DATA SHEET FOR *ADCATROL* CONTROL VALVES

VALVE SIZING

The valve sizing is based on the calculation of the Kv coefficient. The Kv represents the quantity of water , expressed in cubic meters (m3) at 15ºC, that flows through the valve with a pressure drop of 1 bar , in one hour period. The formulas, below indicated, allow the Kv calculation in accordance with the type of fluid and it's operating condition.

After the Kv calculation, the corresponding Kvs is available from the valve data sheet. If real operating data have been used for the calculation, as a rule the calculated Kv should be around 70% to 80% of the selected valve Kvs in order to guaranty proper regulation of maximum flow rate at the given operating conditions preventing that sometimes some *precautionary additions* will result in undesirable valve over sizing. At the same time it is necessary to check whether the minimum flow rate can be even regulated or not considering the chose valve rangeability.

For critical applications,(critical flow velocities, for example), noise prediction, etc, please fill the data sheet available in the next page and submit it to our technical department for proper selection using our software.

Calculation of Kv value			
Pressure Drop	**Medium**		
	Liquids	**Saturated steam**	**Gases**
a) $P2 > \frac{P1}{2}$ $Dp < \frac{P1}{2}$	$Kv = Q1\sqrt{\frac{d1}{Dp \times 1000}}$	$Kv = \frac{Q2}{22{,}4\sqrt{Dp \times P2}}$	$Kv = \frac{Q3}{514}\sqrt{\frac{d2 \times T}{Dp \times P2}}$
b) $P2 < \frac{P1}{2}$ $Dp > \frac{P1}{2}$		$Kv = \frac{Q2}{11{,}2 \times P1}$	$Kv = \frac{Q3}{257 \times P1}\sqrt{d2 \times T}$

Remarks: For superheated steam and other fluids please consult.

a) *Subcritical pressure drop: downstream absolute pressure more than 50% of the absolute upstream pressure in the valve.*

b) *Supercritical pressure drop: downstream absolute pressure is equal or less than 50% of the upstream absolute pressure in the valve.*

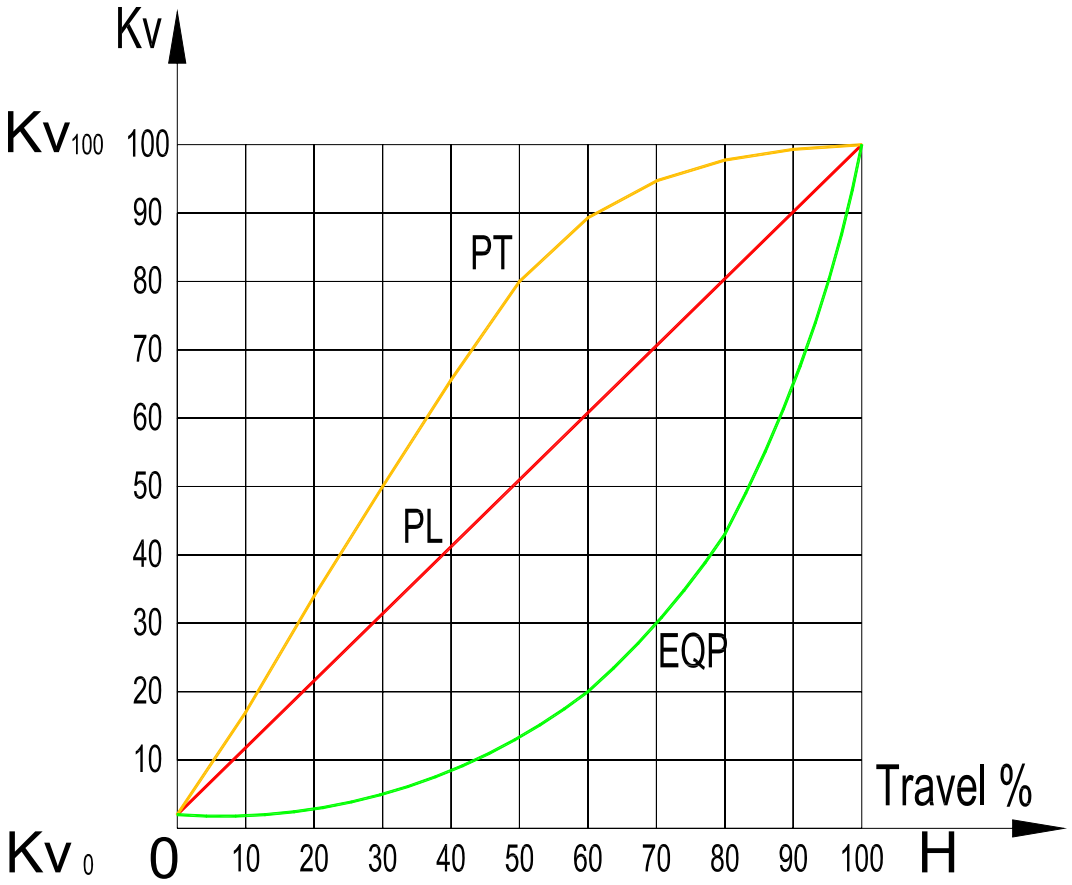
Kv	*Flow coefficient*	*m3/h*
P1	*Upstream absolute pressure*	*bar*
P2	*Downstream absolute pressure*	*bar*
Dp	*Pressure drop (P1 – P2)*	*bar*
Q1	*Flow rate*	*m3/h*
Q2	*Flow rate*	*Kgs/h*
Q3	*Flow rate*	*N.m3/h (0ºC – 1013 mbar)*
d1	*Specific weight of liquid*	*Kg/m3*
d2	*Specific weight of gas*	*Kg/m3*
T	*Absolute temperature (T=273 + t ºC)*	*ºK*
t	*Fluid temperature*	*ºC*

