Know-how makes the difference

V-notch Ball Valves

...for optimal flow control

SIL3

CE

TA-Luft Certified for Low Emissions

FIRESAFE
API 607 4th

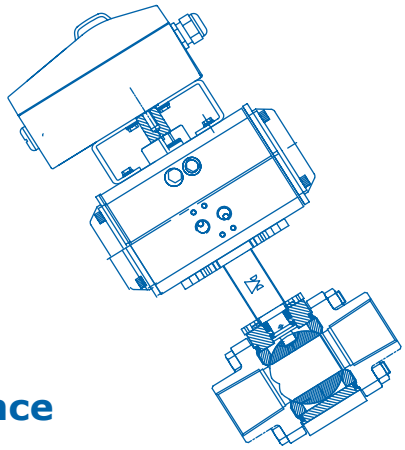
ATEX

EU1935/2004

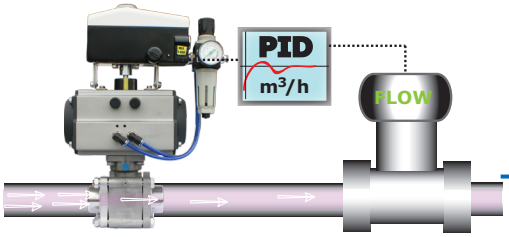
DVC
ARMATEC

With DVC as your business partner, you are always guaranteed a wide and well sorted product range and a unique technical know-how

Product development is a key factor for DVC, ensuring you the best products at any time



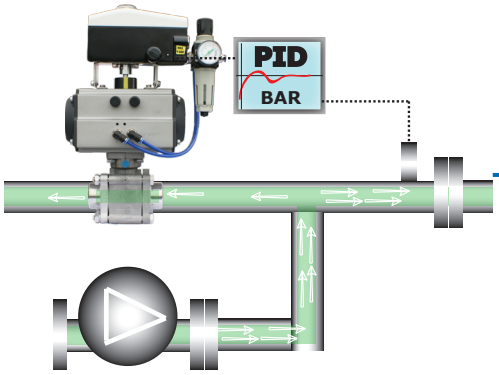
- **Easy on-site maintenance**
- **Extremely low installation costs**
- **Modular and highly flexible solutions**
- **2-in-1 solution - control and on-off**
- **Straight-through flow and high Kv values**
- **Green Technology - low energy consumption**



Application

Flow control

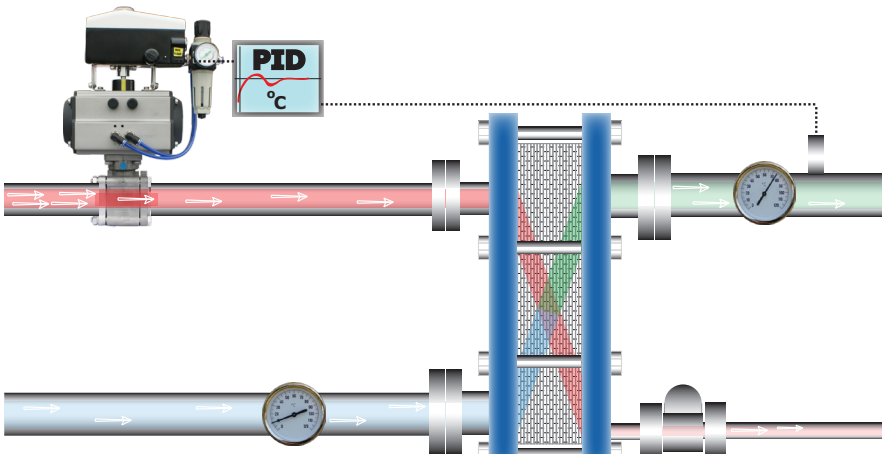
Steam	**(Max 7barg) PTFE+25%C**
	(Max 9barg) PEEK
Liquid	**(-20 to 220°C)**
Oil	**(-20 to 220°C)**
Gas/air	**(-20 to 220°C)**



Application

Pressure control/Bypass valve

Liquid	**(-20 to 220°C)**
Oil	**(-20 to 220°C)**
Gas/air	**(-20 to 220°C)**
Vacuum	**(1,3mbar absolut)**



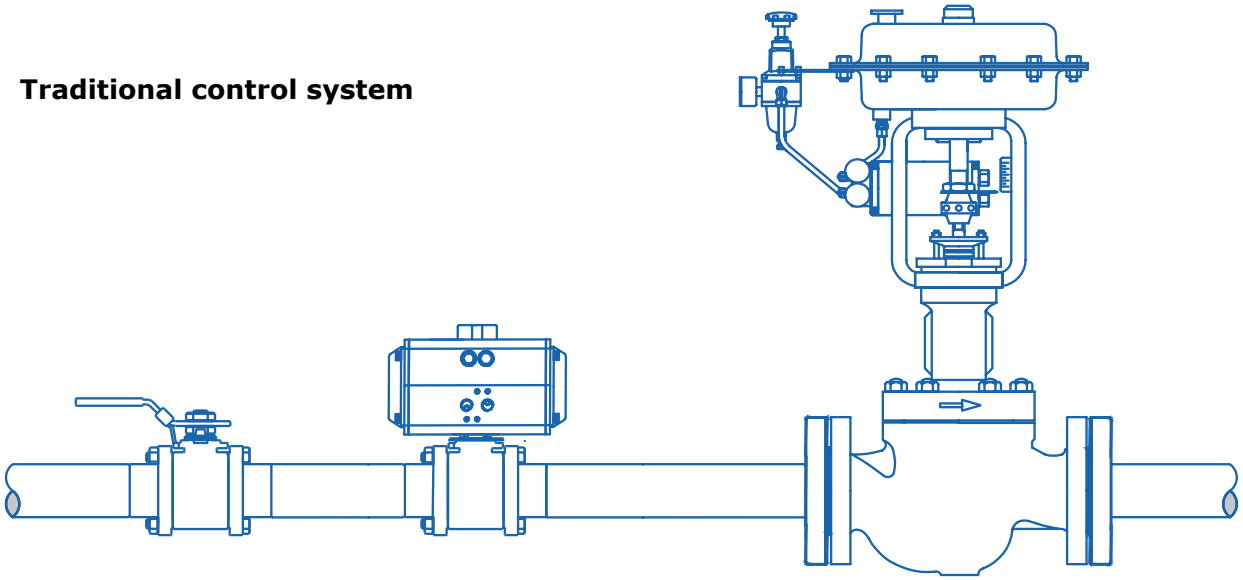
Example of temperature control on a heat exchanger.

Media type: Steam, hot water, hot oil, ice water, glycol ect.

B-V-NOTCH-UK-03-2021 REV. E

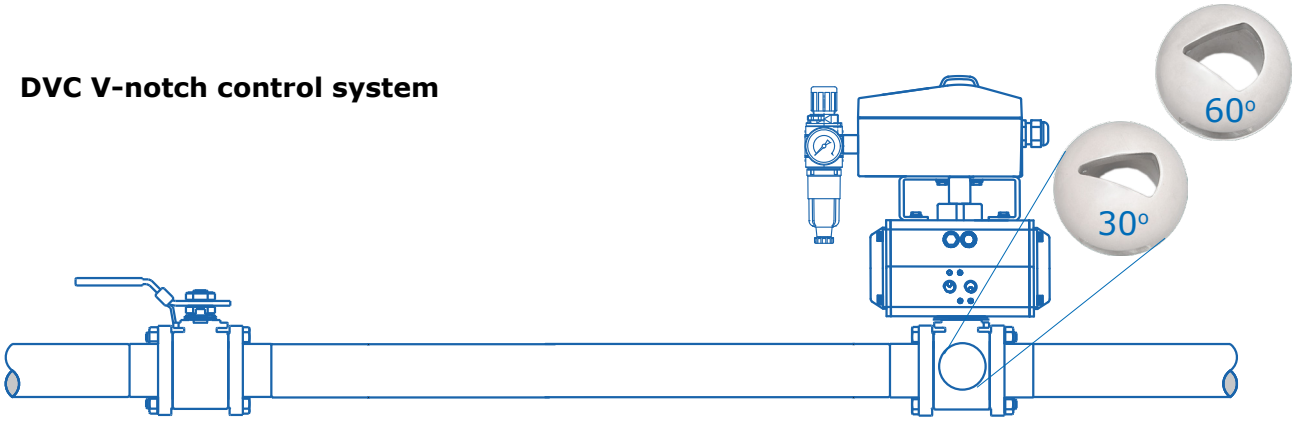
ADVANTAGES OF THE DVC V-NOTCH

Traditional control system



Service valve Automated on/off valve Control valve

DVC V-notch control system



Service valve Control valve

The DVC control system has a great deal of advantages to offer you compared to a traditional system without compromising the essence of using a control valve in the first place - that is to have stable and accurate flow control, combined with a compact and light weight solution.

- **Cost savings** - big savings in regards to SRO-system - less programming, wiring, hardware
- **Cost savings** - no additional automatic on/off valve is needed - results in further savings due to no additional installation/maintenance costs
- **Cost savings** - modular design, use the same type of valve for manual valves, on/off valves and control valves
- **Cost savings** - You can do your own maintenance on your control valve now - easier, faster - and cheaper using the same spare parts as other DVC 3-pcs ball valves
- **Cost savings** - Less spare parts required in stock
- **Cost savings** - substantial savings when stainless steel valves are required
- **Cost savings** - low power and air consumption - green profile
- **Cost savings** - no flanges, bolts, nuts and gaskets required for installation of DVC control valve

V-NOTCH BALL- SIZING - LIQUID

V-NOTCH SIZE SELECTION GUIDE - LIQUID

FLOW VALUES AT 90% OPEN VALVE

ΔP [Bar]	DN10FB DN15RB 30° [M³/h]	DN10FB DN15RB 60° [M³/h]	DN15FB DN20RB 30° [M³/h]	DN15FB DN20RB 60° [M³/h]	DN20FB DN25RB 30° [M³/h]	DN20FB DN25RB 60° [M³/h]	DN25FB DN32RB 30° [M³/h]	DN32FB DN40RB 30° [M³/h]	DN25FB DN32RB 60° [M³/h]	DN40FB DN50RB 30° [M³/h]	DN32FB DN40RB 60° [M³/h]	DN40FB DN50RB 60° [M³/h]	DN50FB DN65RB 30° [M³/h]	DN65FB DN80RB 30° [M³/h]	DN80FB 100RB 30° [M³/h]	DN50FB DN65RB 60° [M³/h]	DN65FB DN80RB 60° [M³/h]	DN80FB 100RB 60° [M³/h]	DN100F 30° [M³/h]	DN100F 60° [M³/h]
0,01	0,070	0,140	0,190	0,370	0,380	0,770	0,830	1,110	1,300	1,450	2,210	3,400	3,660	5,270	5,530	7,060	8,760	10,880	11,050	18,020
0,02	0,099	0,198	0,269	0,523	0,537	1,089	1,174	1,570	1,838	2,051	3,125	4,808	5,176	7,453	7,821	9,984	12,389	15,387	15,627	25,484
0,03	0,121	0,242	0,329	0,641	0,658	1,334	1,438	1,923	2,252	2,511	3,828	5,889	6,339	9,128	9,578	12,228	15,173	18,845	19,139	31,212
0,04	0,140	0,280	0,380	0,740	0,760	1,540	1,660	2,220	2,600	2,900	4,420	6,800	7,320	10,540	11,060	14,120	17,520	21,760	22,100	36,040
0,05	0,157	0,313	0,425	0,827	0,850	1,722	1,856	2,482	2,907	3,242	4,942	7,603	8,184	11,784	12,365	15,787	19,588	24,328	24,709	40,294
0,06	0,171	0,343	0,465	0,906	0,931	1,886	2,033	2,719	3,184	3,552	5,413	8,328	8,965	12,909	13,546	17,293	21,458	26,650	27,067	44,140
0,07	0,185	0,370	0,503	0,979	1,005	2,037	2,196	2,937	3,439	3,836	5,847	8,996	9,683	13,943	14,631	18,679	23,177	28,786	29,236	47,676
0,08	0,198	0,396	0,537	1,047	1,075	2,178	2,348	3,140	3,677	4,101	6,251	9,617	10,352	14,906	15,641	19,969	24,777	30,773	31,254	50,968
0,09	0,210	0,420	0,570	1,110	1,140	2,310	2,490	3,330	3,900	4,350	6,630	10,200	10,980	15,810	16,590	21,180	26,280	32,640	33,150	54,060
0,10	0,221	0,443	0,601	1,170	1,202	2,435	2,625	3,510	4,111	4,585	6,989	10,752	11,574	16,665	17,487	22,326	27,702	34,406	34,943	56,984
0,20	0,313	0,626	0,850	1,655	1,699	3,444	3,712	4,964	5,814	6,485	9,883	15,205	16,368	23,568	24,731	31,573	39,176	48,657	49,417	80,588
0,30	0,383	0,767	1,041	2,027	2,081	4,217	4,546	6,080	7,120	7,942	12,105	18,623	20,047	28,865	30,289	38,669	47,980	59,592	60,523	98,700
0,40	0,443	0,885	1,202	2,340	2,403	4,870	5,249	7,020	8,222	9,171	13,977	21,503	23,148	33,330	34,975	44,651	55,403	68,811	69,886	113,968
0,50	0,495	0,990	1,344	2,616	2,687	5,445	5,869	7,849	9,192	10,253	15,627	24,042	25,880	37,265	39,103	49,922	61,943	76,933	78,135	127,421
0,60	0,542	1,084	1,472	2,866	2,943	5,964	6,429	8,598	10,070	11,232	17,119	26,336	28,350	40,821	42,835	54,687	67,855	84,276	85,593	139,582
0,70	0,586	1,171	1,590	3,096	3,179	6,442	6,944	9,287	10,877	12,132	18,490	28,446	30,622	44,092	46,267	59,068	73,291	91,029	92,451	150,766
0,80	0,626	1,252	1,699	3,309	3,399	6,887	7,424	9,928	11,628	12,969	19,767	30,411	32,736	47,136	49,462	63,147	78,352	97,314	98,834	161,176
0,90	0,664	1,328	1,802	3,510	3,605	7,305	7,874	10,530	12,333	13,756	20,966	32,255	34,722	49,996	52,462	66,977	83,105	103,217	104,830	170,953
1,00	0,700	1,400	1,900	3,700	3,800	7,700	8,300	11,100	13,000	14,500	22,100	34,000	36,600	52,700	55,300	70,600	87,600	108,800	110,500	180,200
2,00	0,990	1,980	2,687	5,233	5,374	10,889	11,738	15,698	18,385	20,506	31,254	48,083	51,760	74,529	78,206	99,843	123,885	153,866	156,271	254,841
3,00	1,212	2,425	3,291	6,409	6,582	13,337	14,376	19,226	22,517	25,115	38,278	58,890	63,393	91,279	95,782	122,283	151,728	188,447	191,392	312,116
4,00	1,400	2,800	3,800	7,400	7,600	15,400	16,600	22,200	26,000	29,000	44,200	68,000	73,200	105,400	110,600	141,200	175,200	217,600	221,000	360,400
5,00	1,565	3,130	4,249	8,273	8,497	17,218	18,559	24,820	29,069	32,423	49,417	76,026	81,840	117,841	123,655	157,866	195,880	243,284	247,086	402,939

