ENGINEERING
TOMORROW

Data sheet

Manual presetting valves LENO™ MSV-BD

Description

LENO™ MSV-BD is a range of manual valves for balancing flow in heating and cooling systems.

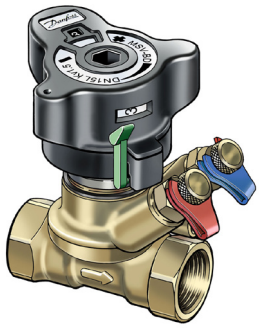
LENO™ MSV-BD is a combined presetting and shut off valve with a range of unique features:

- Removable hand wheel for easy mounting.
- 360° turnable measuring station for convenient measuring and draining.
- Numeric presetting scale, visible from more angles.
- Easy locking of presetting.
- Built-in test plugs for Ø 3 mm needles.
- Drain connection with separate draining of inlet and outlet side of valve.
- Open-close with Allen key for extra force.
- Open-closed colour indicator.

It is recommended to use LENO™ MSV-BD in constant flow systems. The valve may be mounted in flow or return.

DN 15 and 20 valves are available with internal or external thread. Other dimensions with internal thread.

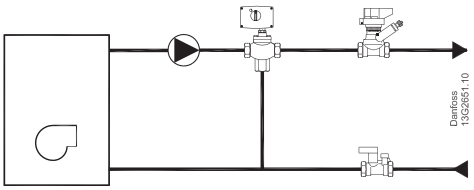
MSV-BD PURE valves are available in DN15LF - 25 range. The only difference between MSV-BD and MSV-BD PURE valves is the brass material used for valve construction.



Danfoss PFM 1000 measuring instruments contain valve data for LENO™ MSV-BD in memory.

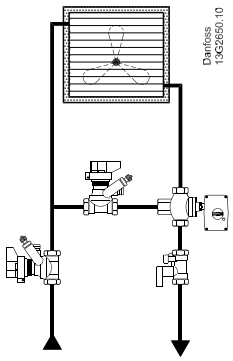
Application

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



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

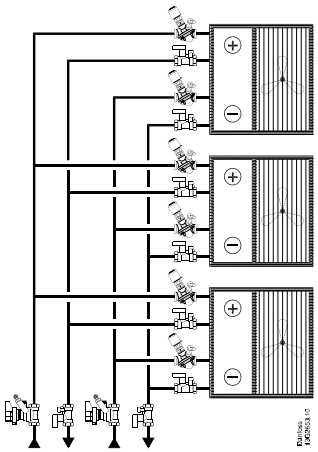
Air handling unit



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

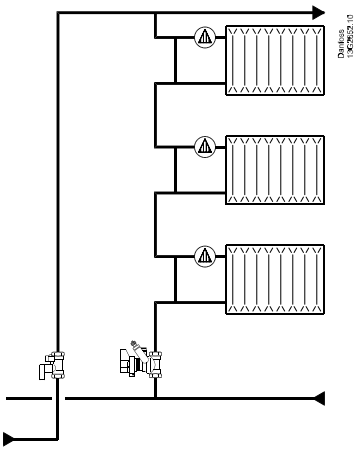
Application

Fan coils



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

1-pipe system

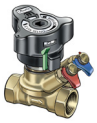


- For balancing.
- Shut-off function for service/repair.

DOMESTIC HOT WATER SYSTEMS: *Depending on local legislation it can be used in Domestic hot water applications.*

Ordering

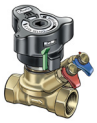
LENO™ MSV-BD valve with internal thread

Type	Material	Size (mm)	k_{VS} (m^3/h)	Connection	Quantity	Code No.
	DZR brass [1] (CW602N)	DN 15 LF	2.5	G ½"	1	**003Z4000**
		DN 15	3.0	G ½"	1	**003Z4001**
		DN 20	6.0	G ¾"	1	**003Z4002**
		DN 25	9.5	G 1"	1	**003Z4003**
		DN 32	18	G 1¼"	1	**003Z4004**
		DN 40	26	G 1½"	1	**003Z4005**
		DN 50	40	G 2"	1	**003Z4006**
		DN 15	3.0	G ½"	8	**003Z4261**
		DN 20	6.6	G ¾"	8	**003Z4262**
		DN 25	9.5	G 1"	8	**003Z4263**

LENO™ MSV-BD valve with external thread

Type	Material	Size (mm)	k_{VS} (m^3/h)	Connection	Code No.
	DZR brass [1] (CW602N)	DN 15 LF	2.5	G ¾ A [2]	**003Z4100**
		DN 15	3.0	G ¾ A [2]	**003Z4101**
		DN 20	6.0	G 1 A	**003Z4102**

LENO MSV-BD PURE (Lead < 0,1%) valve with internal thread

Type	Material	Size (mm)	k_{VS} (m^3/h)	Connection	Code No.
	Ecobrass (CW724R)	DN 15 LF	2.5	G ½"	**003Z9990**
		DN 15	3.0	G ½"	**003Z9991**
		DN 20	6.0	G ¾"	**003Z9992**
		DN 25	9.5	G 1"	**003Z9993**

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Ordering *(continued)*

LENO™ MSV-BD/S set solution

Type	Material	Size (mm)	k_{VS} (m^3/h)	Drain flow [3] (l/h)	Connection	Code No.
	DZR brass [1]	DN 15	3.0	281	½"	**003Z4051**
		DN 20	6.0	277	¾"	**003Z4052**
		DN 25	9.5	316	1"	**003Z4053**
		DN 32	18	305	1¼"	**003Z4054**
		DN 40	26	208	1½"	**003Z4055**
		DN 50	40	308	2"	**003Z4056**

[1] *Corrosion resistant brass*
[2] *Eurocone DIN V 3838*
[3] *Drain flow is measured at 1 bar static pressure and 0.1 bar differential pressure.*