RECOMMENDED FLOW VELOCITIES AT THE INLET OF VALVE, FOR THE SIZING OF NOMINAL PIPE SIZE :

Liquids : 2,5 m/s ; Gases : 20m/s ; Saturated steam : 25 m/s ; Superheated steam : 50m/s

SUPERCRITICAL PRESSURE DROP
When pressure ratio is supercritical , speed of flow reaches acoustic velocity at the narrowest section causing higher level of noisiness, cavitation or flashing, the single or double perforated trim design is recommended.

INHERENT FLOW CHARACTERISTICS



PT – On-off , the flow rate changes from 0 to 100% - fully open or fully closed control.
PL – Linear , the flow capacity or Kv increases linearly with valve travel . The flow is directely proportional to the valve travel .Recommended when there are no relevant variations in differential pressure or flow rates
EQP – Equal-percentage, for equal increments of valve plug travel the change in flow rate with respect to travel may be expressed as a constant percent of the flow rate at the time of the change. At constant differential pressure, the valve travel increase of 10% usually corresponds to a flow rate increase equal to 50% of the valve flow preceding the variation. The change in flow rate observed with respect to travel will be relatively small when the valve plug is near it's seat and relatively high when the valve plug is nearly wide open. Recommended when there are wide variations in flow rate or differential pressure.

Kvs VALUES FOR ADCATROL CONTROL VALVES V25 AND V40 - STANDARD CONTOURED AND ON-OFF PLUGS

SEAT D. mm	VALVE STROKE mm	VALVE SIZES											
		DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
4	20	0,1	—	—	—	—	—	—	—	—	—	—	—
4		0,25	—	—	—	—	—	—	—	—	—	—	—
4		0,5	—	—	—	—	—	—	—	—	—	—	—
8		1	—	—	—	—	—	—	—	—	—	—	—
8		1,7	1,7	—	—	—	—	—	—	—	—	—	—
12		2,1	2,5	3	—	—	—	—	—	—	—	—	—
12		2,7	3,7	4	4,3	—	—	—	—	—	—	—	—
15		3,8	4,7	5,8	6,1	6,8	—	—	—	—	—	—	—
20			5,1	6,3	7,8	9,3	10,2	—	—	—	—	—	—
25				9,4	11,7	14,6	17,5	18,7	—	—	—	—	—
32		—	—		15,4	19,2	24	28	30,5	—	—	—	—
40		—	—	—	—	22,2	27.7	34,6	40,8	44,7	—	—	—
50			—	—	—	—	40,1	49	61	68	74,1	—	—
65	30	—	—	—	—	—	—	63,4	79,2	91	109,3	119	—
80		—	—	—	—	—	—	—	89,7	112,1	139,8	166	182
100		—	—	—	—	—	—	—	—	136,7	170,8	212,5	243
125	40 / 50	—	—	—	—	—	—	—	—	—	230,6	288,2	359,4
150		—	—	—	—	—	—	—	—	—	—	316,1	396
200	50 / 80	—	—	—	—	—	—	—	—	—	—	—	590

Kvs VALUES FOR ADCATROL CONTROL VALVES V25 AND V40 - PERFORATED PLUG

SEAT D. mm	VALVE STROKE mm	VALVE SIZES											
		DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
15	25	2,55	2,65	2,65	2,65	2,65	—	—	—	—	—	—	—
20			4,6	4,8	4,8	4,8	4,8	—	—	—	—	—	—
25				7,1	7,5	7,5	7,5	7,5	—	—	—	—	—
32	30	—	—		11,8	11,8	11,8	11,8	11,8	—	—	—	—
40		—	—	—	—	18	18	18	19	19	—	—	—
50			—	—	—	—	28	30	30	30	30	—	—
65	40	—	—	—	—	—	—	48	50	50	50	50	—
80	50	—	—	—	—	—	—	—	74	75	75	76	76
100		—	—	—	—	—	—	—	—	115	121	121	121
125	60	—	—	—	—	—	—	—	—	—	180	189	189
150	80	—	—	—	—	—	—	—	—	—	—	260	270
200		—	—	—	—	—	—	—	—	—	—	—	402

Kvs VALUES FOR ADCATROL CONTROL VALVES V25 - BALANCED PERFORATED PLUG

SEAT D. mm	VALVE STROKE mm	VALVE SIZES											
		DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
80	50	—	—	—	—	—	—	—	—	75	—	—	—
100		—	—	—	—	—	—	—	—	—	121	—	—
125	60	—	—	—	—	—	—	—	—	—		189	—
150	80	—	—	—	—	—	—	—	—	—	—	—	270

STEAM EQUIPMENT

ADCATROL – DETAILS FOR SELECTION AND SIZING

CUSTOMER: ..... OUR REF[e] .....

