

## Data Sheet

# Manual Presetting Valves LENO™ MSV-B

### Description

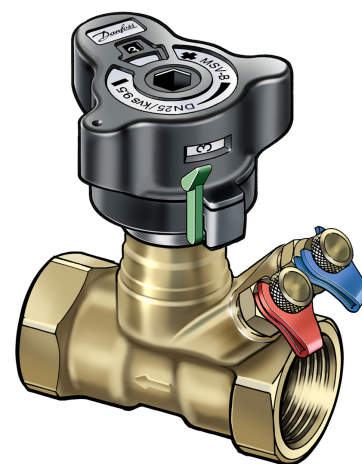
LENO™ MSV-B is a new generation of manual valves for balancing flow in heating, cooling and domestic hot water systems.

LENO™ MSV-B is a combined presetting and shut off valve with a range of unique features:

- Removable hand wheel for easy mounting.
- Numeric presetting scale, visible from more angles.
- Easy locking of presetting.
- Built-in measuring nipples for 3mm needles.
- Open-close with Allen key in emergency.
- Open-closed colour indicator.

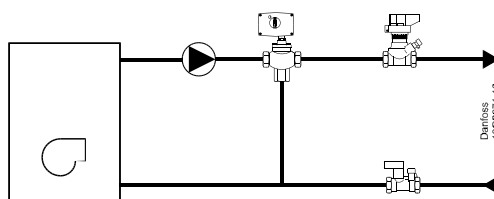
It is recommended to use LENO™ MSV-B in constant flow systems in front of boilers, flat stations or heat pumps in one-family houses for balancing, shut off function for service and repair, flow verification, one-pipe systems. The valve may be mounted in flow or return.

DN 15 valves are available with internal or external thread. Other dimensions with internal thread.



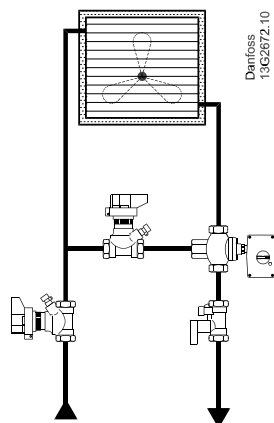
Danfoss PFM 5000/100 measuring instruments contain valve data for LENO™ MSV-B in memory.

### Application



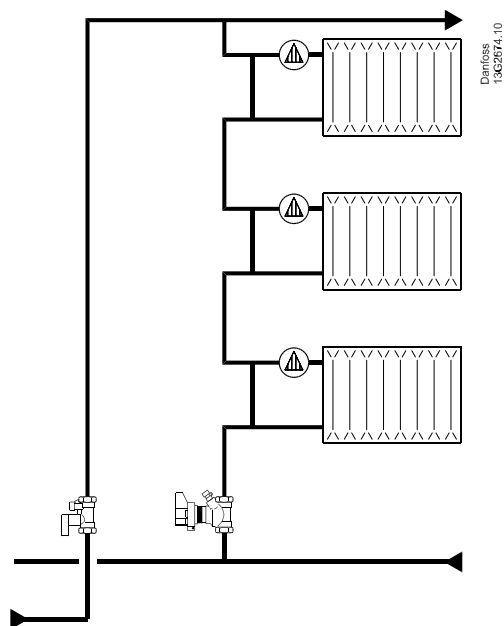
Boiler, flat station or heat pump in 1-family houses.

- For balancing.
- Shut-off function for service/repair.



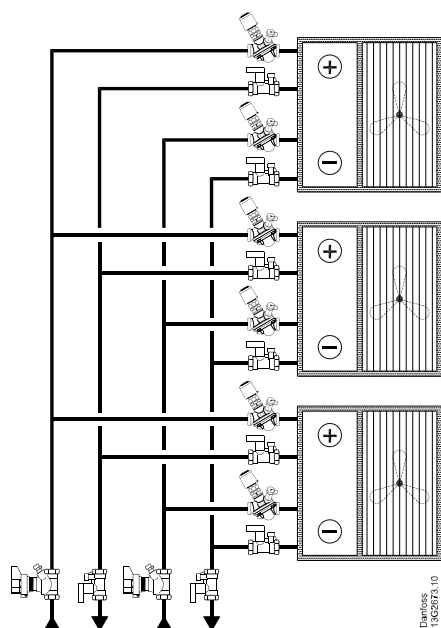
Air handling unit

- For constant flow.
- For balancing.
- Shut-off function for service/ repair.



1-pipe system

- For balancing.
- Shut-off function for service/repair.

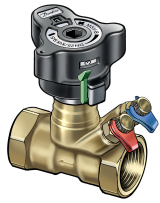


Fan coils

- For flow verification.
- Shut-off function for service/ repair.

Ordering

**LENO™ MSV-B valve with internal thread**

Type	Material	Size	$k_{vs}$ (m <sup>3</sup> /h)	Connection	Code no.
	DZR* Brass	DN 15 LF	2.5	R <sub>p</sub> 1/2"	<b>003Z4030</b>
		DN 15	3.0	R <sub>p</sub> 1/2"	<b>003Z4031</b>
		DN 20	6.0	R <sub>p</sub> 3/4"	<b>003Z4032</b>
		DN 25	9.5	R <sub>p</sub> 1"	<b>003Z4033</b>
		DN 32	18	R <sub>p</sub> 1 1/4"	<b>003Z4034</b>
		DN 40	26	R <sub>p</sub> 1 1/2"	<b>003Z4035</b>
		DN 50	40	R <sub>p</sub> 2"	<b>003Z4036</b>

**LENO™ MSV-B valve with external thread**

Type	Material	Size	$k_{vs}$ (m <sup>3</sup> /h)	Connection	Code no.
	DZR* Brass	DN 15 LF	2.5	G 3/4 A**	<b>003Z4131</b>
		DN 15	3.0	G 3/4 A**	<b>003Z4130</b>

\*Corrosion resistant brass

\*\*Eurocone DIN V 3838


**Accessories**

Type	Code no.
Standard measuring nipples, 2 pcs.	<b>003Z4662</b>
Extended measuring nipples, 60 mm, 2 pcs.	<b>003Z4657</b>
Operating handle	<b>003Z4652</b>
Flow measuring instrument PFM 100	<b>003L8260</b>
Flow measuring instrument PFM 5000, PN 10	<b>003L8331</b>
Flow measuring instrument PFM 5000 Multi Source, PN 10	<b>003L8333</b>
Identification tag & strips, 10 pcs.	<b>003Z4660</b>

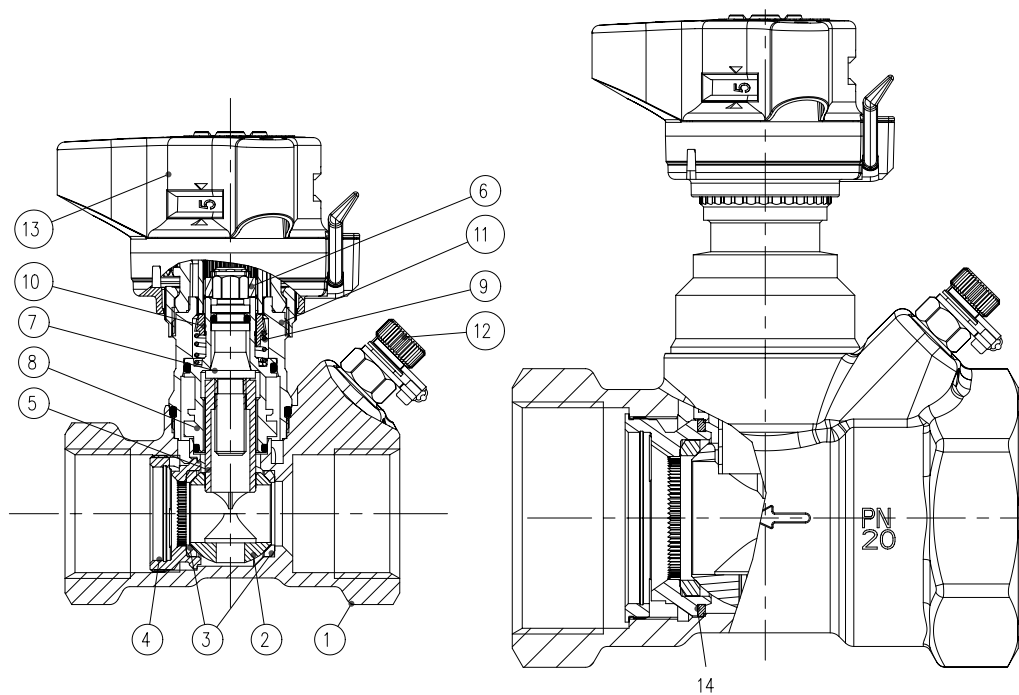
**Compression fittings for valves with external thread**