Accessories

Type	Code No.
Standard test plugs, 2 pcs.	**003Z4662**
Measuring test plugs, 53 mm, red and blue	**003Z3946**
Operating handle	**003Z4652**
MSV-BD drain plug (Ecobrass)	**003Z2649**
Drain connection, ½" thread	**003Z4096**
Drain connection, ¾" thread	**003Z4097**
Flow measuring instrument PFM 1000 (10 bar)	**003Z8260**
Flow measuring instrument PFM 1000 (20 bar)	**003Z8261**
Identification tag & strips, 10 pcs.	**003Z4660**
MSV-BD insulation, DN 15	**003Z4781**
MSV-BD insulation, DN 20	**003Z4782**
MSV-BD insulation, DN 25	**003Z4783**
MSV-BD insulation, DN 32	**003Z4784**
MSV-BD insulation, DN 40	**003Z4785**
MSV-BD insulation, DN 50	**003Z4786**

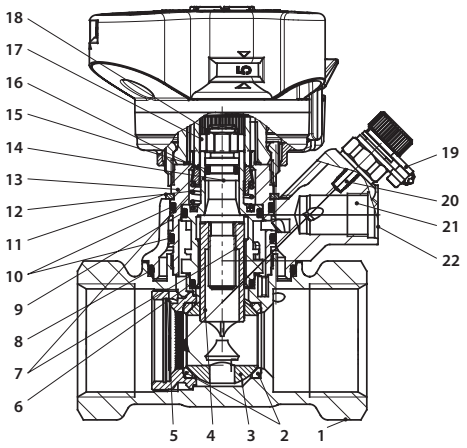
LENO™ MSV-BD valve with external thread

Pipe (mm)	Valve thread	PEX fittings, Code no.	Alupex fittings, Code no.
12 x 1.1	G ¾	**013G4150**	-
12 x 2	G ¾	**013G4152**	**013G4182**
13 x 2	G ¾	**013G4153**	-
14 x 2	G ¾	**013G4154**	**013G4184**
15 x 1.7	G ¾	**013G4165**	-
15 x 2.5	G ¾	**013G4155**	**013G4185**
16 x 1.5	G ¾	**013G4157**	-
16 x 2	G ¾	**013G4156**	**013G4186**
16 x 2.25	G ¾	-	**013G4187**
17 x 2	G ¾	**013G4162**	-
18 x 2	G ¾	**013G4158**	**013G4188**
18 x 2.5	G ¾	**013G4159**	-
20 x 2	G ¾	**013G4160**	**013G4190**
20 x 2.5	G ¾	**013G4161**	**013G4191**

Compression fittings for valves with external thread

Steel/copper pipes	Dimension	Code no.
	G ¾ x 15	**013G4125**
	G ¾ x 16	**013G4126**
	G ¾ x 18	**013G4128**
	G 1 x 18	**013U0134**
	G 1 x 22	**013U0135**

Design



1. Valve body
2. Ball seat
3. Ball
4. Throttle bush
5. Support screw
6. O-ring
7. Shut-off bush
8. O-ring
9. O-ring
10. O-ring
11. Retaining ring (corrosion protected)
12. Spring
13. Valve top
14. Spindle
15. O-ring
16. Rotation lock
17. Spindle head
18. Retaining ring, corrosion protected
19. Strips, 2 pcs.
20. Test plugs protection screw
21. Drain connection
22. Drain plug (PURE products only)

Materials and parts in contact with water

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

Technical data

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.

Removal of the handle

1. Set the handle at 0.0.
2. Release the setting lock (green).
3. Unscrew the union nut.

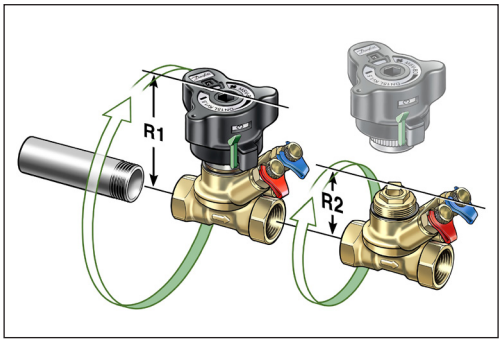
Calibration of the handle

Before refitting, ensure that the handle setting is 0.0.

For DN 15 - 20 valves with external thread

Danfoss offers a complete range of compression fittings for steel, cobber and PEX pipes.

DN	R1/R2 (mm)
15	86/67
20	89/69
25	91/71
32	118/84
40	118/84
50	124/90



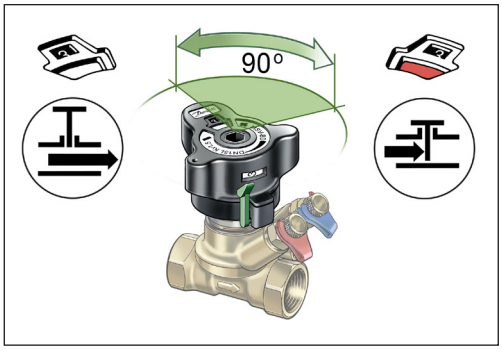
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Shut-off

