

HydroControl M

Fixed Orifice Double Regulating Valve PN 25 DN 15...50



Double regulating valve for static hydronic balancing of pipe networks in closed heating and cooling systems. It offers a measuring function via a fixed orifice metering station, which allows simultaneous measurement and setting.

The HydroControl V consists of a flow optimised Y-pattern body, a valve insert with low pitch, double O-ring sealing, ergonomically designed handwheel, sophisticatedly cone shaped plug, a fixed orifice metering station as well as two HydroPort auxiliary valves. All functions are accessible from the top.

Functions

- Flow regulation with reproducible, blockable and lead sealable presetting
- Shutoff
- Flow measurement connection
- Impulse tube connection
- Draining, filling and venting the system section upstream or downstream of the valve I

Features

- + Fixed orifice metering station allows simultaneous measurement and setting
- + All functions always included for easy selection
- + New HydroPort auxiliary valves for easy, quick and safe connection of accessories

Technical data

Nominal sizes	DN 15 to DN 50
Variants	With internal thread according to EN 10226
Operating temperature	-20 to 150 °C
Operating pressure	Max. 25 bar / PN 25
Medium	Heating or cooling water according to VDI 2035 or ONORM 5195 Water-glycol mixtures with max. 50 % glycol content
Kvs values	0.19 to 35

Product Details

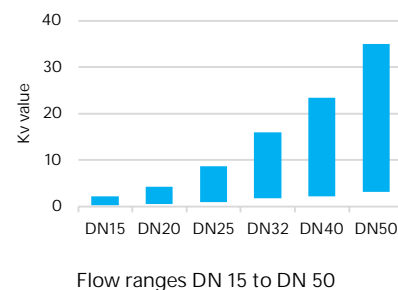
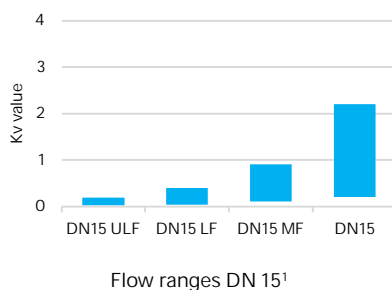
Functions

Flow regulation

The flow is regulated by limiting the stroke of the valve plug and thus reducing the opening between the valve plug and the valve seat. The low thread pitch allows very precise setting. The plug position is shown on the front of the handwheel on a scale from 0.0 (closed) to 5.0 (fully open) in increments of 0.05. This value is the presetting.

The HydroControl M has a linear characteristic line and a wide flow range evenly graded over all nominal sizes. For nominal size DN 15, variants with reduced flow are available to be able to regulate even the smallest volume flows precisely.

As is typical for regulating valves, the control quality decreases, the smaller the opening is between plug and seat. Therefore, a presetting below 0.5 should be avoided with the HydroControl M.



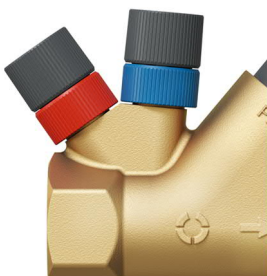
Presetting

- Reproducible: when the valve is closed, e.g. to shut off the pipeline, it can only be opened to the set presetting value
- Blockable: the valve is blocked at the presetting position
- Lead-sealable: the valve can be additionally lead sealed, e.g. with sealing wire (item no. 1089091)

Shutoff

Turning the handwheel clockwise until it stops shuts off the pipeline tightly.

HydroPort



Each HydroControl V is equipped with two HydroPort auxiliary valves as standard. The HydroPort allows snap-on connection of accessories. HydroPort valves are opened by a short turn. A quarter turn is sufficient to measure the pressure, a full turn is sufficient to drain and fill.

FILLING, DRAINING AND VENTING

Filling, draining and venting is done with the HydroPort adapter (item no. 1069601). When the main valve is in the shut-off position, the system section upstream or downstream of the valve can be selectively filled or drained.

¹ ULF = Ultra Low Flow, LF = Low Flow, MF = Medium Flow

IMPULSLEITUNGSANSCHLUSS

The HydroPort enables a quick, safe and secure connection of the impulse tube of a HydroControl D differential pressure regulator. Impulse tubes of other differential pressure regulators can be connected with the HydroPort adapter and suitable connection pieces.

CONNECTION OF AN OV-DMC 3

The measuring hoses of an OV-DMC 3 measuring device can be connected directly to the HydroPort.

Measurement

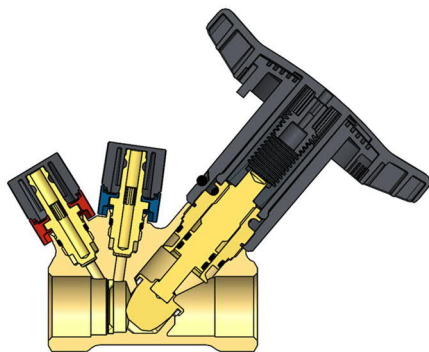
The fixed orifice metering station of the HydroControl M allow simultaneous measurement and setting. This means that the valve can be set in real time based on the flow value displayed on the measuring device. The fixed orifice metering station has its own Kv value that must be used for measurements. The measurement Kv value is different from the valve Kv value and may only be used for measurements on the valve. For pressure loss calculation and sizing, the valve Kv value must be used, which can be found in the section "Sizing" from page 6.

MEASUREMENT KV VALUES

DN 15 ULF	DN 15 LF	DN 15 MF	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
0.29	0.62	1.28	2.74	5.51	10.7	22.8	35.6	54.8

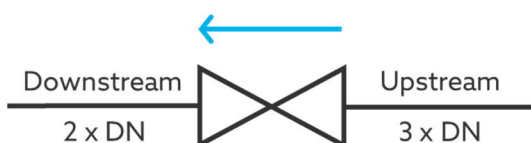
The measurement Kv values are already stored in the OV-DMC 3 measuring system.

Design and Materials



Position	Material
Handwheel assembly	Polyamide plastic PA6
Body	Dezincification resistant brass CW602
Bonnet	Dezincification resistant brass CW602
Bonnet seal	EPDM O-ring
Spindle	Dezincification resistant brass CW602
Spindle seal	Double EPDM O-ring
Plug	Dezincification resistant brass CW602
Seat seal	PTFE
HydroPort valve	Dezincification resistant brass CW602
HydroPort seal	EPDM O-ring
Protection caps	Polyamide plastic PA6

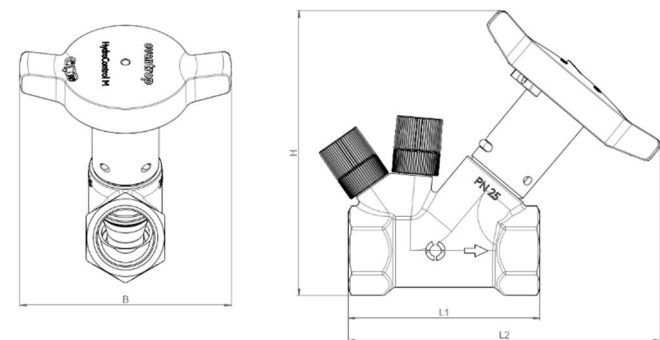
Installation



Calming sections of 3 x DN upstream and 2 x DN downstream of the HydroControl M should be provided. The valve must be installed correctly in the flow direction which is indicated by an arrow on the body.