Pipe (mm)	Valve thread	PEX fittings, code no.	Alupex fittings, code no.
12 x 1.1	G 3/4	<b>013G4150</b>	
12 x 2	G 3/4	<b>013G4152</b>	<b>013G4182</b>
13 x 2	G 3/4	<b>013G4153</b>	
14 x 2	G 3/4	<b>013G4154</b>	<b>013G4184</b>
15 x 1.7	G 3/4	<b>013G4165</b>	
15 x 2.5	G 3/4	<b>013G4155</b>	<b>013G4185</b>
16 x 1.5	G 3/4	<b>013G4157</b>	
16 x 2	G 3/4	<b>013G4156</b>	<b>013G4186</b>
16 x 2.25	G 3/4		<b>013G4187</b>
17 x 2	G 3/4	<b>013G4162</b>	
18 x 2	G 3/4	<b>013G4158</b>	<b>013G4188</b>
18 x 2.5	G 3/4	<b>013G4159</b>	
20 x 2	G 3/4	<b>013G4160</b>	<b>013G4190</b>
20 x 2.5	G 3/4	<b>013G4161</b>	<b>013G4191</b>

**Compression fittings for valves with external thread**

Steel/copper pipes	Dimension	Code no.
	G 3/4 x 15	<b>013G4125</b>
	G 3/4 x 16	<b>013G4126</b>
	G 3/4 x 18	<b>013G4128</b>

**Design**



- |                  |                   |                              |
|------------------|-------------------|------------------------------|
| 1. Valve house   | 6. Spindle head   | 11. Top                      |
| 2. Ball          | 7. Spindle        | 12. Measuring nipple         |
| 3. Ball seat     | 8. Shut off bush  | 13. Handle                   |
| 4. Support screw | 9. Spring         | 14. Gasket for support screw |
| 5. Throttle      | 10. Rotation lock |                              |

**Technical Data**

**Materials and parts in contact with water**

Valve body	DZR brass
O-rings	EPDM
Ball	Brass/chromium plated
Ball sealing	Teflon

Max. static working pressure	20 bar
Static test pressure	30 bar
Max. differential pressure across valve	2.5 bar (250 kPa)
Max. flow temperature	120 °C
Min. temperature	-20°C
Cooling liquids	Ethylene glycol / propylene glycol and HYCOOL (max. 30 %)

**Fitting**

Before fitting the valve the installer must ensure that the pipe system is clean and:

1. the valve can be turned 360 degrees (if threaded pipe is used).
2. the valve is fitted according to the flow direction arrow.

DN	R1/R2 (mm)
15	96/58
20	99/60
25	101/63
32	124/87
40	127/90
50	131/94

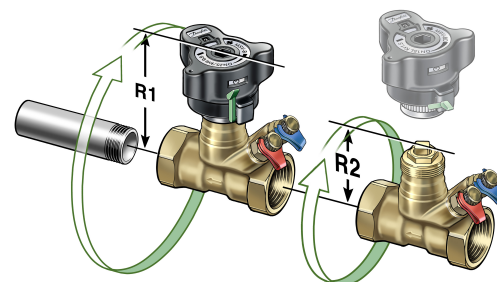
**Removal of the handle**

1. Set the handle at 0/0.
2. Release the setting lock (green).
3. Unscrew the union nut.

**Calibration of the handle**

Before refitting, ensure that the handle setting is 0/0.

**For DN 15 valves with external thread** Danfoss offers a complete range of compression fittings for steel, copper and PEX pipes.



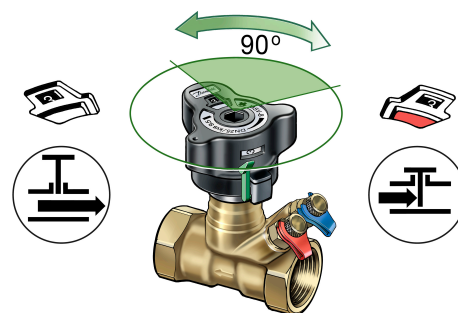
**Shut-Off**

In order to shut-off the valve the handle must be pressed down.

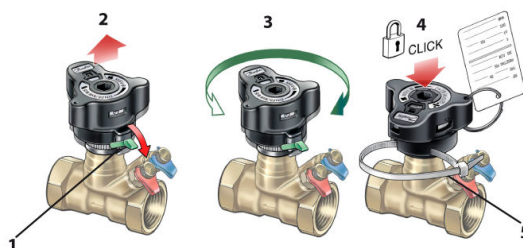
The shut-off function features a ball valve, which only requires a 90 degree turn to shut the valve completely.

An indicator window shows the actual setting:

- red = closed
- white = open



**Setting and Locking**



The valve has a built-in presetting feature for accurate flow ratings.

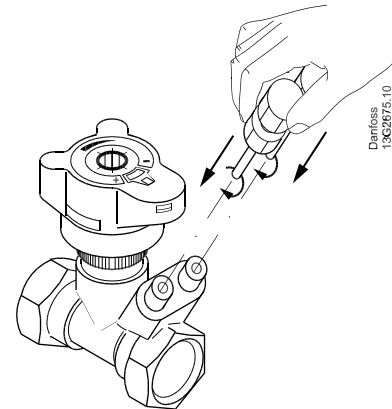
Setting the required flow is made in 5 steps:

1. In open position, release the lock using the green lever or a 3 mm Allen key.
2. The handle pops up automatically.

3. The calculated value can now be set.
4. The setting is locked when the handle is pressed to click.
5. Seal - the setting can be protected by using a strip as shown.

**Measuring**

The flow through the LENO™ MSV-B valve can be measured using Danfoss PFM 5000/100 or other brands of measuring instruments. The LENO™ MSV-B valve is supplied with two measuring nipples for 3 mm needles. A twin bracket enables the user to connect both needles simultaneously.

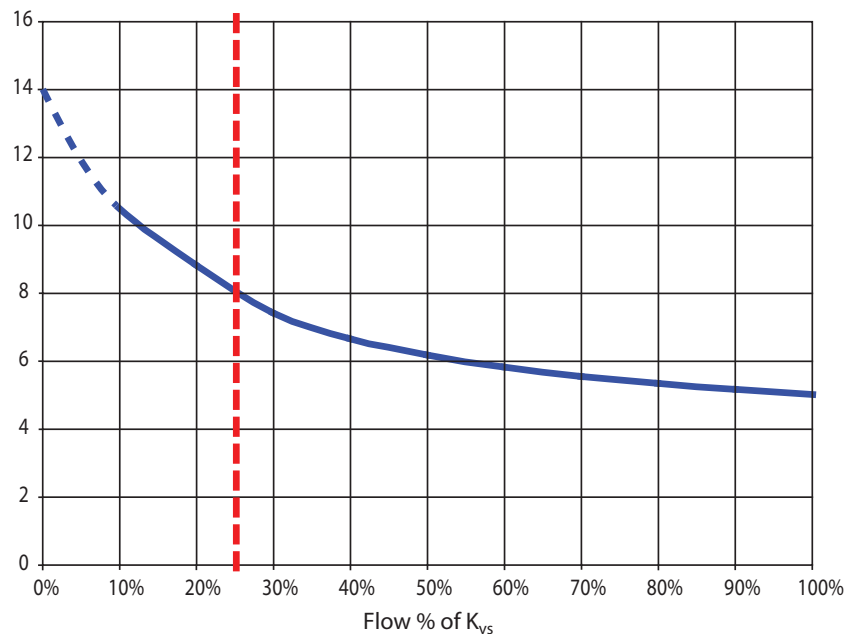


Procedure for flow measuring:

1. Select flow measuring
2. Select valve brand
3. Select valve type and dimension
4. Enter presetting
5. Connect valve and instrument
6. Calibrate static pressure
7. Measure the flow

**Measuring Accuracy**

Maximum error in measured flow [%]



The red line indicates 25% of max. flow.