VALVE TYPE: ..... REG NR.: DATE: ..... / ..... / ..... PAGE: ..... / .....

	1	OPERATING CONDITIONS	SERVICE :				
	2		PIPELINE SIZE / RATING : DN ..... PN..... CLASS				
	3		FLUID :..... STATE AT THE INPUT : ☐ LIQUID ☐ STEAM ☐ GAS				
	4		VISCOSITY : cP TEMP.: °C SPECIF. WEIGHT : ☐ Kgs/dm3 ☐ Kg/Nm3				
				MIN.	STAND.	MAX.	UNIT
	5		FLOW RATE :				
	6		UPSTREAM PRESSURE ABS.(Gauge + Atmospheric press.) :				
	7		DOWNSTREAM PRESSURE ABS.(Gauge + Atmospheric press.) :				
	8		PRESSURE DROP :				
	9		AMBIENT TEMPERATURE ° C :				
	10	VALVE BODY	VALVE TYPE: ☐ 2 way ☐ Straightway ☐ Angle valve Fluid Direction: ☐ under ☐ over (the seat) ☐ 3 way ☐ Mixing AB ← A ☐ Diverging AB → A ACTION ON FAILURE: AB ← ☐ B AB → ☐ B				
	11		TAG:				
	12		SIZE / RATING: DN ..... PN..... CLASS				
	13		TYPE OF CONNECTION: ☐ Flanged ☐ EN ☐ ANSI ☐ Threaded ☐ Welded end				
	14		BODY MATERIAL:				
	15		PLUG MATERIAL: ☐ Stainless steel ☐ Soft ☐ Stellite ☐				
	16		SOFT SEAT SEAL MATERIAL: ☐ PTFE / GR ☐ PTFE ☐				
	17		PLUG CHARACTERISTICS: ☐ Equal % ☐ Linear ☐ On / Off				
	18		SEAL: ☐ Metal ☐ Soft ☐ CLASSE				
	19		SEAT MATERIAL: ☐ Stainless steel ☐ Stellite ☐				
	20		REDUCE BORE: ☐ Yes ☐ No Size				
	21		BONNET: ☐ Standard ☐ Finned ☐ Extended ☐				
	22		STUFFING BOX PACKING: ☐ Virgin PTFE ☐ PTFE / GR ☐ Pure Graphite ☐ Bellows ☐ Other Number ____				
	23	ACTUATOR	ACTUATOR REF.: ..... ☐ Pneumatic ☐ Electric ☐ Manual ☐				
	24		PNEUMATIC SIGNAL: ☐ 0,2 - 1 bar ☐ 0,4 - 1,2 bar ☐ 0,4 - 2 bar ☐ 0 - 2,5 bar ☐				
	25		ACTION ON AIR FAILURE: ☐ Closed ☐ Opened HANDWEEL: ☐ Yes ☐ No				
	26		ELECTRIC SIGNAL: ☐ 4-20 mA ☐ 0-10 V ☐ ..... INITIAL COMPRESSION ..... mm				
	27		ACTION ON CURRENT FAILURE: ☐ Closed ☐ Opened ☐ Stop				
	28		ELECTRIC SUPPLY: ☐ 230 V ☐ 24 V ☐				
	29		LIMIT SWITCHES: ☐ Open valve limit switch ☐ Close valve limit switch				
	30	POSITIONER	POSITIONER REF: ..... ☐ Pneumatic ☐ Electro - pneumatic ☐ Electric				
	32		CONTROL SIGNAL: ☐ Pneumatic ☐ Electric				
	33		CONTROL VALVE: Opened at: ..... psi/bar ..... mA .....V Closed at: ..... psi/bar ..... mA V				
	34		AIR FILTER REGULATOR: ☐ Yes ☐ No AIR SUPPLY: ..... psi / bar				
	35		SOLENOID VALVE: ☐ Yes ☐ No				

REMARKS: _____

VALSTEAM ADCA

"ADCATROL" CONTROL VALVES
General Information

TWO WAY VALVES

Application:
On/off, control of flow, pressure, temperature.