Dimensions

DN	Connection	B [mm]	L1 [mm]	L2 [mm]	H [mm]	Weight [kg]
15	Rp ½	109	76	147	131	0.6
20	Rp ¾	109	84	152	136	0.7
25	Rp 1	109	99	161	147	1.0
32	Rp 1 ¼	109	119	176	157	1.4
40	Rp 1 ½	109	127	180	164	1.8
50	Rp 2	109	159	199	184	3.1



Item numbers

DN	Connection size	Kvs	Measurement Kv	Item no.
15 ULF	Rp ½	0.19	0.29	1065844
15 LF	Rp ½	0.4	0.62	1065834
15 MF	Rp ½	0.9	1.28	1065824
15	Rp ½	2.2	2.74	1065804
20	Rp ¾	4.3	5.51	1065806
25	Rp 1	8.6	10.7	1065808
32	Rp 1 ¼	15.9	22.8	1065810
40	Rp 1 ½	23.4	35.6	1065812
50	Rp 2	35.0	54.8	1065816

Accessories

HydroPort adapter



With external thread G 3/4.
For connecting accessories to HydroPort auxiliary valves. Also suitable for permanent connection, e.g. for impulse tubes of third-party controllers. This adapter is not required for connecting the impulse tube of the HydroControl D.

Suitable for	Item no.
All nominal sizes	1069601

HydroPort extensions (2-fold)



For extending HydroPort auxiliary valves on insulated valves. For permanent attachment to the valve. 2 each with red and blue marking.

Length	Suitable for	Item no.
L=40 mm	All nominal sizes	1069602
L=80 mm	All nominal sizes	1069603

Wire seal kit



10-fold, consisting of seal and sealing wire

Suitable for	Item no.
All nominal sizes	1089091

Insulation shells



Only for heating systems. Meets the requirements of Appendix 8 to sections 69 and 71 (1), line ee) of the German Building Energy Act (GEG). Building material class B2 according to DIN 4102 and EN 13501-1.
Operating temperature up to 110 °C.

Suitable for	Item no.
DN 15	1069610
DN 20	1069611
DN 25	1069612
DN 32	1069613
DN 40	1069614
DN 50	1069615

Sizing

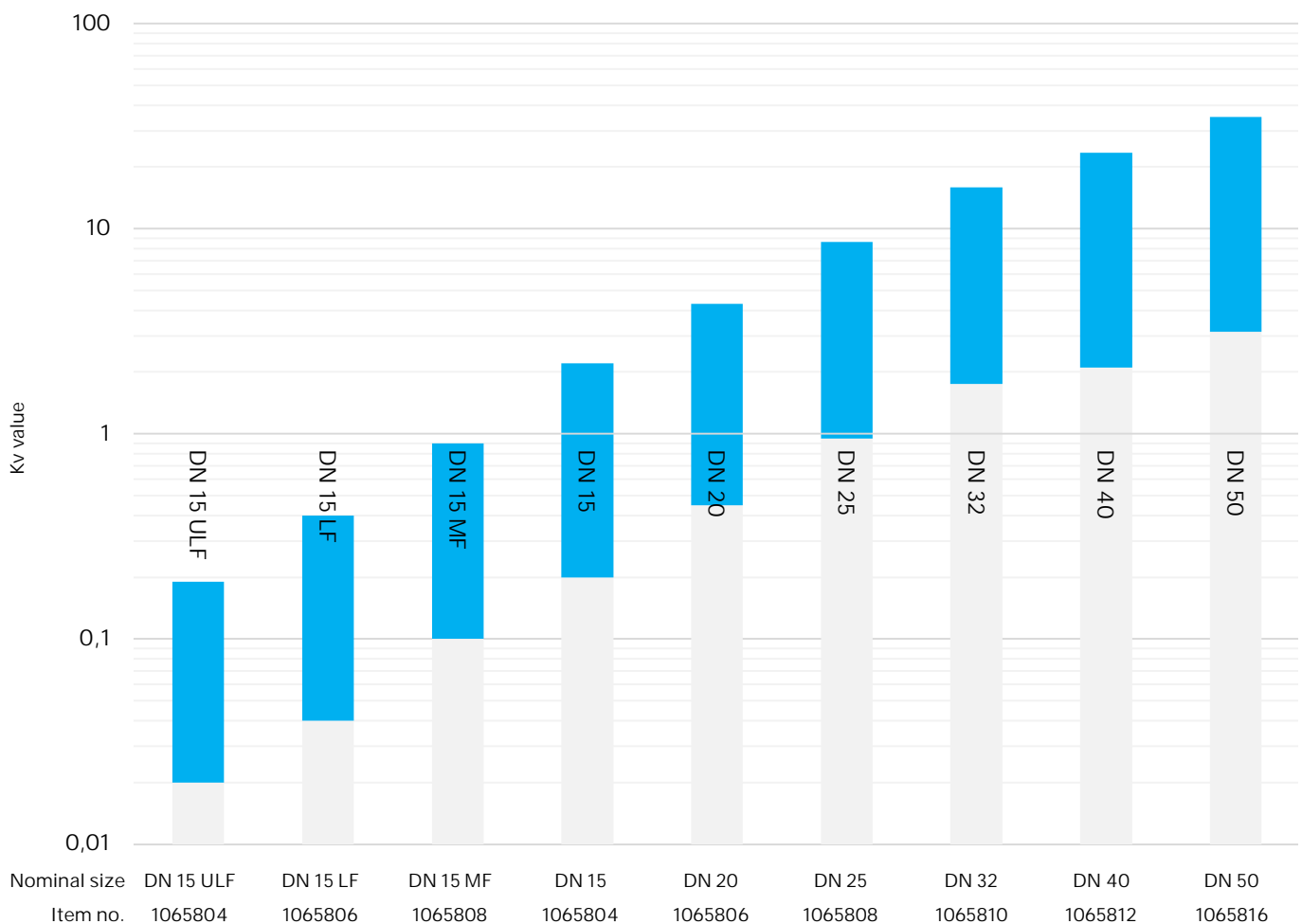
This Product Data sheet offers various options to size the HydroControl M:

- Use the alignment chart below for a quick sizing across all nominal sizes
- Use the Kv value table and the flow charts on the following pages for an accurate determination of the presetting value
- At the end of the data sheet you will find information on the exact Kv value calculation taking into account the medium temperature. Furthermore, you will find information on the approximate calculation of corrected flow values when using glycol mixtures

Alignment chart

The alignment chart enables a quick determination of suitable valves. The Y-axis is the Kv value. To improve readability, it is logarithmic. To determine suitable valves, find the scale value on the Y-axis and draw a horizontal line to the right. If there is an overlap with the blue flow range, the valve is suitable.