LENO™ MSV-B is very accurate, due to the separate functions for presetting and shut-off.

According to BS7350:1990 flow rates must be within following values:

- ± 18 % at 25 % open position
- ± 10 % at fully open position

**K<sub>v</sub>-Signal**

K<sub>v</sub>-signal values are used for non-Danfoss measuring instruments. Danfoss PFM 3000\*/4000 have all data in memory, and the instruments are using this formula:

$$\Delta P_{val} = \Delta P_{sig} \left( \frac{k_{v-sig}}{k_{v-val}} \right)^2$$

$\Delta p$  across the measuring nipples ( $k_{v-sig}$ ) and  $\Delta p$  across the valve ( $k_{v-val}$ ) is not the same due to turbulence influence for pressure measuring. \* with software 9.4 or higher

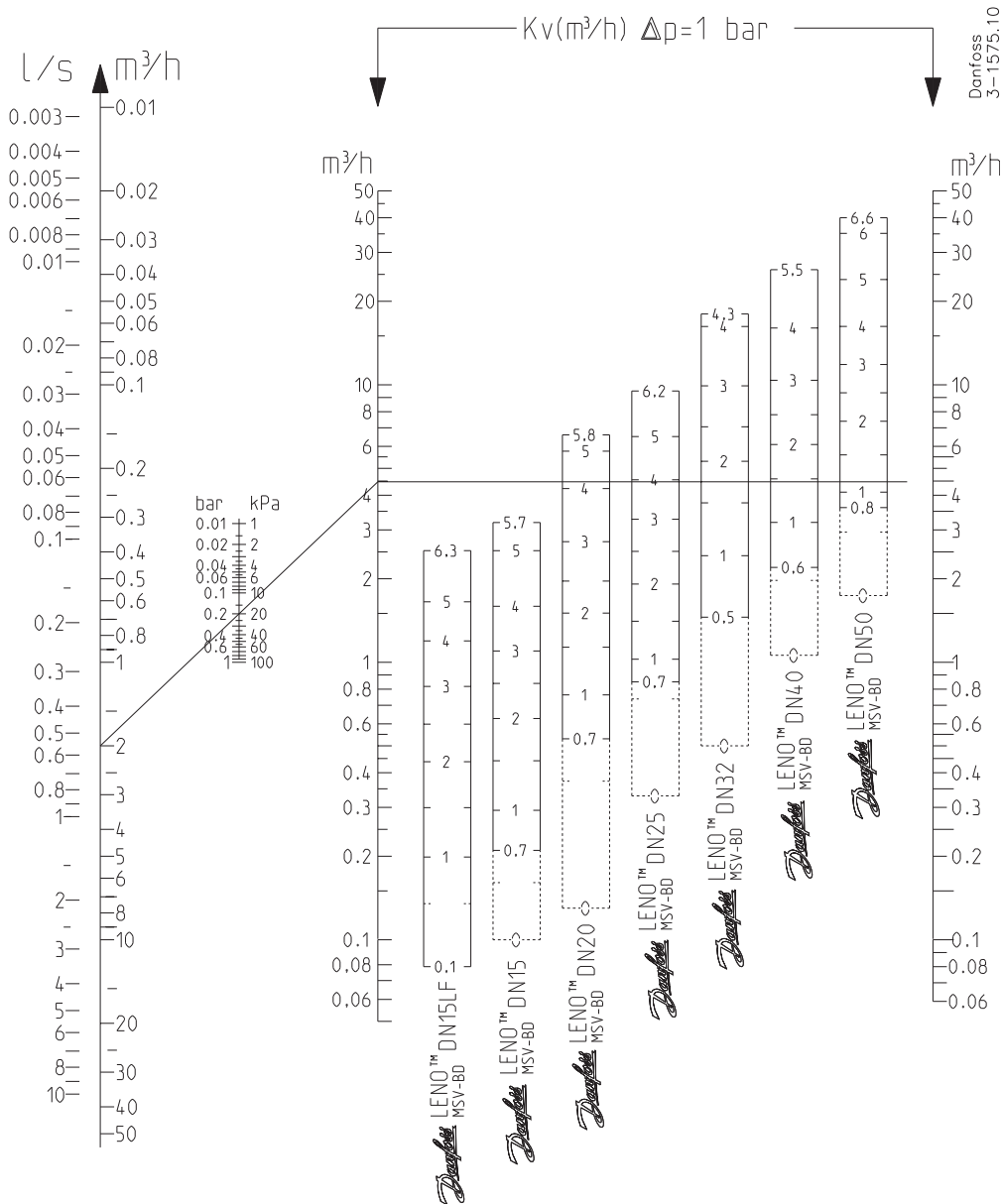
**$K_v$ -Signal Values**

Setting	DN 15LF	DN 15	DN20	DN25	DN32	DN40	DN50
0.0	0.07	0.10	0.12	0.34	0.51	1.05	1.75
0.1	0.08	0.11	0.16	0.44	0.73	1.20	2.01
0.2	0.09	0.12	0.20	0.53	0.92	1.36	2.25
0.3	0.11	0.13	0.26	0.61	1.10	1.55	2.47
0.4	0.12	0.14	0.32	0.67	1.26	1.74	2.69
0.5	0.13	0.16	0.38	0.73	1.43	1.95	2.91
0.6	0.15	0.19	0.45	0.79	1.60	2.17	3.12
0.7	0.16	0.21	0.53	0.84	1.78	2.40	3.35
0.8	0.17	0.24	0.60	0.90	1.97	2.64	3.58
0.9	0.19	0.26	0.67	0.95	2.18	2.88	3.82
1.0	0.20	0.29	0.74	1.01	2.39	3.13	4.07
1.1	0.21	0.32	0.82	1.08	2.62	3.39	4.33
1.2	0.23	0.34	0.89	1.14	2.87	3.64	4.60
1.3	0.25	0.37	0.96	1.22	3.12	3.90	4.89
1.4	0.27	0.40	1.03	1.29	3.38	4.16	5.18
1.5	0.30	0.44	1.09	1.37	3.64	4.43	5.49
1.6	0.32	0.47	1.16	1.46	3.92	4.69	5.80
1.7	0.35	0.51	1.23	1.55	4.18	4.96	6.13
1.8	0.37	0.54	1.30	1.65	4.48	5.24	6.46
1.9	0.40	0.58	1.38	1.75	4.76	5.51	6.80
2.0	0.43	0.61	1.45	1.85	5.05	5.80	7.14
2.1	0.46	0.65	1.53	1.96	5.35	6.08	7.49
2.2	0.49	0.69	1.61	2.07	5.65	6.38	7.84
2.3	0.52	0.73	1.69	2.18	5.96	6.68	8.19
2.4	0.56	0.77	1.78	2.29	6.27	6.99	8.55
2.5	0.59	0.80	1.87	2.41	6.60	7.30	8.91
2.6	0.62	0.85	1.97	2.53	6.94	7.63	9.27
2.7	0.66	0.89	2.07	2.65	7.29	7.98	9.64
2.8	0.69	0.93	2.17	2.77	7.67	8.33	10.00
2.9	0.73	0.97	2.29	2.89	8.06	8.70	10.37
3.0	0.76	1.01	2.40	3.01	8.48	9.08	10.74
3.1	0.80	1.04	2.52	3.13	8.92	9.48	11.11
3.2	0.83	1.08	2.65	3.25	9.38	9.90	11.49
3.3	0.87	1.12	2.78	3.37	9.87	10.33	11.88
3.4	0.90	1.16	2.91	3.49	10.38	10.79	12.27
3.5	0.94	1.20	3.05	3.62	10.91	11.26	12.67
3.6	0.97	1.25	3.19	3.74	11.46	11.74	13.09
3.7	1.01	1.30	3.33	3.87	12.02	12.25	13.51
3.8	1.06	1.35	3.47	4.00	12.58	12.77	13.95
3.9	1.10	1.41	3.61	4.13	13.12	13.30	14.41
4.0	1.14	1.47	3.75	4.26	13.64	13.85	14.88
4.1	1.18	1.53	3.89	4.39	14.12	14.41	15.38
4.2	1.23	1.59	4.02	4.53	14.52	14.98	15.89