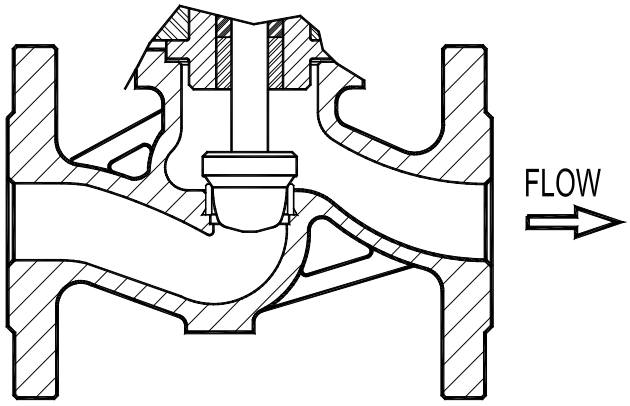


Fig.1

THREE WAY MIXING VALVES

Application:
Mixing of two streams
By-pass at heat exchangers

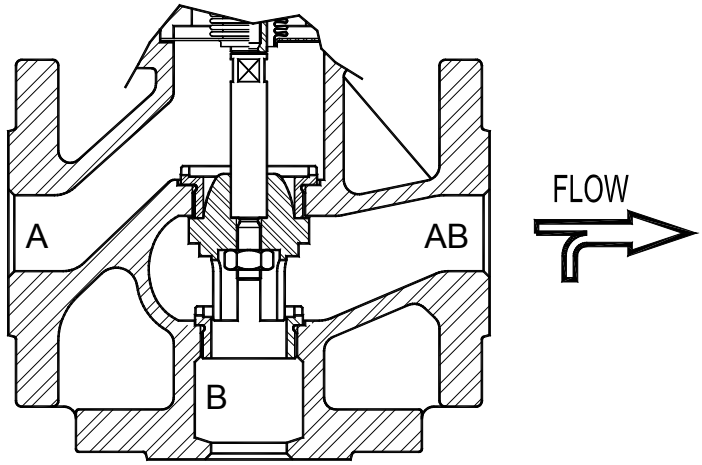


Fig.2

THREE WAY DIVERTING VALVES

Application:
Diverting of two streams
By-pass at heat exchangers *
Diverting into two different systems
(* The mixing design is recommended, see Fig.6)

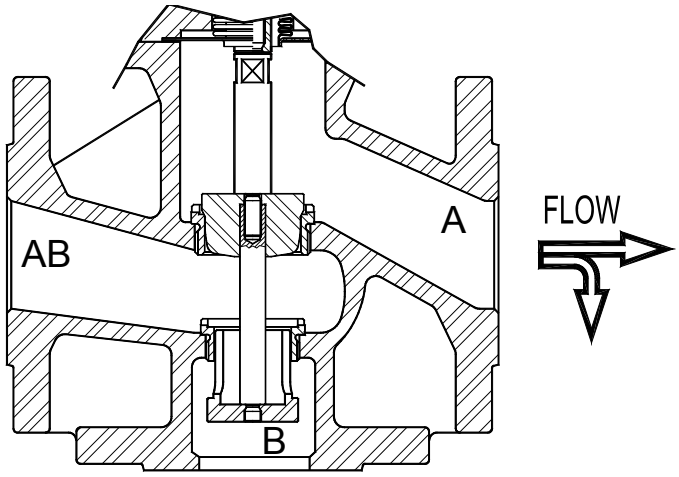


Fig.3

TYPICAL REGULATION LOOPS

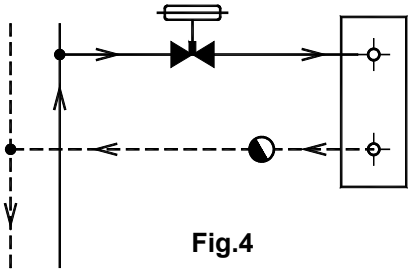


Fig.4

Two-way valve arrangement
Fluid : saturated steam

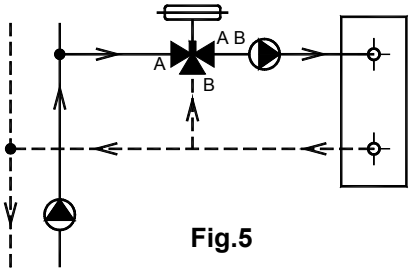


Fig.5

Three – way mixing valve arrangement
(mixing regulation)
Fluids: water, diathermic oil, …

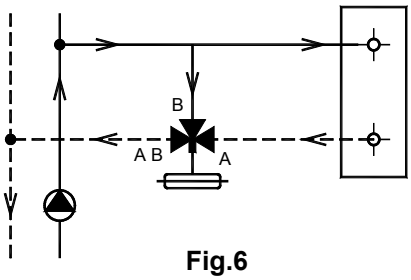


Fig.6

Three – way mixing valve arrangement
(diverting regulation)
Fluids: water, diathermic oil, …

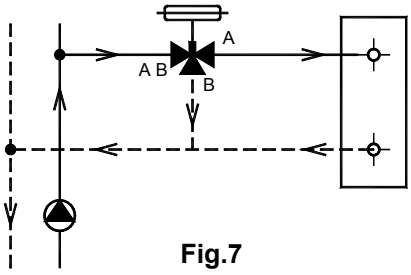


Fig.7

Three – way diverting valve arrangement
Fluids: water, diathermic oil, …

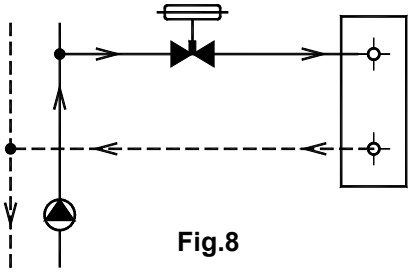
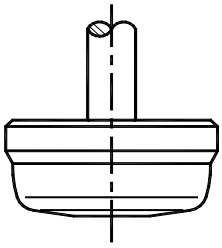


Fig.8

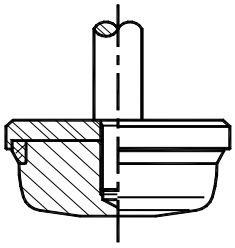
Two-way valve arrangement
Fluids: water, diathermic oil,…

ADCATROL - VALVE PLUGS



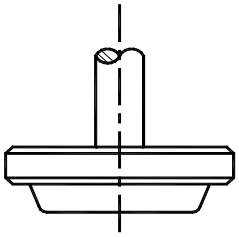
PARABOLIC PLUG (two-way valve)

Characteristic:	linear or equal percentage
Flow direction:	from below
Ratio:	30:1 to 50:1
Material:	stainless steel
Sealing:	metal to metal
Leakage:	0,005% of Kvs value
Application:	steam, water and other fluids and gases without cavitation.



