc (for rough regulation)
- locked execution
- attachment for E-actuator
- limit switches
- gland packing with scraper ring

**2. APPLICATION**

Valve can be used as globe valves and globe valve with throttle or regulating disc for rough regulation. The valves are designed to be used in the power and chemical industries where working media, liquids, steams and gases are conveyed. The valve suitability for a particular use depends on the service life of the material used and the aggressivity of the working medium at a working temperature. If the valves are used for working media containing dirt, abrasive particles or surface freezing materials, it may result in a deterioration of the valve function, valve premature wear and disabling; in addition, a damage to the pressure cover of the valve may result in that case.

### **3. SURFACE PROTECTION**

- the valves are painted according to an order or the manufacturer's usual procedures
- except for the valves for oxygen, which are degreased and free of lubricating greases unsuitable for oxygen, inside areas and surfaces are unpainted or inted according to the customer's requirements.

### **4. MARKING**

The following identification data are pre-cast or stamped on the valves:

- nominal inside diameter DN
- nominal pressure PN
- arrow to identify the medium flow direction
- material identification mark
- serial number/year of manufacture
- manufacturer identification mark
- other data such as „kv“ value

### **5. SAFETY INSTRUCTIONS**

- the valves may only be used in accordance with this Technical Description and Mounting, Service and Maintenance Instructions.
- the valves may not be exposed to overloading or unexpected chemical and mechanical effects of working media.
- the valve mounting, putting into operation, service and maintenance may only be performed by the personnel who have been acquainted with contents of this Technical Description and Mounting, Service and Maintenance Instructions.
- no valve alterations or modifications which could affect the valve function or safety of operation or operating personnel are allowed without the manufacturer's approval,
- besides the instructions included in this Technical Description and Mounting, Service and Maintenance Instructions, generally binding safety regulations and injury prevention regulations must be observed.

### **6. WARRANTIES**

The manufacturer warrants that this product will have the properties required by technical standards or other stipulated documents within the stipulated period. The manufacturer shall be liable for the defects which occur within the warranty period and are communicated to the manufacturer in writing in time. In case of a claim, the warranty certificate must be submitted to the manufacturer.

The manufacturer shall not bear any liability for the products supplied if:

- any product alteration or modification is performed without the prior approval of the manufacturer,
- the product is improperly installed or operated or exposed to overloading or unexpected chemical or mechanical effects of working media

Product with nominal inside diameter greater then DN25 is according to requirement of NV 26/2003 reading in form and direction 2014/68/EU. For this product was yield declaration of conformity EU in agreement with s.13 of law 22/1997 reading in form and direction 2014/68/EU. Product is marked by symbol CE.

Product with nominal inside diameter smaller or equal then DN25 is according to requirement of article 3 paragraph 3 of direction 2014/68/EU and s.2 article 6 of NV 26/2003 reading in form. For this product is not execute declaration of conformity and may not to be marked by symbol CE.

## **7. PACKING AND TRANSPORT**

If a manner of transport is not specified in the contract, the fittings will be delivered in the closed position, with blinded outlets and inlets, without packaging, loose put on palettes. The fittings must be secured for preventing them from moving. Handling with valve's actuator (handwheel, electric actuator, gearbox, ...) is forbidden. Damage incurred due to manipulation or storage is not object of legitimate complaint.

## **8. STORAGE**

The fittings are stored in a closed, compact-floor room. They must be protected against humidity, weather effects and other destructive effects. Protective coats and preservation layers must be checked in 6-month periods and preserved as necessary. The packing and blinding plugs removed for that reason must be restored after removing the corrosion. Direct storage of valves on each other is forbidden.

## **9. MOUNTING INSTRUCTIONS**

9.1 Prior starting the valve mounting, the appropriate pipeline must be clean and free of any dirt. Blowing through the pipeline is not allowed after mounting the valves as it could result in damages to the packing areas of the body and plug seats. In addition, the following must be checked prior the valve mounting:

- whether data on the valve comply with that specified in the order
- to check the valve laying-out length, flange and welding-end connection dimensions and cleanness of flanges and welding ends

If any valve damage, occurred in valve handling or storage, is found, that valve shall not have to be used to be mounted in pipeline.