4.3	1.27	1.66	4.15	4.68	14.84	15.55	16.44
4.4	1.31	1.73	4.28	4.82		16.13	17.00
4.5	1.35	1.81	4.40	4.98		16.69	17.59
4.6	1.39	1.91	4.52	5.13		17.25	18.21
4.7	1.43	2.00	4.62	5.29		17.80	18.86
4.8	1.47	2.08	4.72	5.46		18.32	19.54
4.9	1.51	2.16	4.82	5.64		18.80	20.24
5.0	1.54	2.23	4.90	5.81		19.25	20.97
5.1	1.60	2.30	4.97	6.00		19.65	21.73
5.2	1.66	2.36	5.04	6.19		19.98	22.51
5.3	1.72	2.41	5.09	6.38		20.24	23.30
5.4	1.79	2.46	5.14	6.57		20.41	24.12
5.5	1.87	2.50	5.18	6.77		20.48	24.94
5.6	1.93	2.54	5.21	6.96			25.76
5.7	1.99	2.57	5.24	7.15			26.58
5.8	2.04		5.27	7.34			27.38
5.9	2.09			7.52			28.16
6.0	2.14			7.69			28.90
6.1	2.18			7.85			29.59
6.2	2.22			7.98			30.21
6.3	2.26			8.09			30.74
6.4				8.17			31.17
6.5				8.22			31.47
6.6							31.61



Sizing



Correction Factors

Temp. °C	Correction factors, ethylene glycol / propylene glycol percentage (max. 30 %)						
	25	30	40	50	60	65	100
-40.0	1)	1)	1)	1)	0.89	0.88	1)
-17.8	1)	1)	0.93	0.91	0.90	0.89	0.86
4.4	0.95	<b>0.95</b>	0.93	0.92	0.91	0.90	0.87
26.6	0.96	0.95	0.94	0.93	0.92	0.91	0.88
48.9	0.97	0.96	0.95	0.94	0.93	0.92	0.90
71.1	0.98	0.98	0.96	0.95	0.94	0.94	0.95
93.3	1.00	0.99	0.97	0.96	0.95	0.95	0.92
115.6	2)	2)	2)	2)	2)	2)	0.94

1) Below freezing point

2) Above boiling point

**Example:** Flow needed = 30 m<sup>3</sup>/h  
 Flow after correction:  
 30 x 0.95 = 28 m<sup>3</sup>/h

**Valve Size and Presetting**

**Example:**

**Given**

- Max. pipe flow Q = 2.0 m<sup>3</sup>/h
- $\Delta p_r = 15 \text{ kPa}$
- $\Delta p_a = 45 \text{ kPa}$
- $\Delta p_m = 10 \text{ kPa}$
- $\Delta p_i = \Delta p_a - \Delta p_v - \Delta p_m$
- $\Delta p_i = 45 \text{ kPa} - 15 \text{ kPa} - 10 \text{ kPa} = 20 \text{ kPa}$

Correct valve size and presetting is found in flow diagramme, page 7.

Q = 2.0 m<sup>3</sup>/h and  $\Delta p_i = 20 \text{ kPa}$

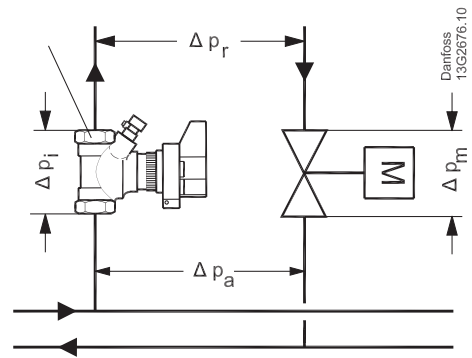
On page 12 intersect guides and presetting is found to be 4.2 (DN 20 valve)

Setting can be also calculated from the formula:

$$k_v = \frac{Q [m^3/h]}{\sqrt{\Delta p_i [bar]}} = \frac{2.0}{\sqrt{0.20}} = 4.5 \text{ m}^3/h$$

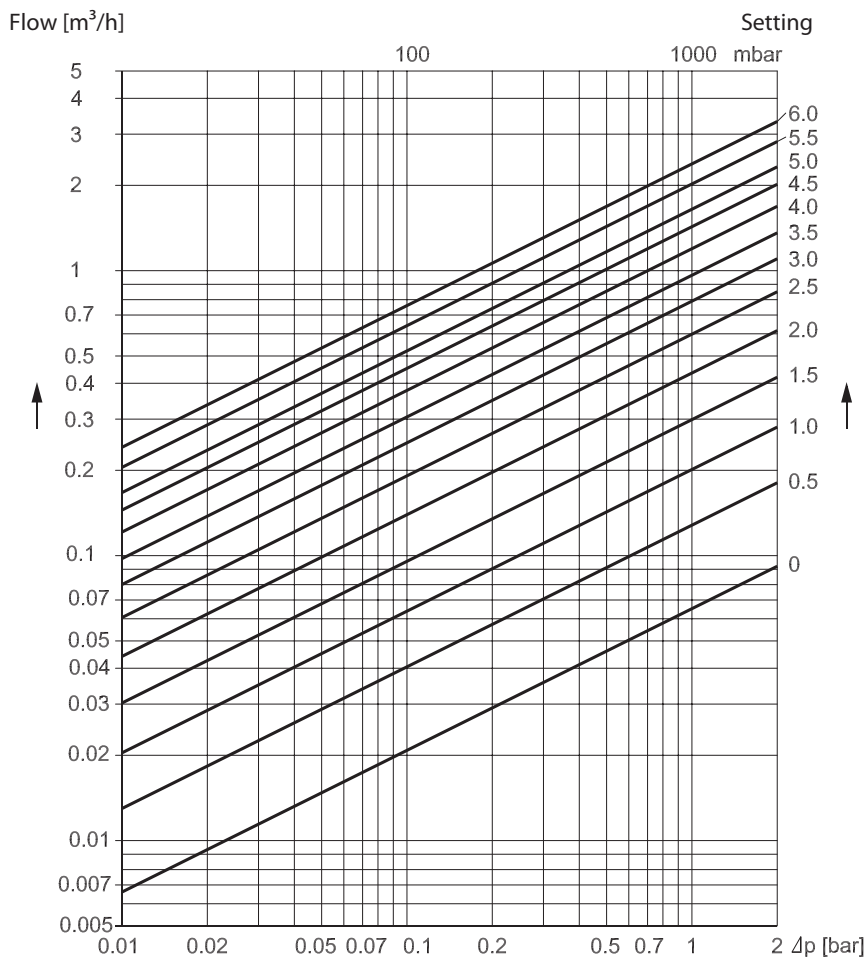
which corresponds to presetting 4.2 as shown on pages 7 and 12.