Flow values for liquids are based on following:

Water, 20°C, density = 1kg/dm³

Valve is **90%** OPEN (*90-100% OPEN = 20-30% additional flow capacity*)

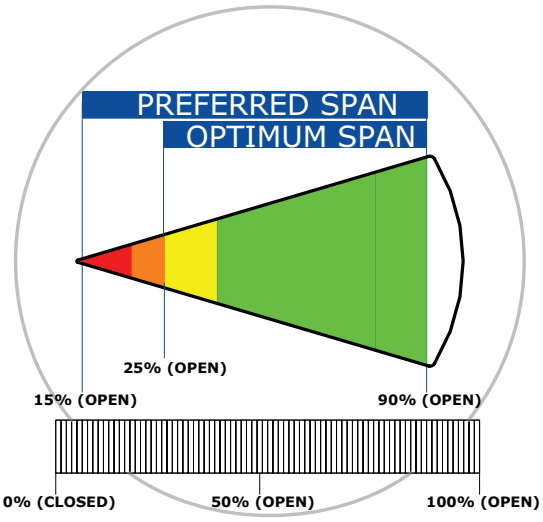
Step 1: Choose the differential pressure from left column.
Step 2: Choose the flowrate value, equal to or just above the required.
Step 3: Choose the valve Size and V-notch from top row.

Choosing the correct size V-notch will give you the best possible control and maximum lifetime of valve.

Due to velocity and noise, DVC does not advice a higher differential pressure than 5bar maximum for control. Max ΔP is 15bar (Fluid, not critical flow).

Constantly control at 15-25% OPEN valve will reduce lifetime of valve seats.

Other valve sizes (6") and V-notch (90°) on request.



V-NOTCH BALL - SIZING - SATURATED STEAM

V-NOTCH SIZE SELECTION GUIDE - SATURATED STEAM

FLOW VALUES AT 90% OPEN VALVE

DN10FB/15RB - 30° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	5,7	8,1	CRITICAL FLOW									
1,5	6,5	9,2	11,2	13,0	14,5	$P2_{abs} \leq (P1_{abs} x 0.58)$						
2,0	7,4	10,5	12,8	14,8	16,6	18,2	19,6	21,0	22,2	23,4		
2,5	8,2	11,7	14,3	16,5	18,4	20,2	21,8	23,3	24,7	26,1		
3,0	9,0	12,7	15,5	17,9	20,0	21,9	23,7	25,3	26,9	28,3	34,7	
3,5	9,7	13,7	16,8	19,4	21,7	23,8	25,7	27,4	29,1	30,7	37,6	
4,0	10,3	14,6	17,9	20,6	23,1	25,3	27,3	29,2	30,9	32,6	39,9	46,1
4,5	10,9	15,4	18,9	21,8	24,4	26,8	28,9	30,9	32,8	34,5	42,3	48,9
5,0	11,5	16,3	19,9	23,0	25,7	28,2	30,4	32,5	34,5	36,4	44,5	51,4
5,5	12,0	17,0	20,8	24,0	26,8	29,4	31,7	33,9	36,0	37,9	46,5	53,6
6,0	12,4	17,5	21,4	24,7	27,7	30,3	32,7	35,0	37,1	39,1	47,9	55,3
6,5	13,0	18,4	22,5	26,0	29,0	31,8	34,4	36,7	39,0	41,1	50,3	58,1
7,0	13,5	19,0	23,3	26,9	30,1	33,0	35,6	38,1	40,4	42,6	52,1	60,2

DN10FB/15RB - 60° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	10,8	15,2	CRITICAL FLOW									
1,5	13,0	18,4	22,5	26,0	29,0	$P2_{abs} \leq (P1_{abs} x 0.58)$						
2,0	14,8	21,0	25,7	29,7	33,2	36,3	39,2	41,9	44,5	46,9		
2,5	16,5	23,3	28,6	33,0	36,9	40,4	43,6	46,6	49,5	52,1		
3,0	17,9	25,3	31,0	35,8	40,1	43,9	47,4	50,7	53,7	56,6	69,4	
3,5	19,4	27,4	33,6	38,8	43,4	47,5	51,3	54,9	58,2	61,3	75,1	
4,0	20,6	29,2	35,7	41,3	46,1	50,5	54,6	58,3	61,9	65,2	79,9	92,2
4,5	21,8	30,9	37,8	43,7	48,9	53,5	57,8	61,8	65,5	69,1	84,6	97,7
5,0	23,0	32,5	39,8	46,0	51,4	56,3	60,9	65,1	69,0	72,7	89,1	102,9
5,5	24,0	33,9	41,6	48,0	53,6	58,8	63,5	67,9	72,0	75,9	92,9	107,3
6,0	24,7	35,0	42,8	49,5	55,3	60,6	65,4	69,9	74,2	78,2	95,8	110,6
6,5	26,0	36,7	45,0	52,0	58,1	63,6	68,7	73,5	77,9	82,2	100,6	116,2
7,0	26,9	38,1	46,6	53,8	60,2	65,9	71,2	76,2	80,8	85,1	104,3	120,4

DN15FB/20RB - 30° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	15,6	22,1	CRITICAL FLOW									
1,5	17,6	24,9	30,5	35,3	39,4	$P2_{abs} \leq (P1_{abs} x 0.58)$						
2,0	20,1	28,5	34,9	40,3	45,0	49,3	53,2	56,9	60,4	63,6		
2,5	22,4	31,6	38,8	44,8	50,0	54,8	59,2	63,3	67,1	70,8		
3,0	24,3	34,4	42,1	48,6	54,4	59,5	64,3	68,8	72,9	76,9	94,2	
3,5	26,3	37,2	45,6	52,7	58,9	64,5	69,7	74,5	79,0	83,3	102,0	
4,0	28,0	39,6	48,5	56,0	62,6	68,6	74,1	79,2	84,0	88,5	108,4	125,2
4,5	29,7	41,9	51,4	59,3	66,3	72,6	78,5	83,9	89,0	93,8	114,8	132,6
5,0	31,2	44,1	54,1	62,4	69,8	76,5	82,6	88,3	93,6	98,7	120,9	139,6
5,5	32,6	46,0	56,4	65,1	72,8	79,8	86,1	92,1	97,7	103,0	126,1	145,6
6,0	33,6	47,5	58,1	67,1	75,1	82,2	88,8	94,9	100,7	106,1	130,0	150,1
6,5	35,3	49,9	61,1	70,5	78,8	86,4	93,3	99,7	105,8	111,5	136,5	157,7
7,0	36,5	51,7	63,3	73,1	81,7	89,5	96,7	103,3	109,6	115,5	141,5	163,4

DN15FB/20RB - 60° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	30,4	43,0	CRITICAL FLOW									
1,5	34,3	48,5	59,5	68,7	76,8	$P2_{abs} \leq (P1_{abs} x 0.58)$						
2,0	39,2	55,4	67,9	78,4	87,6	96,0	103,7	110,9	117,6	123,9		
2,5	43,6	61,6	75,5	87,1	97,4	106,7	115,3	123,2	130,7	137,8		
3,0	47,3	66,9	82,0	94,7	105,9	116,0	125,2	133,9	142,0	149,7	183,3	
3,5	51,3	72,5	88,8	102,5	114,6	125,6	135,7	145,0	153,8	162,1	198,6	
4,0	54,5	77,1	94,4	109,0	121,9	133,5	144,2	154,2	163,5	172,4	211,1	243,8
4,5	57,7	81,7	100,0	115,5	129,1	141,4	152,8	163,3	173,2	182,6	223,6	258,2
5,0	60,8	86,0	105,3	121,6	135,9	148,9	160,8	171,9	182,4	192,2	235,4	271,8
5,5	63,4	89,7	109,8	126,8	141,8	155,3	167,8	179,3	190,2	200,5	245,6	283,6
6,0	65,4	92,4	113,2	130,7	146,2	160,1	172,9	184,9	196,1	206,7	253,1	292,3
6,5	68,7	97,1	118,9	137,3	153,5	168,2	181,7	194,2	206,0	217,1	265,9	307,0
7,0	71,2	100,6	123,2	142,3	159,1	174,3	188,3	201,3	213,5	225,0	275,6	318,2

DN20FB/25RB - 30° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	31,2	44,1	CRITICAL FLOW									
1,5	35,3	49,9	61,1	70,5	78,8	$P2_{abs} \leq (P1_{abs} x 0.58)$						
2,0	40,3	56,9	69,7	80,5	90,0	98,6	106,5	113,8	120,8	127,3		
2,5	44,8	63,3	77,5	89,5	100,1	109,6	118,4	126,6	134,3	141,5		
3,0	48,6	68,8	84,2	97,2	108,7	119,1	128,6	137,5	145,9	153,7	188,3	
3,5	52,7	74,5	91,2	105,3	117,7	129,0	139,3	148,9	158,0	166,5	203,9	
4,0	56,0	79,2	97,0	112,0	125,2	137,1	148,1	158,4	168,0	177,0	216,8	250,4
4,5	59,3	83,9	102,7	118,6	132,6	145,3	156,9	167,7	177,9	187,5	229,7	265,2
5,0	62,4	88,3	108,1	124,9	139,6	152,9	165,2	176,6	187,3	197,4	241,8	279,2
5,5	65,1	92,1	112,8	130,2	145,6	159,5	172,3	184,2	195,4	205,9	252,2	291,2
6,0	67,1	94,9	116,3	134,3	150,1	164,4	177,6	189,9	201,4	212,3	260,0	300,2
6,5	70,5	99,7	122,1	141,0	157,7	172,7	186,6	199,4	211,5	223,0	273,1	315,3
7,0	73,1	103,3	126,6	146,2	163,4	179,0	193,3	206,7	219,2	231,1	283,0	326,8

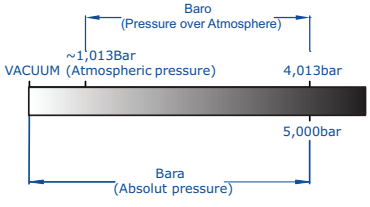
DN20FB/25RB - 60° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

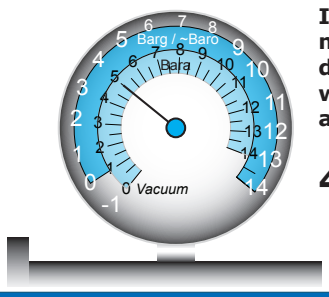
bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	63,2	89,4	CRITICAL FLOW									
1,5	71,4	101,0	123,7	142,9	159,7	$P2_{abs} \leq (P1_{abs} x 0.58)$						
2,0	81,6	115,3	141,3	163,1	182,4	199,8	215,8	230,7	244,7	257,9		
2,5	90,7	128,2	157,1	181,4	202,8	222,1	239,9	256,5	272,0	286,8		
3,0	98,5	139,3	170,6	197,0	220,3	241,3	260,7	278,6	295,6	311,5	381,6	
3,5	106,7	150,9	184,8	213,4	238,6	261,4	282,3	301,8	320,1	337,4	413,3	
4,0	113,4	160,4	196,5	226,9	253,7	277,9	300,2	320,9	340,3	358,8	439,4	507,4
4,5	120,2	169,9	208,1	240,3	268,7	294,3	317,9	339,9	360,5	380,0	465,4	537,4
5,0	126,5	178,9	219,1	253,0	282,9	309,9	334,7	357,8	379,5	400,0	489,9	565,7
5,5	132,0	186,6	228,6	263,9	295,1	323,2	349,1	373,2	395,9	417,3	511,1	590,1
6,0	136,0	192,4	235,6	272,0	304,2	333,2	359,9	384,7	408,1	430,1	526,8	608,3
6,5	142,9	202,1	247,5	285,8	319,5	350,0	378,0	404,1	428,6	451,8	553,4	639,0
7,0	148,1	209,4	256,5	296,2	331,1	362,7	391,8	418,8	444,2	468,3	573,5	662,2

Please notice that absolute pressure (bara) is measured from absolute vacuum.

