

VENR

CONTROL VALVE



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TECHNICAL DATA SHEET

1. GENERAL FEATURES

Control Valves [VENR]

DN 15 ÷ DN 400

PN 16 ÷ PN 160

Design

- Casted or forged body and bonnet
- Bolted bonnet (BB)
- Rising stem (RS), outside screw and yoke (OS&Y)
- Parabolic or perforated plug
- Seats are integral or welded on

Applications

- The main purpose of the control valves is to manage fluid flow/pressure drop in 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

- PN 16 ÷ PN 160
- Temperatures up to 600°C
- p/t according to EN 12516-1

Materials

- Carbon, low alloys, heat resistant alloys and stainless steels

Advantages

- Long service life
- Respect to emission standards
- Easy handling and maintenance
- Stem packing replacement in working conditions

Options

- Electric actuator
- Pneumatic actuator
- Multistage design
- Throttling plug
- Balanced plug
- Valve characteristic linear, equal-percentage or quick open
- Spring loaded stuffing box (SLSB)
- Locking devices
- Limit switches
- Flanged or weld ends according to other Standards and Norms.

Testing

- Every produced control valve shall be tested according to EN 12266, ANSI/FCI 70-2 and EN 60534

2. PARTS & MATERIALS

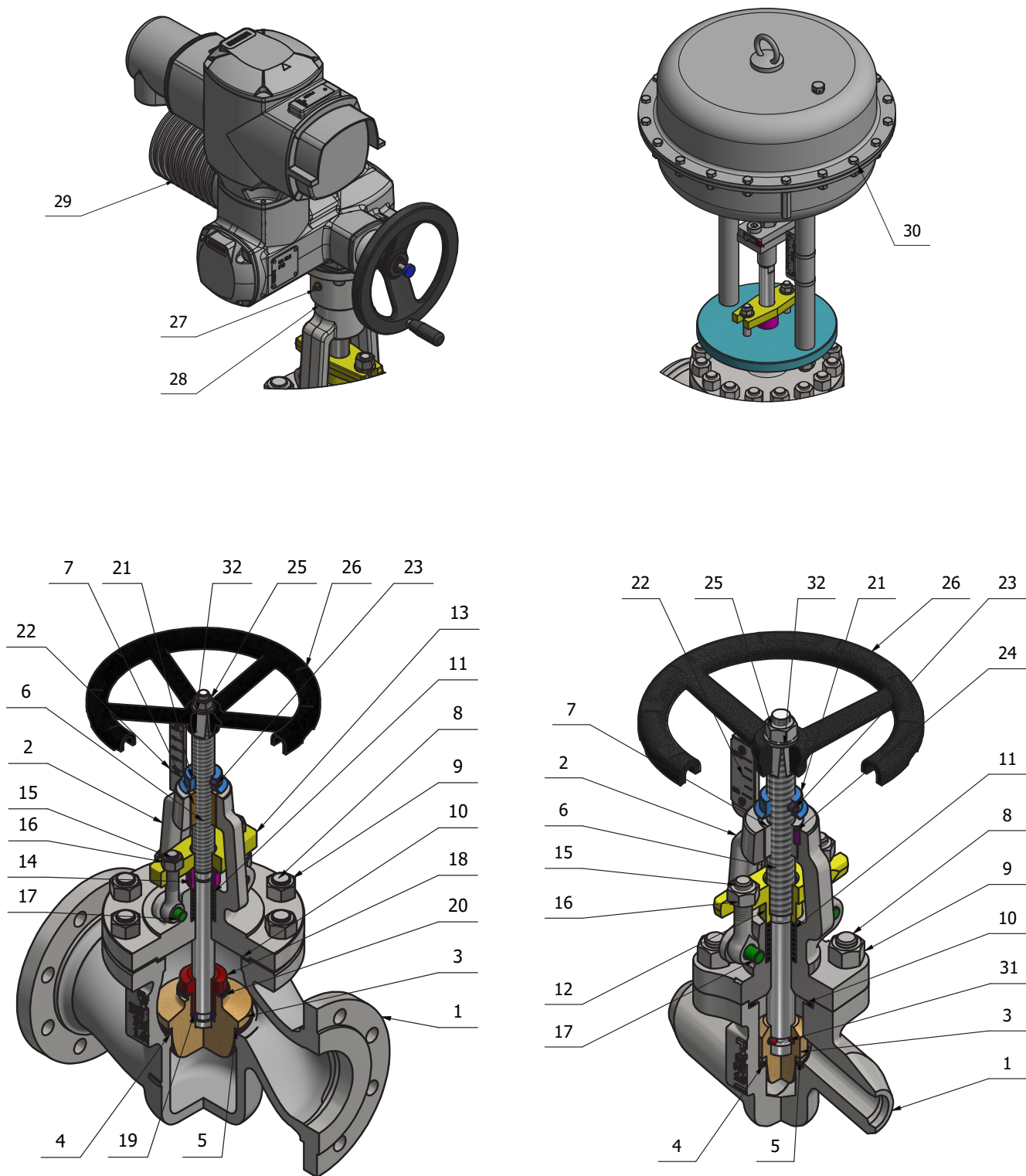


Figure C.1 – Parts

List of materials

Table C.1

Parts	Name		Material Group acc. to EN 12516-1						
1	Body ⁽¹⁾		1.0619	1.5419	1.7357	1.7379	1.4955	1.4308	1.4408
2	Bonnet ⁽¹⁾								
1	Body ⁽¹⁾	DN 15 ÷ DN 50 ⁽²⁾	1.0460	1.5415	1.7335	1.7383	1.4903	1.4301	1.4401
2	Bonnet ⁽¹⁾								
3	Plug		1.4021	1.5415	1.7335	1.7383	1.4903	1.4301	1.4401
4	Body seat ⁽³⁾		Hard-Faced 13Cr or Stellite™					Basic material or Stellite™	
5	Plug seat ⁽³⁾								
6	Stem		1.4021 / 1.4122 / 1.4923 ⁽⁴⁾					1.4301	1.4401