**MSV-B**



- $\Delta p_i$  Pressure drop across LENO™ MSV-B valve
- $\Delta p_m$  Pressure drop across valve
- $\Delta p_r$  Necessary pressure for the riser
- $\Delta p_a$  Available pressure for the riser

Flow Diagrammes, DN 15 LENO™ MSV-B DN 15 LF

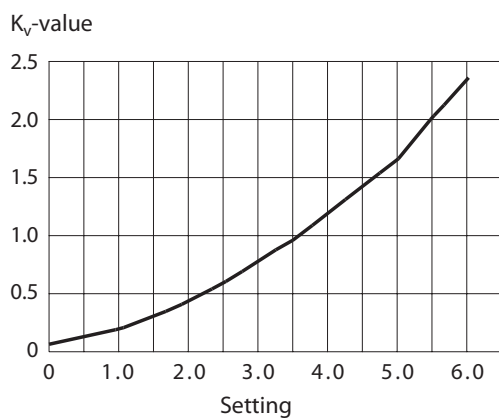


Setting	k <sub>v</sub> -value
0.0	0.07
0.1	0.08
0.2	0.09
0.3	0.11
0.4	0.12
0.5	0.13
0.6	0.15
0.7	0.16
0.8	0.17
0.9	0.19
1.0	0.20
1.1	0.22
1.2	0.23
1.3	0.25
1.4	0.28
1.5	0.30
1.6	0.32
1.7	0.35
1.8	0.38
1.9	0.41
2.0	0.44
2.1	0.47
2.2	0.50
2.3	0.53

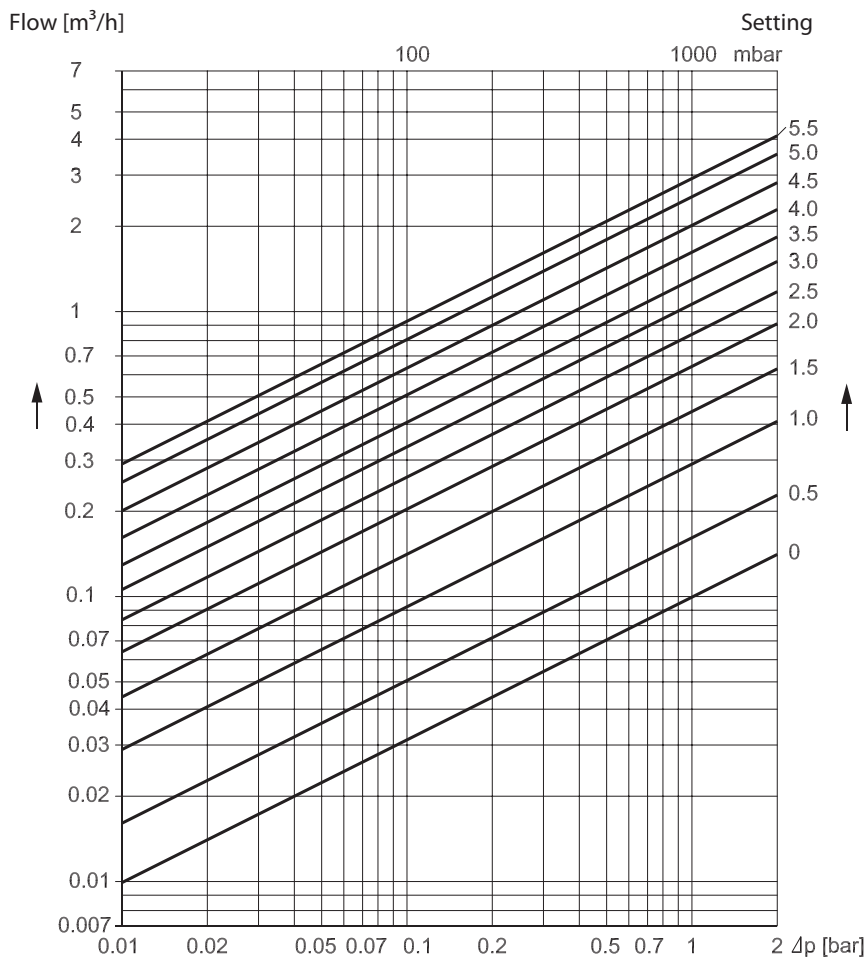
2.4	0.56
2.5	0.60
2.6	0.63
2.7	0.67
2.8	0.71
2.9	0.74
3.0	0.78
3.1	0.82

Setting	$k_v$ -value
3.2	0.86
3.3	0.89
3.4	0.93
3.5	0.97
3.6	1.01
3.7	1.05
3.8	1.10
3.9	1.15
4.0	1.19
4.1	1.24
4.2	1.29
4.3	1.33
4.4	1.38
4.5	1.43
4.6	1.48
4.7	1.52
4.8	1.56
4.9	1.61
5.0	1.65
5.1	1.72
5.2	1.78
5.3	1.86
5.4	1.94
5.5	2.03
5.6	2.10
5.7	2.17
5.8	2.23
5.9	2.30
6.0	2.36
6.1	2.42
6.2	2.47

**Flow characteristics**



Flow Diagrammes, DN 15 LENO™ MSV-B DN 15



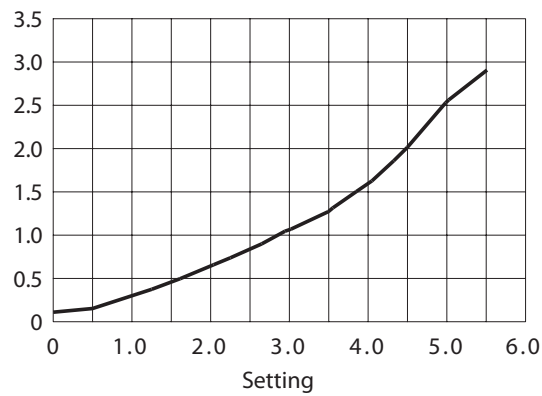
Setting	$k_v$ -value
0.0	0.11
0.1	0.12
0.2	0.13
0.3	0.14
0.4	0.16
0.5	0.19
0.6	0.20
0.7	0.21
0.8	0.24
0.9	0.27
1.0	0.29
1.1	0.32
1.2	0.35
1.3	0.38
1.4	0.41
1.5	0.44
1.6	0.48
1.7	0.51
1.8	0.55
1.9	0.59
2.0	0.63
2.1	0.67
2.2	0.71
2.3	0.75

2.4	0.80
2.5	0.84
2.6	0.88
2.7	0.93
2.8	0.97

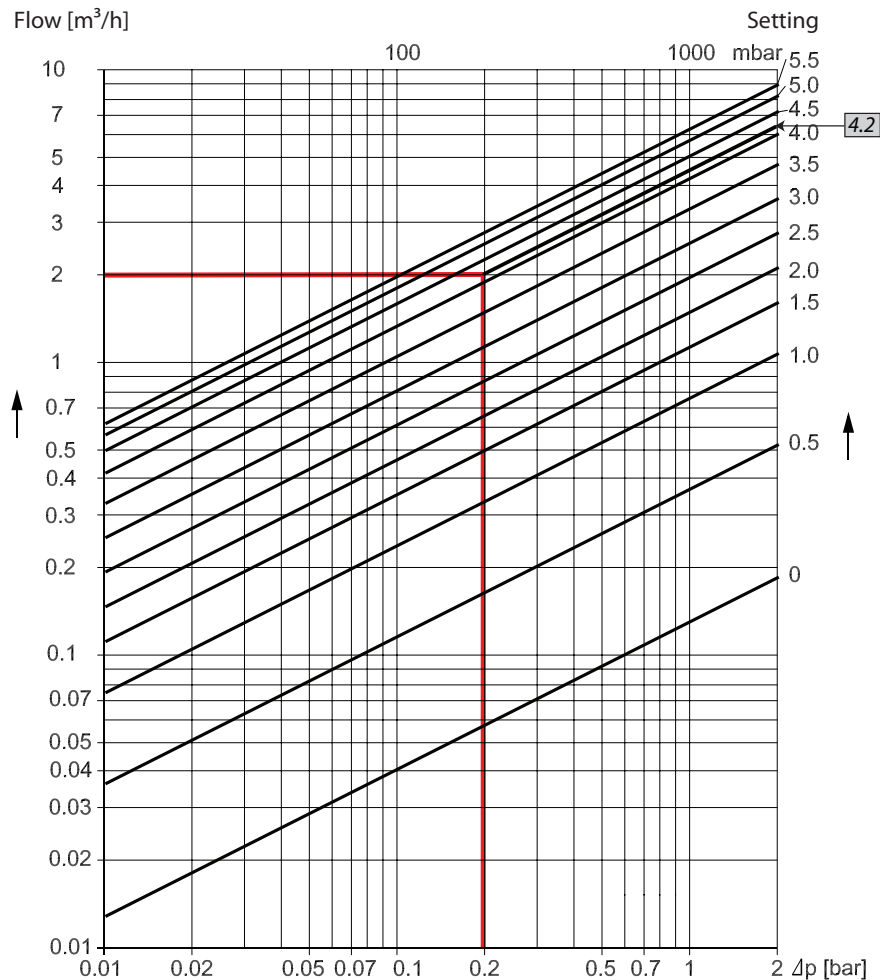
Setting	$k_v$ -value
2.9	1.02
3.0	1.06
3.1	1.10
3.2	1.14
3.3	1.19
3.4	1.23
3.5	1.28
3.6	1.34
3.7	1.40
3.8	1.46
3.9	1.52
4.0	1.59
4.1	1.66
4.2	1.74
4.3	1.82
4.4	1.91
4.5	2.00
4.6	2.12
4.7	2.23
4.8	2.33
4.9	2.43
5.0	2.53
5.1	2.61
5.2	2.70
5.3	2.77
5.4	2.84
5.5	2.90
5.6	2.95
5.7	3.00