P1 = upstream press. [bar_{abs}]
P2 = downstream press. [bar_{abs}]

Critical flow: $P2_{abs} \leq (P1_{abs} x 0.58)$





In an ordinary system your manometer will normally display "barg" or "baro" which is the pressure above atmospheric pressure.

4barg = 5bara

V-NOTCH BALL - SIZING - SATURATED STEAM

V-NOTCH SIZE SELECTION GUIDE - SATURATED STEAM

FLOW VALUES AT 90% OPEN VALVE

DN25FB/32RB - 30° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	68,2	96,4	CRITICAL FLOW									
1,5	77,0	108,9	133,4	154,0	172,2	$P2_{abs} \leq (P1_{abs} x 0.58)$						
2,0	87,9	124,3	152,3	175,8	196,6	215,4	232,6	248,7	263,7	278,0		
2,5	97,7	138,2	169,3	195,5	218,6	239,4	258,6	276,5	293,2	309,1		
3,0	106,2	150,2	183,9	212,4	237,5	260,1	281,0	300,4	318,6	335,8	411,3	
3,5	115,0	162,7	199,2	230,0	257,2	281,7	304,3	325,3	345,1	363,7	445,5	
4,0	122,3	172,9	211,8	244,6	273,4	299,5	323,5	345,9	366,9	386,7	473,6	546,9
4,5	129,5	183,2	224,4	259,1	289,6	317,3	342,7	366,4	388,6	409,6	501,7	579,3
5,0	136,4	192,8	236,2	272,7	304,9	334,0	360,8	385,7	409,1	431,2	528,1	609,8
5,5	142,2	201,2	246,4	284,5	318,1	348,4	376,3	402,3	426,7	449,8	550,9	636,1
6,0	146,6	207,4	254,0	293,2	327,9	359,1	387,9	414,7	439,9	463,6	567,9	655,7
6,5	154,0	217,8	266,8	308,0	344,4	377,3	407,5	435,6	462,0	487,0	596,5	688,8
7,0	159,6	225,7	276,5	319,2	356,9	391,0	422,3	451,5	478,9	504,8	618,2	713,8

DN25FB/32RB - 60° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	106,8	151,0	CRITICAL FLOW									
1,5	120,6	170,6	208,9	241,2	269,7	$P2_{abs} \leq (P1_{abs} x 0.58)$						
2,0	137,7	194,7	238,5	275,4	307,9	337,3	364,3	389,5	413,1	435,4		
2,5	153,1	216,5	265,2	306,2	342,3	375,0	405,1	433,0	459,3	484,1		
3,0	166,3	235,2	288,1	332,7	371,9	407,4	440,1	470,4	499,0	526,0	644,2	
3,5	180,1	254,8	312,0	360,3	402,8	441,3	476,6	509,5	540,4	569,7	697,7	
4,0	191,5	270,9	331,8	383,1	428,3	469,2	506,8	541,7	574,6	605,7	741,8	856,6
4,5	202,9	286,9	351,4	405,8	453,7	497,0	536,8	573,8	608,6	641,6	785,7	907,3
5,0	213,6	302,0	369,9	427,1	477,5	523,1	565,0	604,1	640,7	675,4	827,1	955,1
5,5	222,8	315,1	385,9	445,6	498,2	545,7	589,4	630,1	668,4	704,5	862,9	996,3
6,0	229,6	324,8	397,8	459,3	513,5	562,5	607,6	649,5	688,9	726,2	889,4	1027
6,5	241,2	341,2	417,8	482,5	539,4	590,9	638,2	682,3	723,7	762,8	934,3	1079
7,0	250,0	353,6	433,0	500,0	559,0	612,4	661,5	707,1	750,0	790,6	968,3	1118

DN32FB/40RB - 30° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	91,2	128,9	CRITICAL FLOW									
1,5	103,0	145,6	178,4	206,0	230,3	$P2_{abs} \leq (P1_{abs} x 0.58)$						
2,0	117,6	166,3	203,6	235,2	262,9	288,0	311,1	332,6	352,7	371,8		
2,5	130,7	184,9	226,4	261,4	292,3	320,2	345,9	369,7	392,2	413,4		
3,0	142,0	200,8	246,0	284,0	317,6	347,9	375,7	401,7	426,1	449,1	550,0	
3,5	153,8	217,5	266,4	307,6	343,9	376,8	407,0	435,1	461,5	486,4	595,7	
4,0	163,5	231,3	283,3	327,1	365,7	400,6	432,7	462,6	490,6	517,2	633,4	731,4
4,5	173,2	245,0	300,0	346,5	387,3	424,3	458,3	490,0	519,7	547,8	670,9	774,7
5,0	182,4	257,9	315,8	364,7	407,8	446,7	482,5	515,8	547,1	576,6	706,2	815,5
5,5	190,2	269,0	329,5	380,5	425,4	466,0	503,3	538,0	570,7	601,5	736,7	850,7
6,0	196,1	277,3	339,6	392,2	438,5	480,3	518,8	554,6	588,2	620,1	759,4	876,9
6,5	206,0	291,3	356,8	411,9	460,6	504,5	545,0	582,6	617,9	651,3	797,7	921,1
7,0	213,5	301,9	369,7	426,9	477,3	522,9	564,8	603,8	640,4	675,0	826,7	954,6

DN32FB/40RB - 60° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	181,5	256,7	CRITICAL FLOW									
1,5	205,0	290,0	355,1	410,1	458,5	$P2_{abs} \leq (P1_{abs} x 0.58)$						
2,0	234,1	331,1	405,5	468,2	523,4	573,4	619,3	662,1	702,3	740,3		
2,5	260,3	368,1	450,8	520,5	582,0	637,5	688,6	736,1	780,8	823,0		
3,0	282,8	399,9	489,8	565,5	632,3	692,6	748,1	799,8	848,3	894,2	1095	
3,5	306,3	433,1	530,4	612,5	684,8	750,2	810,3	866,2	918,8	968,5	1186	
4,0	325,6	460,5	564,0	651,2	728,1	797,6	861,5	921,0	976,8	1030	1261	1456
4,5	344,9	487,8	597,4	689,8	771,2	844,8	912,5	975,5	1035	1091	1336	1542
5,0	363,1	513,4	628,8	726,1	811,8	889,3	960,6	1027	1089	1148	1406	1624
5,5	378,7	535,6	656,0	757,5	846,9	927,7	1002	1071	1136	1198	1467	1694
6,0	390,4	552,1	676,2	780,8	873,0	956,3	1033	1104	1171	1235	1512	1746
6,5	410,1	580,0	710,3	820,2	917,0	1005	1085	1160	1230	1297	1588	1834
7,0	425,0	601,1	736,1	850,0	950,3	1041	1124	1202	1275	1344	1646	1901

DN40FB/50RB - 30° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

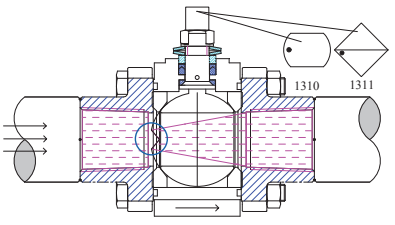
bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	119,1	168,4	CRITICAL FLOW									
1,5	134,5	190,3	233,0	269,1	300,8	$P2_{abs} \leq (P1_{abs} x 0.58)$						
2,0	153,6	217,2	266,0	307,2	343,4	376,2	406,4	434,4	460,8	485,7		
2,5	170,8	241,5	295,8	341,5	381,8	418,3	451,8	483,0	512,3	540,0		
3,0	185,5	262,4	321,3	371,0	414,8	454,4	490,8	524,7	556,6	586,7	718,5	
3,5	200,9	284,2	348,0	401,9	449,3	492,2	531,6	568,3	602,8	635,4	778,2	
4,0	213,6	302,1	370,0	427,3	477,7	523,3	565,2	604,3	640,9	675,6	827,4	955,4
4,5	226,3	320,0	391,9	452,6	506,0	554,3	598,7	640,0	678,9	715,6	876,4	1012
5,0	238,2	336,9	412,6	476,4	532,6	583,5	630,2	673,8	714,6	753,3	922,6	1065
5,5	248,5	351,4	430,4	497,0	555,6	608,7	657,5	702,8	745,5	785,8	962,4	1111
6,0	256,1	362,2	443,7	512,3	572,8	627,4	677,7	724,5	768,4	810,0	992,0	1146
6,5	269,1	380,5	466,0	538,1	601,6	659,1	711,9	761,0	807,2	850,9	1042	1203
7,0	278,9	394,4	483,0	557,7	623,5	683,0	737,8	788,7	836,6	881,8	1080	1247

DN40FB/50RB - 60° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	279,3	395,0	CRITICAL FLOW									
1,5	315,5	446,1	546,4	630,9	705,4	$P2_{abs} \leq (P1_{abs} x 0.58)$						
2,0	360,1	509,3	623,8	720,3	805,3	882,2	952,8	1019	1080	1139		
2,5	400,4	566,3	693,5	800,8	895,3	980,8	1059	1133	1201	1266		
3,0	435,0	615,2	753,5	870,0	972,7	1066	1151	1230	1305	1376	1685	
3,5	471,2	666,3	816,1	942,3	1054	1154	1247	1333	1413	1490	1825	
4,0	500,9	708,4	867,7	1002	1120	1227	1325	1417	1503	1584	1940	2240
4,5	530,6	750,4	919,0	1061	1186	1300	1404	1501	1592	1678	2055	2373
5,0	558,6	789,9	967,4	1117	1249	1368	1478	1580	1676	1766	2163	2498
5,5	582,7	824,0	1009	1165	1303	1427	1542	1648	1748	1843	2257	2606
6,0	600,6	849,4	1040	1201	1343	1471	1589	1699	1802	1899	2326	2686
6,5	630,9	892,2	1093	1262	1411	1545	1669	1784	1893	1995	2444	2822
7,0	653,9	924,7	1133	1308	1462	1602	1730	1849	1962	2068	2532	2924

When you mount a V-notch ball valve it is of great importance that the V-notch opens into the medium flow "up streams". Please look at illustration.

Ball valves delivered with V-notch from DVC are all marked on top of the stem. That way you can identify which way the V-notch is placed inside the ball valve. It is important that the ball is placed correctly inside the ball valve, please be aware of this during service or assembling/disassembling. On the valve body a flow arrow indicates which way is the correct flow direction.



B-V-NOTCH-UK-03-2021 REV. E

V-NOTCH BALL - SIZING - SATURATED STEAM

DN50FB/65RB - 30° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	300,6	425,2	*CRITICAL FLOW*									
1,5	339,6	480,2	588,2	679,2	759,3	*$P2_{abs} \leq (P1_{abs} x 0.58)$*						
2,0	387,7	548,3	671,5	775,4	866,9	949,6	1026	1097	1163	1226		
2,5	431,0	609,6	746,6	862,0	963,8	1056	1140	1219	1293	1363		
3,0	468,3	662,2	811,1	936,6	1047	1147	1239	1324	1405	1481	1814	
3,5	507,2	717,3	878,5	1014	1134	1242	1342	1435	1522	1604	1964	
4,0	539,2	762,6	934,0	1078	1206	1321	1427	1525	1618	1705	2089	2412
4,5	571,2	807,8	989,3	1142	1277	1399	1511	1616	1714	1806	2212	2554
5,0	601,3	850,3	1041	1203	1344	1473	1591	1701	1804	1901	2329	2689
5,5	627,2	887,0	1086	1254	1403	1536	1660	1774	1882	1983	2429	2805
6,0	646,5	914,3	1120	1293	1446	1584	1711	1829	1940	2045	2504	2891
6,5	679,2	960,5	1176	1358	1519	1664	1797	1921	2037	2148	2630	3037
7,0	703,9	995,4	1219	1408	1574	1724	1862	1991	2112	2226	2726	3148