7	Stem nut		1.0715 / Cu-Alloy						
8	Stud bolts		A193 B7 or 1.7225	A193 B16 or 1.7709 / 1.4913 ⁽⁵⁾				A193 B8 or 1.4301	A193 B8M or 1.4401
9	Nuts		A194 2H or 1.1191	A194 7 or 1.7709				A194 8 or 1.4301	A194 8M or 1.4401
10	Bonnet gasket		spiral-wound or reinforced graphite						
11	Stem packing rings		graphite with corrosion inhibitor						
12	Gland		1.0460 or 1.0619					1.4301	
13	Gland flange		1.0425					1.4301	
14	Packing gland		1.4021					1.4301	
15	Gland bolts		1.1181					1.4301	
16	Gland nuts		A194 2H or 1.1191					A194 B8 or 1.4301	
17	Pin		1.1191					1.4301	
18	Plug nut		1.4021 / 1.4122					1.4301	
19	Ring		1.1191					1.4301	
20	Plug gasket		1.0333						
21	Position indicator		1.1191					1.4301	
22	Scale		1.4301						
23	Set screw		steel						
24	Spring type pin		steel						
25	Handwheel nut		1.1191					1.4301	
26	Handwheel		epoxy coated steel						
27	Grease injector		Cu-Alloy / steel						
28	Carrier		1.1191				1.4301		
29	Electric actuator		commercial						
30	Pneumatic actuator		commercial						
31	Balls		1.4021						
32	Nameplate		stainless steel						

TM trademark materials

(1) Other materials available acc. to EN standard

(2) DN 15 ÷ DN 50 only for butt welding ends

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

(4) Over 500°C

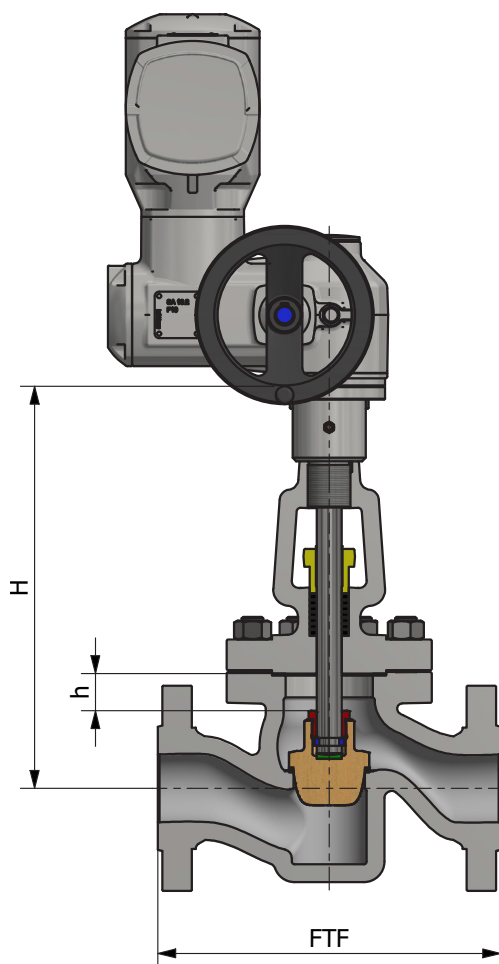
(5) Over 500°C

3. STANDARDS & DIMENSIONS

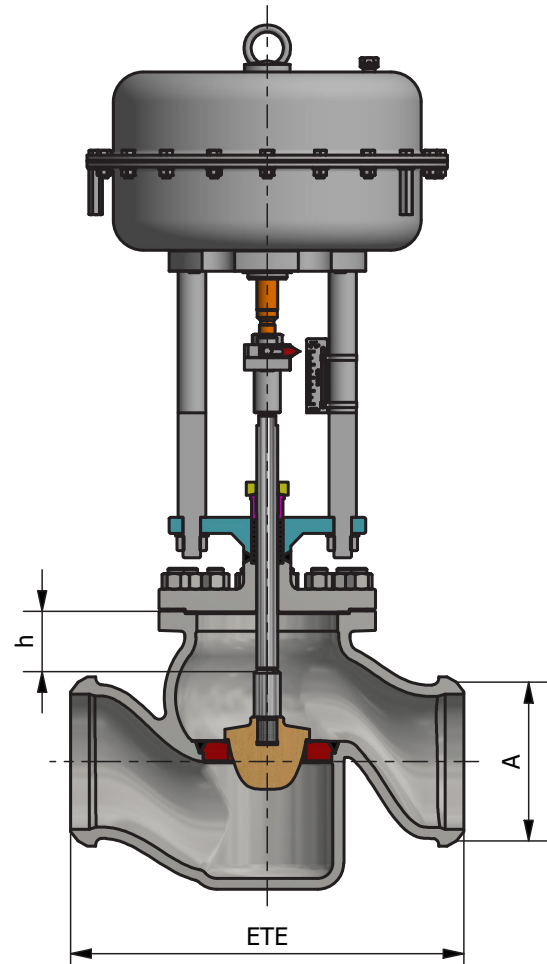
Standards

Table C.2

VENR	PN 16 ÷ PN 160
General design	EN 1349 and EN 60534
Wall thickness	EN 12516
Pressure / temperature rating	EN 12516
FTF and ETE according to	EN 558 and EN 12982
Flanged Ends according to	EN 1092-1
Welding Ends according to	EN 12627
Testing according to	EN 12266, ANSI/FCI 70-2 and EN 60534



VENR type with flanged ends



VENR type with welding ends
(Dimensions A in the Table C.6)