**Flow characteristics**

$K_v$ -value



Flow Diagrammes, DN 20 LENO™ MSV-B DN 20

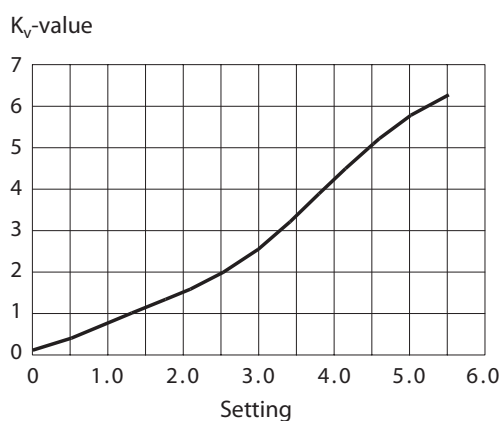


Setting	k <sub>v</sub> -value
0.0	0.13
0.1	0.15
0.2	0.19
0.3	0.24
0.4	0.30
0.5	0.37
0.6	0.45
0.7	0.53
0.8	0.61
0.9	0.68
1.0	0.76
1.1	0.84
1.2	0.92
1.3	0.99
1.4	1.06
1.5	1.13
1.6	1.21
1.7	1.28
1.8	1.35
1.9	1.43
2.0	1.50
2.1	1.59
2.2	1.67

2.3	1.76
2.4	1.86
2.5	1.96
2.6	2.07
2.7	2.19
2.8	2.31

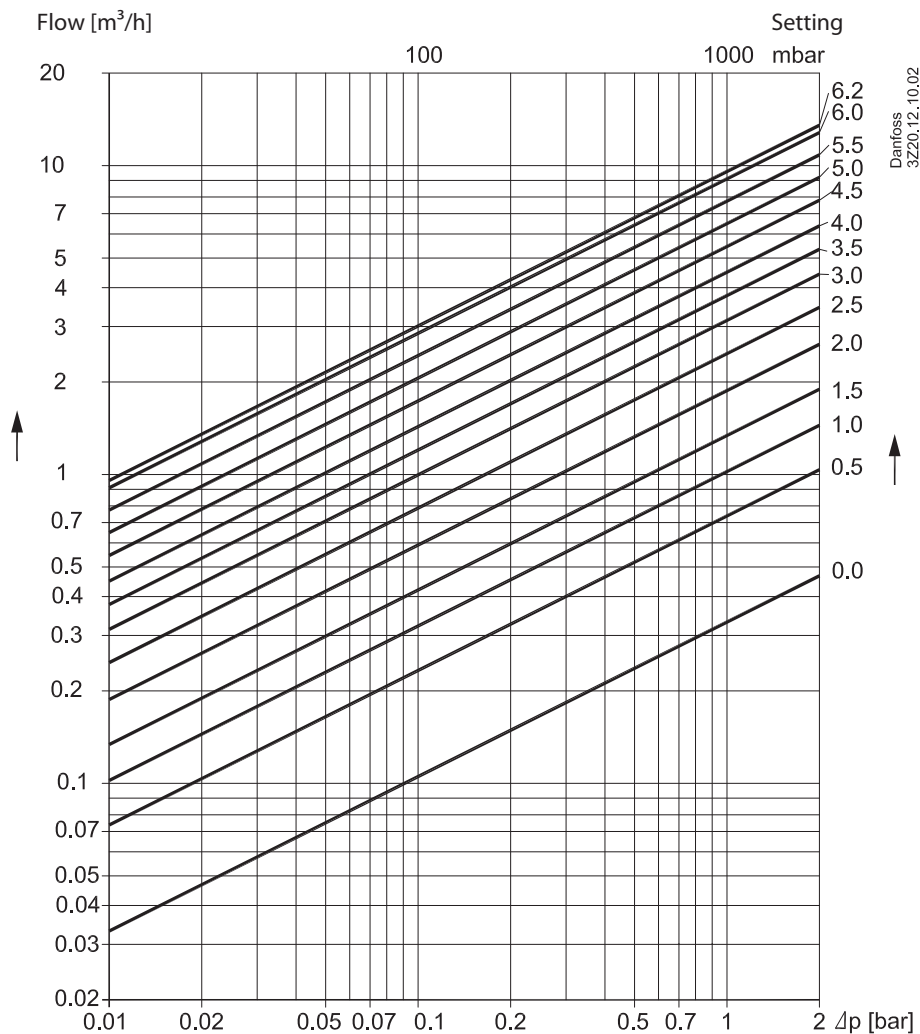
Setting	$K_v$ -value
2.9	2.44
3.0	2.58
3.1	2.72
3.2	2.87
3.3	3.03
3.4	3.19
3.5	3.36
3.6	3.53
3.7	3.70
3.8	3.87
3.9	4.05
4.0	4.23
4.1	4.40
<b>4.2</b>	<b>4.58</b>
4.3	4.75
4.4	4.91
4.5	5.07
4.6	5.22
4.7	5.37
4.8	5.51
4.9	5.64
5.0	5.77
5.1	5.88
5.2	5.99
5.3	6.09
5.4	6.19
5.5	6.29
5.6	6.39
5.7	6.49
5.8	6.60

**Flow characteristics**





Flow Diagrammes, DN 25 LENO™ MSV-B DN 25

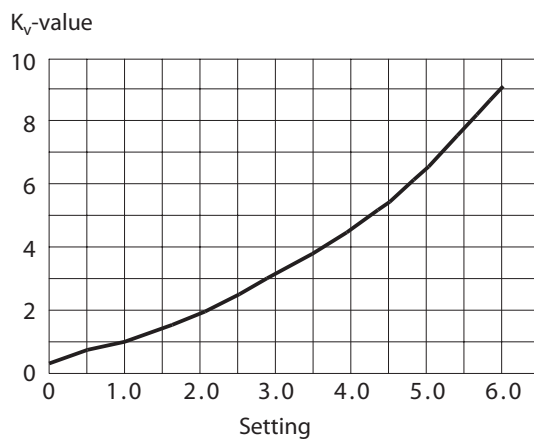


Setting	$k_v$ -value
0.0	0.33
0.1	0.44
0.2	0.53
0.3	0.61
0.4	0.68
0.5	0.74
0.6	0.79
0.7	0.85
0.8	0.91
0.9	0.96
1.0	1.03
1.1	1.09
1.2	1.16
1.3	1.24
1.4	1.32
1.5	1.41
1.6	1.50
1.7	1.60
1.8	1.70
1.9	1.80

