Kv values

When calculating and dimensioning pipe systems, the following values or formulas for valve resistance must be used. In calculating work, they provide the actual capacity of the valve since the pressure drop is based on measurements (see SMS 1000) at the feed outlet at such a distance from the valve that turbulence inside the valve itself does not influence the values.

Kv values for various presettings

Turns \ Size	10	15	20	25	32	40	50
0.5	—	0.20	0.5	0.6	1.1	1.6	2.6
1	0.09	0.38	0.8	0.9	1.9	2.8	4.2
1.5	0.16	0.57	1.2	1.8	3.1	4.5	6.9
2	0.35	1.05	1.9	3.3	4.5	6.1	11.6
2.5	0.64	1.9	2.8	5.4	7.1	9.3	16.6
3	1.14	3.0	3.8	6.9	9.6	13.0	22.6
3.5	1.78	3.7	4.7	8.2	11.9	17.2	28
4	2.0	4.0	5.7	8.7	13.9	20	32

Note! Graphs on the next page.

FORMULAS (For computer use only)

$Kv = A + B\ turns + C\ turns^2 + D\ turns^3 + E\ turns^4 + F\ turns^5$

Coeff. \ Size	10	15	20	25	32	40	50
A	0.00668	−0.03431	−0.02093	−0.03350	−0.05099	−0.05992	−0.04415
B	−0.01598	1.05705	1.65360	2.40131	3.66344	4.38643	7.57468
C	0.31401	−1.46590	−1.80589	−3.79416	−3.65238	−2.64276	−7.51568
D	−0.32904	0.92511	1.22866	3.07745	2.42248	1.14152	5.41771
E	0.14644	−0.17303	−0.29990	−0.81872	−0.53524	−0.00115	−1.25357
F	−0.01893	0.00817	0.02552	0.07077	0.03875	−0.02744	0.09390

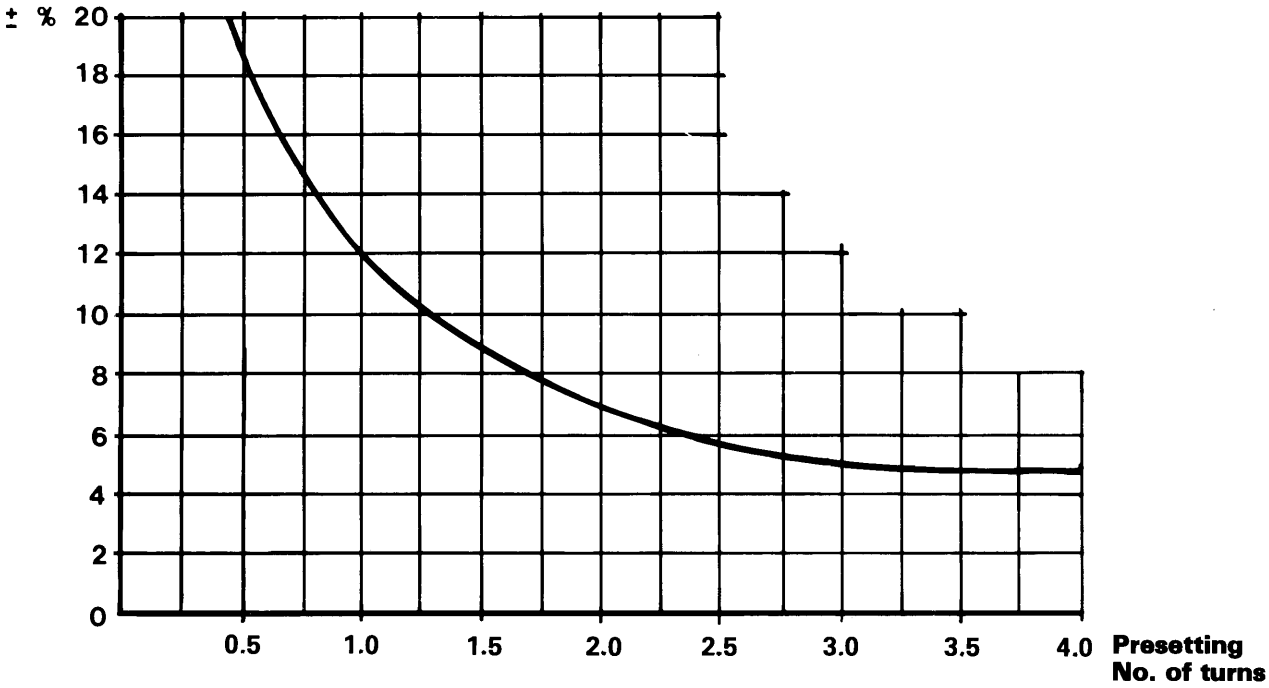
$Kv\ max \cong \frac{1}{590} \bullet (d+10)^{2,4}$ d = valve size in mm (10, 15, 20 etc.)

Measuring accuracy

A valve that operates with a high level of flow capacity naturally has a large cross-section area when fully open. TA works with high tolerance demands with respect to valve seat and cone diameters. The level of accuracy is highest when the valve is open. The smaller the opening at which the valve is set, the greater the part played by manufacturing tolerances since the variation in measurement is then considerably more from the viewpoint of percentage.

As a result of extensive measurements carried out in our laboratory, it has been possible to determine the following anticipated maximum deviation in any installation:

Deviation concerning flow with different presettings



Correction factors for different liquids

For liquids other than water at +20°C, the pressure drop concerned can be obtained from the TA diagram after correction of ΔP with a factor equal to the weight per unit volume in tons/m³.

Example

Known flow: Increase the pressure drop read off in the diagram by 10 % if the weight per unit volume is 1.1 tons/m³.

Known pressure drop: Decrease pressure drop by 10 % if weight per unit volume is 1.1 tons/m³, read off the flow in the diagram with this pressure drop.

The above-mentioned applies to liquids that have on the whole the same viscosity ($\leq$ 20 cSt = 3°E = 100 S.U.) as water, that is to say most water/glycol mixtures and water/brine solutions.

Björsell, Borås

PRESSURE DROP DIAGRAM STA-D

This graph shows the pressure drop over the pressure test points of the valve.

The capacity lines represent mean value on valves produced. The measuring has been carried out with water at a temperature of 20°C.

Measurement for noise levels carried out according to ISO 3822/I. The lines refer to fully open valve (4 turns). The pressure drop for the specified noise levels can be increased 1.5 times if the valve is set on 2.5 turns or less without the specified noise levels being exceeded.