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

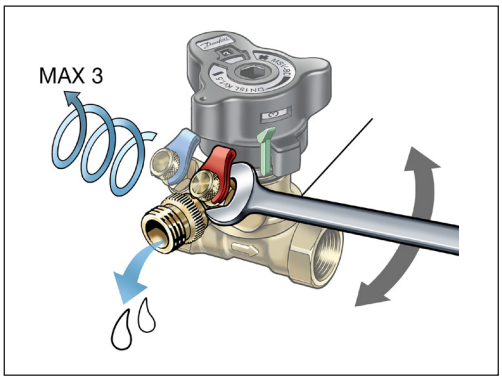


Draining

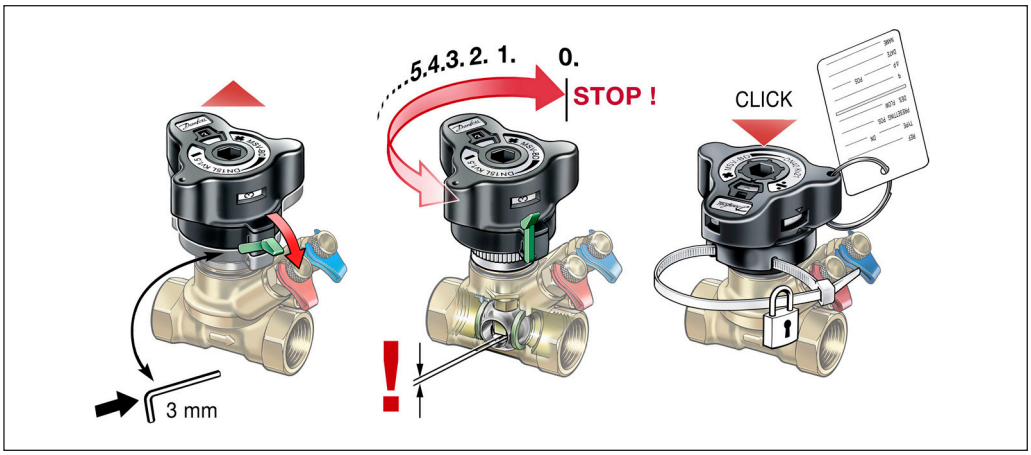
Note!
The drain connection is an accessory and must be purchased separately.

The drain tap can rotate 360 degrees for convenient operation.

Draining the system pipes can be done selectively:
When the red test plug is opened, the valve inlet pipe is drained.
Opening the blue test plug will drain the pipe on the valve outlet side. Test plugs unscrewing protection screw is located between valve test plugs.



Setting and sealing



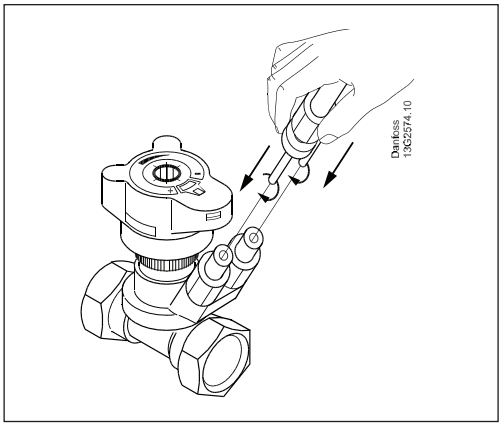
The valve has a presetting feature for setting/ adjusting flow ratings.

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 handled is pressed to click.
5. The setting can be sealed by using a strip as shown.

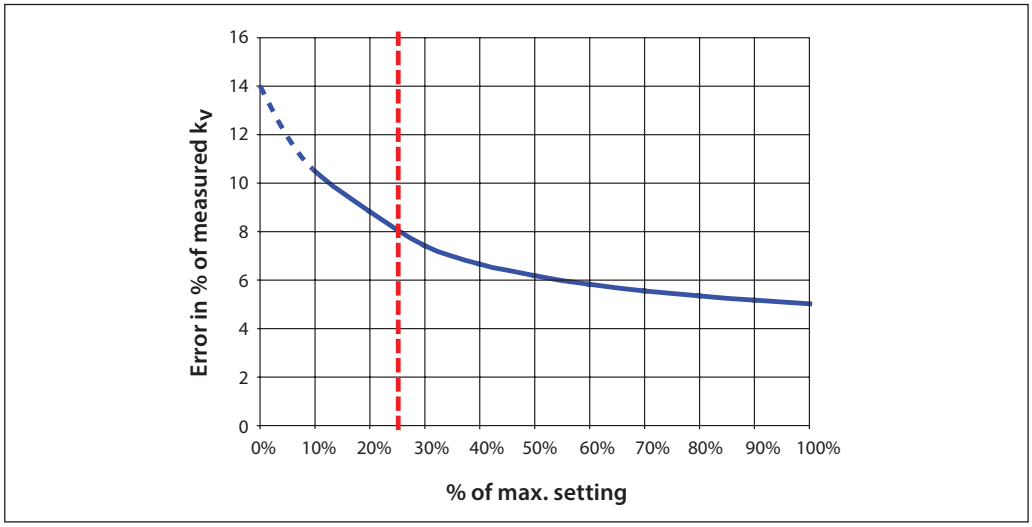
Measuring

The flow through the LENO™ MSV-BD valve can be measured using Danfoss PFM 1000 or other brands of measuring instruments.
The LENO™ MSV-BD valve is supplied with two test plugs for Ø3 mm needles.
A twin bracket enables the user to connect both needles simultanously.

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.



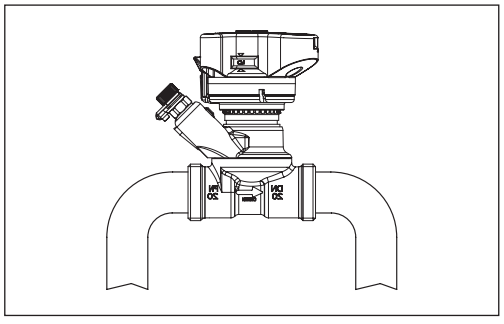
Measuring accuracy



LENO™ MSV-BD is very accurate, due to the separate functions for presetting and shut-off. Valve can be mounted everywhere in the system (closed to T-pieces, elbows, pumps, etc.), since it is unaffected by turbulence in any setting or instalation.

The red line indicates 25% of max. flow.

According to BS7350:1990 flow rates must be within following values:
± 18% at 25% open position
± 10% at fully open position



Kv-signal

kv-signal values are used for non-Danfoss measuring instruments. Danfoss PFM 1000 have all data in memory, and the instruments are using this formula:

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

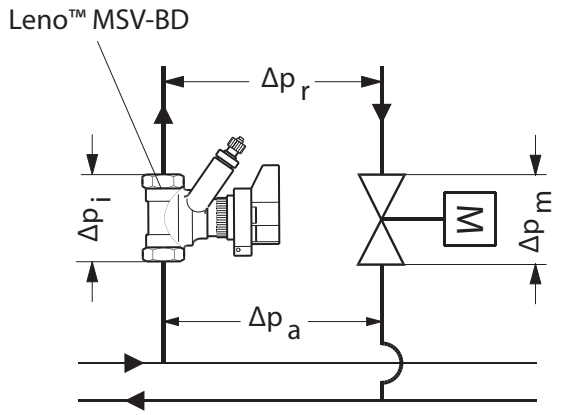
Δp across the test plugs (k_v-sig) and Δp across the valve (k_v-val) is not the same due to turbulence influence for pressure measuring.