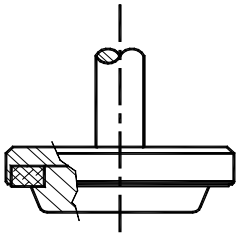
PARABOLIC PLUG (two-way valve)

Characteristic:	linear or equal percentage
Flow direction:	from below
Ratio:	30:1 to 50:1
Material:	stainless steel
Sealing:	soft sealing-PTFE/Graphite
Leakage:	rate 1, DIN 3230 Class V acc. DIN60534
Application:	steam, water and other fluids and gases up to 200ºC without cavitation.



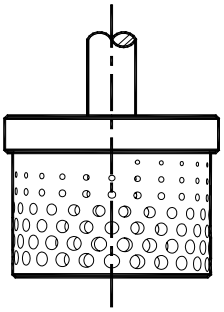
ON/OFF PLUG (two-way valve)

Characteristic:	none
Flow direction:	from below or above
Material:	stainless steel
Sealing:	metal to metal
Leakage:	rate 3 ,DIN3230
Application:	shut off of all media



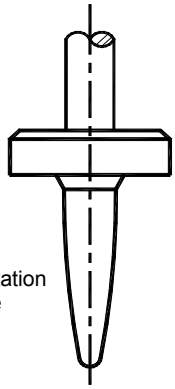
ON/OFF PLUG (two-way valve)

Characteristic:	none
Flow direction:	from below or above
Material:	stainless steel
Sealing:	soft sealing-PTFE/Graphite
Leakage:	rate 1 ,DIN3230
Application:	shut off of all media up to 200ºC



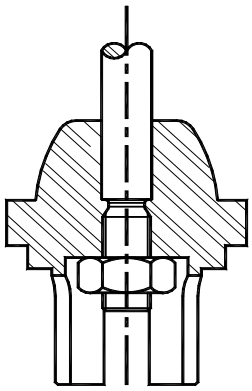
PERFORATED PLUG (two-way valve)

Characteristic:	linear or equal percentage
Flow direction:	from above
Ratio:	30:1 to 40:1
Material:	stainless steel
Sealing:	metal to metal
Leakage:	0,005% of Kvs value
Application:	steam, water and other fluids and gases.Can be use where cavitation and flashing is present and if noise reduction is required.



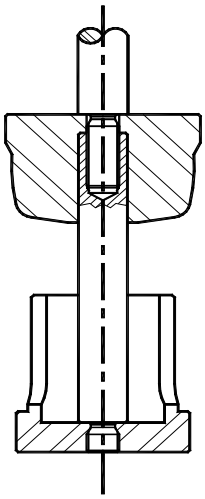
MICROFLOW PLUG (two-way valve)

Characteristic:	linear or equal percentage
Flow direction:	from below
Ratio:	50:1
Material:	stainless steel
Sealing:	metal to metal
Leakage:	0,005 of Kvs value
Application:	steam, water and other fluids and gases where extremely low flow rates are present.



MIXING PLUG (three-way valve)

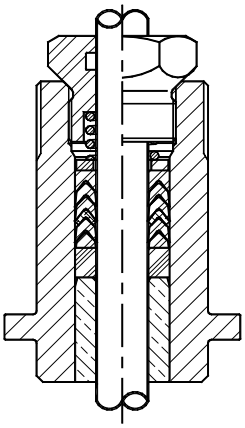
Characteristic:	linear/linear
Ratio:	30:1 to 50:1
Material:	stainless steel
Sealing:	metal to metal
Leakage:	0,005% of Kvs value
Application:	Water, diathermic oil, …



DIVERTING PLUG (three-way valve)

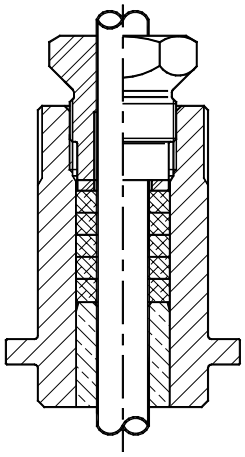
Characteristic:	linear /linear
Ratio:	30:1
Material:	stainless steel
Sealing:	metal to metal
Leakage:	0,005 of Kvs value
Application:	Water, diathermic oil,…

ADCATROL SPINDLE PACKING



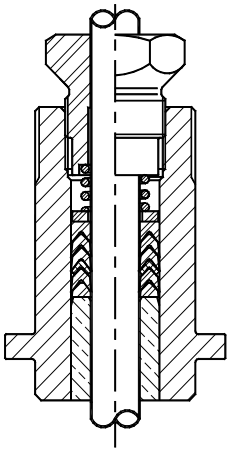
"V" RINGS WITH SPRING

Type:	V1.1
Max.pressure :	40bar
Max.temperature:	200ºC
Material:	PTFE/Graphite
Application:	Steam, water and other fluids