Figure C.2 – Dimensions

Nominal Pressure	Diameter Nominal	Face - To - Face	End - To - End	Centre-to - connection flange ISO 5210	Stroke	Connection flange ISO 5210	Kvs	Mass ⁽¹⁾	
PN	DN	FTF	ETE	H	h		m³/h	ETE	FTF
		mm						kg	
PN 16	15	130	130	251	24	F10-B1	10	4,3	5
	20	150	130	251	24	F10-B1	10	4,3	6
	25	160	130	251	24	F10-B1	10	4,5	7
	32	180	160	290	30	F10-B1	20	7	11
	40	200	180	305	25	F10-B1	25	11	14
	50	230	210	325	28	F10-B1	40	14	18
	65	290	290	338	36	F10-B1	75	18	25
	80	310	310	373	40	F10-B1	100	26	36
	100	350	350	425	48	F10-B1	160	43	50
	125	400	400	519	70	F10-B1	290	60	74
	150	480	480	544	78	F10-B1	400	85	99
	200	600	600	645	105	F14-B1	735	151	160
	250	730	730	840	122	F14-B1	1150	260	305
	300	850	850	847	111	F16-B1	1600	295	367
PN 25 ÷ PN 40	350	980	980	1226	162	F16-B1	2150	785	822
	400	1100	1100	1392	170	F25-B1	3000	1305	1363
	15	130	130	251	24	F10-B1	10	4,3	5
	20	150	130	251	24	F10-B1	10	4,3	6
	25	160	130	251	24	F10-B1	10	4,5	7
	32	180	160	290	30	F10-B1	20	7	11
	40	200	180	305	25	F10-B1	25	11	14
	50	230	210	325	28	F10-B1	40	14	19
	65	290	290	338	36	F10-B1	75	18	26
	80	310	310	373	40	F10-B1	100	26	37
	100	350	350	425	48	F10-B1	160	43	52
	125	400	400	519	70	F14-B1	290	60	77
	150	480	480	544	78	F14-B1	400	85	103
	200	600	600	645	105	F14-B1	735	151	177
PN 63	250	730	730	840	122	F16-B1	1150	260	337
	300	850	850	847	111	F25-B1	1600	295	392
	350	980	980	1226	162	F30-B1	2150	785	868
	400	1100	1100	1392	170	F30-B1	3000	1305	1423
	15	210	150	255	24	F10-B1	10	4,8	7
	20	230	150	255	24	F10-B1	10	4,8	9
	25	230	160	255	24	F10-B1	10	5	11
	32	260	180	305	28	F10-B1	20	12	18
	40	260	210	310	28	F10-B1	25	14	21
	50	300	250	382	44	F10-B1	40	24	32
	65	340	340	403	42	F10-B1	75	39	47
	80	380	380	474	52	F14-B1	100	60	73
	100	430	430	583	64	F14-B1	160	100	112
	125	500	500	626	70	F14-B1	290	155	175
PN 100 ÷ PN 160	150	550	550	719	90	F16-B1	400	238	268
	200	650	650	923	128	F16-B1	735	446	480
	250	775	775	1121	156	F25-B1	1150	770	865
	15	210	150	255	24	F10-B1	10	4,8	7
	20	230	150	255	24	F10-B1	10	4,8	9
	25	230	160	255	24	F10-B1	10	5	11
	32	260	180	305	28	F10-B1	20	12	18
	40	260	210	310	28	F10-B1	25	14	21
	50	300	250	382	44	F10-B1	40	24	35
	65	340	340	403	42	F14-B1	75	39	50
	80	380	380	474	52	F14-B1	100	60	79
	100	430	430	583	64	F16-B1	160	100	124
	125	500	500	626	70	F16-B1	290	155	192
	150	550	550	719	90	F25-B1	400	238	288
	200	650	650	923	128	F30-B1	735	446	510
	250 ⁽²⁾	775	775	1121	156	F30-B1	1150	770	865