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K_V-signal values

Setting	DN 15LF	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
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	4.19	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		6.38		20.24	23.30
5.4	1.79	2.46		6.57		20.41	24.12
5.5	1.87	2.50		6.77	-	20.48	24.94
5.6	1.93	2.54		6.96			25.76
5.7	1.99	2.57		7.15			26.58
5.8	2.04			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						30.74
6.4				-			31.17
6.5	-						31.47
6.6							31.61

Valve size and presetting



Δpi Pressure drop across LENO™ MSV-BD valve
Δpm Pressure drop across valve
Δpr Necessary pressure for the riser
Δpa Available pressure for the riser

Example

Given:
Max. pipe flow Q .....2.0 m^3/h
Δp_r.....15 kPa
Δp_a .....45 kPa
Δp_m .....10 kPa
Δp_i .....Δp_a - Δp_v - Δp_m

Δp_i = 45 kPa - 15 kPa - 10KPa = 20 kPa

Correct valve size and presetting is found in the sizing and flow diagrammes, p 9.

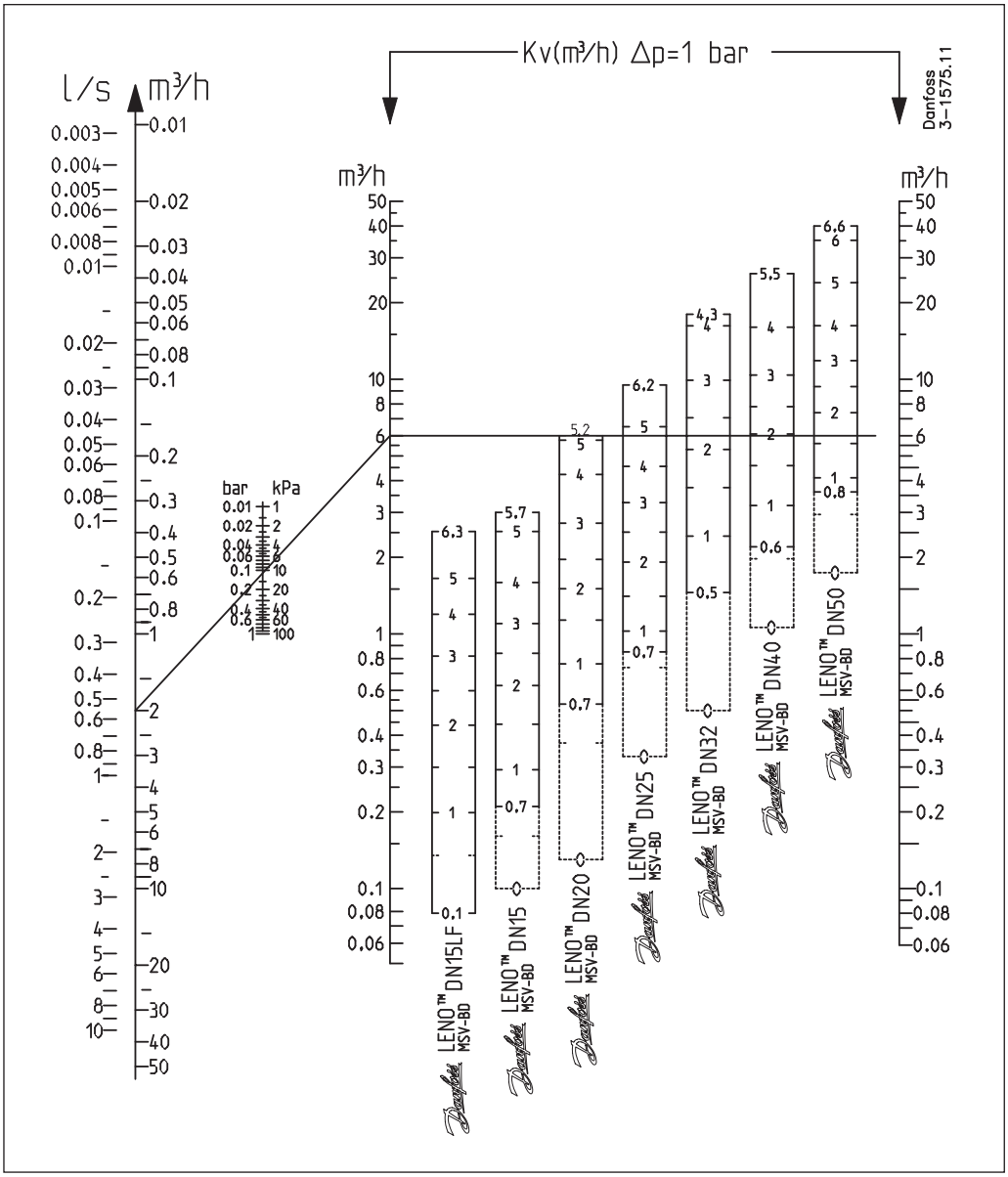
Q = 2.0 m^3/h and Δp_i = 20 kPa

Setting can be also calculated from the formula:

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

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Sizing



Correction factors

Medium: Ethylene glycol / propylene glycol percentage (max. 30 %).