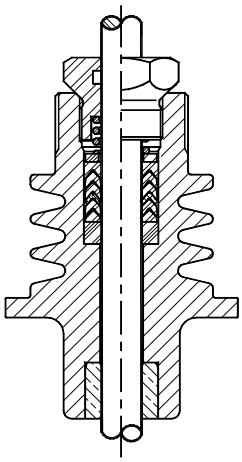
GRAPHITE

Type	G1
Max.pressure :	40bar
Max.temperature:	400ºC
Material:	Graphite
Application:	Steam, water and other fluids



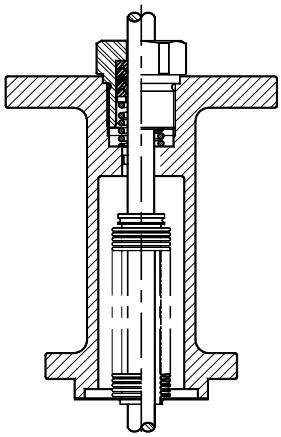
"V" RINGS WITH SPRING

Type:	V2.1
Max.pressure :	40bar
Max.temperature:	180ºC
Material:	PTFE
Application:	Steam, water and other fluids



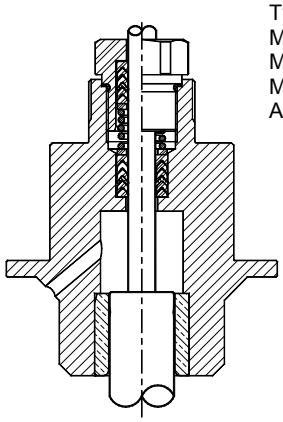
"V" RINGS W/SPRING &COOLING FINS

Type:	V1.1 and VV1.1
Max.pressure :	40bar
Max.temperature:	250ºC
Material:	PTFE/Graphite
Application:	Steam, water and other fluids



BELLOWS

Max.pressure :	25bar
Max.temperature:	400ºC
Material:	Stainless steel
Application:	Water,diathermic oil,…



"V" RINGS WITH SPRINGS

Type:	VV1.1
Max.pressure :	40bar
Max.temperature:	200ºC
Material:	PTFE/Graphite
Application:	Steam, water and other fluids