(1) Mass without actuators

(2) Dimensions only for PN 100

- Depending on the execution's weights are subject to modification

4. FLANGED ENDS DESIGN & DIMENSIONS

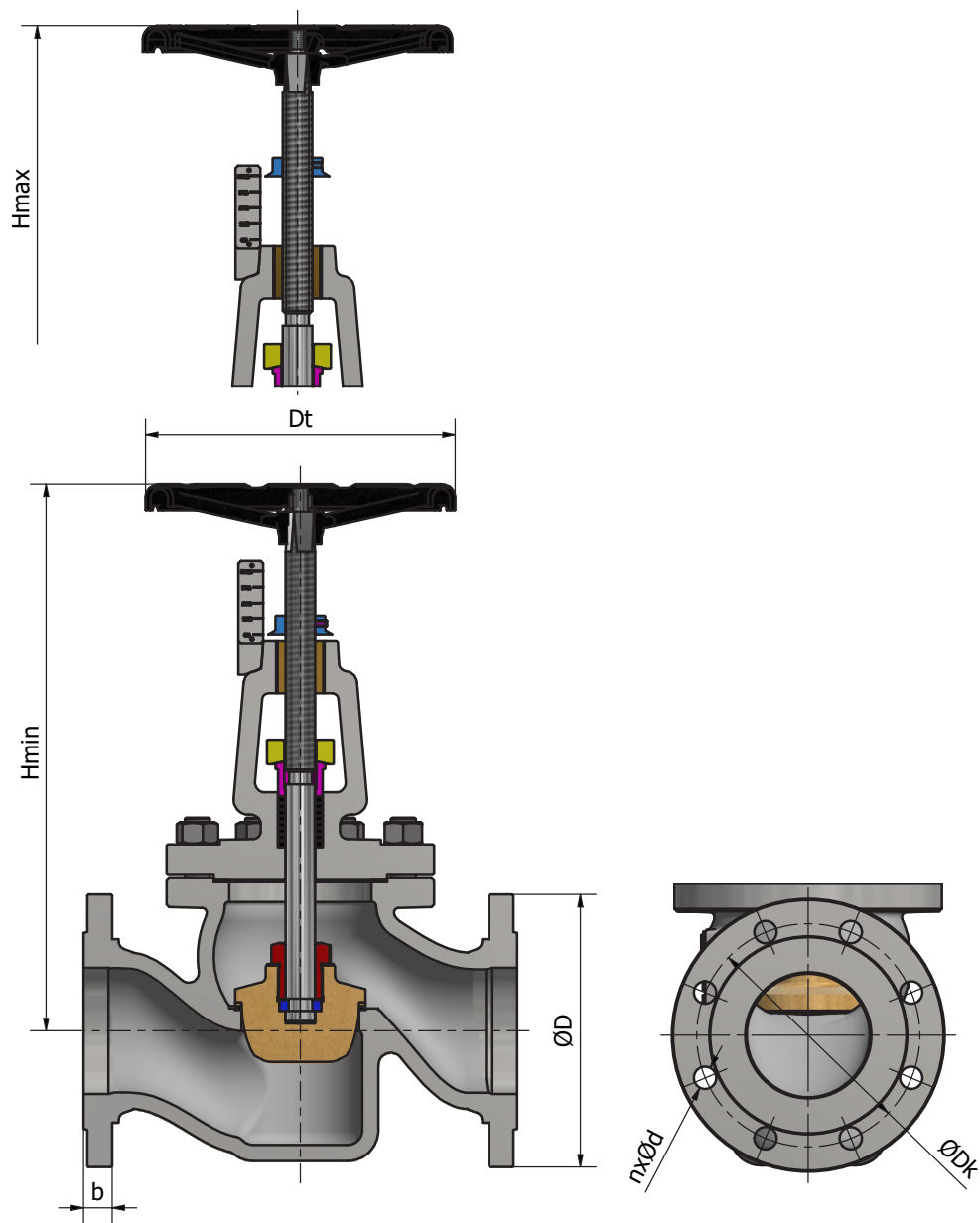


Figure C.3 – VENR with flanged ends - dimensions

Flanged ends dimensions

Table C.4

DN		15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400
PN 16																	
mm	øD	95	105	115	140	150	165	185	200	220	250	285	340	405	460	520	580
	øDk	65	75	85	100	110	125	145	160	180	210	240	295	355	410	470	525
	nxød	4x14	4x14	4x14	4x18	4x18	4x18	8 ⁽¹⁾ x18	8x18	8x18	8x18	8x22	12x22	12x26	12x26	16x26	16x30
	b	16	18	18	18	18	18	18	20	20	22	22	24	26	28	30	32
	Hmax	267	267	267	321	357	368	384	437	490	632	662	807	1004	1159	1643	1842
	Hmin	243	243	243	291	332	340	348	397	442	562	584	702	882	1048	1481	1672
	Dt	125	125	125	150	150	150	200	250	250	300	300	400	400	500	630	630
PN 25																	
mm	øD	95	105	115	140	150	165	185	200	235	270	300	360	425	485	555	620
	øDk	65	75	85	100	110	125	145	160	190	220	250	310	370	430	490	550
	nxød	4x14	4x14	4x14	4x18	4x18	4x18	8x18	8x18	8x22	8x26	8x26	12x26	12x30	16x30	16x33	16x36
	b	16	18	18	18	18	20	22	24	24	26	28	30	32	34	38	40
	Hmax	267	267	267	321	357	368	384	437	490	632	662	807	1004	1159	1643	1842
	Hmin	243	243	243	291	332	340	348	397	442	562	584	702	882	1048	1481	1672
	Dt	125	125	125	150	150	150	200	250	250	300	300	400	400	500	630	630
PN 40																	
mm	øD	95	105	115	140	150	165	185	200	235	270	300	375	450	515	580	660
	øDk	65	75	85	100	110	125	145	160	190	220	250	320	385	450	510	585
	nxød	4x14	4x14	4x14	4x18	4x18	4x18	8x18	8x18	8x22	8x26	8x26	12x30	12x33	16x33	16x36	16x39
	b	16	18	18	18	18	20	22	24	24	26	28	34	38	42	46	50
	Hmax	267	267	267	321	357	368	384	437	490	632	662	807	1004	1159	1643	1842
	Hmin	243	243	243	291	332	340	348	397	442	562	584	702	882	1048	1481	1672
	Dt	125	125	125	150	150	150	200	250	250	300	300	400	400	500	630	630
PN 63																	
mm	øD	105	130	140	155	170	180	205	215	250	295	345	415	470			
	øDk	75	90	100	110	125	135	160	170	200	240	280	345	400			
	nxød	4x14	4x18	4x18	4x22	4x22	4x22	8x22	8x22	8x26	8x30	8x33	12x36	12x36			
	b	20	22	24	26	28	26	26	28	30	34	36	42	46			
	Hmax	272	272	272	358	358	454	487	562	689	733	868	1079	1509			
	Hmin	248	248	248	330	330	410	445	510	625	663	778	951	1353			
	Dt	150	150	150	200	200	250	300	300	400	400	500	500	630			
PN 100																	
mm	øD	105	130	140	155	170	195	220	230	265	315	355	430	505			
	øDk	75	90	100	110	125	145	170	180	210	250	290	360	430			
	nxød	4x14	4x18	4x18	4x22	4x22	4x26	8x26	8x26	8x30	8x33	12x33	12x36	12x39			
	b	20	22	24	26	28	30	34	36	40	40	44	52	60			
	Hmax	272	272	272	358	358	454	487	562	689	733	868	1079	1509			
	Hmin	248	248	248	330	330	410	445	510	625	663	778	951	1353			
	Dt	150	150	150	200	200	250	300	300	400	400	500	500	630			
PN 160																	
mm	øD	105	130	140	155	170	195	220	230	265	315	355	430				
	øDk	75	90	100	110	125	145	170	180	210	250	290	360				
	nxød	4x14	4x18	4x18	4x22	4x22	4x26	8x26	8x26	8x30	8x33	12x33	12x36				
	b	20	22	24	26	28	30	34	36	40	44	50	60				
	Hmax	272	272	272	358	358	454	487	562	689	733	868	1079				
	Hmin	248	248	248	330	330	410	445	510	625	663	778	951				
	Dt	150	150	150	200	200	250	300	300	400	400	500	500				

(1) 8 holes is preferred however 4 holes may be supplied upon special request by the Customer.