### **9.2 MOUNTING:**

The valves shall be mounted in direct sections of pipeline where the flow of working medium is undisturbed; they shall not be mounted near behind crossing or mixing pieces of pipeline. The following position of the valve is recommended: the stem and operating elements upright or the stem is inclined to the horizontal axis by a maximum angle of 90°. The direction of working medium flow must correspond to the direction of the arrow marked on the valve. The valve must be mounted and attached to pipeline so that the forces, torques and vibrations acting on the valve are eliminated. As for the rotation electric actuator valves, the electric actuator must independently be attached to pipeline so that the valve is not loaded with the weight of the electric actuator. Electric actuators of an appropriate closing torque may only be mounted to the valves supplied without an electric actuator. When an electric actuator is installed, the mounting instructions of that particular electric actuator shall have to be observed. Synchronising the electric actuator connection must be carried out so that the direction of the electric actuator rotation is in accordance with the requirements for the valve operating (open/closed).

### **9.3 WELDING THE VALVE TO PIPELINE:**

Only the officially authorised welders may perform welding the valves to pipeline. Prior to welding, open the valve by approximately 2 turns. Arrange the opposite pipeline with

arranged welding ends so that it is coaxial to the valve and overlapping the inside and outside dimensions of pipes are in accordance with applicable standards. Choose the procedure of welding so that the strain in the weld joint is as low as possible to prevent adverse structures, which could adversely affect the weld joint safety and the body seat, from occurring. During welding, the procedures of the welding process, heat treatment and weld joint testing must be observed.

#### **9.4 CONNECTING THE FLANGED-END VALVES TO PIPELINE:**

When the flanged-end valves are being mounted to pipeline, a mutual alignment of the pipeline flanges and valve flanges, threaded hole positions and packing areas of opposite flanges must be observed. In no case, the packing may interfere the flow cross-section of pipeline. The bolts of side flanges shall be tightened crosswise. The torques and procedure of mounting shall be determined by the customer depending on the packing used.

#### **9.5**

The valve body and bonnet can be insulated up to the gland. However, the gland bolts must not be insulated.

#### **9.6**

After completing the valve mounting, the following must be checked:

- valve controllability (by opening and closing the valve)
- proper tightening of all the bolts and nuts of the gland bush
- whether the direction of the arrow on the valve body corresponds to the direction of working medium flow in pipeline

### **10. VALVE OPERATING – PUTTING INTO OPERATION**

Opening the valve is performed by turning the handwheel left. Closing the valve is performed by turning the handwheel right. Operating the valve using levers or other means is not allowed. Electric actuators must be adjusted to the closing torque. Starting up (heating) the valve lasts until the valve temperature is equal to the working medium temperature. The heating rate shall be governed by applicable regulations depending on the pipeline type and material used. When the valve is being put into operation, flange packing shall be inspected visually. If any leakage is found, it shall have to be removed by tightening the bolts and nuts (the procedure is specified in Clause 13a), otherwise a permanent damage to the packing could occur (in that case, the packing will have to be replaced by a new one). When the bolts and nuts of flange packing are being tightened, the valves shall have to be cold and free of pressure. In operation, the valve must be in the “fully open” or “fully closed” positions. The valves equipped with a lock are secured against unauthorised use in the “fully open” or “fully closed” positions. Prior to putting the valve into operation, the valve readiness for operation must be checked by testing the valve function. The valve commissioning may only be carried out after the valve has successfully passed the operating tests to find that it has complied with the requirements specified in Clauses 9, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6.

### **11. REPAIRS**

Within the warranty period, only a manufacturer’s representative may perform repairing.



## 12. MAINTENANCE

- in operation, daily visual inspections of gland packing shall be carried out. If any leakage is found, it shall be removed by tightening the appropriate bolts and nuts (pos.13, 14) the procedure is specified in Clauses 13a. When tightening the bolts and nuts of the gland and flange packing, the valve shall have to be cold and free of pressure. It is allowed to remove packing leakage by slightly tightening the gland after lowering the pressure to 16 bars. If a high tightening force is applied, it could result in high control forces and excessive wear of the gland and stem. If it is not possible to remove leakage by tightening, the packing shall have to be replaced by a new one.
- it is recommended to check the valve controllability by turning the handwheel in one-month periods
- it is recommended to regularly lubricate the stem thread and bearings every six months. As the valves for oxygen are degreased, any greases or oils which have not been approved for oxygen must not be used for lubricating.  
WARNING! – As for the valves for oxygen, applicable safety regulations must be observed.
- closing tightness shall be checked by closing the valve. If any seat leakage is found, the seat shall have to be repaired and the plug replaced by a new one.