DN50FB/65RB - 60° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	579,9	820,1	*CRITICAL FLOW*									
1,5	655,0	926,4	1135	1310	1465	*$P2_{abs} \leq (P1_{abs} x 0.58)$*						
2,0	747,8	1058	1295	1496	1672	1832	1979	2115	2243	2365		
2,5	831,4	1176	1440	1663	1859	2037	2200	2352	2494	2629		
3,0	903,3	1277	1565	1807	2020	2213	2390	2555	2710	2856	3498	
3,5	978,3	1384	1695	1957	2188	2396	2588	2767	2935	3094	3789	
4,0	1040	1471	1802	2080	2326	2548	2752	2942	3121	3289	4029	4652
4,5	1102	1558	1908	2204	2464	2699	2915	3116	3305	3484	4267	4927
5,0	1160	1640	2009	2320	2593	2841	3069	3280	3479	3668	4492	5187
5,5	1210	1711	2096	2420	2705	2964	3201	3422	3630	3826	4686	5411
6,0	1247	1764	2160	2494	2789	3055	3300	3527	3741	3944	4830	5577
6,5	1310	1853	2269	2620	2929	3209	3466	3705	3930	4143	5074	5859
7,0	1358	1920	2352	2715	3036	3326	3592	3840	4073	4293	5258	6072

DN65FB/80RB - 30° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	432,9	612,2	*CRITICAL FLOW*									
1,5	489,0	691,5	846,9	977,9	1093	*$P2_{abs} \leq (P1_{abs} x 0.58)$*						
2,0	558,2	789,4	966,9	1116	1248	1367	1477	1579	1675	1765		
2,5	620,6	877,7	1075	1241	1388	1520	1642	1755	1862	1963		
3,0	674,3	953,6	1168	1349	1508	1652	1784	1907	2023	2132	2611	
3,5	730,3	1033	1265	1461	1633	1789	1932	2066	2191	2309	2828	
4,0	776,5	1098	1345	1553	1736	1902	2054	2196	2329	2455	3007	3472
4,5	822,4	1163	1425	1645	1839	2015	2176	2326	2467	2601	3185	3678
5,0	865,8	1224	1500	1732	1936	2121	2291	2449	2597	2738	3353	3872
5,5	903,1	1277	1564	1806	2019	2212	2390	2554	2709	2856	3498	4039
6,0	930,9	1317	1612	1862	2082	2280	2463	2633	2793	2944	3606	4163
6,5	977,9	1383	1694	1956	2187	2395	2587	2766	2934	3092	3787	4373
7,0	1013	1433	1755	2027	2266	2483	2681	2867	3040	3205	3925	4532

DN65FB/80RB - 60° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	719,5	1018	*CRITICAL FLOW*									
1,5	812,8	1149	1408	1626	1817	*$P2_{abs} \leq (P1_{abs} x 0.58)$*						
2,0	927,9	1312	1607	1856	2075	2273	2455	2624	2784	2934		
2,5	1032	1459	1787	2063	2307	2527	2729	2918	3095	3262		
3,0	1121	1585	1941	2242	2506	2745	2965	3170	3362	3544	4341	
3,5	1214	1717	2103	2428	2714	2973	3212	3433	3642	3839	4701	
4,0	1291	1825	2235	2581	2886	3161	3415	3651	3872	4081	4999	5772
4,5	1367	1933	2368	2734	3057	3349	3617	3867	4101	4323	5295	6114
5,0	1439	2035	2493	2878	3218	3525	3807	4070	4317	4551	5574	6436
5,5	1501	2123	2600	3002	3357	3677	3972	4246	4504	4747	5814	6714
6,0	1547	2188	2680	3095	3460	3790	4094	4377	4642	4893	5993	6920
6,5	1626	2299	2815	3251	3635	3982	4301	4598	4877	5140	6296	7270
7,0	1685	2382	2918	3369	3767	4127	4457	4765	5054	5327	6525	7534

DN80FB/100RB - 30° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	454,2	642,4	*CRITICAL FLOW*									
1,5	513,1	725,6	888,7	1026	1147	*$P2_{abs} \leq (P1_{abs} x 0.58)$*						
2,0	585,8	828,4	1015	1172	1310	1435	1550	1657	1757	1852		
2,5	651,2	921,0	1128	1302	1456	1595	1723	1842	1954	2059		
3,0	707,5	1001	1225	1415	1582	1733	1872	2001	2123	2237	2740	
3,5	766,3	1084	1327	1533	1714	1877	2027	2167	2299	2423	2968	
4,0	814,8	1152	1411	1630	1822	1996	2156	2305	2444	2577	3156	3644
4,5	863,0	1220	1495	1726	1930	2114	2283	2441	2589	2729	3342	3860
5,0	908,5	1285	1574	1817	2031	2225	2404	2570	2725	2873	3518	4063
5,5	947,7	1340	1641	1895	2119	2321	2507	2681	2843	2997	3670	4238
6,0	976,9	1382	1692	1954	2184	2393	2585	2763	2931	3089	3783	4369
6,5	1026	1451	1777	2052	2295	2514	2715	2902	3078	3245	3974	4589
7,0	1063	1504	1842	2127	2378	2605	2814	3008	3190	3363	4119	4756

DN80FB/100RB - 60° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

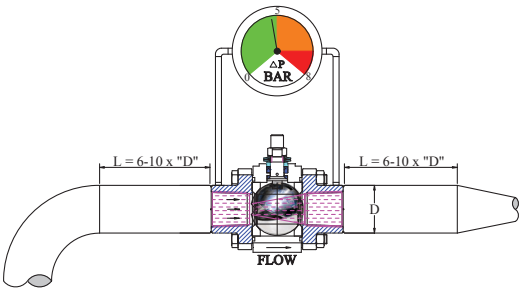
bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	893,7	1264	*CRITICAL FLOW*									
1,5	1009	1428	1748	2019	2257	*$P2_{abs} \leq (P1_{abs} x 0.58)$*						
2,0	1152	1630	1996	2305	2577	2823	3049	3260	3457	3644		
2,5	1281	1812	2219	2563	2865	3139	3390	3624	3844	4052		
3,0	1392	1969	2411	2784	3113	3410	3683	3937	4176	4402	5391	
3,5	1508	2132	2611	3015	3371	3693	3989	4264	4523	4768	5839	
4,0	1603	2267	2777	3206	3584	3927	4241	4534	4809	5069	6208	7169
4,5	1698	2401	2941	3396	3797	4159	4492	4803	5094	5369	6576	7593
5,0	1787	2528	3096	3575	3997	4378	4729	5055	5362	5652	6922	7993
5,5	1865	2637	3230	3729	4169	4567	4933	5274	5594	5896	7221	8339
6,0	1922	2718	3329	3844	4298	4708	5085	5436	5766	6078	7444	8595
6,5	2019	2855	3497	4038	4514	4945	5342	5710	6057	6384	7819	9029
7,0	2092	2959	3624	4185	4679	5125	5536	5918	6277	6617	8104	9357

When you use V-notch ball valves for controlling saturated steam, it is of great importance that the installation is without elbow joints and restrictions within a distance of **6-10** times the pipe diameter. Turbulence and non linear flow will cause extra wear on the seats. Also avoid any "steam flashing" as this may damage the control valve.

DVC ball valve are suitable for controlling saturated steam up to **7barg** not critical flow (**Standard seats PTFE+25% carbon**). When using **PEEK** seats (ceramic reinforced PTFE) it is possible to control up to **9barg** saturated steam. PEEK seats are less compressible and will cause the breakaway torque to increase. Please consult DVC if any questions regarding other seat materials.

DVC does not recommend regulating at higher differential pressure than **5bar** as this may cause bad regulation accuracy, noise and extra wear on the seats.

Always make sufficient drain precautions to avoid any water hammering as this may damage any steam components.



V-NOTCH BALL - SIZING - SATURATED STEAM

V-NOTCH SIZE SELECTION GUIDE - SATURATED STEAM

FLOW VALUES AT 90% OPEN VALVE

DN100FB - 30° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	908	1284	CRITICAL FLOW									
1,5	1025	1450	1776	2050	2292	$P2_{abs} \leq (P1_{abs} x 0.58)$						
2,0	1170	1655	2027	2341	2617	2867	3097	3311	3511	3701		
2,5	1301	1840	2254	2603	2910	3188	3443	3681	3904	4115		
3,0	1414	1999	2449	2828	3161	3463	3741	3999	4241	4471	5476	
3,5	1531	2166	2652	3063	3424	3751	4051	4331	4594	4842	5931	
4,0	1628	2302	2820	3256	3640	3988	4307	4605	4884	5148	6305	7281
4,5	1724	2439	2987	3449	3856	4224	4563	4878	5173	5453	6679	7712
5,0	1815	2567	3144	3631	4059	4447	4803	5134	5446	5740	7031	8118
5,5	1894	2678	3280	3787	4234	4639	5010	5356	5681	5988	7334	8469
6,0	1952	2761	3381	3904	4365	4781	5164	5521	5856	6173	7560	8730
6,5	2050	2900	3551	4101	4585	5023	5425	5800	6151	6484	7941	9170
7,0	2125	3005	3681	4250	4752	5205	5622	6011	6375	6720	8230	9503

DN100FB - 60° V-NOTCH / 90% OPEN / SATURATED STEAM [KG/H]

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3	ΔP 0,4	ΔP 0,5	ΔP 0,6	ΔP 0,7	ΔP 0,8	ΔP 0,9	ΔP 1,0	ΔP 1,5	ΔP 2,0
1,2	1480	2093	CRITICAL FLOW									
1,5	1672	2364	2896	3344	3739	$P2_{abs} \leq (P1_{abs} x 0.58)$						
2,0	1909	2699	3306	3817	4268	4675	5050	5399	5726	6036		
2,5	2122	3001	3676	4244	4745	5198	5615	6002	6366	6711		
3,0	2306	3261	3993	4611	5155	5647	6100	6521	6917	7291	8929	
3,5	2497	3531	4325	4994	5584	6117	6607	7063	7491	7897	9671	
4,0	2655	3755	4599	5310	5937	6503	7024	7509	7965	8396	10283	11873
4,5	2812	3977	4871	5624	6288	6889	7440	7954	8437	8893	10892	12577
5,0	2960	4187	5127	5921	6620	7251	7832	8373	8881	9361	11465	13239
5,5	3088	4367	5349	6176	6905	7564	8171	8735	9265	9766	11960	13811
6,0	3183	4502	5514	6366	7118	7797	8422	9004	9550	10066	12329	14236
6,5	3344	4729	5792	6688	7477	8191	8847	9458	10031	10574	12951	14954
7,0	3465	4901	6002	6931	7749	8489	9169	9802	10396	10959	13422	15498

Flow values for steam are based on following:

Saturated steam, 1-7bar **absolut**, Not critical flow. 0,1-2bar diff pressure.

Valve is **90%** OPEN (*90-100% OPEN = 20-30% more flow capacity*)

Step 1: Choose the steam pressure from left column. (Bar absolut)
Step 2: Choose the differential pressure from top row.
Step 3: You now have the flowrate (kg/h), for the specific V-notch size at 90% open valve.

(Please look at example below)

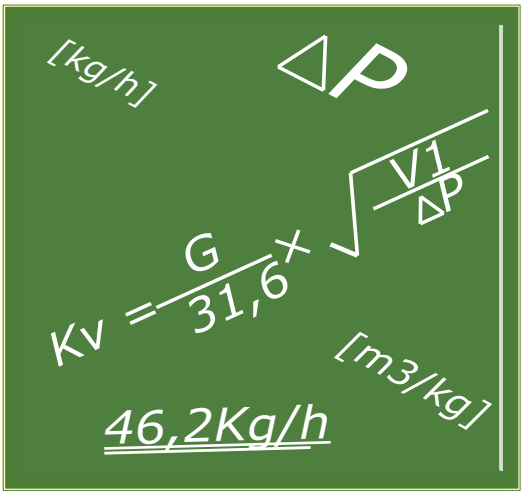
Choosing the correct size V-notch will give you the best possible regulation and maximum lifetime of valve.

Due to velocity and noise, DVC does not advice a higher differential pressure than 5bar maximum for regulation.

Max operational pressure for regulation of saturated steam is:
SEAT MATERIAL: PTFE + 25%C = 7bar
SEAT MATERIAL: PEEK = 9bar

Constantly regulating at 15-25% OPEN valve will reduce lifetime of valve seats.

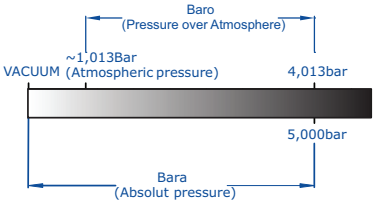
Other sizes valves (5"-6") and V-notch (90°) on request.



...DVC has made the calculations...
...you get all the benefits and save time...