5. BUTT WELDING ENDS DESIGN

Symbols		Table C.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	

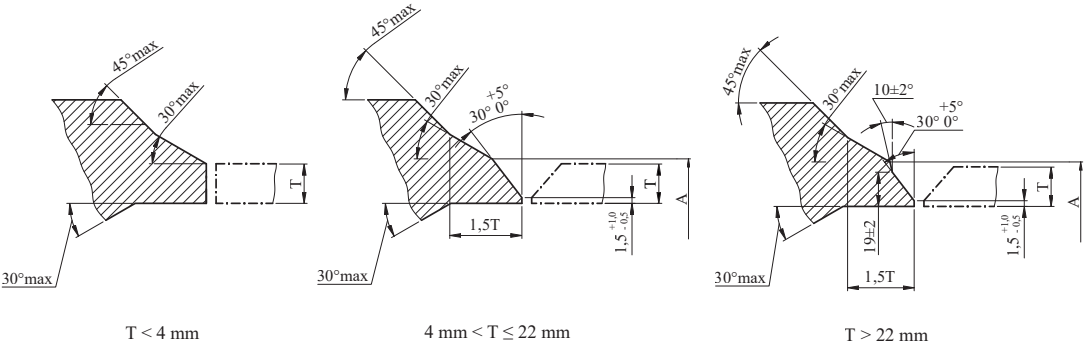


Figure C.4 - Form of the butt welding ends EN 12627

Dimensions and tolerance of outside diameter																Table C.6
DN	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400
A (mm)	22	28	35	44	5	62	78	91	117	144	172	223	278	329	362	413
Tolerance (mm)	+2,5 -1	+2,5 -1,5	+2,5 -2			+2,5 -2,5			+4 -2,5							