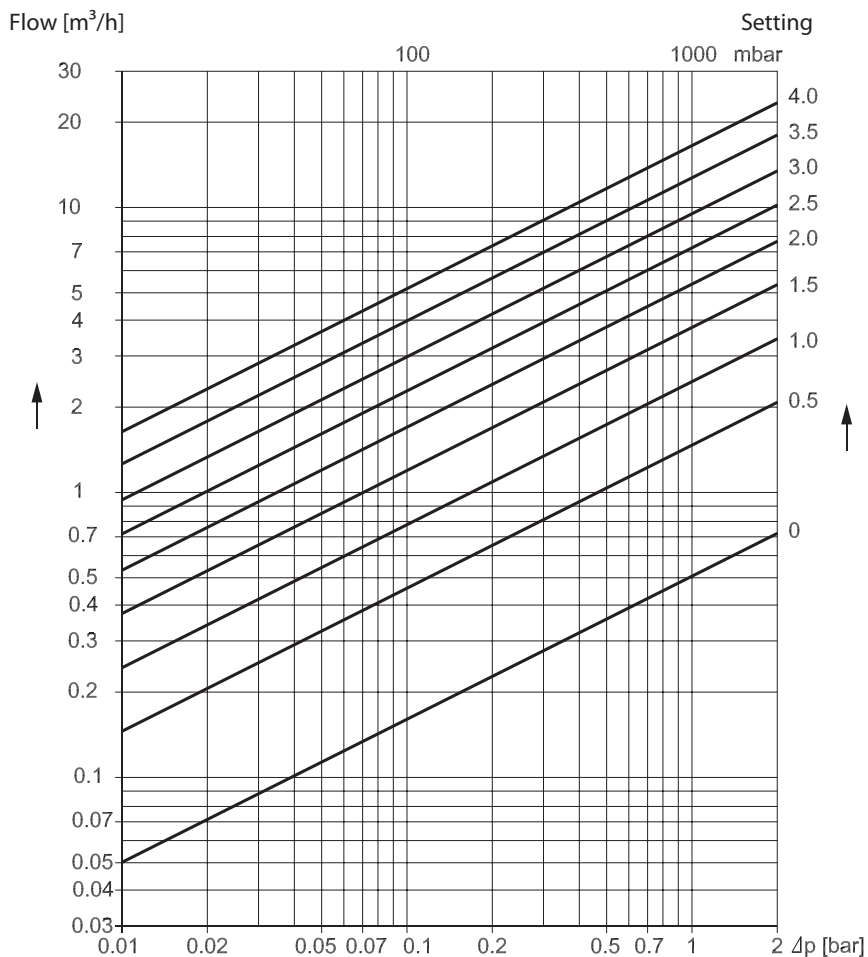
2.0	1.91
2.1	2.03
2.2	2.15
2.3	2.26
2.4	2.39
2.5	2.51
2.6	2.64
2.7	2.76
2.8	2.89
2.9	3.02
3.0	3.15

Setting	$K_v$ -value
3.1	3.28
3.2	3.41
3.3	3.54
3.4	3.68
3.5	3.81
3.6	3.95
3.7	4.09
3.8	4.24
3.9	4.39
4.0	4.55
4.1	4.71
4.2	4.88
4.3	5.05
4.4	5.23
4.5	5.42
4.6	5.62
4.7	5.83
4.8	6.05
4.9	6.27
5.0	6.51
5.1	6.75
5.2	7.00
5.3	7.26
5.4	7.53
5.5	7.80
5.6	8.06
5.7	8.33
5.8	8.59
5.9	8.84
6.0	9.08
6.1	9.30
6.2	9.50

**Flow characteristics**



Flow Diagrammes, DN 32 LENO™ MSV-B DN 32

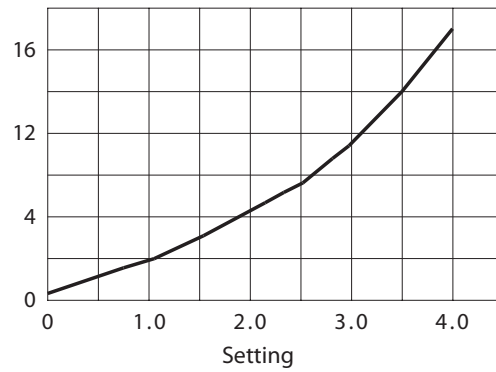


Setting	k <sub>v</sub> -value
0.0	0.50
0.1	0.75
0.2	0.95
0.3	1.13
0.4	1.29
0.5	1.45
0.6	1.62
0.7	1.80
0.8	1.99
0.9	2.20
1.0	2.42
1.1	2.66
1.2	2.92
1.3	3.19
1.4	3.47
1.5	3.75
1.6	4.05
1.7	4.36
1.8	4.67
1.9	4.98
2.0	5.30
2.1	5.63

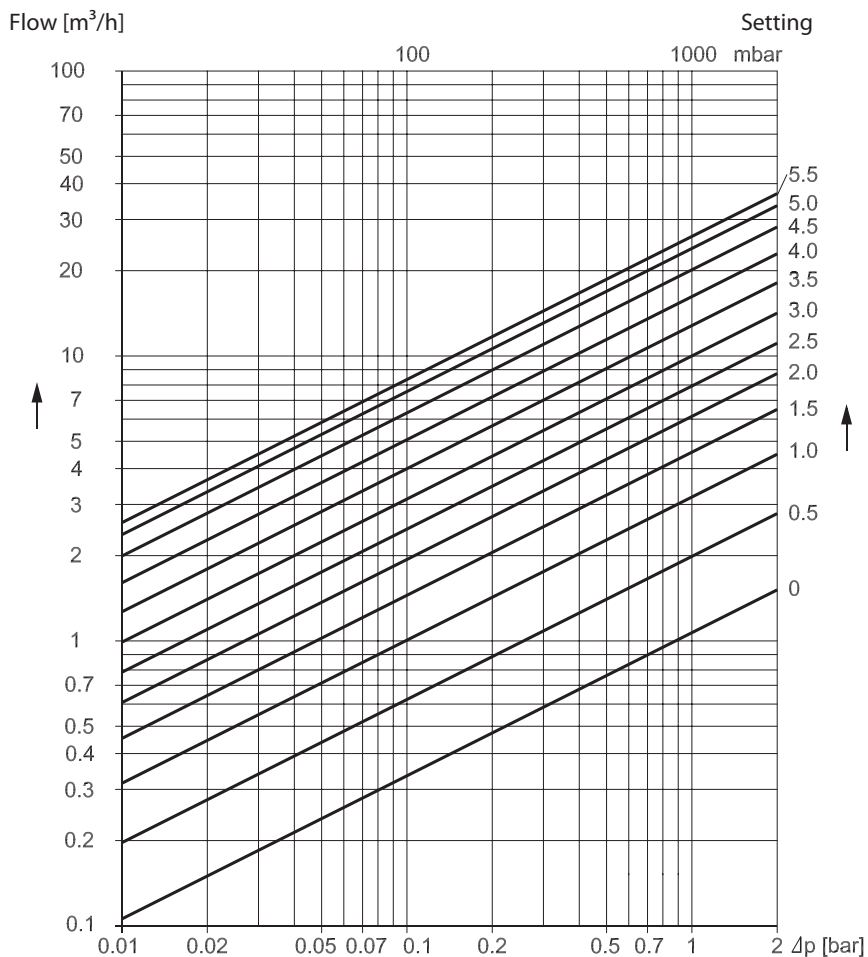
Setting	$k_v$ -value
2.2	5.97
2.3	6.32
2.4	6.68
2.5	7.06
2.6	7.46
2.7	7.89
2.8	8.34
2.9	8.83
3.0	9.35
3.1	9.92
3.2	10.52
3.3	11.16
3.4	11.85
3.5	12.51
3.6	13.23
3.7	13.98
3.8	14.74
3.9	15.49
4.0	16.23
4.1	16.91
4.2	17.51
4.3	18.00

**Flow characteristics**

$K_v$ -value



Flow Diagrammes, DN 40 LENO™ MSV-B DN 40

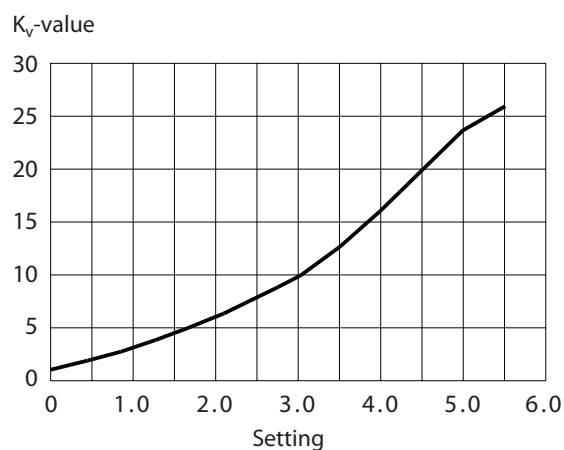


Setting	k <sub>v</sub> -value
0.0	1.06
0.1	1.21
0.2	1.38
0.3	1.56
0.4	1.76
0.5	1.97
0.6	2.20
0.7	2.43
0.8	2.68
0.9	2.93
1.0	3.19
1.1	3.46
1.2	3.73
1.3	4.01
1.4	4.29
1.5	4.58
1.6	4.87
1.7	5.17
1.8	5.47
1.9	5.78
2.0	6.09
2.1	6.41
2.2	6.74
2.3	7.09