The item number of the desired variant can be read directly from the table below:

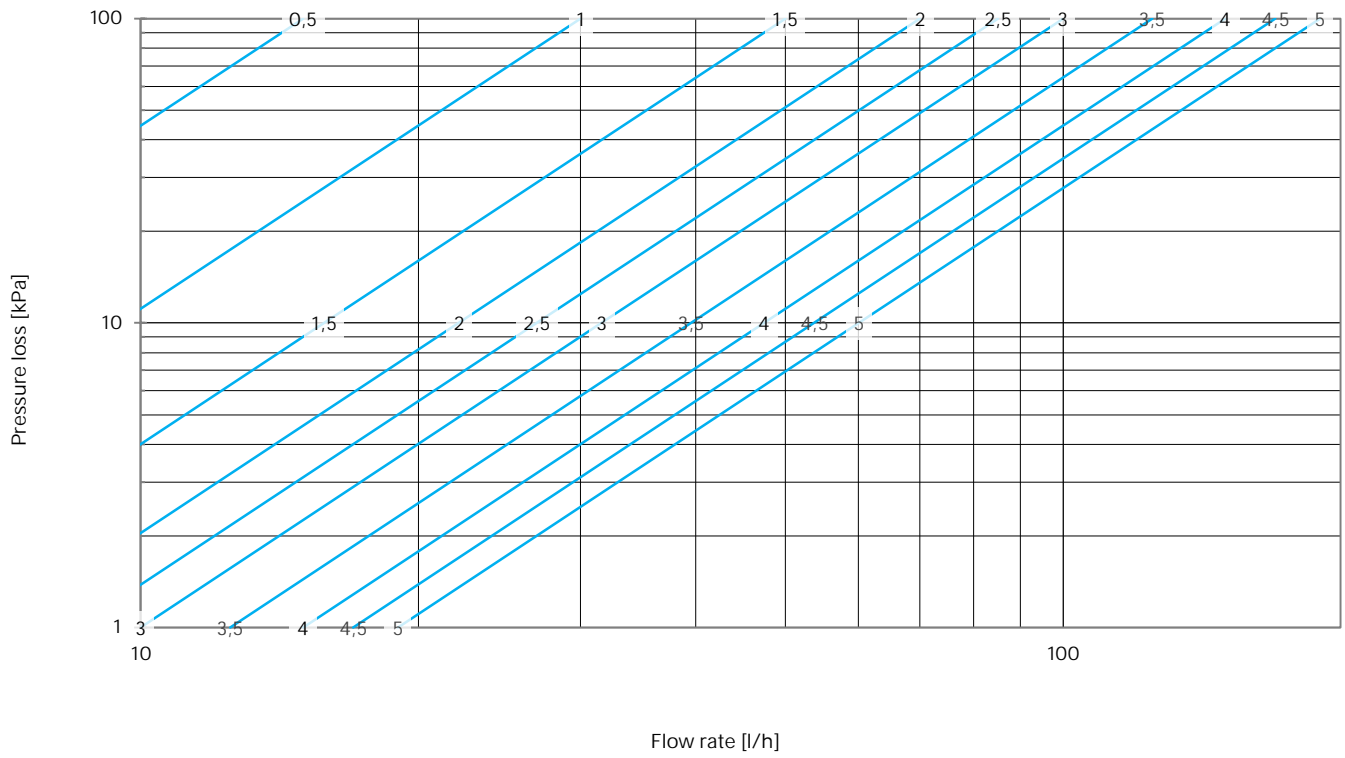


Kv values

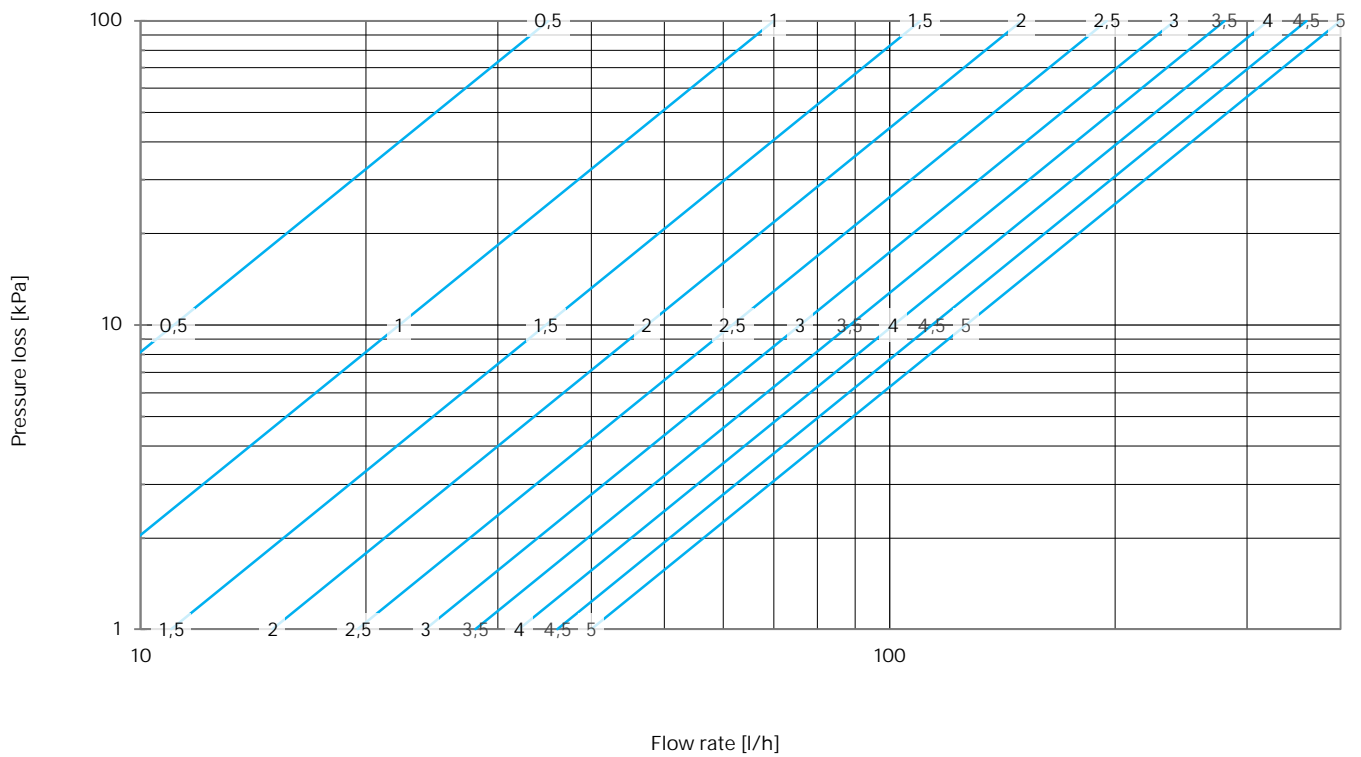
V	DN 15 ULF	DN 15 LF	DN 15 MF	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
0.0	0				0	0	0	0	0
0.1	0.003	0.007	0.02	0.04	0.09	0.19	0.35	0.42	0.63
0.2	0.006	0.014	0.04	0.08	0.18	0.38	0.70	0.84	1.26
0.3	0.009	0.021	0.06	0.12	0.27	0.57	1.05	1.26	1.89
0.4	0.012	0.028	0.08	0.16	0.36	0.76	1.40	1.68	2.52
0.5	0.015	0.035	0.10	0.20	0.45	0.95	1.75	2.10	3.15
0.6	0.018	0.042	0.11	0.24	0.54	1.14	2.10	2.52	3.78
0.7	0.021	0.049	0.13	0.28	0.63	1.33	2.45	2.94	4.41
0.8	0.024	0.056	0.15	0.32	0.72	1.52	2.80	3.36	5.04
0.9	0.027	0.063	0.17	0.36	0.81	1.71	3.15	3.78	5.67
1.0	0.03	0.07	0.19	0.4	0.9	1.9	3.5	4.2	6.3
1.1	0.034	0.078	0.21	0.45	0.98	2.05	3.77	4.66	6.87
1.2	0.038	0.086	0.23	0.50	1.06	2.20	4.04	5.12	7.44
1.3	0.042	0.094	0.25	0.55	1.14	2.35	4.31	5.58	8.01
1.4	0.046	0.102	0.27	0.60	1.22	2.50	4.58	6.04	8.58
1.5	0.050	0.110	0.29	0.65	1.30	2.65	4.85	6.50	9.15
1.6	0.054	0.118	0.30	0.70	1.38	2.80	5.12	6.96	9.72
1.7	0.058	0.126	0.32	0.75	1.46	2.95	5.39	7.42	10.29
1.8	0.062	0.134	0.34	0.80	1.54	3.10	5.66	7.88	10.86
1.9	0.066	0.142	0.36	0.85	1.62	3.25	5.93	8.34	11.43
2.0	0.07	0.15	0.38	0.9	1.7	3.4	6.2	8.8	12.0
2.1	0.073	0.159	0.40	0.94	1.79	3.58	6.50	9.25	12.63
2.2	0.076	0.168	0.41	0.98	1.88	3.76	6.80	9.70	13.26
2.3	0.079	0.177	0.43	1.02	1.97	3.94	7.10	10.15	13.89