PHYSICAL PROPERTIES OF SATURATED STEAM

Pm (bar)	Pa (bar)	T (°C)	V (m^3/Kg)	he (Kcal/Kg)	he (KJ/Kg)	r (Kcal/Kg)	r (KJ/Kg)	hg (Kcal/Kg)	hg (KJ/Kg)
0,00	1,013	100,0	1,673	100,1	419,1	539,4	2258,4	639,5	2677,5
0,05	1,063	101,4	1,601	101,5	425,0	538,4	2254,2	639,9	2679,1
0,10	1,113	102,6	1,533	102,8	430,4	537,7	2251,2	640,5	2681,6
0,15	1,163	105,1	1,471	104,1	435,8	536,9	2247,9	641,0	2683,7
0,20	1,213	106,2	1,414	105,3	440,9	536,2	2245,0	641,5	2685,8
0,30	1,313	107,4	1,312	107,6	450,5	534,7	2238,7	642,3	2689,2
0,40	1,413	109,5	1,225	109,8	459,7	533,3	2232,8	643,1	2692,5
0,50	1,513	111,6	1,149	111,9	468,5	531,9	2227,0	643,8	2695,5
0,60	1,613	113,5	1,038	113,8	476,5	530,6	2221,5	644,4	2698,0
0,70	1,713	115,4	1,024	115,7	484,4	529,5	2216,9	645,2	2701,3
0,80	1,813	117,1	0,971	117,5	491,9	528,3	2211,9	645,8	2703,8
0,90	1,913	118,8	0,923	119,2	499,1	527,1	2206,9	646,3	2705,9
1,00	2,013	120,4	0,881	120,8	505,8	526,0	2202,3	646,8	2708,0
1,10	2,113	121,9	0,841	122,4	512,5	525,1	2198,5	647,5	2711,0
1,20	2,213	123,4	0,806	124,0	519,2	524,1	2194,3	648,1	2713,5
1,30	2,313	124,9	0,773	125,4	525,0	523,1	2190,1	648,5	2715,1
1,40	2,413	126,3	0,743	126,8	530,9	522,2	2186,3	649,0	2717,2
1,50	2,513	127,6	0,714	128,1	536,3	521,1	2181,7	649,2	2718,1
1,60	2,613	128,9	0,689	129,5	542,2	520,4	2178,8	649,9	2721,0
1,70	2,713	130,1	0,665	130,7	547,2	519,5	2175,0	650,2	2722,3
1,80	2,813	131,4	0,643	132,0	552,7	518,6	2171,3	650,6	2723,9
1,90	2,913	132,5	0,622	133,2	557,7	517,8	2167,9	651,0	2725,6
2,00	3,013	133,7	0,603	134,4	562,7	517,0	2164,6	651,4	2727,3
2,20	3,213	135,9	0,568	136,6	571,9	515,5	2158,3	652,1	2730,2
2,40	3,413	138,0	0,536	138,8	581,1	514,0	2152,0	652,8	2733,1
2,60	3,613	140,0	0,509	140,8	589,5	512,6	2146,2	653,4	2735,7
2,80	3,813	141,9	0,483	142,8	597,9	511,2	2140,3	654,0	2738,2
3,00	4,013	143,7	0,461	144,7	605,8	509,9	2134,8	654,6	2740,7
3,20	4,213	145,4	0,440	146,4	612,9	508,6	2129,4	655,0	2742,4
3,40	4,413	147,2	0,422	148,2	620,5	507,4	2124,4	655,6	2744,9
3,60	4,613	148,8	0,405	149,9	627,6	506,1	2118,9	656,0	2746,5
3,80	4,813	150,4	0,389	151,5	634,3	505,0	2114,3	656,5	2748,6
4,00	5,013	152,0	0,374	153,1	641,0	503,8	2109,3	656,9	2750,3
4,20	5,213	153,4	0,361	154,6	647,3	502,7	2104,7	657,3	2752,0
4,40	5,413	154,8	0,348	156,1	653,6	501,6	2100,1	657,7	2753,7
4,60	5,613	156,2	0,336	157,6	659,8	500,6	2095,9	658,2	2755,8
4,80	5,813	157,6	0,325	159,0	665,7	499,5	2091,3	658,5	2757,0
5,00	6,013	158,9	0,315	160,3	671,1	498,5	2087,1	658,8	2758,3
5,50	6,513	162,1	0,292	163,6	685,0	496,1	2077,1	659,7	2762,0
6,00	7,013	165,0	0,272	166,7	697,9	493,8	2067,4	660,5	2765,4
6,50	7,513	167,8	0,255	169,6	710,1	491,6	2058,2	661,2	2768,3
7,00	8,013	170,5	0,240	172,4	721,8	489,4	2049,0	661,8	2770,8
7,50	8,513	173,0	0,227	175,1	733,1	487,4	2040,6	662,5	2773,8
8,00	9,013	175,4	0,215	177,6	743,6	485,4	2032,3	663,0	2775,8
8,50	9,513	177,7	0,204	180,0	753,6	483,5	2024,3	663,5	2777,9
9,00	10,013	180,0	0,194	182,3	763,3	481,6	2016,4	663,9	2779,6
9,50	10,513	182,1	0,185	184,6	772,9	479,8	2008,8	664,4	2781,7
10,00	11,013	184,1	0,177	186,8	782,1	478,0	2001,3	664,8	2783,4
11,00	12,013	188,0	0,163	190,9	799,3	474,6	1987,1	665,5	2786,3
12,00	13,013	191,7	0,151	194,8	815,6	471,4	1973,7	666,2	2789,2
13,00	14,013	195,1	0,141	198,5	831,1	468,3	1960,7	666,8	2791,8
14,00	15,013	198,3	0,132	202,0	845,7	465,3	1948,1	667,3	2793,9
15,00	16,013	201,4	0,124	205,3	859,6	462,5	1936,4	667,8	2795,9
16,00	17,013	204,4	0,117	208,5	872,9	459,7	1924,7	668,2	2797,6
17,00	18,013	207,2	0,110	211,5	885,5	457,0	1913,4	668,5	2798,9
18,00	19,013	209,9	0,105	214,4	897,8	454,4	1902,5	668,8	2800,1
19,00	20,013	212,5	0,100	217,2	909,4	451,8	1891,6	669,0	2801,0
20,00	21,013	215,0	0,095	220,0	921,1	449,4	1881,5	669,4	2802,6
21,00	22,013	217,3	0,090	222,6	932,0	447,0	1871,5	669,6	2803,5
22,00	23,013	219,6	0,087	225,1	942,4	444,6	1861,5	669,7	2803,9
23,00	24,013	221,8	0,083	227,6	952,9	442,2	1851,4	669,8	2804,3
24,00	25,013	224,0	0,080	230,0	963,0	440,0	1842,2	670,0	2805,2
25,00	26,013	226,1	0,077	232,3	972,6	437,7	1832,6	670,0	2805,2