EXAMPLE:

Flow:	150kg/h
Upstream pressure:	5 bara
ΔP:	0,2bar



1st choice

Left column bara = 5,0bar absolut
upper row ΔP = 0,2bar
nearest value above = 178,9kg/h (90% OPEN valve)
Valve = DN20FB 60° V-notch

DN20 - 60° V-NOTCH

bara	ΔP 0,1	ΔP 0,2	ΔP 0,3
4,0	113,4	160,4	196,5
4,5	120,2	169,9	208,1
5,0	~~126,5~~	178,9	219,1
5,5	132,0	186,6	228,6
6,0	136,0	192,4	235,6

2nd choice

Valve = DN15FB 60° V-notch (Costumers choise due to piping)
Nearest flow above = 160,8kg/h
ΔP = 0,6....0,7bar (accepting a bigger pressuredrop reduces valve size)

DN15 - 60° V-NOTCH

bara	ΔP 0,6	ΔP 0,7	ΔP 0,8
4,0	133,5	147,2	154,2
4,5	141,4	152,8	163,3
5,0	~~148,9~~	160,8	171,9
5,5	155,3	167,8	179,3
6,0	160,1	172,9	184,9

V-NOTCH BALL - FINDING YOUR FLOW COEFFICIENT

Flow Equation				
Fluid	**Service Condition**	**Equation**		
Liquid	Sub-critical condition $\Delta P < F_L^2(P_1 \div P_V)$	$K_V = Q \times \sqrt{\frac{G_L}{\Delta P}}$		
		$K_V = \frac{W_L}{\sqrt{\Delta P \times G_L}}$		
	Critical condition $\Delta P \geq F_L^2(P_1 \div P_V)$	$K_V = \frac{Q_L}{F_L} \times \sqrt{\frac{G_L}{(P_1 \div P_V)}}$		
		$K_V = \frac{W_L}{F_L\sqrt{(P_1 \div P_V) \times G_L}}$		
Gas	$X < F_K \times X_T$	$K_V = \frac{Q_g}{450 \times P_1 \times Y} \times \sqrt{\frac{G_g \times T_1 \times Z}{X}}$		
		$K_V = \frac{W_g}{31{,}5 \times Y \times \sqrt{X \times P_1 \times \gamma_1}}$		
	$X \geq F_K \times X_T$	$K_V = \frac{Q_g}{300 \times P_1} \times \sqrt{\frac{G_g \times T_1 \times Z}{F_K \times X_T}}$		
		$K_V = \frac{W_g}{21 \times \sqrt{F_K \times X_T \times P_1 \times \gamma_1}}$		
Saturated Steam	$X < F_K \times X_T$	$K_V = \frac{W_g}{22{,}4 \times P_1 \times Y\sqrt{X}}$		
	$X \geq F_K \times X_T$	$K_V = \frac{W_g}{15 \times P_1 \times \sqrt{F_K \times X_T}}$		
Super-heated Steam	$X < F_K \times X_T$	$K_V = \frac{W_g \times (1 + 0.00126 \times \Delta t)}{21 \times \sqrt{F_K \times X_T \times P_1 \times \gamma_1}}$		
	$X \geq F_K \times X_T$	$K_V = \frac{W_g \times (1 + 0.00126 \times \Delta t)}{15 \times P_1 \times \sqrt{F_K \times X_T}}$		

K_V	Valve flow coefficient (m^3/h)
F_L	Liquid pressure recovery factor of a valve without attached fittings (dimensionless) – Refer to Table 1
G_L	Liquid specific gravity (1.0 for water at 15°C)
P_1	Upstream absolute static pressure (kgf/cm^2A)
P_2	Downtream absolute static pressure (kgf/cm^2A)
P_V	Absolute vapour pressure of liquid at inlet temperature (kgf/cm^2A) – Refers to Table 2
ΔP	Differential pressure ($P_1 - P_2$) (kgf/cm^2A)
Q_L	Volumetric flow rate of liquid (m^3/h)
W_L	Weight or mass flow rate of liquid (t/h)
G_g	Gas specific gravity – Refers to Table 3
Q_g	Volumetric flow rate of gas (m^3/h)
X	Ratio of pressure drop $\frac{\Delta P}{P_1}$
X_T	Pressure drop ratio factor (dimensionless) – Refer to Table 1
W_g	Gas or steam mass flow rate (kg/h)
$\gamma 1$	Specific gravity, upstream conditions (kg/m^3)
F_K	Ratio of specific heat factors – Refer to Table 3
Y	$Expansion\ factor = 1 \div \frac{X}{3 \times F_K \times X_T}$
T_1	Absolut upstream temperature (°K)
Δt	Upstream superheated steam temperature (°C)
Z	Compressibility factor, dimensionless = 1

Valve sizing info:

Recovery factor **"F_L"**

The recovery factor of a valve only depends on the shape of the body and the trim. The increase in fluid static pressure that occurs as fluid moves trough a valve from the vena contracta (restriction) to the valve outlet and downstream piping. The F_L coefficient is crucial when approaching to cavitation, which can be avoided selecting a valve size with lower recovery factor.
The recovery factor does not occur in sizing equations for compressible fluids. Its use is unsuitable for gas and vaporous medias.

Pressure drop ratio factor **"X_T"**

The X_T factor is used for gas and vaporous medias to describe the point of critical or maximum flow through the valve.

V-notch flow control valves from DVC are not designed to operate under "critical" conditions. Please avoid such selections when dimensioning the size.

Abrasive media

DVC does not recommend the use of V-notch control valve for abrasive medias. If used for such application please expect a significant shorter lifespan of seats. Also the ball surface may be damaged.

Please consult DVC if in doubt.

TABLE 1		% OF VALVE ROTATION										
		0	10	20	30	40	50	60	70	80	90	100
$V_{30,60,90}$ Equal %	F_L	0.00	0.96	0.95	0.94	0.93	0.92	0.90	0.88	0.86	0.82	0.75
	X_T	0.00	0.72	0.65	0.60	0.54	0.48	0.42	0.36	0.28	0.16	0.12

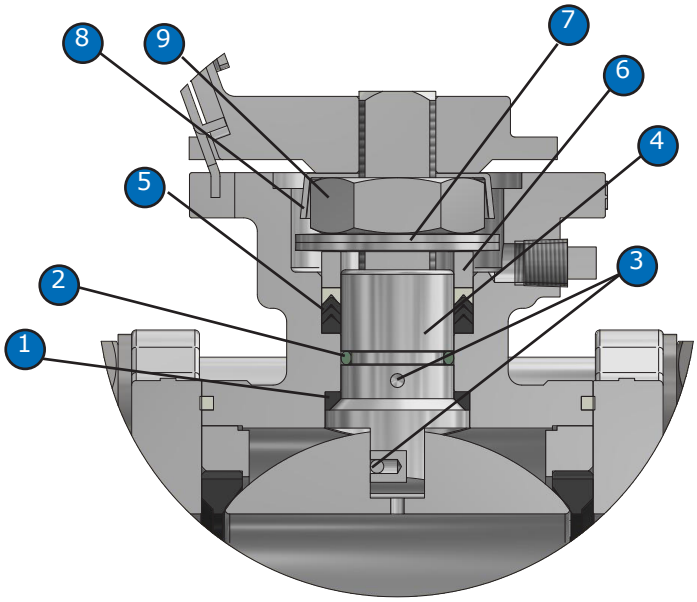
TABLE 2	P_v	
Liquid	Formula	P_v
Acetone	C_2H_4	47.861
Acetic Acid	$C_2H_4O_2$	0.0273
Ammonia	NH_3	0.7310
Benzene	C_6H_6	0.1621
Butane	C_4H_{10}	2.890
Carbon Dioxide	CO_2	58.420
Ethene	C_2H_6	47.861
Ethanol	C_2H_6O	0.1029
Ethylene Glycol	$C_2H_4(OH)_2$	69.58^{-6}
Glycerin	$C_3H_5(OH)_3$	110.50^{-6}
Nitrogen	-	0.988
OIL WT32	-	205.48^{-6}
OIL WT64	-	306.59^{-6}
Sulfur Dioxide	SO_2	3.3929
Water	H_2O	0.0238

TABLE 3	Gas gravity and heatfactor		
Gas	Formula	G_g	F_k
Air	-	1.00	1.00
Ammonia	NH_3	0.59	0.92
Argon	Ar	1.38	1.19
Carbon Dioxide	CO_2	1.52	0.91
Carbon Monoxide	CO	0.97	1.01
Ethylene	C_2H_4	0.97	0.87
Chlorine	Cl_2	2.49	0.96
Ethene	C_2H_8	1.50	0.87
Helium	He	0.14	1.19
Hydrogen	H_2	0.07	1.00
Methane	CH_4	0.55	0.90
Oxygen	O_2	1.10	1.00
Nitrogen	N_2	0.97	1.00
Saturated steam	H_2O	-	0.94
Superheated steam	H_2O	-	0.94

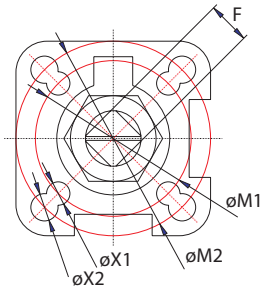
Triple-sealing stem packing system

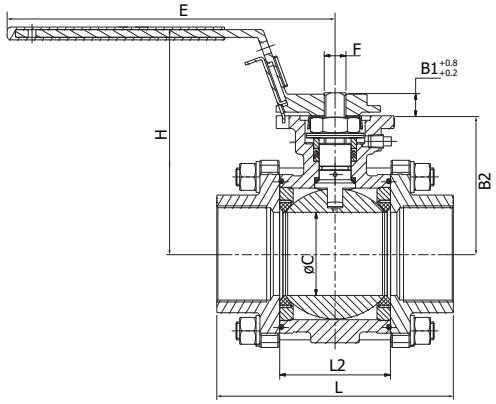
- MAINTENANCE FREE - LIVE LOADED
- EXTRA LONG SERVICE INTERVALS
- TA - LUFT APPROVED

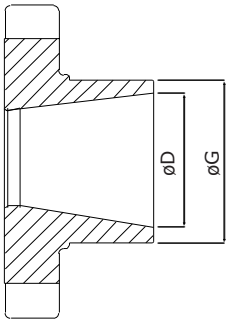
1	Antistatic stem with pyramid segment as 1.st stage sealing 45 degrees slope.
2	O-ring as 2. stage sealing element.
3	Anti static devices stem-to-ball and stem-to-body as standard.
4	Smooth stem finish reduces seal friction and operating torque prolonging service intervals.
5	V-ring in multiple layers expanding sideways and offering the 3rd sealing element.
6	Gland of stainless steel equalizes the compressive forces on the sealing system.
7	Belleville washers keep the sealing system optimal during changing pressures and temperatures.
8	Lock saddle stabilizing the stem nut avoiding loosening during operation.
9	Stem nut compresses the entire stem system to make the sealing optimal.



3-PCS BALL VALVE - FOR V-NOTCH BALL TYPE 1251/1351





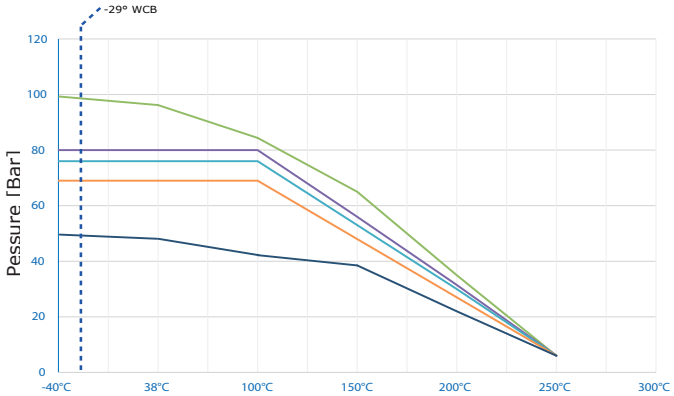


Dimension	Valve with handle								ISO top flange						Stem	
[mm]	L [mm]			L2	B2	øC	E	H	BCD	ISO 5211	øM1	øM2	øX1X4	øX2X4	F	B1
	Thread	1351	1251	[mm]	[mm]	[mm]	[mm]	[mm]			[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
DN08FB		Butt weld/SMS	Butt weld													
DN10FB / DN15RB	71.0	116.0	70.6	25.2	40.0	15.0	140.0	83.0	54.0	F03/F04	36	42	5.5	5.5	9.0	9.0
DN15FB / DN20RB	72.0	116.0	71.6	25.2	40.0	15.0	140.0	83.0	54.0	F03/F04	36	42	5.5	5.5	9.0	9.0
DN20FB / DN25RB	97.0	125.0	96.6	32.3	45.0	20.0	140.0	88.0	62.5	F03/F04	36	42	5.5	5.5	9.0	9.0
DN25FB / DN32RB	110.0	135.0	109.0	42.3	52.0	25.0	165.0	97.0	71.0	F04/F05	42	50	5.5	7.0	11.0	11.0
DN32FB / DN40RB	118.0	146.0	118.0	49.4	57.0	31.8	165.0	103.0	80.9	F04/F05	42	50	5.5	7.0	11.0	11.0
DN40FB / DN50RB	130.0	157.0/167.0	129.0	57.2	75.0	38.0	202.0	130.0	94.2	F07	-	70	-	9.0	14.0	14.0
DN50FB / DN65RB	142.0	202.0	145.0	71.4	84.0	50.0	202.0	139.0	114.0	F07	-	70	-	9.0	14.0	15.0
DN65FB / DN80RB	185.0	215.0	185.0	86.6	108.0	65.0	257.0	177.0	139.0	F07/F10	70	102	9.0	11.0	17.0	18.0
DN80FB / DN100RB	205.0	230.0	205.0	99.0	118.0	76.0	257.0	187.0	160.0	F07/F10	70	102	9.0	11.0	17.0	18.0
DN100FB	240.0	260.0	241.0	127.0	140.0	100.0	405.0	207.5	193.0	F10	102	-	11.0	-	22.0	22.5