2.4	0.082	0.186	0.45	1.06	2.06	4.12	7.40	10.60	14.52
2.5	0.085	0.195	0.47	1.10	2.15	4.30	7.70	11.05	15.15
2.6	0.088	0.204	0.48	1.14	2.24	4.48	8.00	11.50	15.78
2.7	0.091	0.213	0.50	1.18	2.33	4.66	8.30	11.95	16.41
2.8	0.094	0.222	0.52	1.22	2.42	4.84	8.60	12.40	17.04
2.9	0.097	0.231	0.53	1.26	2.51	5.02	8.90	12.85	17.67
3.0	0.10	0.24	0.55	1.3	2.6	5.2	9.2	13.3	18.3
3.1	0.105	0.248	0.57	1.35	2.71	5.36	9.56	13.82	19.05
3.2	0.110	0.256	0.59	1.40	2.82	5.52	9.92	14.34	19.80
3.3	0.115	0.264	0.61	1.45	2.93	5.68	10.28	14.86	20.55
3.4	0.120	0.272	0.63	1.50	3.04	5.84	10.64	15.38	21.30
3.5	0.125	0.280	0.65	1.55	3.15	6.00	11.00	15.90	22.05
3.6	0.130	0.288	0.66	1.60	3.26	6.16	11.36	16.42	22.80
3.7	0.135	0.296	0.68	1.65	3.37	6.32	11.72	16.94	23.55
3.8	0.140	0.304	0.70	1.70	3.48	6.48	12.08	17.46	24.30
3.9	0.145	0.312	0.72	1.75	3.59	6.64	12.44	17.98	25.05
4.0	0.15	0.32	0.74	1.8	3.7	6.8	12.8	18.5	25.8
4.1	0.154	0.328	0.76	1.84	3.76	6.98	13.11	18.99	26.72
4.2	0.158	0.336	0.77	1.88	3.82	7.16	13.42	19.48	27.64
4.3	0.162	0.344	0.79	1.92	3.88	7.34	13.73	19.97	28.56
4.4	0.166	0.352	0.80	1.96	3.94	7.52	14.04	20.46	29.48
4.5	0.170	0.360	0.82	2.00	4.00	7.70	14.35	20.95	30.40
4.6	0.174	0.368	0.84	2.04	4.06	7.88	14.66	21.44	31.32
4.7	0.178	0.376	0.85	2.08	4.12	8.06	14.97	21.93	32.24
4.8	0.182	0.384	0.87	2.12	4.18	8.24	15.28	22.42	33.16
4.9	0.186	0.392	0.88	2.16	4.24	8.42	15.59	22.91	34.08
5.0 (Kvs)	0.19	0.40	0.90	2.2	4.3	8.6	15.9	23.4	35.0