6. TYPES of CONTROL VALVE TRIM

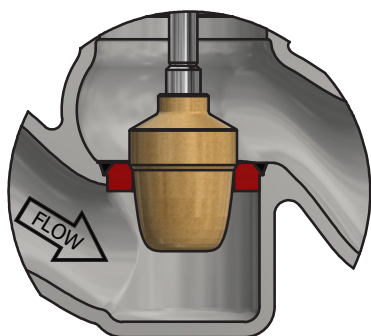


Figure C.5 – Parabolic plug

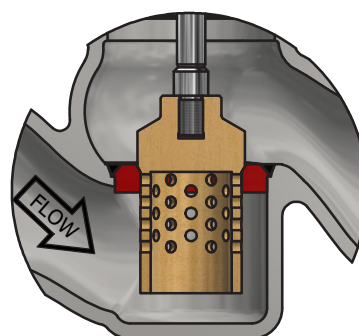


Figure C.6 – Perforated plug

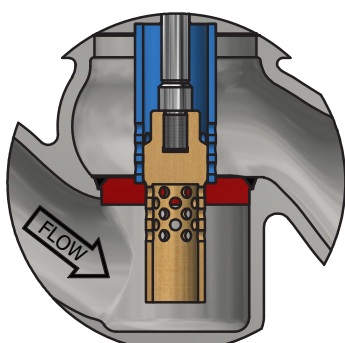


Figure C.7 – Perforated plug and cage

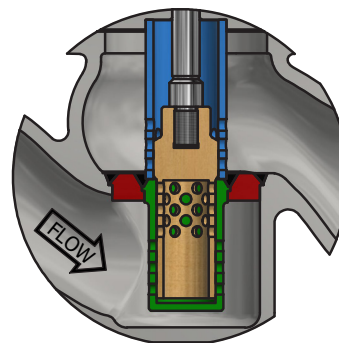


Figure C.8 – Perforated plug, perforated seat and cage

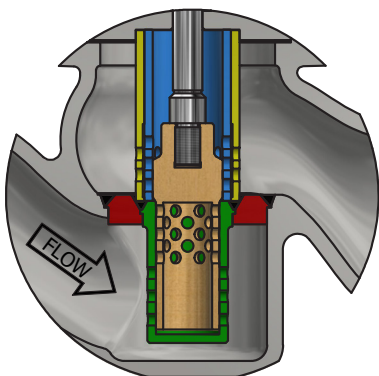


Figure C.9 – Perforated plug, perforated seat and two cages

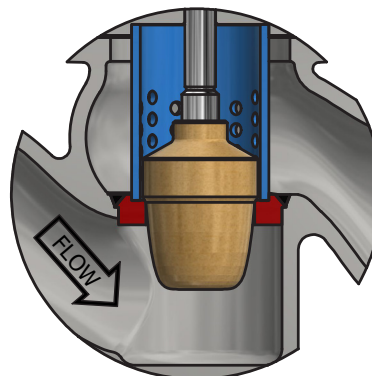


Figure C.10 – Cage for noise reduction

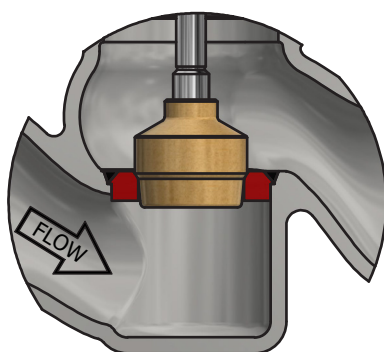


Figure C.11 – Throttling plug

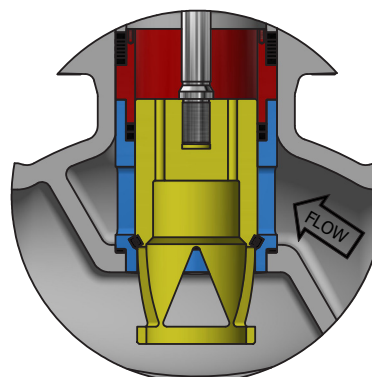


Figure C.12 – Balanced plug

7. FLOW CHARACTERISTIC

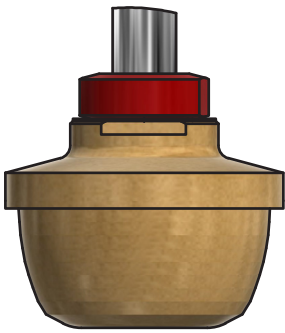


Figure C.13 – Equal Percentage

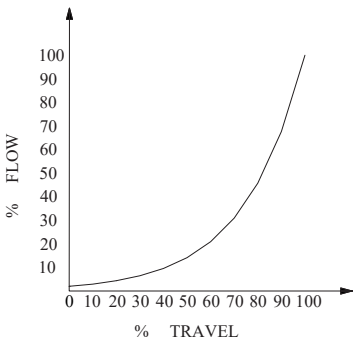


Figure C.14 – Equal Percentage curve

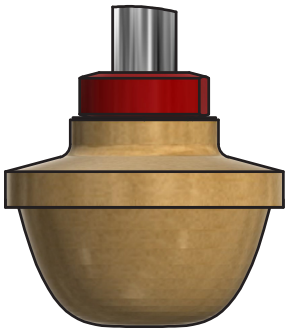


Figure C.15 – Linear characteristic

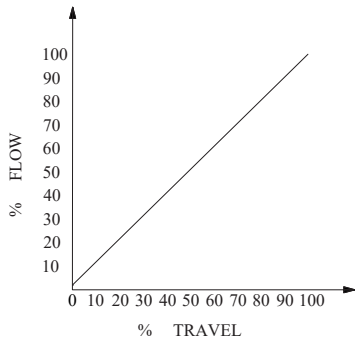


Figure C.16 – Linear curve

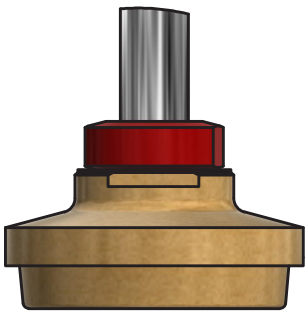


Figure C.17 – Quick opening

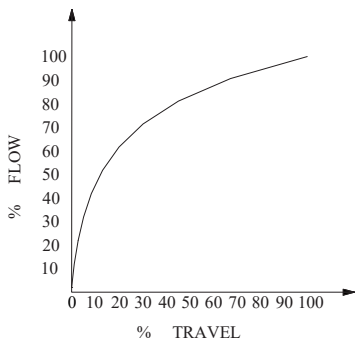


Figure C.18 – Quick opening curve



8. Kvs VALUES

The K_v s value expresses the amount of flow in a control valve at a fully-open valve position and a differential pressure (Δp) of 1 bar.

Medium	Liquid	Gases	Steam
Pressure drop	m³/h		kg/h
$p_2 > \frac{p_1}{2}$	$K_v = Q \cdot \sqrt{\frac{\rho}{1000 \cdot \Delta p}}$	$K_v = \frac{G}{519} \cdot \sqrt{\frac{\rho_G \cdot T_1}{\Delta p \cdot p_2}}$	$K_v = \frac{W}{31,62} \cdot \sqrt{\frac{v_2}{\Delta p}}$
$\Delta p < \frac{p_1}{2}$			
$p_2 < \frac{p_1}{2}$		$K_v = \frac{G}{259,5 \cdot p_1} \cdot \sqrt{\rho_G \cdot T_1}$	$K_v = \frac{W}{31,62} \cdot \sqrt{\frac{2 \cdot v^*}{p_1}}$
$\Delta p > \frac{p_1}{2}$			

p_1 (bar) – input pressure

p_2 (bar) – output pressure

Δp (bar) – differential pressure $p_1 - p_2$

Q (m³/h) – volume flow rate

G (m³/h) – flow rate of gases related to 0°C and 1013 mbar

W (kg/h) – Mass flow rate

ρ (kg/m³) – density of liquids

ρ_G (kg/m³) – density of gases at 0°C and 1013 mbar

T_1 (K) – 273 + μ_1 where is μ_1 – temperature in °C upstream of the valve

v_2 (m³/kg) – specific volume for p_2 and μ_1

v^* (m³/kg) – specific volume for $p_1/2$ and μ_1

K_v s (m³/h) = $1,3 \cdot K_v$

Kvs values

Table C.7

Kvs [m³/h]	SD ⁽¹⁾ [mm]	DN (Diameter Nominal)															
		15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400
0,25	4	•	•	•													
0,32	4	•	•	•													
0,4	5	•	•	•	•	•	•										
0,5	5	•	•	•	•	•	•										
0,63	6	•	•	•	•	•	•										
0,8	7	•	•	•	•	•	•										
1	7	•	•	•	•	•	•										
1,25	8	•	•	•	•	•	•										
1,6	10	•	•	•	•	•	•	•									
2	11	•	•	•	•	•	•	•									
2,5	12	•	•	•	•	•	•	•									
3,2	13	•	•	•	•	•	•	•									
4	15	•	•	•	•	•	•	•	•								
5	17	•	•	•	•	•	•	•	•								
6,3	19	•	•	•	•	•	•	•	•	•							
8	21	•	•	•	•	•	•	•	•	•							
10	23	•	•	•	•	•	•	•	•	•							
12,5	25				•	•	•	•	•	•							
16	29				•	•	•	•	•	•							
20	32				•	•	•	•	•	•	•						
25	38					•	•	•	•	•	•						
32	42						•	•	•	•	•						
40	48						•	•	•	•	•	•					
50	52							•	•	•	•	•					
63	59							•	•	•	•	•	•				
75	64							•	•	•	•	•	•	•			
80	66								•	•	•	•	•	•			
100	74								•	•	•	•	•	•			
125	83									•	•	•	•	•			
160	94										•	•	•	•	•		
200	105											•	•	•	•		
250	115												•	•	•		
290	125													•	•		
320	132														•		
360	140															•	
400	148																•
500	165																
570	176																
630	185																
735	200																
800	210																
1000	235																
1150	250																
1250	260																
1600	295																
2000	330																
2250	350																
2500	370																
3000	400																