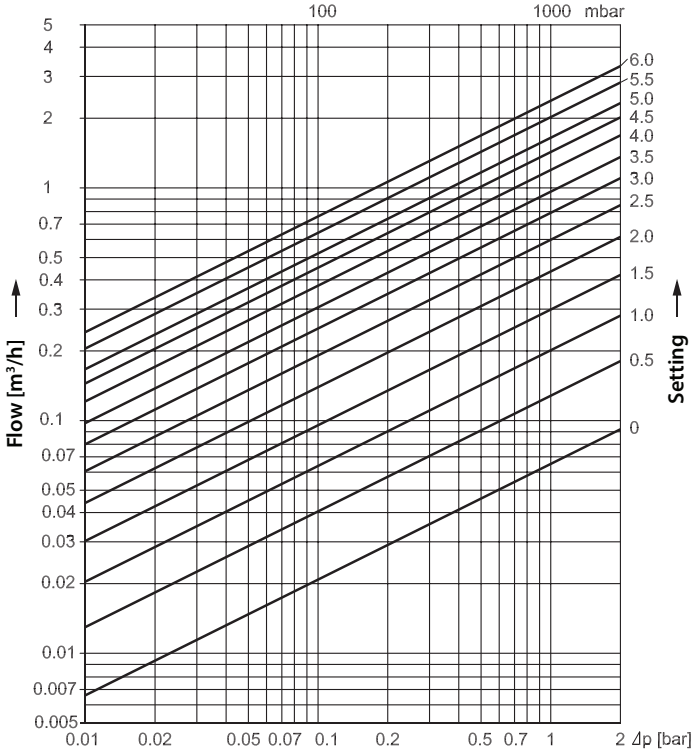
Temp. °C	Flow, m³/h						
	25	30	40	50	60	65	100
-40.0	[1]	[1]	[1]	[1]	0.89	0.88	[1]
-17.8	[1]	[1]	0.93	0.91	0.90	0.89	0.86
4.4	0.95	0.95	0.93	0.92	0.91	0.90	0.87
26.6	0.96	0.95	0.94	0.93	0.92	0.91	0.88
48.9	0.97	0.96	0.95	0.94	0.93	0.92	0.90
71.1	0.98	0.98	0.96	0.95	0.94	0.94	0.95
93.3	1.00	0.99	0.97	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*

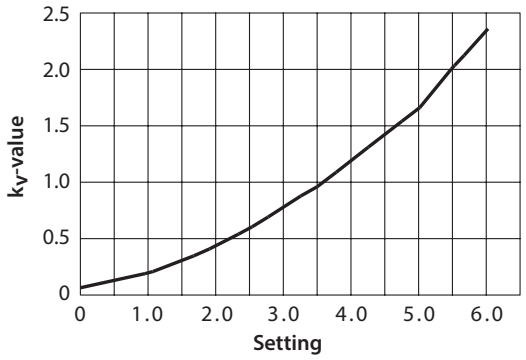
Example
Flow needed .....30 m³/h
Flow after correction .....30 x 0.95 = 28 m³/h

Flow diagrammes, DN 15 LF

LENO™ MSV-BD DN 15 LF



Flow characteristics

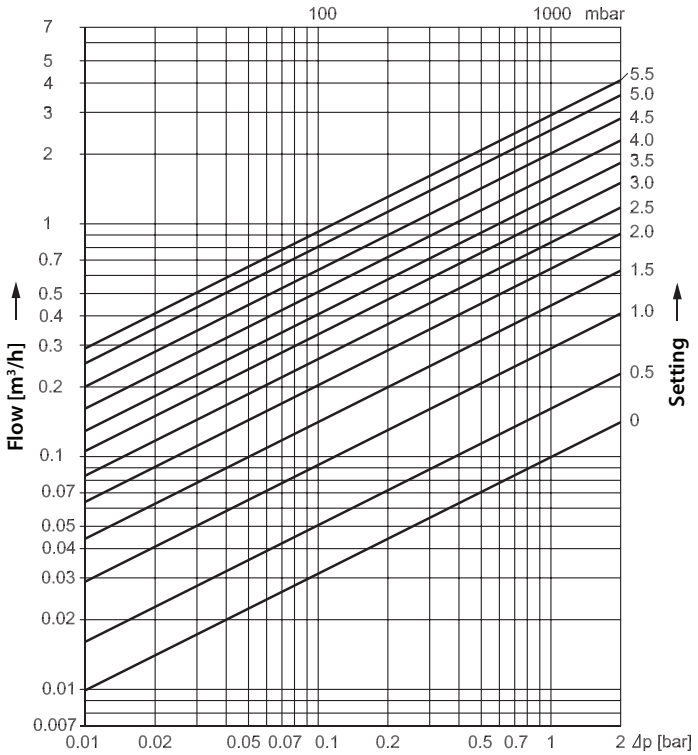


Setting	k_V-value
0.0	0.07
0.1	0.08
0.2	0.09
0.3	0.11
0.4	0.12
0.5	0.13
0.6	0.15
0.7	0.16
0.8	0.17
0.9	0.19
1.0	0.20
1.1	0.22
1.2	0.23
1.3	0.25
1.4	0.28
1.5	0.30
1.6	0.32
1.7	0.35
1.8	0.38
1.9	0.41
2.0	0.44
2.1	0.47
2.2	0.50
2.3	0.53
2.4	0.56
2.5	0.60
2.6	0.63
2.7	0.67
2.8	0.71
2.9	0.74
3.0	0.78
3.1	0.82
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
6.3	2.53

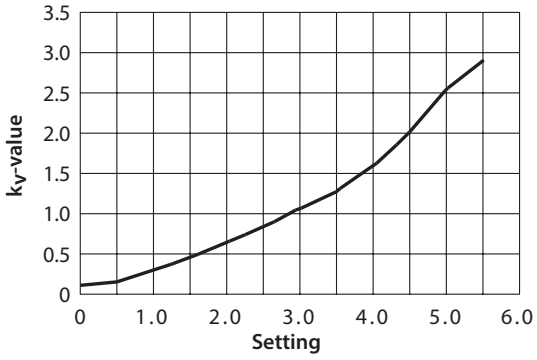
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Flow diagrammes, DN 15