Flow charts

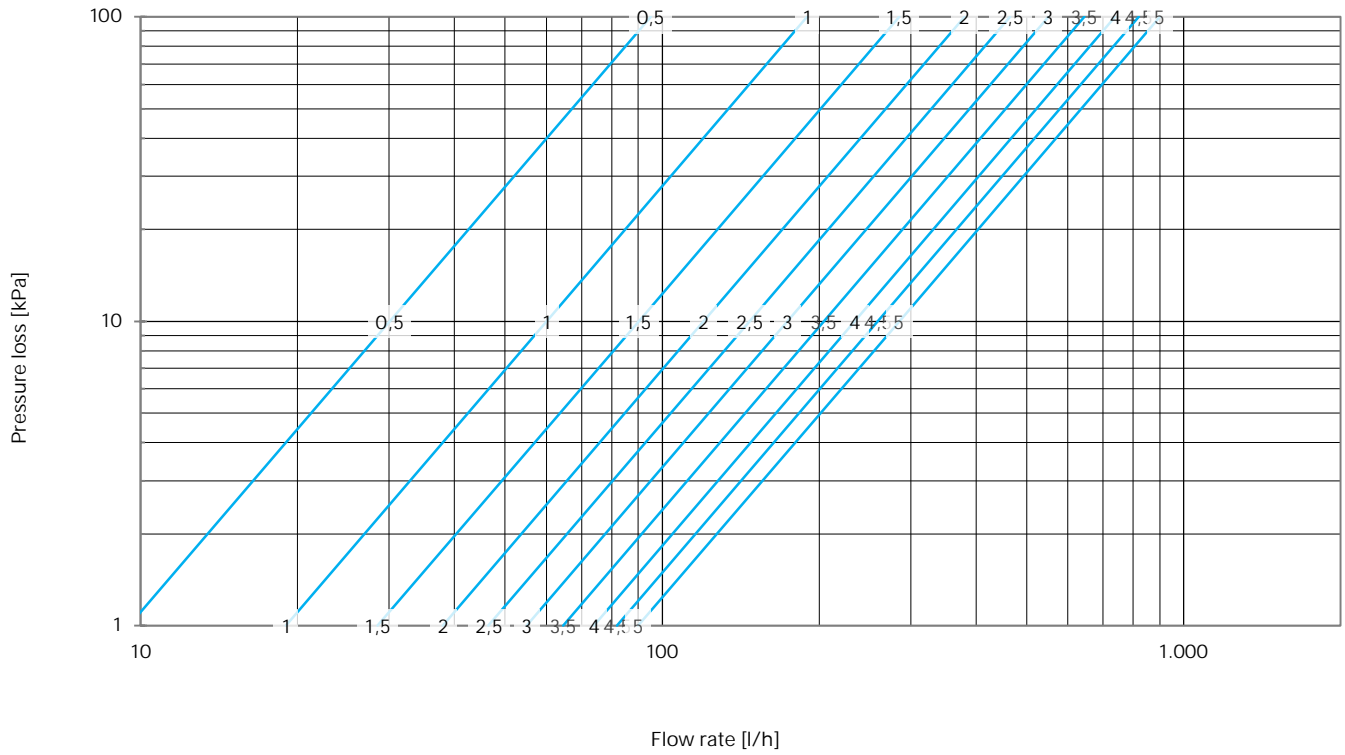
DN 15 ULF



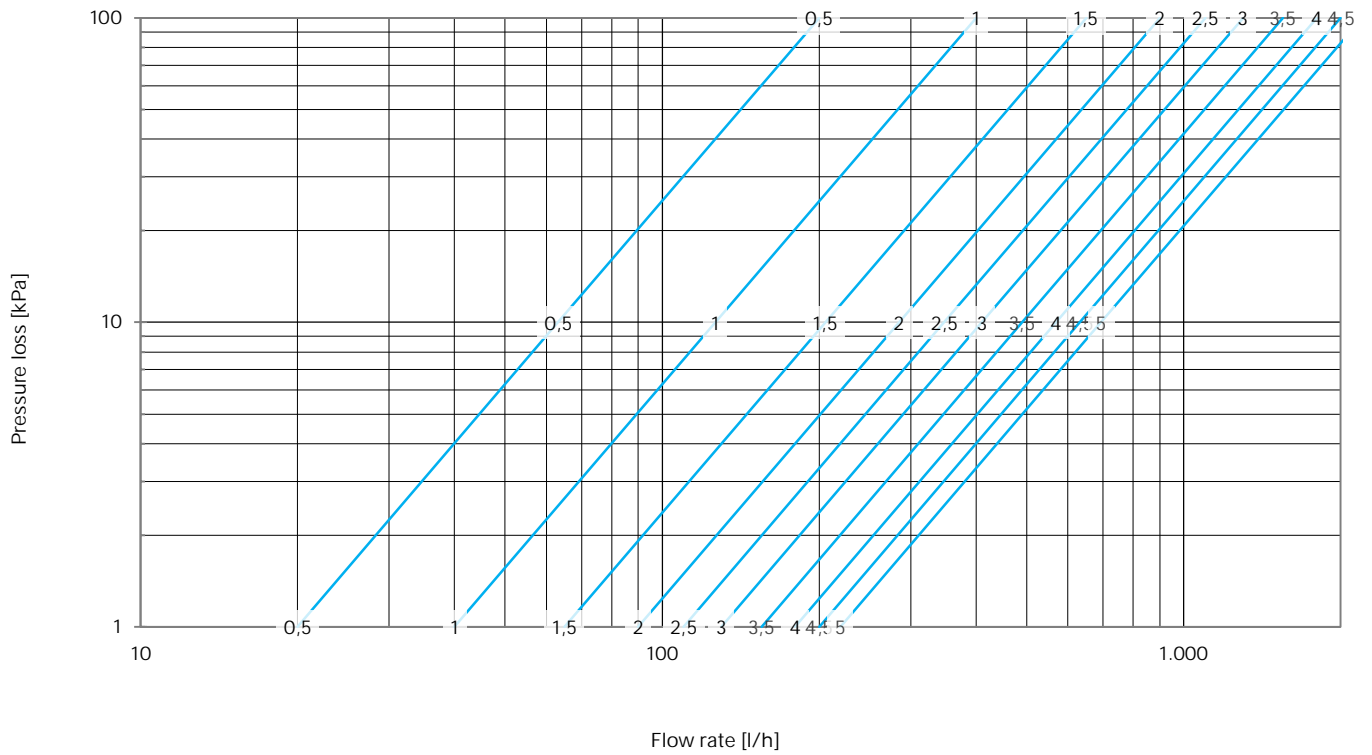
DN 15 LF



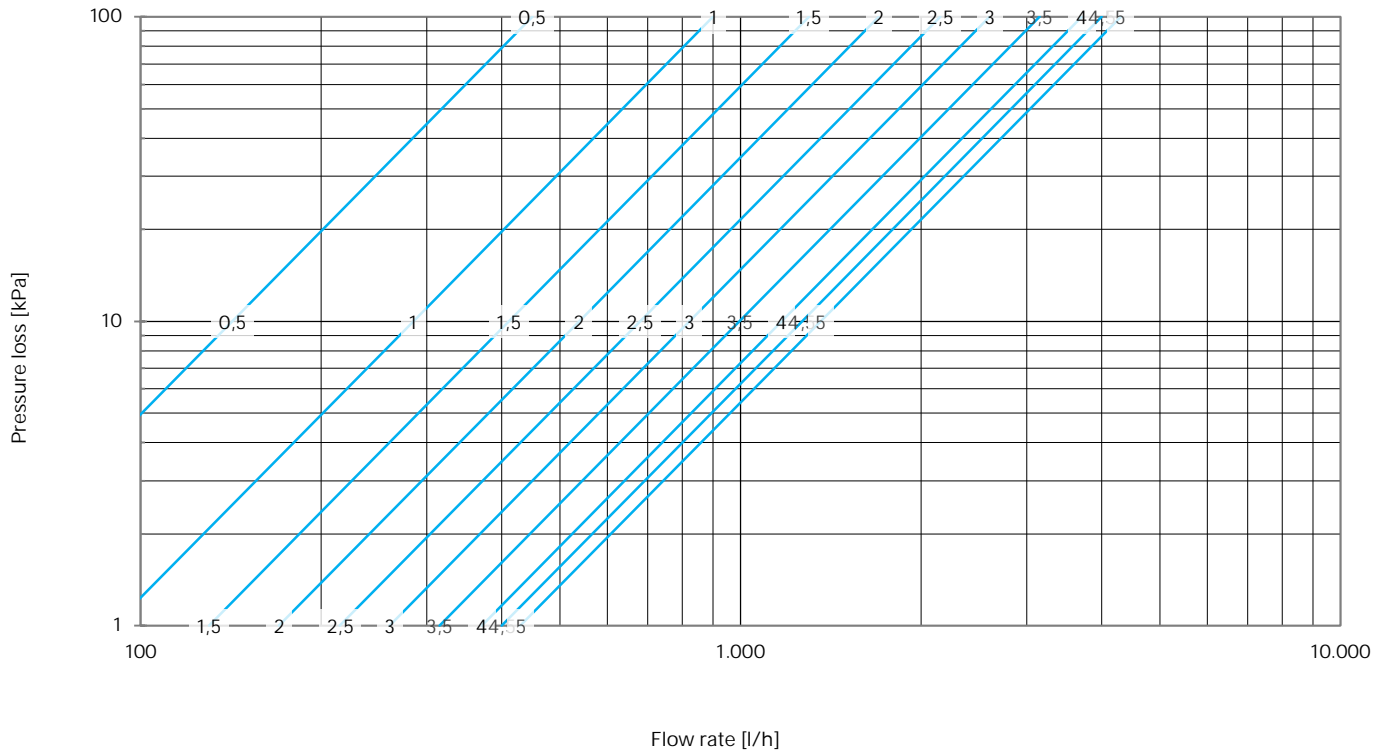
DN 15 MF



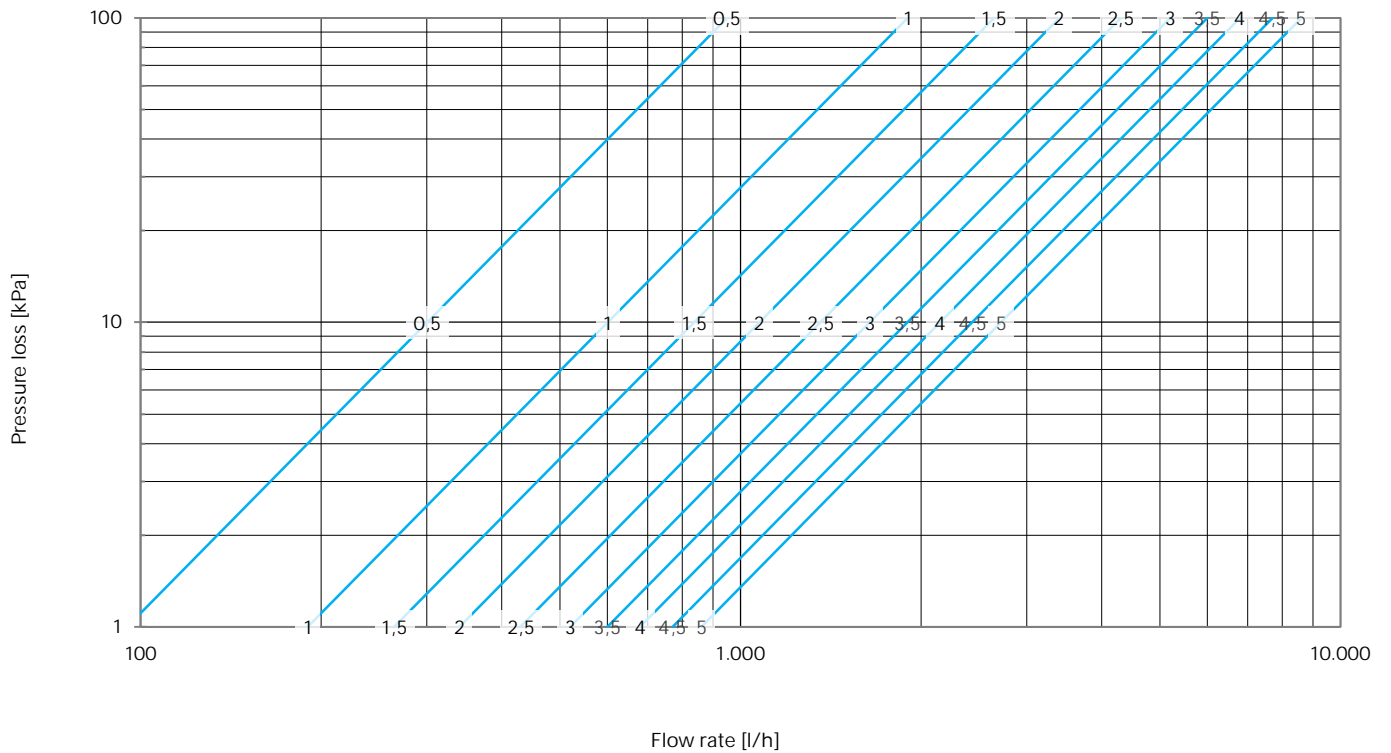
DN 15



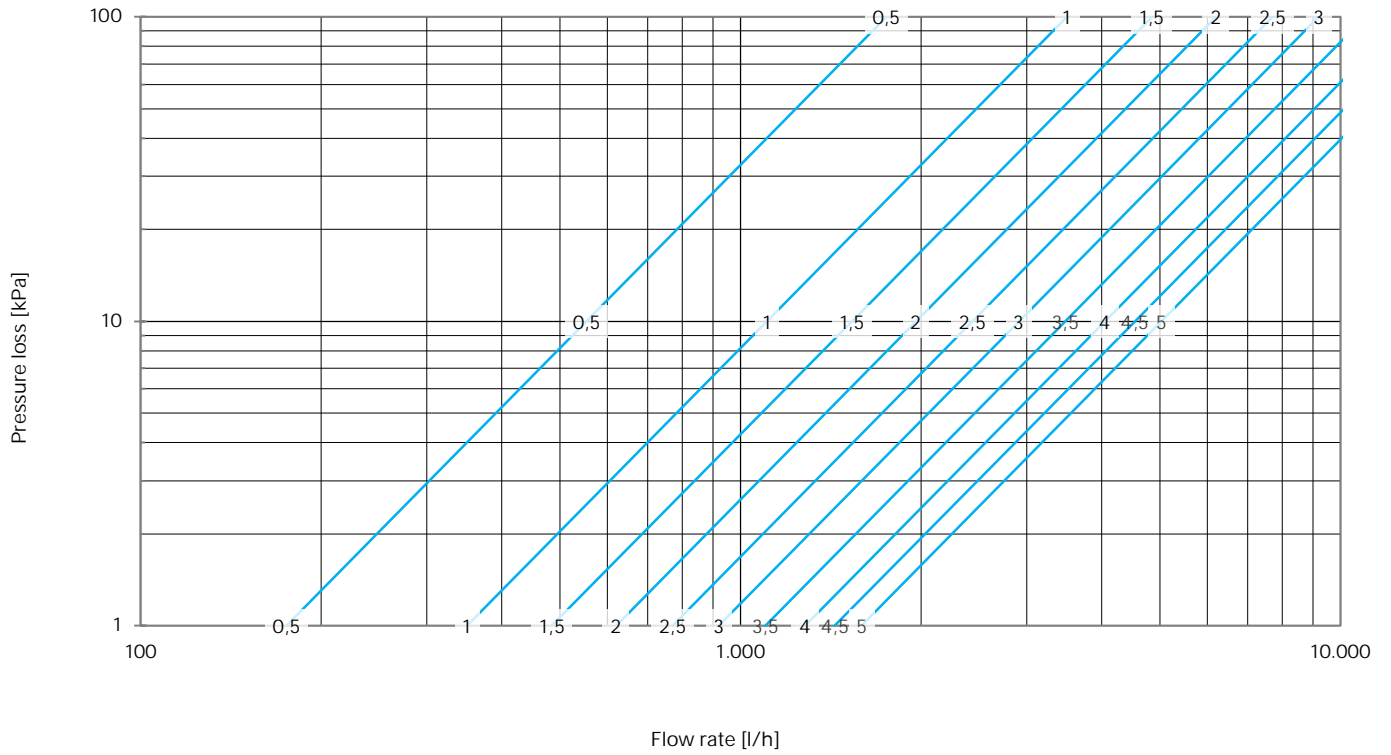
DN 20



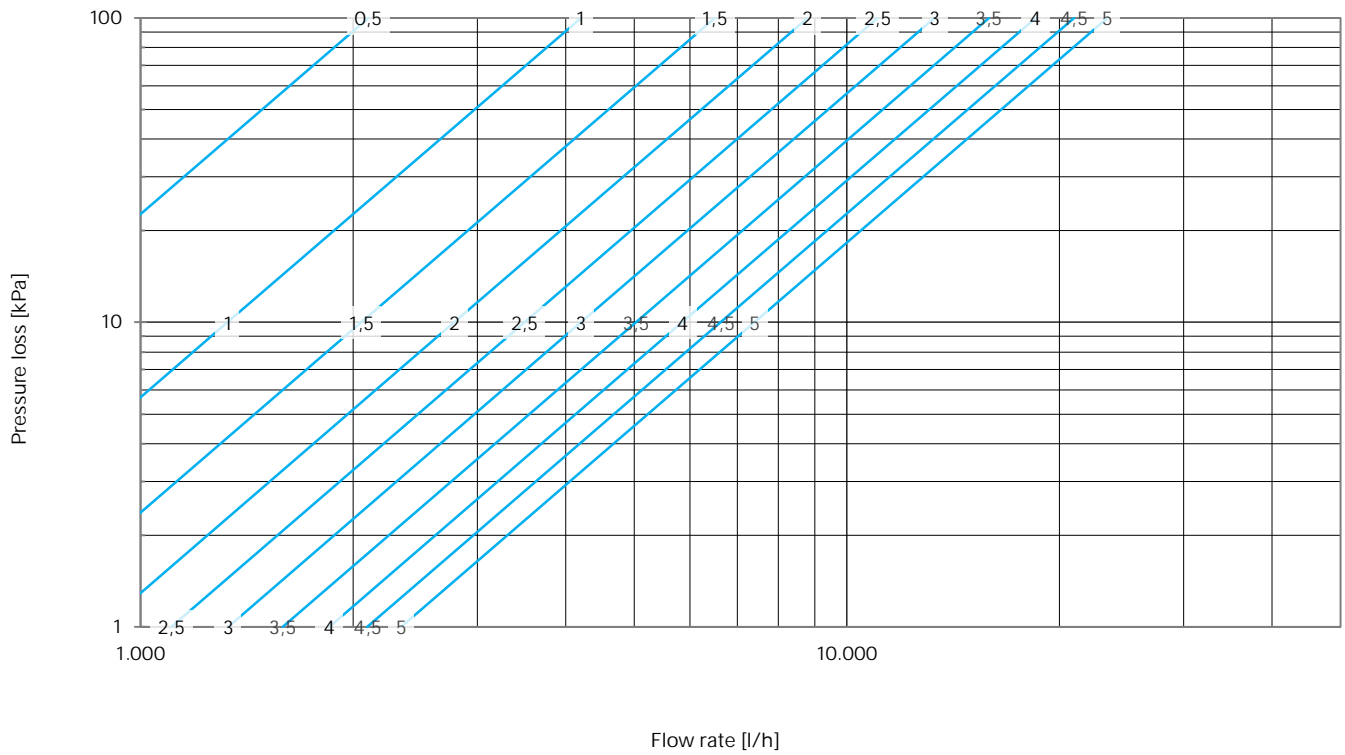
DN 25



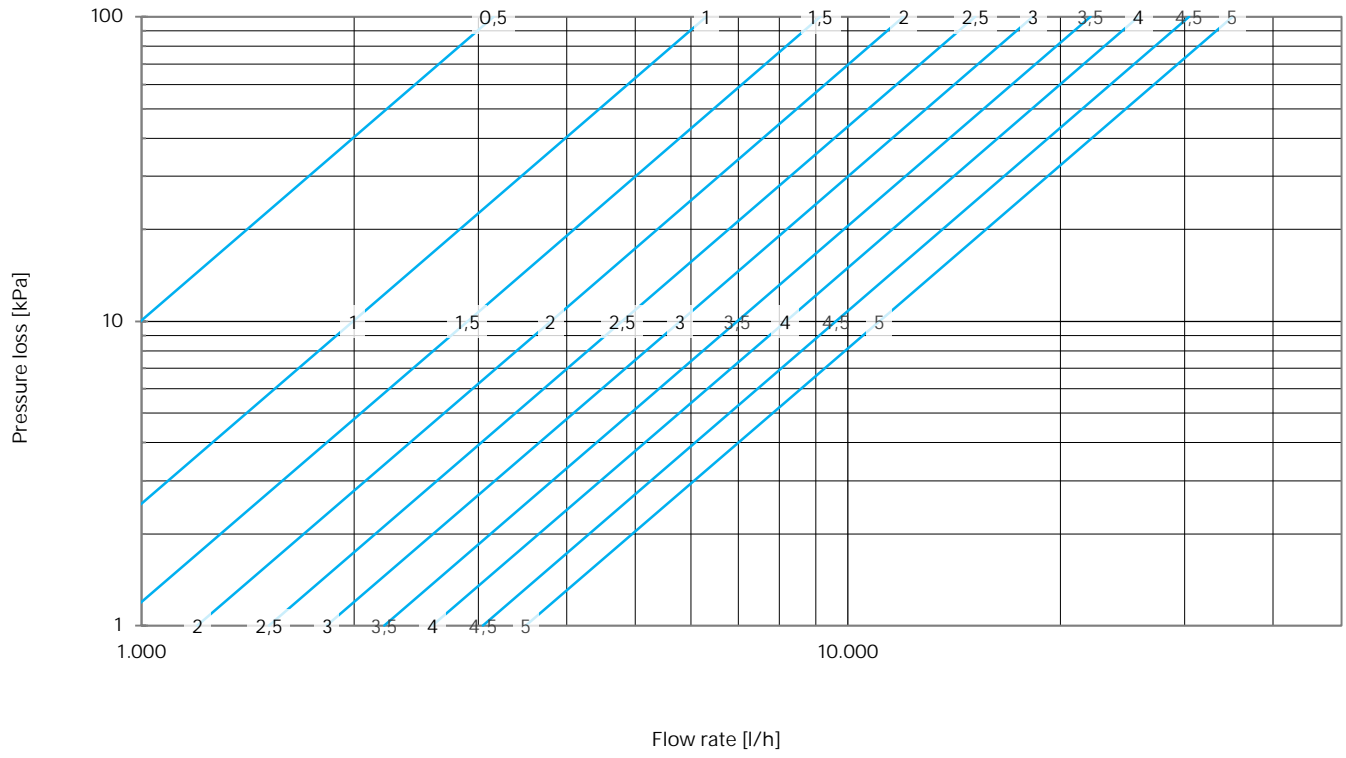
DN 32



DN 40



DN 50



Kv Value Calculation

The flow coefficient Kv is the volume of water in m³ that flows through an opening within one hour with a pressure loss of 1 bar. For control and regulating valves, this opening is typically the gap between the valve seat and the valve plug. The required Kv value can be easily calculated with the Kv formula:

$$Kv = Q \times \sqrt{\frac{1 \text{ bar}}{\Delta P}} \times \frac{\rho}{1000 \frac{\text{kg}}{\text{m}^3}}$$

- Q is the volume flow in m³/h