(1) SD – seat diameter



9. OPTIONAL EXECUTIONS

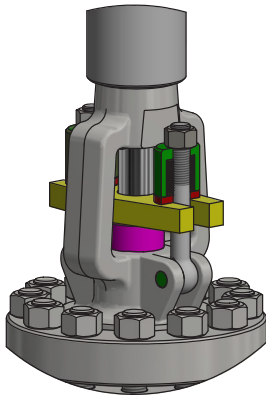


Figure C.19 - Spring Loaded Stuffing Box

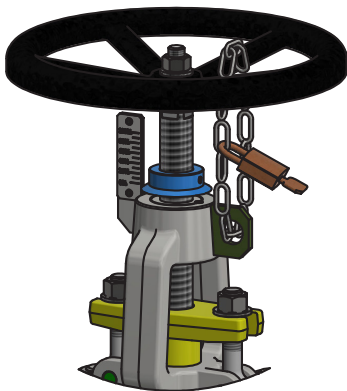


Figure C.20 – Locking Devices

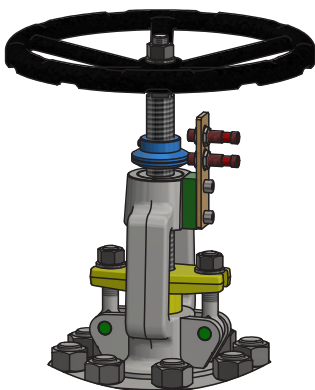


Figure C.21 – Limit Switches

10. PRESSURE & TEMPERATURE RATINGS

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

Table C.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	16	16,0	16,0	16,0	15,0	14,2	13,4	12,3	11,1	10,4	9,6	8,8										
	25	25,0	25,0	25,0	23,4	22,2	21,0	19,2	17,4	16,2	15,0	13,7										
	40	40,0	40,0	40,0	37,4	35,5	33,6	30,7	27,8	25,9	24,0	22,2										
	63	63,0	63,0	63,0	59,0	55,9	52,9	48,4	43,8	40,8	37,8	34,6										
	100	100,0	100,0	100,0	93,6	88,8	84,0	76,8	69,6	64,8	60,0	54,9										
	160	160,0	160,0	160,0	149,8	142,1	134,5	122,9	111,4	103,7	96,0	87,9										
1.0619	16	16,0	16,0	16,0	15,0	14,2	13,4	12,3	11,1	10,4	9,6	8,8	5,9									
	25	25,0	25,0	25,0	23,4	22,2	21,0	19,2	17,4	16,2	15,0	13,7	9,2									
	40	40,0	40,0	40,0	37,4	35,5	33,6	30,7	27,8	25,9	24,0	22,2	14,7									
	63	63,0	63,0	63,0	59,0	55,9	52,9	48,4	43,8	40,8	37,8	34,6	23,2									
	100	100,0	100,0	100,0	93,6	88,8	84,0	76,8	69,6	64,8	60,0	54,9	36,8									
	160	160,0	160,0	160,0	149,8	142,1	134,5	122,9	111,4	103,7	96,0	87,9	58,9									
1.5419 1.5415	16	16,0	16,0	16,0	16,0	15,7	14,6	13,6	12,7	11,9	11,5	11,4	10,7	10,5	10,4	7,3	6,3	4,5	4,0			
	25	25,0	25,0	25,0	25,0	24,5	22,8	21,3	19,8	18,6	18,0	17,7	16,7	16,4	16,3	11,3	9,9	7,1	6,3			
	40	40,0	40,0	40,0	40,0	39,1	36,5	34,1	31,7	29,8	28,8	28,4	26,7	26,2	26,1	18,1	15,8	11,3	10,0			
	63	63,0	63,0	63,0	63,0	61,6	57,5	53,7	49,9	46,9	45,4	44,7	42,0	41,3	41,1	28,6	24,9	17,8	15,8			
	100	100,0	100,0	100,0	100,0	97,8	91,2	85,2	79,2	74,4	72,0	71,0	66,7	65,5	65,3	45,3	39,5	28,3	25,1			
	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			
1.7357 1.7335	16	16,0	16,0	16,0	16,0	16,0	16,0	16,0	16,0	14,9	13,7	13,7	12,6	11,8	11,6	10,0	8,9	7,3	6,7	4,2		
	25	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	23,3	21,3	21,3	19,7	18,5	18,1	15,6	13,9	11,5	10,5	6,5		
	40	40,0	40,0	40,0	40,0	40,0	40,0	40,0	40,0	37,3	34,1	34,1	31,5	29,5	28,9	25,0	22,3	18,3	16,8	10,5		
	63	63,0	63,0	63,0	63,0	63,0	63,0	63,0	63,0	58,7	53,8	53,8	49,7	46,5	45,5	39,3	35,1	28,9	26,4	16,5		
	100	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	93,1	85,3	85,4	78,9	73,9	72,2	62,4	55,8	45,9	41,9	26,1		
	160	160,0	160,0	160,0	160,0	160,0	160,0	160,0	160,0	149,1	136,6	136,6	126,2	118,2	115,6	99,9	89,3	73,4	67,1	41,8		
1.7379 1.7383	16	16,0	16,0	16,0	16,0	16,0	16,0	16,0	16,0	15,0	13,7	13,2	12,6	11,8	11,6	10,5	10,2	8,6	8,0	5,6	4,4	2,4
	25	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	23,5	21,3	20,65	19,7	18,5	18,1	16,5	15,9	13,5	12,5	8,8	6,8	3,7
	40	40,0	40,0	40,0	40,0	40,0	40,0	40,0	40,0	37,5	34,1	33,0	31,5	29,5	28,9	26,3	25,4	21,5	20,1	14,1	10,9	6,0
	63	63,0	63,0	63,0	63,0	63,0	63,0	63,0	63,0	59,1	53,8	51,9	49,7	46,5	45,5	41,5	40,0	33,9	31,6	22,2	17,1	9,4
	100	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	93,8	85,3	82,4	78,9	73,9	72,2	65,8	63,5	53,9	50,1	35,2	27,2	14,9
	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	86,2	80,2	56,3	43,5	23,9
1.4955 1.4903	16	16,0	16,0	16,0	16,0	16,0	16,0	16,0	16,0	15,0	13,7	13,2	12,6	11,8	11,6	10,5	10,2	9,6	9,6	9,3	8,9	8,0
	25	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	23,5	2,13	20,6	19,7	18,5	18,1	16,5	15,9	15,0	14,9	14,6	14,0	12,5
	40	40,0	40,0	40,0	40,0	40,0	40,0	40,0	40,0	37,5	34,1	32,9	31,5	29,5	28,9	26,3	25,4	24,1	23,9	23,3	22,3	20,0
	63	63,0	63,0	63,0	63,0	63,0	63,0	63,0	63,0	59,1	53,8	51,9	49,7	46,5	45,5	41,5	40,0	37,9	37,7	36,7	35,2	31,5
	100	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	93,8	85,3	82,4	78,9	73,9	72,2	65,8	63,5	60,2	59,8	58,2	55,9	50,0
	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
1.4308 1.4301	16	16,0	16,0	16,0	14,8	13,0	11,2	10,5	9,9	9,1	8,7	8,5	8,2	8,1	8,0	7,9	7,8	7,3	7,3	7,1	6,4	5,0
	25	25,0	25,0	25,0	23,1	20,3	17,5	16,5	15,4	14,3	13,6	13,3	12,9	12,6	12,5	12,3	12,2	11,4	11,3	11,1	10,0	7,9
	40	40,0	40,0	40,0	37,0	32,5	28,0	26,3	24,6	22,8	21,7	21,3	20,6	20,2	20,1	19,7	19,5	18,2	18,1	17,7	16,0	12,6
	63	63,0	63,0	63,0	58,2	51,2	44,1	41,5	38,8	36,0	34,2	33,5	32,5	31,8	31,6	31,0	30,7	28,7	28,6	27,9	25,2	19,8
	100	100,0	100,0	100,0	92,4	81,2	70,0	65,8	61,6	57,1	54,3	53,2	51,5	50,4	50,2	49,3	48,7	45,6	45,4	44,3	40,0	31,5
	160	160,0	160,0	160,0	147,9	130,0	112,1	105,3	98,6	91,4	87,0	85,2	82,5	80,7	80,3	78,9	78,0	73,0	72,6	70,9	64,0	50,4
1.4408 1.4401	16	16,0	16,0	16,0	15,2	13,7	12,1	11,2	10,3	9,9	9,4	8,3	9,1	9,0	8,9	8,9	8,8	8,4	9,2	8,3	7,0	5,8
	25	25,0	25,0	25,0	23,8	21,4	18,9	17,5	16,1	15,4	14,7	13,0	14,1	14,0	14,0	13,9	13,8	13,1	14,4	12,9	10,9	9,1
	40	40,0	40,0	40,0	38,1	34,2	30,2	28,0	25,8	24,6	23,5	20,9	22,6	22,4	22,4	22,2	22,1	20,9	23,1	20,7	17,5	14,5
	63	63,0	63,0	63,0	60,0	53,8	47,6	44,1	40,6	38,8	37,0	32,9	35,6	35,3	35,2	34,9	34,8	32,9	36,3	32,6	27,6	22,8
	100	100,0	100,0	100,0	95,2	85,4	75,6	70,0	64,4	61,6	58,8	52,2	56,6	56,0	55,9	55,4	55,2	52,3	57,7	51,7	43,7	36,3
	160	160,0	160,0	160,0	152,4	136,7	121,0	112,1	103,1	98,6	94,1	83,5	90,5	89,6	89,5	88,7	88,4	83,7	92,3	82,8	70,0	58,1