LENO™ MSV-BD DN 15



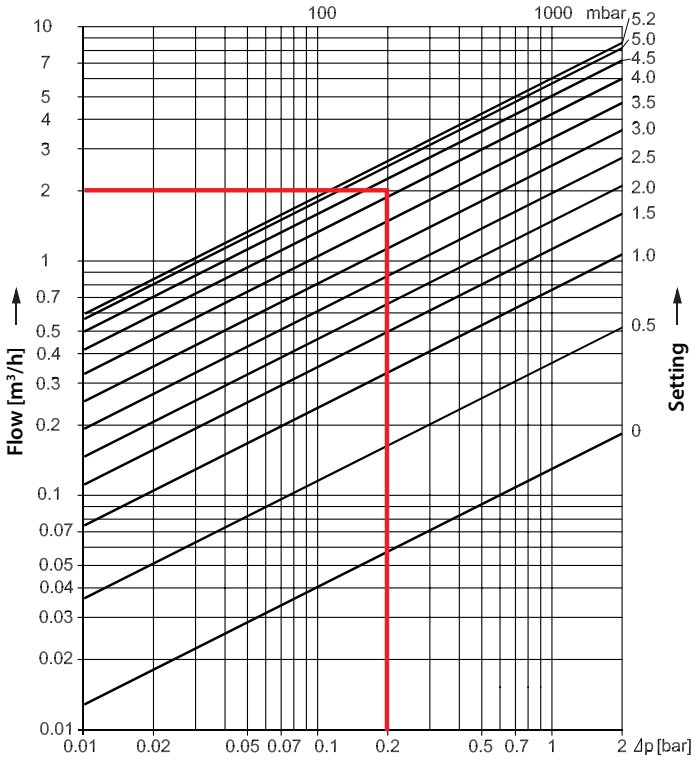
Flow characteristics



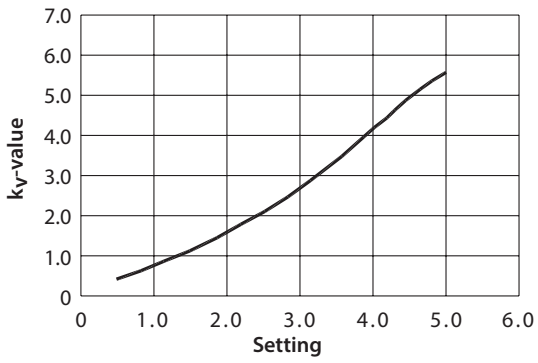
Setting	k_V-value
0.0	0.10
0.1	0.11
0.2	0.12
0.3	0.13
0.4	0.14
0.5	0.16
0.6	0.19
0.7	0.21
0.8	0.24
0.9	0.27
1.0	0.29
1.1	0.32
1.2	0.35
1.3	0.38
1.4	0.41
1.5	0.44
1.6	0.48
1.7	0.51
1.8	0.55
1.9	0.59
2.0	0.63
2.1	0.67
2.2	0.71
2.3	0.75
2.4	0.80
2.5	0.84
2.6	0.88
2.7	0.93
2.8	0.97
2.9	1.02
3.0	1.06
3.1	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 diagrammes, DN 20

LENO™ MSV-BD DN 20



Flow characteristics

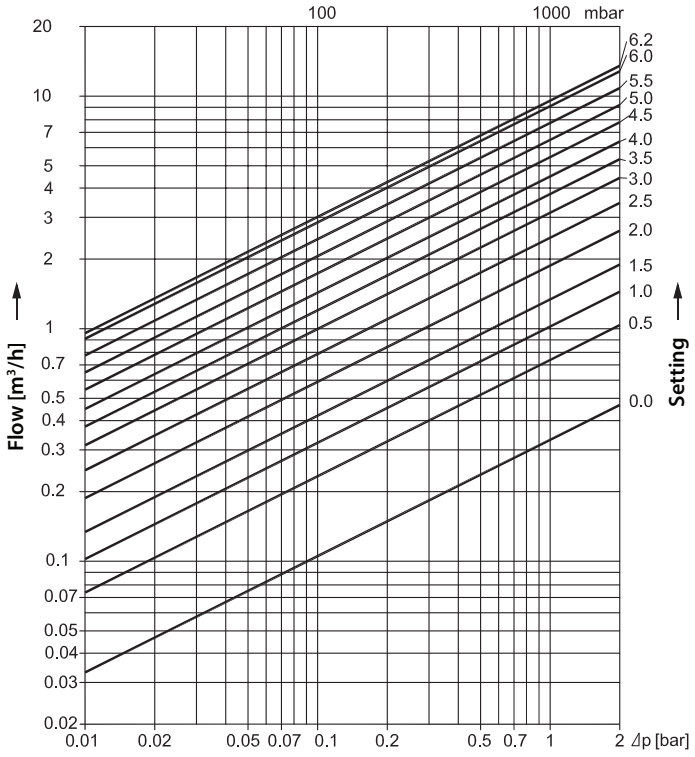


Setting	k_V-value
0.0	0.13
0.1	0.15
0.2	0.19
0.3	0.24
0.4	0.30
0.5	0.37
0.6	0.45
0.7	0.53
0.8	0.61
0.9	0.68
1.0	0.76
1.1	0.84
1.2	0.92
1.3	0.99
1.4	1.06
1.5	1.13
1.6	1.21
1.7	1.28
1.8	1.35
1.9	1.43
2.0	1.50
2.1	1.59
2.2	1.67
2.3	1.76
2.4	1.86
2.5	1.96
2.6	2.07
2.7	2.19
2.8	2.31
2.9	2.44
3.0	2.58
3.1	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
4.2	4.58
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	6.00

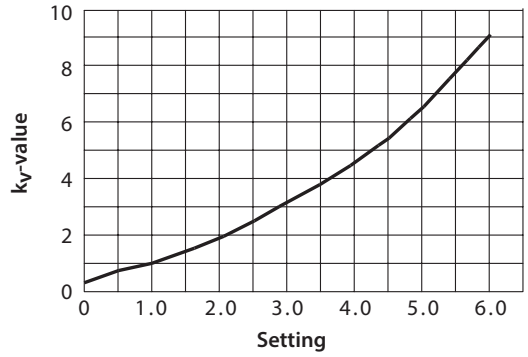
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Flow diagrammes, DN 25