MASS FLOWRATES OF SATURATED STEAM FOR DIFFERENT VELOCITIES IN PIPES DIN2448 - STANDARD

Pm bar	v m/s	FLOWRATE Kgs / h													
		DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200	DN 250	DN 300
0.4	15	10	17	28	48	64	103	171	236	397	600	878	1476	2346	3319
	25	17	29	47	80	107	171	285	393	662	1000	1464	2459	3911	5532
	40	28	46	75	128	171	274	456	628	1058	1601	2342	3935	6257	8851
0.6	15	12	20	33	56	76	121	202	278	468	708	1036	1741	2769	3917
	25	20	34	55	94	126	202	336	463	781	1181	1727	2902	4615	6528
	40	33	54	89	151	202	324	538	741	1249	1889	2764	4644	7384	10445
0.8	15	13	22	35	60	81	130	216	297	501	757	1108	1862	2960	4187
	25	22	36	59	101	135	216	360	495	835	1262	1846	3103	4934	6979
	40	35	58	95	161	216	346	575	792	1335	2019	2954	4964	7894	11166
1	15	14	24	39	67	89	143	238	327	552	835	1221	2052	3263	4615
	25	24	40	65	111	149	238	396	546	920	1391	2035	3420	5438	7692
	40	38	64	104	178	238	381	634	873	1472	2226	3256	5471	8700	12307
1.5	15	18	29	48	82	110	176	293	404	681	1030	1507	2532	4026	5694
	25	30	49	80	137	184	294	489	673	1135	1716	2511	4219	6710	9491
	40	47	79	129	219	294	470	783	1078/	1816	2746	4018	6751	10735	15185
2	15	21	35	57	97	131	209	347	478	806	1219	1784	2998	4767	6743
	25	35	58	95	162	218	348	579	797	1344	2032	2973	4996	7945	11238
	40	56	93	152	259	348	557	927	1276	2150	3252	4757	7994	12711	17980
2.5	15	24	40	66	112	151	241	401	553	931	1409	2061	3463	5506	7789
	25	41	67	110	187	251	402	669	921	1552	2348	3435	5771	9177	12982
	40	65	108	176	300	402	643	1070	1474	2484	3756	5495	9234	14684	20770
3	15	28	46	75	127	171	273	454	626	1055	1595	2333	3921	6235	8820
	25	46	76	125	212	285	455	757	1043	1758	2658	3889	6535	10392	14699
	40	73	122	199	339	455	728	1212	1669	2813	4253	6223	10456	16627	23519
4	15	34	56	92	157	211	337	560	771	1300	1966	2876	4833	7685	10871
	25	57	94	154	261	351	561	934	1286	2167	3277	4794	8055	12809	18119
	40	90	150	246	418	561	898	1494	2057	3467	5243	7670	12888	20495	28990
5	15	40	67	109	186	250	400	665	916	1544	2334	3415	5738	9125	12907
	25	67	111	182	310	417	666	1109	1527	2573	3890	5692	9564	15208	21512
	40	107	178	292	496	667	1066	1774	2443	4116	6224	9107	15302	24333	34420
6	15	47	77	127	216	289	463	770	1061	1788	2703	3955	6646	10568	14948
	25	78	129	211	359	482	772	1284	1768	2979	4505	6592	11076	17613	24913
	40	124	206	338	575	772	1235	2054	2829	4767	7208	10546	17722	28180	39861
7	15	53	88	144	244	328	525	873	1202	2026	3064	4482	7532	11977	16941
	25	88	146	239	407	547	875	1455	2004	3377	5106	7470	12553	19961	28235
	40	141	234	383	652	875	1399	2328	3206	5402	8170	11953	20084	31937	45176
8	15	59	98	160	273	366	586	975	1342	2261	3420	5003	8407	13369	18911
	25	98	163	267	455	610	976	1624	2237	3769	5700	8339	14012	22282	31518
	40	157	261	427	727	977	1562	2599	3579	6031	9120	13342	22420	35651	50429
9	15	65	109	178	302	406	649	1080	1487	2506	3790	5545	9318	14816	20958
	25	109	181	296	504	676	1082	1800	2479	4177	6317	9242	15529	24694	34930
	40	174	289	474	806	1082	1731	2880	3966	6683	10107	14787	24847	39510	55888
10	15	72	119	195	331	445	711	1184	1630	2747	4154	6078	10212	16239	22971
	25	119	198	324	552	741	1186	1973	2717	4578/	6923	10129	17021	27066	38285
	40	191	317	519	884	1186	1897	3157	4347	7325	11077	16207	27233	43305	61255
12	15	84	139	228	388	521	834	1388	1911	3220	4869	7124	11971	19036	26926
	25	140	232	380	647	869	1390	2313	3185	5367	8115	11873	19951	31726	44877
	40	224	372	608	1036	1390	2224	3700	5095	8587	12985	18998	31922	50761	71803
14	15	96	160	261	444	596	954	1587	2186	3683	5570	8150	13694	21776	30802
	25	160	266	435	740	994	1590	2645	3643	6139	9284	13583	22823	36293	51336
	40	256	425	696	1185	1591	2544	4233	5829	9823	14854	21732	36517	58068	82138
16	15	108	180	294	501	673	1076	1791	2466	4156	6284	9194	15450	24567	34751
	25	181	300	491	835	1122	1794	2985	4110	6926	10474	15324	25749	40945	57918
	40	289	480	785	1337	1794	2870	4775	6576	11082	16758	24518	41199	65513	92668
18	15	121	201	328	559	750	1199	1995	2748	4631	7003	10245	17215	27375	38722
	25	201	334	547	931	1250	1999	3326	4580	7718	11671	17075	28692	45625	64537
	40	322	535	875	1489	2000	3198	5321	7328	12348	18673	27320	45907	73000	103259
20	15	134	222	363	617	829	1326	2205	3037	5118	7740	11324	19027	30256	42798
	25	223	369	604	1029	1381	2209	3676	5062	8530	12899	18873	31712	50427	71330
	40	356	591	967	1646	2210	3535	5881	8099	13648	20639	30196	50740	80684	114128