### 12.1 VALVE DISMANTLING:

Dismantling may only be carried out on valves which are free of pressure, discharged and cold. Electric lines must be dead and off. The valves which have been used for aggressive, combustible and explosive working media must be flushed out and blown through with inert or neutralising media.

#### VALVE DISMANTLING PROCEDURE

- a) loosen and, then, remove the gland nuts (pos. 14), bolt with nut (pos. 16 and 17) fastening the yoke (pos. 2)
- b) yoke draw out by 90°C
- c) turn the handwheel left (pos.12), the yoke assembly will rise from the body space
- d) yoke (pos.2) underlay and turn hand wheel to the right, occur to release of yoke
- e) pull up the top superstructure (yoke, stem, hand wheel) from body
- f) remove position indicator (pos. 23)
- g) unscrew the stem from the yoke (spindle nut) pos. 2(6)
- h) for dismounting of hand wheel pull out circlip (pos.25) and put out hand wheel from stem nut.

Attention shall particularly be paid to:

- packing surfaces of the gland area
- packing areas of the body and areas of the stem
- stem thread
- the stem nut thread
- gland nuts and bolts

Note: Damaged parts must be repaired or replaced by new ones.

STEM – the stem thread must not be worn; the cylindrical area passing through the gland packing must be of a roughness not greater than Ra 0,8

BODY SEAT – if the seat surface is damaged slightly, it can be repaired by resurfacing or lapping using a special seat-shaped jig. In case of grinding the seat, use an adhesive abrasive paper of a grain size of about 80. In case of lapping the seat, use an adhesive abrasive paper of a grain size of about 280. By lapping, a conical area roughness of Ra

0,1 shall be reached. The defects which can not be removed by lapping must be machined (down to a depth of max. 1 mm), resurfaced and lapped again.

STEM SEAT – if the packing surface is damaged slightly, it can be repaired by lapping. Use the „Borkarbid 400“ paste first and the „Borkarbid 800“ paste then – for finishing

## 12.2 SPARE PARTS

Spare parts can be ordered separately according to the operating experience.

### LIST OF SPARE PARTS:

- stem (pos. 3)
- handwheel (pos. 12)
- gland packing – pressed or knitted rings (pos. 9, 18 and 19)
- bolts (pos. 13 and 16)
- nuts (poz. 14 and 17)
- position indicator (pos. 23)
- screw ring (pos. 25)

If spare parts are ordered, the following data shall have to be included in the order:

- quantity, number of position, element name
- product name, catalogue number, number of this document
- DN, PN values
- serial number / year of manufacture
- body material
- If a modified valve is supplied, the spare parts shall have to be ordered according to the number of the original order.

## 13. REASSEMBLING

Reassembling the valve shall be carried out after removing all defects and thoroughly cleaning the valve. Reassembling is performed in a reverse sequence of the dismantling procedure.

For reparation of sealing face act upon paragraph 12.1 from article a) to e).

For change gasket packing act upon paragraph 12.1 from article a) to g).

During reassembling, attention shall particularly be paid to reassembling gland packing, repairs of packing areas in the body and plug seats.

### a) Reassembling the Gland Packing

- insert the knitted or pressed rings (depending on the valve type) into the gland chamber
- an uncoil length of knitted rings is calculated according to the below mentioned formula

$$L = \frac{D+d}{2} \cdot 1,1 \cdot \pi$$

D – gland packing outside diameter

d – gland packing inside diameter

- tighten the gland packing to half torque
- open and close the valve
- tighten the gland packing to full torque
- open and close the valve
- loosen the nuts of the gland bolts for half an hour
- retighten the gland packing to full torque
- open and close the valve

#### **14. TESTING**

The repaired and reassembled valve must be tested according to ČSN EN 12266-1 or ČSN 133060-2.

#### **15. VALVE SERVICE**

Since June 1<sup>st</sup>, 1999, Department of Valve Service has been established within ARAKO spol. s.r.o. Opava. We recommend our customers to use the ARAKO services for valve repairing.