LENO™ MSV-BD DN 25



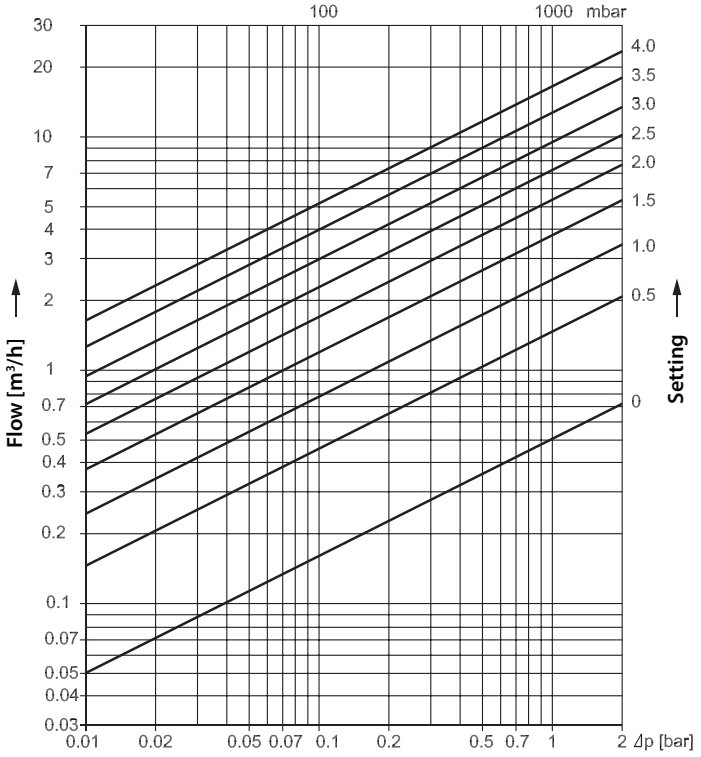
Flow characteristics



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
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

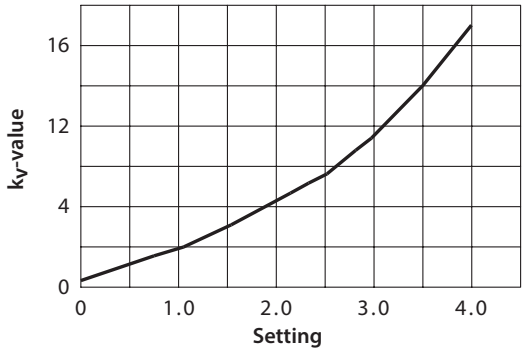
Flow diagrammes, DN 32

LENO™ MSV-BD DN 32



Setting	k_V-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
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

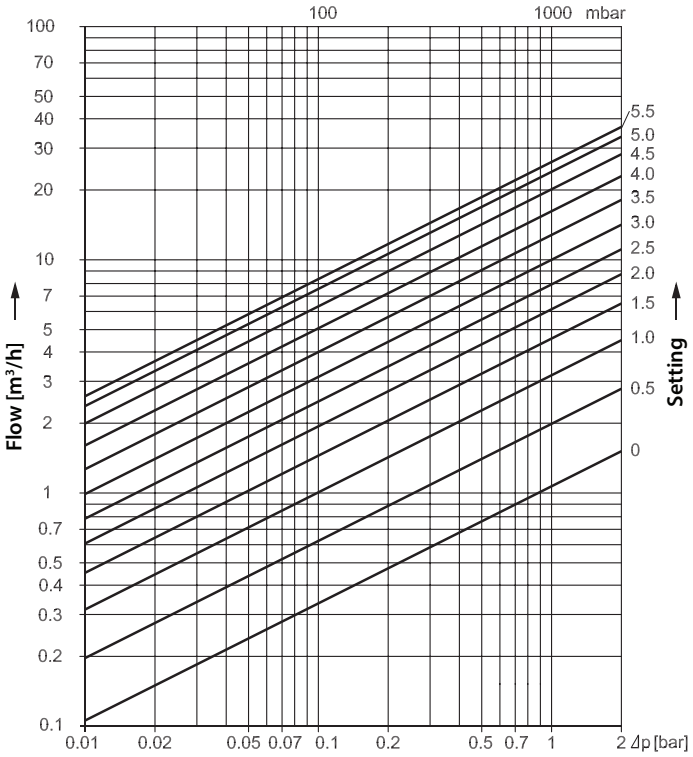
Flow characteristics



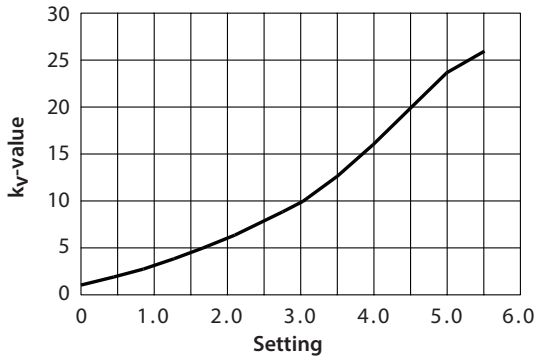
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Flow diagrammes, DN 40