- ΔP is the pressure loss in bar
- ρ is the density in kg/m³ — water with a temperature of 4 °C has a density of 1.000 kg/m³. At 50 °C, water has a density of 988 kg/m³, at 70 °C of 978 kg/m³ and at 100 °C of 958 kg/m³

For use with Excel or other spreadsheets, the formula is:

$$=Q*\text{ROOT}((1/DP)*(p/1000))$$

C4	A	B	C	D	E
	Volume flow	Q	0.5 m ³ /h		
	Pressure loss	Dp	0.1 bar		
	Density	p	988 kg/m ³		
		Kv	1.57		

The objects in **semibold cyan** are to be replaced by values or cell references. Brackets have been added for easier mapping.

For an accurate Kv value calculation, you need the water temperature so that you can look up the density and enter the value into the formula. If a less precise calculation is sufficient, the formula can be simplified by shortening the second fraction by setting the density to 1,000 kg/m³ – which only applies to a water temperature of 4 °C gilt, as mentioned above. The error a Kv value calculated in this way is approx. 1% for water with a temperature of e.g. 70 °C (density 978 kg/m³).

To be calculated	Formula	Spreadsheet formula
Kv value (simplified)	$Kv = Q \times \sqrt{\frac{1 \text{ bar}}{\Delta P}}$	=Q*ROOT(1/DP)

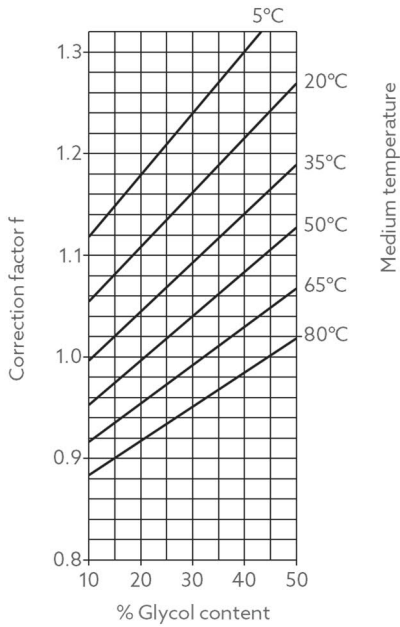
Correction Factors

Additives change the viscosity of water and thus its flow properties. Manufacturers of additives often provide calculation aids that consider the changed properties of the medium when using their products.

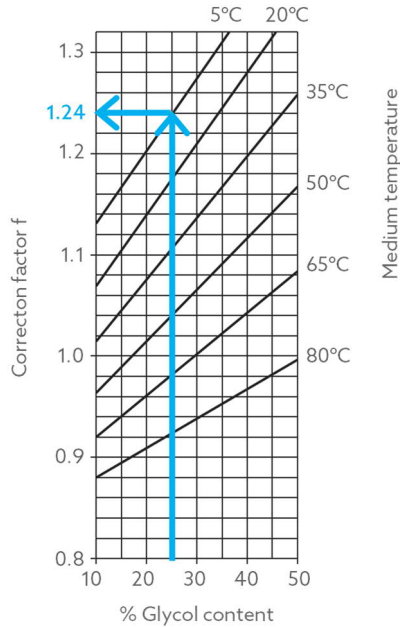
The flow data in this Product Data sheet are based on the properties of water without additives. A quick, but only approximate calculation of the changed flow values when using glycol mixtures is made with the correction factor f, which can be used to recalculate the Kv value or the required pressure loss:

To be calculated	Formula	Spreadsheet formula
Kv value (corrected)	$Kv_{(corr)} = Kv \times \frac{1}{\sqrt{f}}$	Kv*(1/(ROOT(f)))
Pressure loss (corrected)	$\Delta P_{(corr)} = \Delta P \times f$	DP*f

The correction factor can be read in the following two charts at the intersection of the values for media temperature and glycol content.



Correction factor f for ethylene glycol



Correction factor f for propylene glycol

Example:

A glycol content of 25 % and a medium temperature of 5°C result in a factor of 1.24 with the following impacts:

- If the original Kv value was 10, it is now reduced to just short of 9
- If the original flow rate was 10 m³/h, it is now reduced to just short of 9 m³/h (at the same differential pressure)
- If the original differential pressure was 10 kPa, it must now be increased to 12.4 kPa to ensure the same flow rate