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

11. MARKING & LABELING

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

11.1 Marking

General marking of the valve

Table C.9

Item ^a	Subject		Marking
			PN designed valves
1	Product identification	Type	VENR
		Serial number	xxxx.xx.xx/xx
2	Nominal size		DN xxx
3	PN designation		PN xxx
4	Material		xxx
5	Heat batch identification		xxx
6	Arrow for flow direction		→
7	Manufacturer's name and registered trade details		TermoventSC Serbia
8	Maximum allowable temperature, <i>TS</i>		xx °C or xx C
9	Maximum allowable pressure, <i>PS</i>		xx bar
10	Trim		xxx
11	Flow characteristic		xxx
12	Flow coefficient (Kvs)		xxx
13	Month / year of manufacturing		mm/yy

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

11.1.1 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.

11.2 Labeling

Valve information can be found on the valve body, and the typical valve nameplate is shown on Figure C.22.

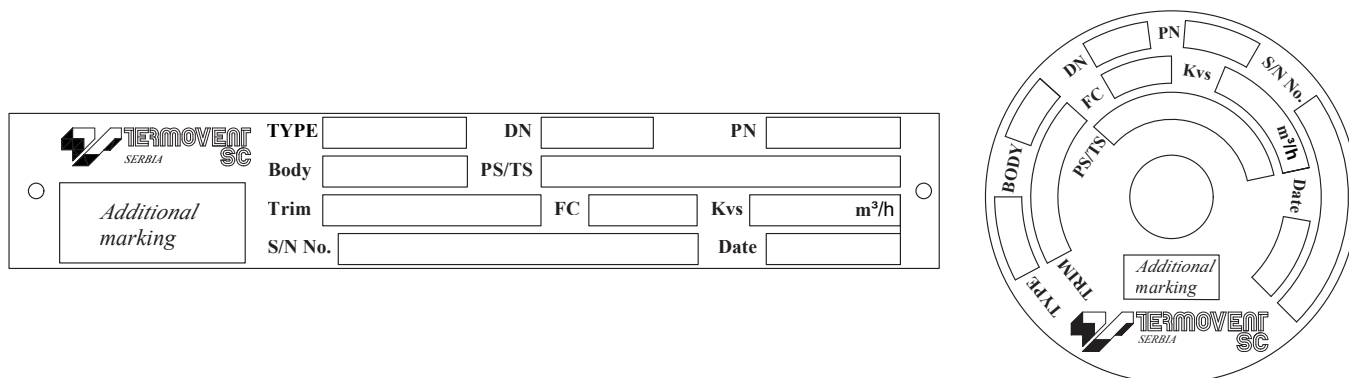


Figure C.22

TYPE	Type of valve
DN	Nominal valve size
PN	Pressure
Body	Material
PS / TS	Pressure-temperature rating
Trim	Material of stem and sealing faces
FC	Flow characteristic
Kvs	Rated flow coefficient
S / N No.	Series Number
Date	Manufacture Date
Additional marking	As per 11.1.1

12. 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.*

13. 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.



TERMOVENT SC DOO

Železnička 1a
21235 Temerin, Serbia
PAK 385116

Phone	+381 21 842 505
	+381 21 842 911
Fax	+381 21 843 238
E-mail	office@termoventsc.rs

termoventsc.rs