Dimension		*) Torque		Weight		Kv-value		Butt weld ends [R=reduce bore] [F=full bore]					
[mm]	[tomme]	FB [Nm]	RB [Nm]	FB [kg]	RB [kg]	90° m³/h		Type 1251		Type 1351		Type 1351	
								EN 12627		ISO 1127		SMS 3008	
						FB	RB	øG/øD [mm]		øG/øD [mm]		øG/øD [mm]	
DN08	1/4"	9	-	0.9	-	8.0	-	14/11,5 (1,25)	F	13,5/10,3 (1,6)	F	10,0/8,0 (1,0)	F
DN10	3/8"	9	-	0.9	-	9.0	-	17,2/12,6 (2,3)	F	17,2/14,0 (1,6)	F	12,0/10,0 (1,0)	F
DN15	1/2"	9	9	1.0	0.8	11.0	9.0	21,7/15 (3,35)	R/F	21,3/18,1 (1,6)	R/F	18,0/16,0 (1,0)	F
DN20	3/4"	12	9	1.5	1.0	28.0	11.0	27,2/20,5 (3,35)	R/F	26,9/23,7 (1,6)	R/F	25,0/22,6 (1,2)	R/F
DN25	1"	20	12	2.0	1.5	48.0	28.0	34/25,7 (4,15)	R/F	33,7/29,7 (2,0)	R/F	32,0/29,6 (1,2)	R
DN32	1 1/4"	33	20	3.0	2.0	71.0	48.0	42,7/34,4 (4,15)	R/F	42,4/38,4 (2,0)	R/F	33,7/31,3 (1,2)	R
DN40	1 1/2"	40	33	4.5	3.0	104.0	71.0	48,6/40,3 (4,15)	R/F	48,3/44,3 (2,0)	R/F	38,0/35,6 (1,2)	R
DN50	2"	66	40	6.5	4.5	208.0	104.0	60,5/51,3 (4,6)	R/F	60,3/55,1 (2,6)	R/F	51,0/48,6 (1,2)	R
DN65	2 1/2"	112	66	12.5	6.5	277.0	208.0	76,3/67,1 (4,6)	R/F	76,1/70,9 (2,6)	R/F	63,5/60,3 (1,6)	R
DN80	3"	113	112	16.5	12.5	502.0	277.0	88,9/80 (4,45)	R/F	88,9/83,7 (2,6)	R/F	76,1/72,9 (1,6)	R
DN100	4"	156	113	26.0	16.5	882.0	502.0	116/103,1 (6,45)	R/F	114,3/109,1 (2,6)	R/F	101,6/97,6 (2,0)	R

* Torque figures include 30% safety factor. (TEST: 0 bar diff. pressure, ambient temperature,non-lubricating).

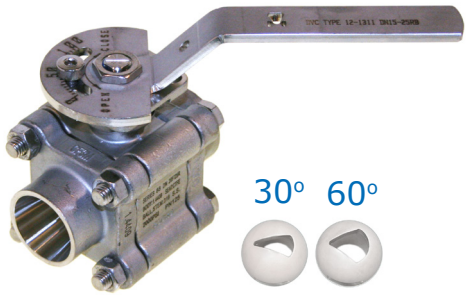
PRESSURE/TEMPERATURE (SEATS PTFE+25%C)



Temperature [°C]

- 1/4" - 1"
- 1 1/4" - 1 1/2"
- 2"
- 2 1/2"
- 3" - 4"

MANUAL CONTROL VALVE

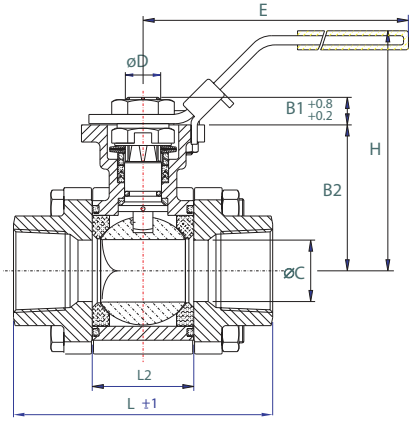


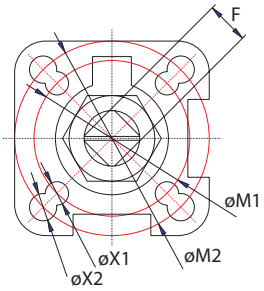
DVC has developed a convenient and simple economical manual operation control valve. The solutions are suitable for process applications that don´t demand dynamic adjustment.

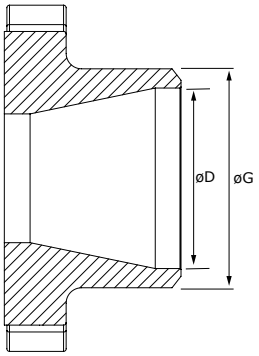
DVC lockable lever are made from AISI304 stainless steel. Scale is 0-100% open, mounted on top of the valves ISO top. Position can be fixed by bolt/nut.

DVC lockable levers are available for Type 1251/1351 and Type 1211/1311. Others on request.

3-PCS BALL VALVE - FOR V-NOTCH BALL TYPE 1211/1311





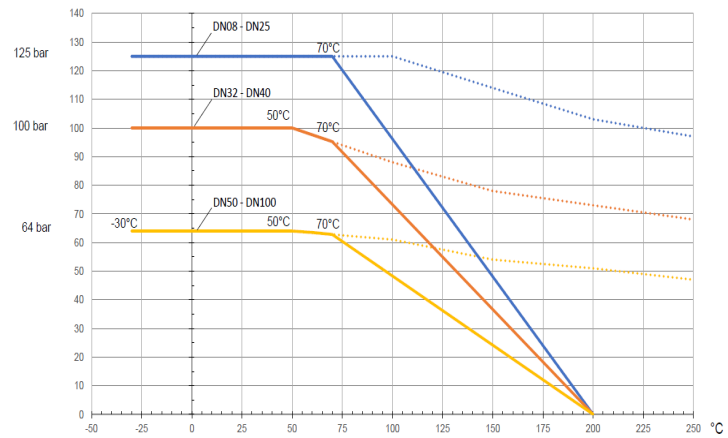


Dimension	Valve with handle								ISO top flange						Stem	
[mm]	L [mm]			L2	B2	øC	E	H	ISO 5211	øM1	øM2	øX1x4	øX2x4	BCD	F	B1
	Thread	Weld	SMS	[mm]	[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[mm]		[mm]	[mm]
DN08FB	75.0	75.0	75.0	24.5	42.6	11.5	140	76.6	F03/F04	36	42	6.0	6	54.0	9	7.6
DN10FB / DN15RB	75.0	75.0	75.0	24.5	42.6	12.6	140	76.6	F03/F04	36	42	6.0	6	54.0	9	7.6
DN15FB / DN20RB	73.0	75.0	75.0	24.5	42.6	15.0	140	76.6	F03/F04	36	42	6.0	6	54.0	9	7.6
DN20FB / DN25RB	86.0	90.0	90.0	31.4	46.8	20.0	140	81.7	F03/F04	36	42	6.0	6	62.5	9	8.6
DN25FB / DN32RB	106.0	110.0	110.0	41.3	59.3	25.0	165	98.6	F04/F05	42	50	6.0	7	71.0	11	10.4
DN32FB / DN40RB	111.0	115.0	115.0	48.4	62.6	32.0	165	101.6	F04/F05	42	50	6.0	7	80.9	11	10.4
DN40FB / DN50RB	130.0	130.0	130.0	56.3	79.0	38.0	217	128.0	F05/F07	50	70	7.5	9	94.2	14	13.4
DN50FB / DN65RB	143.0	143.0	143.0	71.4	87.7	50.0	217	137.0	F05/F07	50	70	7.5	9	114.0	14	13.4
DN65FB / DN80RB	185.0	185.0	185.0	86.6	108.7	65.0	380	167.5	F07/F10	70	102	10.0	12	139.0	17	16.8
DN80FB / DN100RB	205.0	205.0	205.0	99.0	117.7	76.0	450	176.5	F07/F10	70	102	10.0	12	160.0	17	17.8
DN 100FB	240.0	240.0	240.0	127.0	133.7	100.0	450	192.5	F07/F10	70	102	10.0	12	193.0	17	16.8

Dimension		*) Torque		**) Weight		Kv-value		Butt weld ends [R=reduce bore] [F=full bore]									
[mm]	[tomme]	FB [Nm]	RB [Nm]	FB [kg]	RB [kg]	90° M³/H		Type 1211 EN 12627		Type 1311 ISO 1127		Type 1311 SMS3008		Type 1311 DIN 11850-2			
						FB	RB	øG / øD (mm)		øG / øD (mm)		øG / øD (mm)		øG / øD (mm)			
DN08	1/4"	9	-	0.8	-	8	-	14.0 / 11.5 (1.25)	F	13.5 / 10.3 (1.6)	F	-	-	-	-		
DN10	3/8"	9	-	0.8	-	8	-	17.2 / 12.6 (2.3)	F	17.2 / 14.0 (1.6)	F	12.0 / 10.0 (1.0)	F	13.0 / 10.0 (1.5)	F		
DN15	1/2"	11	9	0.8	0.8	11	8	21.7 / 15.0 (3.35)	R/F	21.3 / 18.1 (1.6)	R/F	18.0 / 16.0 (1.0)	R	19.0 / 16.0 (1.5)	F		
DN20	3/4"	12	11	1.3	0.8	28	11	27.2 / 20.5 (3.35)	R/F	26.9 / 23.7 (1.6)	R/F	25.0 / 22.6 (1.2)	R/F	23.0 / 20.0 (1.5)	F		
DN25	1"	19	12	2.0	1.3	50	28	34.0 / 25.7 (4.15)	R/F	33.7 / 29.7 (2.0)	R/F	32.0 / 29.6 (1.2)	F	29.0 / 26.0 (1.5)	F		
DN32	1 1/4"	28	19	2.8	2.0	71	50	42.7 / 34.4 (4.15)	R/F	42.4 / 38.4 (2.0)	R/F	33.7 / 31.3 (1.2)	R	35.0 / 32.0 (1.5)	F		
DN40	1 1/2"	37	28	4.3	2.8	102	71	48.6 / 40.3 (4.15)	R/F	48.3 / 44.3 (2.0)	R/F	38.0 / 35.6 (1.2)	R	41.0 / 38.0 (1.5)	F		
DN50	2"	52	37	5.7	4.4	205	102	60.5 / 51.3 (4.6)	R/F	60.3 / 56.3 (2.0)	R/F	51.0 / 48.6 (1.2)	R	53.0 / 50.0 (1.5)	F		
DN65	2 1/2"	68	52	11.4	6.1	275	205	76.3 / 67.1 (4.6)	R/F	76.1 / 70.9 (2.6)	R/F	63.5 / 60.3 (1.6)	R	70.0 / 66.0 (2.0)	F		
DN80	3"	100	68	15.1	13.0	500	275	116.0 / 103.1 (6.45)	R/F	88.9 / 83.7 (2.6)	R/F	76.1 / 72.9 (1.6)	R	85.0 / 81.0 (2.0)	F		
DN100	4"	112	100	24.3	16.3	867	500	114.3 / 103.1 (5.6)	R/F	114.3 / 109.1 (2.6)	R/F	101.6 / 97.6 (2.0)	R	104.0 / 100.0 (2.0)	F		

*) Torgue figures with 30 % safety factor included.
**) Weight is based on"flower shape" (DN50-100F) butt weld ISO 1127 .

PRESSURE / TEMPERATURE (SEATS PTFE + 25% C)

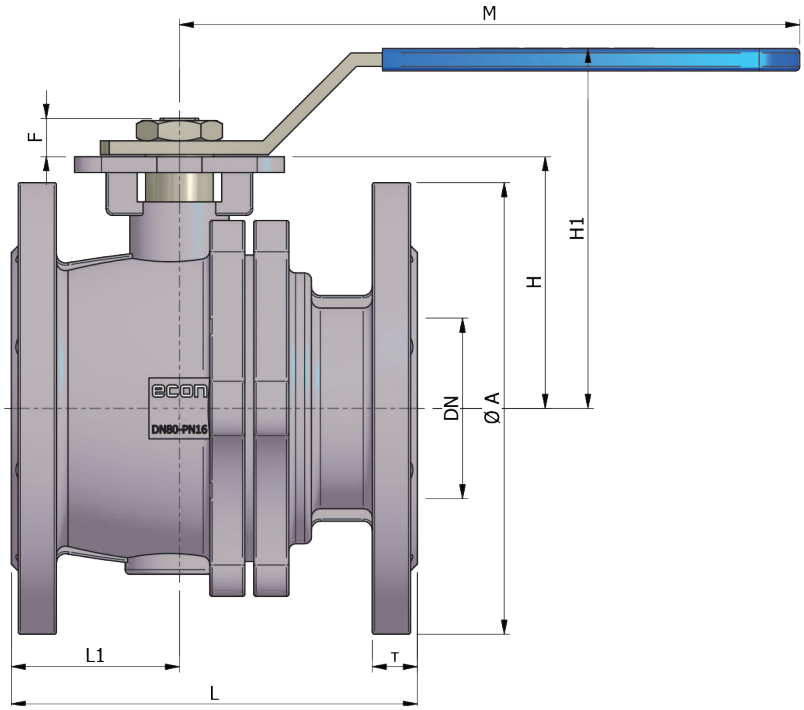


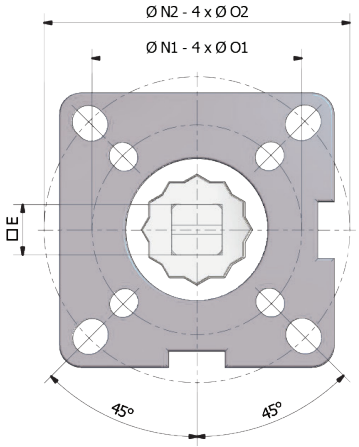
OTHER SEAT MATERIALS ON REQUEST

Material	Max temperature [0barg]
DELRIN	85°C
UHMW	90°C
PTFE PURE	180°C
RPTFE (PTFE+15% glass fibre)	180°C
TFM 1600	220°C
SSPTFE (PTFE+50% SS)	220°C
CPTFE * (PTFE+25% Carbon)	220°C
PEEK **	260°C

* PTFE + 25%C are DVC standard seat material for Type 1251/1351 and 1211/1311 3-pcs ball valve. During years of experience DVC advises this seat material as being the most wear resistance material. This combined with the high temperature span covers 95% of all usages.
**Using PEEK (Ceramic reinforced PTFE) as a seat material causes higher breakaway torque. At particular valve sizes, due to torque, the stem material has to be changed from AISI316 to 17-4PH which is a harder material. Please consult DVC if any questions regarding other seats material.