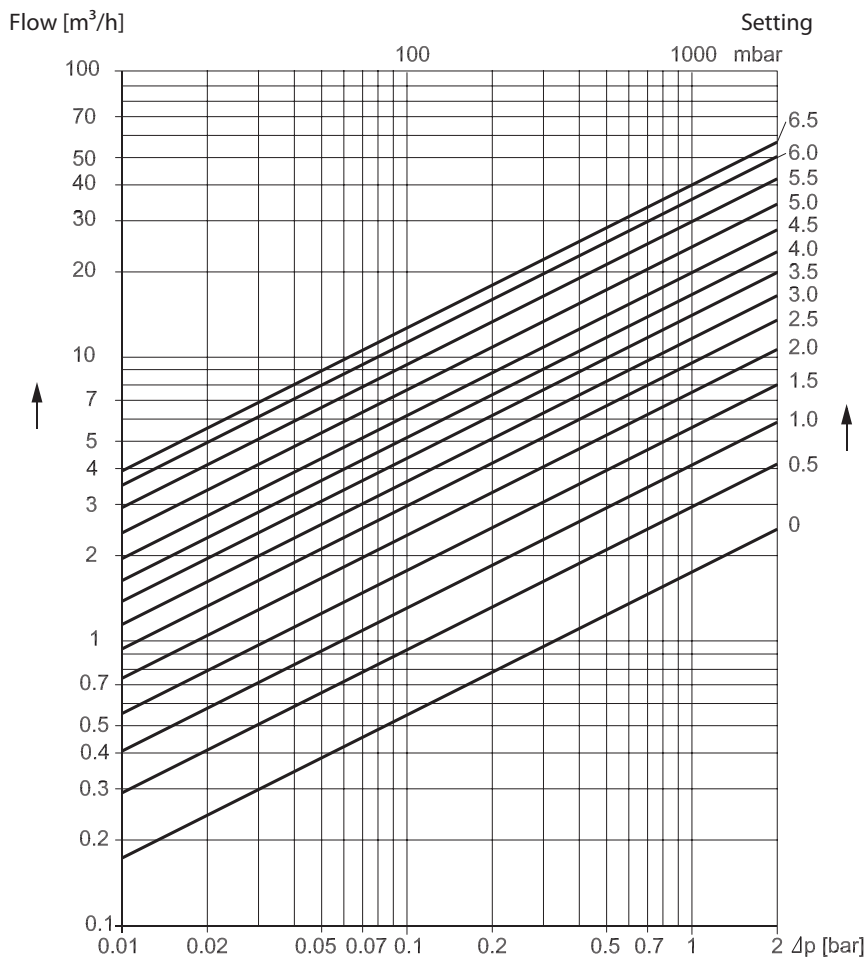
2.4	7.44
2.5	7.80
2.6	8.18
2.7	8.58

Setting	$k_v$ -value
2.8	9.00
2.9	9.44
3.0	9.90
3.1	10.38
3.2	10.89
3.3	11.43
3.4	12.00
3.5	12.60
3.6	13.22
3.7	13.88
3.8	14.56
3.9	15.28
4.0	16.02
4.1	16.79
4.2	17.57
4.3	18.38
4.4	19.19
4.5	20.02
4.6	20.82
4.7	21.61
4.8	22.38
4.9	23.12
5.0	23.81
5.1	24.44
5.2	25.00
5.3	25.46
5.4	25.80
5.5	26.00

**Flow characteristics**



Flow Diagrammes, DN 50 LENO™ MSV-B DN 50

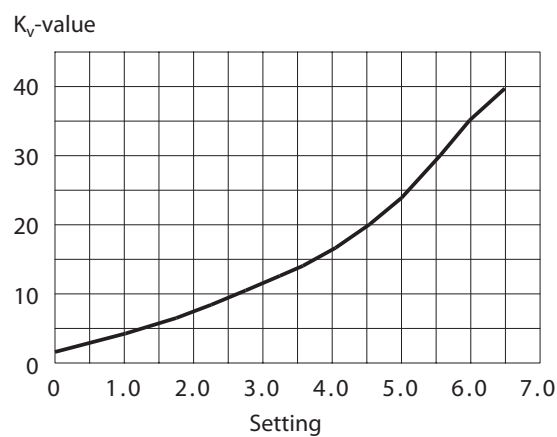


Setting	k <sub>v</sub> -value
0.0	1.74
0.1	2.03
0.2	2.28
0.3	2.51
0.4	2.73
0.5	2.95
0.6	3.16
0.7	3.38
0.8	3.61
0.9	3.85
1.0	4.10
1.1	4.37
1.2	4.65
1.3	4.95
1.4	5.26
1.5	5.59
1.6	5.93
1.7	6.28
1.8	6.64
1.9	7.01
2.0	7.39
2.1	7.78
2.2	8.17
2.3	8.56

2.4	8.96
2.5	9.36
2.6	9.76
2.7	10.17
2.8	10.58
2.9	10.99
3.0	11.41
3.1	11.84
3.2	12.27

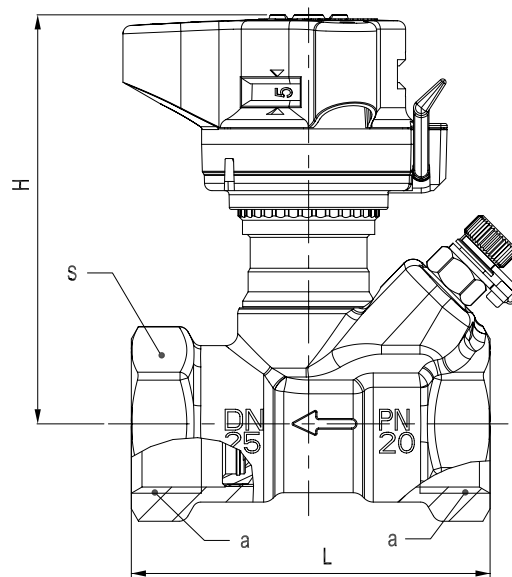
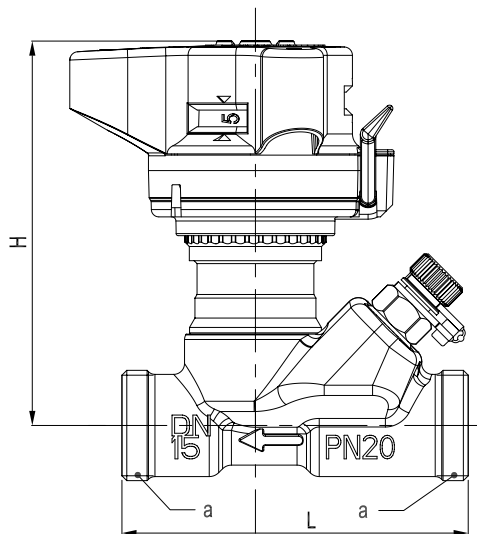
Setting	$k_v$ -value
3.3	12.71
3.4	13.16
3.5	13.62
3.6	14.10
3.7	14.60
3.8	15.12
3.9	15.66
4.0	16.23
4.1	16.84
4.2	17.47
4.3	18.14
4.4	18.84
4.5	19.59
4.6	20.38
4.7	21.21
4.8	22.08
4.9	23.00
5.0	23.96
5.1	24.96
5.2	26.00
5.3	27.07
5.4	28.17
5.5	29.30
5.6	30.44
5.7	31.64
5.8	32.83
5.9	34.01
6.0	35.14
6.1	36.23
6.2	37.24
6.3	38.14
6.4	38.93
6.5	39.56
6.6	40.00

**Flow characteristics**





Dimensions



Size (DN)	ISO 228-1 a (mm)	L (mm)	H (mm)
15	G ¾ A	76	92

Size (DN)	ISO 228-1 a (mm)	L (mm)	H (mm)	S (mm)
15	G ½	76	92	27
20	G ¾	80	95	32
25	G 1	86	98	41
32	G 1¼	102	121	50
40	G 1½	102	125	55
50	G2	130	129	67