FLANGED BALL VALVE - FOR V-NOTCH BALL TYPE E7289





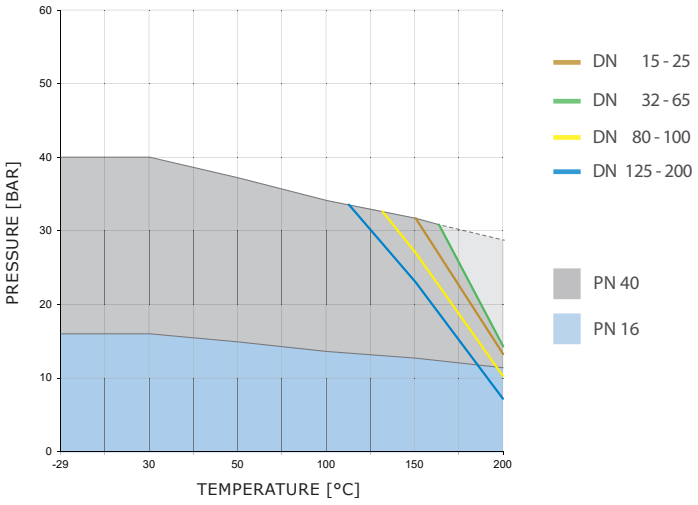
Dim.	Valve with handle							ISO top flange				Weight	Pressure
[mm]	øA	T	F	H	H1	L	L1	M	øO1/øO2	ISO 5211	□E	[kg]	
15	95	16	9	48	78	115	50	145	6/6	F03/F04	9	2,4	PN40
20	105	18	9	53	84	120	54	145	6/6	F03/F04	9	3,2	
25	115	18	11	59	90	125	56	175	6/7	F04/F05	11	4,2	
32	140	18	11	71	102	130	58	175	6/7	F04/F05	11	5,5	
40	150	18	14	76	110	140	58	190	7/9	F05/F07	14	6,9	
50	165	20	14	85	118	150	63	190	7/9	F05/F07	14	9,5	
65	185	22	17	107	155	170	64	265	9/11	F07/F10	17	13,8	
80	200	24	17	117	181	180	70	300	9/11	F07/F10	17	17,7	
100	235	24	22	140	210	190	78	400	-/11	F10	22	25,2	
65	185	18	17	102	150	170	69	265	9/11	F07/F10	17	13,8	PN16
80	200	20	17	112	176	180	75	300	9/11	F07/F10	17	17,7	
100	220	20	22	140	210	190	83	400	-/11	F10	22	25,2	

VALVE DATA

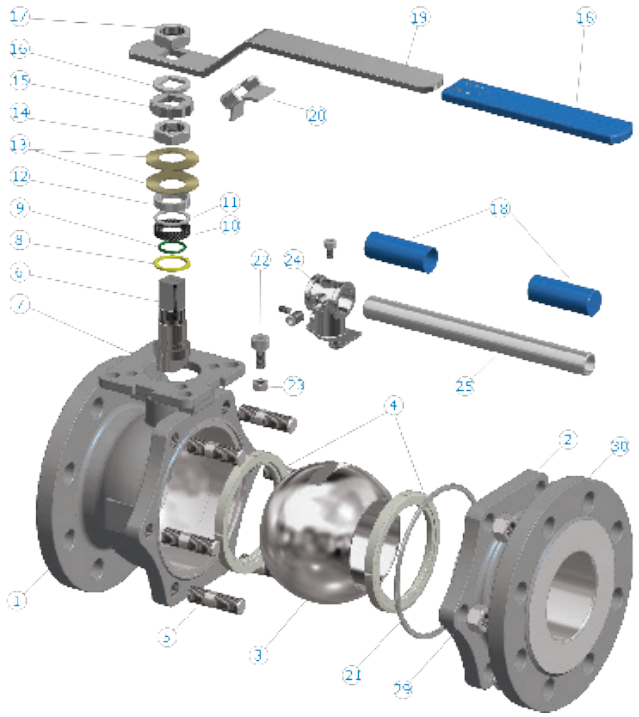
Dim.	* Moment [Nm]	Kv-værdi [m³/h ved 1 bar]	Tryk
[mm]	Løsrivningsmoment	90° helt åben	
15	6,5	15	PN40
20	7,8	31	
25	14,3	41	
32	22,1	62	
40	29,9	103	
50	44,2	163	
65	68,9	386	
80	113,1	514	
100	170,3	943	
65	234,0	386	PN16
80	247,0	514	
100	819,0	943	

*Torque figures with 30 % safety factor included.
When dimensioning the actuator please add the following:
+ 15% if dry air or demineralized water.
+ 30% if sludge or abrasive medias.
- 15% if lubricating medias.

PRESSURE / TEMPERATURE



FLANGED BALL VALVE - FOR V-NOTCH BALL TYPE E7289



No.	Description	Materials
1	BODY	STAINLESS STEEL CF8M
2	CONNECTION	STAINLESS STEEL CF8M
3	BALL	STAINLESS STEEL CF8M
4	SEAT	PTFE TFM 1600
5	STUD	STAINLESS STEEL AISI 304
6	STEM	STAINLESS STEEL AISI 316
7	ANTI-STATIC DEVICE	STAINLESS STEEL AISI 316
8	THRUST WASHER SEAL	PTFE
9	O-RING	FPM
10	GLAND PACKING	GRAFOIL
11	BUSHING	STAINLESS STEEL AISI 304
12	GLAND	STAINLESS STEEL AISI 316
13	BELLEVILLE WASHER	STAINLESS STEEL AISI 301
14	NUT	STAINLESS STEEL AISI 304
15	LOCKING CAP	STAINLESS STEEL AISI 304
16	RING	STAINLESS STEEL AISI 304
17	NUT	STAINLESS STEEL AISI 304
18	SLEEVE	VINYL
19	HAND LEVER	STAINLESS STEEL AISI 304
20	LOCKING DEVICE	STAINLESS STEEL AISI 304
21	BODY GASKET	LEADER® SPIRAL WOUND GRAPHITE/PTFE
22	SOCKET HEAD SCREW	STAINLESS STEEL AISI 304
23	NUT	STAINLESS STEEL AISI 304
24	T-HANDLE SUPPORT	STAINLESS STEEL CF8
25	T-HANDLE*	ZINC PLATED STEEL
26	NUT	STAINLESS STEEL AISI 304

* DN100 - DN150

GENERAL FLOW COEFFICIENTS - KV CHARTS FOR V-NOTCH BALL

DIMENSION	V-PORT	0%	15%	20%	30%	40%	50%	60%	70%	80%	90%	100%
DN10FB	30 60	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.1	0.1 0.1	0.1 0.2	0.2 0.5	0.4 0.7	0.5 1.0	0.7 1.4	0.9 1.9
DN15FB	30 60	0.0 0.0	0.1 0.1	0.1 0.1	0.2 0.3	0.3 0.4	0.4 0.8	0.7 1.2	0.9 1.7	1.4 2.8	1.9 3.7	2.2 5.1
DN20FB	30 60	0.0 0.0	0.1 0.1	0.2 0.2	0.4 0.6	0.6 0.9	0.9 1.4	1.5 2.4	2.0 3.4	2.8 5.5	3.8 7.7	4.6 10.2
DN25FB	30 60	0.0 0.0	0.1 0.2	0.3 0.3	0.7 0.9	1.1 1.5	2.0 2.9	3.0 4.5	4.3 6.7	7.2 10.5	8.3 13.0	8.5 17.9
DN32FB	30 60	0.0 0.	0.2 0.2	0.3 0.5	0.9 1.5	1.7 2.6	3.1 4.7	4.7 8.1	6.8 10.9	8.5 16.2	11.1 22.1	12.8 33.2
DN40FB	30 60	0.0 0.0	0.3 0.3	0.5 0.7	1.4 2.1	2.6 3.4	4.3 6.8	6.4 11.1	9.4 16.2	11.9 23.0	14.5 34.0	17.0 44.2
DN50FB	30 60	0.0 0.0	0.3 0.3	1.0 1.3	3.2 3.9	5.1 7.7	8.5 14.0	12.8 23.0	19.6 33.2	26.4 46.8	36.6 70.6	51.0 93.5
DN65FB	30 60	0.0 0.0	0.3 0.3	0.9 1.3	3.4 4.3	6.8 8.5	10.2 17.9	15.3 28.9	23.8 45.1	31.5 63.8	52.7 87.6	63.8 127.5
DN80FB	30 60	0.0 0.0	0.4 0.4	1.0 2.1	3.4 5.1	6.8 11.9	11.9 21.3	19.6 34.0	28.1 55.3	39.1 77.4	55.3 108.8	69.7 140.3
DN100FB	30 60	0.0 0.0	0.5 0.6	1.7 2.6	5.1 9.4	12.8 21.3	24.7 34.0	40.8 50.2	60.4 76.5	85.0 119.9	110.5 180.2	135.2 302.6
DN150FB	30 60	0.0 0.0	0.8 1.7	2.8 4.3	12.0 18.9	28.4 51.6	51.6 94.6	88.6 163.4	133.3 245.1	189.2 357.8	240.8 504.0	301.0 688.0

ELECTRO PNEUMATIC VALVE POSITIONERS

ABB TZID-C TYPE 5400

Specifications

GENERAL

Input signal:	4 - 20 mA, two-wire technology with choice of HART signal or PROFIBUS PA protocol
Stroke range:	10 - 90 mm resp. 25-120°C
Supply air:	1.4 - 6 bar (20-90 psi)
Control accuracy:	≤0.5%
Ambient temperature:	-40°C to +85°C.
Housing:	Aluminum coated, IP65
Vibration immunity:	10 g at 20-80Hz
Burden voltage:	8.7 V DC (none Ex) 9.7 V DC (Ex intrinsically safe)

OPTIONS

Ex protection:	EEx ib II C T6
Plug-in modules for:	Analog position feedback signal Digital position feedback signal for min./max. position Safety shutdown module.
Kit for:	Mechanical position indicator Digital position feedback for min./max. position with 2 slot-type initiators or micro switch
Accessories:	Pressure gauge block Filter regulator

SIEMENS SIPART PS2 TYPE 5410

Specifications

GENERAL

Setpoint signal:	0/4 - 20 mA with choice of HART signal or PROFIBUS PA protocol
Travel range:	3 - 130 mm (standard)
Slewing angle:	30° - 100° (standard)
Auxiliary power:	
- pneumatic	1.4 to 7 bar
- electrical	4-20 mA (two-wire circuit) or 18-30 V (four-wire circuit) or bus-powered 10.5 mA with PROFIBUS PA
Ambient temperature:	-30°C to +80°C

OPTIONS (can be retrofitted)

Binary inputs:	Floating contacts or 24 V
Explosion protection:	II 2G EEx ia/ib II C T6 or II 2G EEx d II C T6 or II 3G EEx n A L [L]IIC T6
Other approvals:	FM (Factory mutual) CSA

Additional modules on request
Alarm outputs/fault message output (with slot-type initiators if required)
Mounting kits
Pressure gauge block
Solenoid valve block
Position feedback module, 4-20 mA
External position sensor
Also non-contact

ELECTRO PNEUMATIC VALVE POSITIONERS

SIEMENS SIPART PS100 TYPE 5421

Specifications

GENERAL

Input signal:	4 - 20 mA, two-wire technology (12-30 V)
Supply air:	1.4 - 7 bar (20,3 - 101,5 PSI)
Rotation:	90°
Ambient temperature:	-20°C til 80°C
Stroke range:	10 - 130 mm
Air quality:	ISO 8573-1 Class 3
Material:	Aluminum
Protection class:	IP66

OPTION

Position feedback:	Analog (4 - 20 mA)
Accessories:	Filter regulator Type 5412

ACCESSORIES/OPTIONS

PNEUMATIC ACTUATOR DOUBLE ACTING OR SPRING RETURN TYPE 505

GENERAL

Torque double acting:	14 to 3.500 Nm at 6 bar
Torque spring return:	14 to 1.620 Nm at 6bar
Rotation angle:	0° to 90°. Adjustable +5° to -5°
Pressure:	2 to 10 bar
Temperature:	-20°C. to +80°C.
Work media:	Air (PNEUROP/ISO Class 4)
Connections:	ISO 5211 for brackets
	DIN 3337 coupling (star shaped)
	VDI/VDE 3845 for accessories
	NAMUR for work media

FILTER REGULATOR TYPE 5412

GENERAL

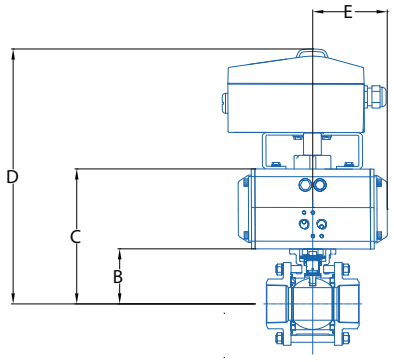
Material:	Fiberglass/Polycarbonate
Max. supply pressure	At 23°C: 12 bar
	At 50°C: 10 bar
Control pressure:	0.5 - 8 bar
Hysteresis:	0.35 bar
Temperature:	0°C to +50°C
Filter element:	25µm
Drain:	Semi automatic (HA4)
Port size:	1/4" BSPP
Manometer:	0-12 bar

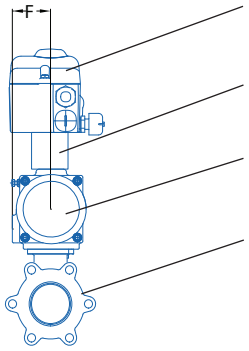
ELECTRICAL ACTUATOR WITH PCU - POSITIONER TYPE 5630

GENEREL

Material:	Aluminum, polyester powder coated.
Power supply:	230V/50Hz AC; 24V AC/DC; 400V 3-Phase
Positioner:	4 - 20mA input/output
Enclosure:	IP67
Temperature:	-20°C/+70°C
Travel angle:	90°
Torque:	60 - 3000Nm
Duty range:	S4 70% Max. 300-1600 start/hour

DIMENSIONS COMPLETE UNIT - 1251/1351





TZID-C ELECTRO PNEUMATIC POSITIONER

POSITIONER BRACKET AND COUPLING SS

505 DA/SR PNEUMATIC ACTUATOR

1251/1351 3-PCS BALL VALVE

DIM [MM]	505 DA size	B	C	D	E	F
DN10FB/15RB	**40**	40.0	106.5	252.5	61.0	36.0
DN15FB/20RB	**40**	40.0	106.5	252.5	61.0	36.0
DN20FB/25RB	**52**	45.0	117.0	263.0	73.5	41.5
DN25FB/32RB	**52**	52.0	124.0	270.0	73.5	41.5
DN32FB/40RB	**63**	57.0	144.2	290.2	84.0	47.0
DN40FB/50RB	**75**	75.0	174.5	320.5	95.0	53.0
DN50FB/65RB	**75**	84.0	183.5	329.5	95.0	53.0
DN 65FB/80RB	**83**	108.0	216.7	362.7	102.0	57.0
DN 80FB/100RB	**92**	118.0	234.5	380.5	131.0	58.5
DN 100FB	**105**	140.0	273.0	419.0	134.0	64.0

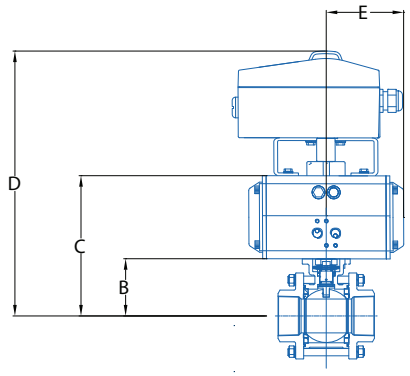
DIM [MM]	505 SR size	B	C	D	E	F
DN10FB/15RB	**52**	40.0	114.6	260.6	73.5	41.5
DN15FB/20RB	**52**	40.0	114.6	260.6	73.5	41.5
DN20FB/25RB	**63**	45.0	134.4	280.4	84.0	47.0
DN25FB/32RB	**75**	52.0	158.8	304.8	95.0	53.0
DN32FB/40RB	**83**	57.0	162.1	308.1	102.0	57.0
DN40FB/50RB	**83**	75.0	187.7	333.2	102.0	57.0
DN50FB/65RB	**92**	84.0	220.7	366.7	131.0	58.5
DN 65FB/80RB	**105**	108.0	241.7	387.7	134.0	64.0
DN 80FB/100RB	**125**	118.0	289.7	418.7	150.5	74.5
DN 100FB	**140**	140.0	305.7	451.7	195.0	77.0

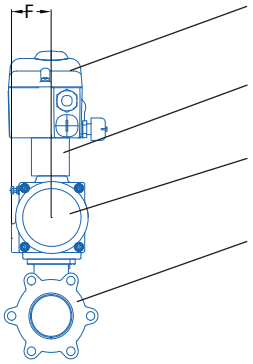
All sizing torques are based on water and other non lubricating liquids. ΔP = max 15bar. Temperatures from 0ºC to 100ºC. Service is with positioner control. Actuator torques are with minimum 40% safety factor [6bar air-supply].

ACTUATOR SIZING - MEDIA AND SERVICE FACTOR

Clean, particle free, lubricating (oils, hydraulic fluid, etct.)	Multiply by: 0.80
Clean, particle free, non-lubricating (water, alcohol, ect.)	Multiply by: 1.00
Gas or saturated steam, clean and wet	Multiply by: 1.00
Gas or saturated steam, clean and dry	Multiply by: 1.30
Gas, dirty unfiltered e.g. natural gas, Chlorine	Multiply by: 1.50
Slurries or heavily corroded and contaminated systems	Multiply by: 2.00
Throttling	Multiply by: 1.20
Positioner control	Multiply by: 1.40
Once per day operation	Multiply by: 1.20
Once per two days or a "plant critical" operation	Multiply by: 1.50

DIMENSIONS COMPLETE UNIT - 1211/1311





TZID-C ELECTRO PNEUMATIC POSITIONER

POSITIONER BRACKET AND COUPLING SS

505 DA/SR PNEUMATIC ACTUATOR

1211/1311 3-PCS BALL VALVE

DIM [MM]	505 DA SIZE	B	C	D	E	F
DN10FB/15RB	**40**	42.6	109.1	255.1	61.0	36.0
DN15FB/20RB	**40**	42.6	109.1	255.1	61.0	36.0
DN20FB/25RB	**52**	46.9	118.9	264.9	73.5	41.5
DN25FB/32RB	**52**	59.3	131.3	277.3	73.5	41.5
DN32FB/40RB	**63**	62.6	149.8	295.8	84.0	47.0
DN40FB/50RB	**75**	79.0	178.5	324.5	95.0	53.0
DN50FB/65RB	**75**	87.7	187.2	333.2	95.0	53.0
DN 65FB/80RB	**83**	108.7	217.4	363.4	102.0	57.0
DN 80FB/100RB	**92**	117.7	234.2	380.2	131.0	58.5
DN 100FB	**105**	133.7	266.7	412.7	134.0	64.0

DIM [MM]	505 SR SIZE	B	C	D	E	F
DN10FB/15RB	**52**	42.6	114.6	260.6	73.5	41.5
DN15FB/20RB	**52**	42.6	114.6	260.6	73.5	41.5
DN20FB/25RB	**63**	46.9	134.4	280.4	84.0	47.0
DN25FB/32RB	**75**	59.3	158.8	304.8	95.0	53.0
DN32FB/40RB	**83**	62.6	162.1	308.1	102.0	57.0
DN40FB/50RB	**83**	79.0	187.7	333.2	102.0	57.0
DN50FB/65RB	**92**	87.7	220.7	366.7	131.0	58.5
DN 65FB/80RB	**105**	108.7	241.7	387.7	134.0	64.0
DN 80FB/100RB	**125**	117.7	289.7	418.7	150.5	74.5
DN 100FB	**140**	133.7	305.7	451.7	195.0	77.0

All sizing torques are based on water and other non lubricating liquids. ΔP = max 15bar. Temperatures from 0ºC to 100ºC. Service is with positioner control. Actuator torques is with minimum 40% safety factor [6bar air-supply].

OPERATING AT TEMPERATURES BELOW 100°C

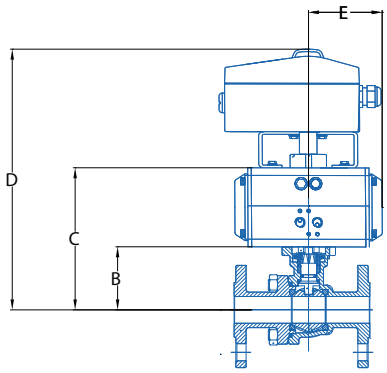
If medium temperature is below 100ºC, it is suitable to use ball valve with direct mounting ISO top.

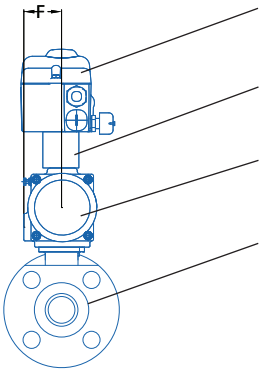
OPERATING AT TEMPERATURES ABOVE 100°C

If medium temperature is above 100ºC, it is suitable to use ball valve with DVC bracket and coupling. Operating at high temperature may damage the gaskets of the pneumatic actuator. DVC pneumatic actuator can be delivered with FPM gaskets for medium temperature up to 150ºC and direct mounting.

DVC offers a wide range of brackets and couplings suitable for all 3-pcs. an 2-pcs. ball valves. The DVC-Quick bracket offers quick disassembly/assembly of actuator within seconds. Closed stem extension systems are suitable for insulation purpose and offers an extra stem sealing. Please consult DVC for optional solutions.

DIMENSIONS COMPLETE UNIT - E7289





TZID-C ELECTRO PNEUMATIC POSITIONER

POSITIONER BRACKET AND COUPLING SS

505 DA/SR PNEUMATIC ACTUATOR

E7289 FLANGED BALL VALVE

DIM [MM]	505 DA size	B	C	D	E	F
DN15 PN40	**40**	48,0	114,5	260,5	61,0	36,5
DN20 PN40	**40**	53,0	119,5	265,5	61,0	36,5
DN25 PN40	**52**	59,0	131,0	277,0	73,5	41,5
DN32 PN40	**63**	71,0	158,5	304,5	84,0	47,0
DN40 PN40	**63**	76,0	163,5	309,5	84,0	47,0
DN50 PN40	**75**	85,0	184,5	330,5	92,0	53,0
DN65 PN40	**83**	107,0	215,7	361,7	102,0	57,0
DN80 PN40	**92**	117,0	233,5	379,5	131,0	58,5
DN100 PN40	**105**	140,0	273,0	419,0	134,0	64,0
DN65 PN16	**83**	102,0	210,7	356,7	102,0	57,0
DN80 PN16	**92**	112,0	228,5	374,5	131,0	58,5
DN100 PN16	**105**	140,0	273,0	419,0	134,0	64,0

DIM [MM]	505 SR size	B	C	D	E	F
DN15 PN40	**52**	48,0	120,0	266,0	73,5	41,5
DN20 PN40	**52**	53,0	125,0	271,0	73,5	41,5
DN25 PN40	**63**	59,0	146,5	272,5	84,0	47,0
DN32 PN40	**75**	71,0	170,5	316,5	95,0	53,0
DN40 PN40	**83**	76,0	184,7	330,7	102,0	57,0
DN50 PN40	**92**	85,0	210,5	514,2	131,0	58,5
DN65 PN40	**105**	107,0	240,0	386,0	134,0	64,0
DN80 PN40	**125**	117,0	272,0	418,0	150,5	74,5
DN100 PN40	**140**	140,0	312,0	458,0	195,0	77,0
DN65 PN16	**105**	102,0	235,0	381,0	134,0	64,0
DN80 PN16	**125**	112,0	267,0	413,0	150,5	74,5
DN100 PN16	**140**	140,0	312,0	458,0	197,0	77,0

All sizing torques are based on water and other non lubricating liquids. ΔP = max 15bar. Temperatures from 0ºC to 100ºC. Service is with positioner control. Actuator torques are with minimum 40% safety factor [6bar air-supply].

Know-how makes the difference

Dansk Ventil Center A/S

Product Range

- Ball Valves
- Butterfly Valves Soft Seated
- Butterfly Valves Metal Seated
- Angle Seat Valves
- Thin Wafer Check Valves
- Safety Valves
- Knife Gate Valves
- Pneumatic Actuators
- Electrical Actuators
- Brackets for Actuators
- Limit Switches
- Level Gauges - Reflex & Transparent
- Control Valves
- Pressure Reducing Valves

Dansk Ventil Center is committed to meeting the needs of customers in an environmentally sound and sustainable manner, through continuous improvements in environmental performance in all our activities.

Dansk Ventil Center is located in the northern part of Europe, in the heart of Denmark.

Visit us at www.dvcas.dk and learn more about Dansk Ventil Center and our products.

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