LENO™ MSV-BD DN 40



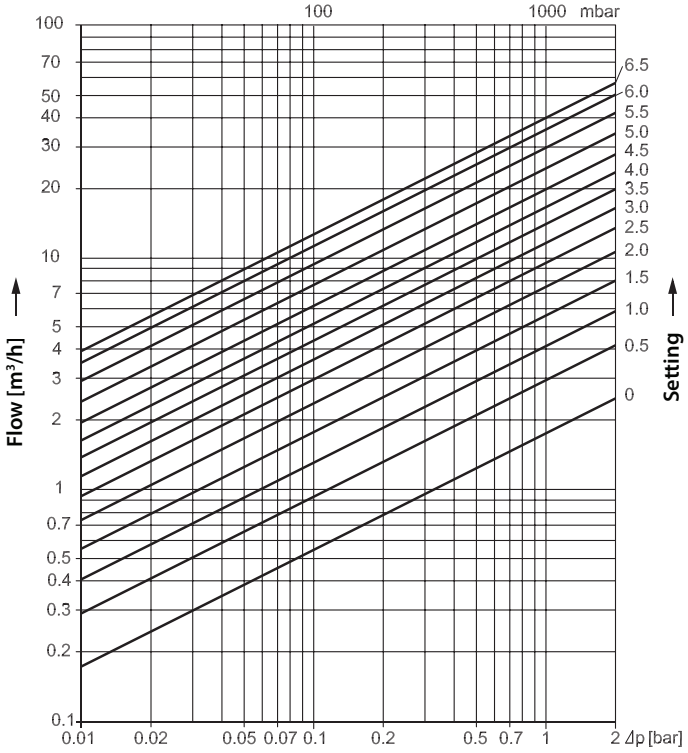
Flow characteristics



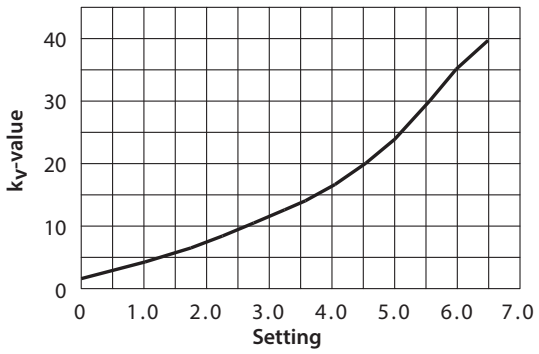
Setting	k_V-value
0.0	1.06
0.1	1.21
0.2	1.38
0.3	1.56
0.4	1.76
0.5	1.97
0.6	2.20
0.7	2.43
0.8	2.68
0.9	2.93
1.0	3.19
1.1	3.46
1.2	3.73
1.3	4.01
1.4	4.29
1.5	4.58
1.6	4.87
1.7	5.17
1.8	5.47
1.9	5.78
2.0	6.09
2.1	6.41
2.2	6.74
2.3	7.09
2.4	7.44
2.5	7.80
2.6	8.18
2.7	8.58
2.8	9.00
2.9	9.44
3.0	9.90
3.1	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 diagrammes, DN 50

LENO™ MSV-BD DN 50



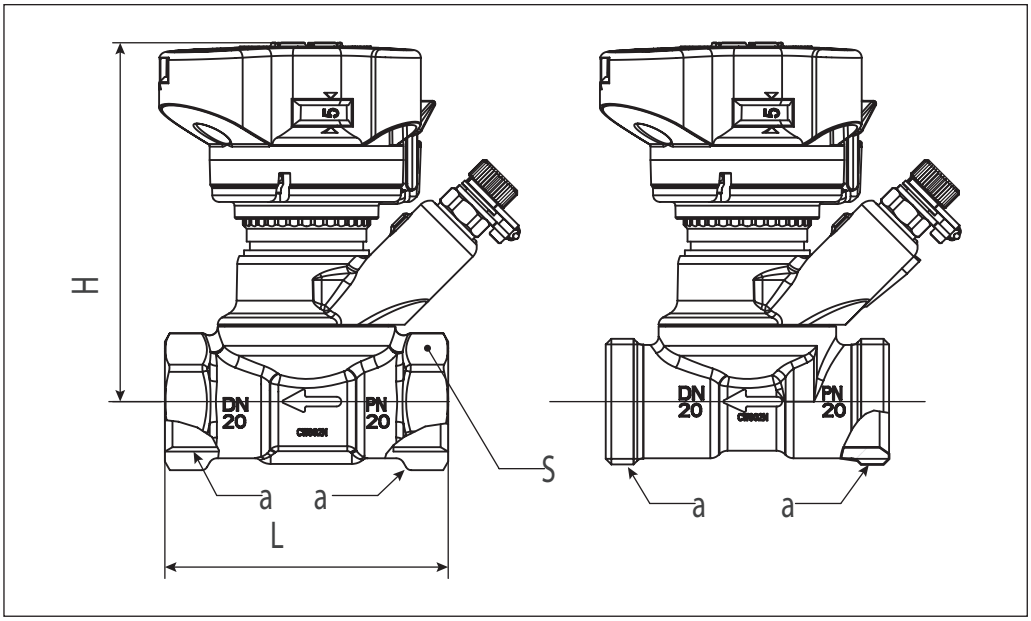
Flow characteristics



Setting	k_V-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
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

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Dimensions



MSV-BD	Size	a Thread ISO 228-1	L (mm)	H (mm)	S (mm)
003Z4000	DN 15 LF	G ½	65	92	27
003Z4001	DN 15	G ½	65	92	27
003Z4002	DN 20	G ¾	75	95	32
003Z4003	DN 25	G 1	85	98	41
003Z4004	DN 32	G 1¼	96.5	121	50
003Z4005	DN 40	G 1½	100	125	55
003Z4006	DN 50	G 2	130	129	67
003Z4100	DN 15 LF	G ¾ A	70	92	-
003Z4101	DN 15	G ¾	70	92	-
003Z4102	DN 20	G 1 A	75	95	-

MSV-BD PURE	Size	a Thread ISO 228-1	L (mm)	H (mm)	S (mm)
003Z9990	DN 15 LF	G ½	65	92	27
003Z9991	DN 15	G ½	65	92	27
003Z9992	DN 20	G ¾	75	95	32
003Z9993	DN 25	G 1	85	98	41

Data sheet **LENO™ MSV-BD**

Tender specifications

LENO™ MSV –BD can be used in heating and cooling systems.

Features	LENO™ MSV-BD
Balancing / Commissioning	•
Presetting	•
Fixed orifice	
Self sealing test plugs	•
Digital visible scale from more sides	•
Shut-off function (ball valve)	•
Draining / filling	•
Draining / filling on both sides of the valve	•
Removable handle	•
Closing indicator	•
Parallel test plugs (25mm center distance)	•
360° rotating measuring station (drain tap and test plugs)	•

Presetting values are visible on top of the valve and from all sides.
Presetting is locked by pressing down the handle. When locked, the shut-off function can be used without changing the presetting.
The handle is released with the green key or with a 3 mm Allen key.
To prevent unintended changes of the presetting, the handle can be sealed by using a strip.

The system can be drained and filled on both sides of the ball valve.

External thread versions comes in sizes DN 15 and DN 20 and are prepared for Danfoss standard fittings. DN 15 is designed with Euro cone, according to DIN V 3838.

LENO™ MSV-BD has a leakage rate A according to ISO 5208, the ball valve is 100% tight.

The LENO™ MSV-BD measuring accuracy is 8% at 25% of max. setting.
Accuracy is according to BS 7350 : 1990.

Measuring instruments must be equipped with Ø3 mm measuring needles. Danfoss measuring instruments PFM 1000 contain all relevant valve data.

Valve sizes . . . . . DN 15 (LF) – DN 50 , DN 15 (LF) - DN25 (PURE)
Pressure class. PN20
Static test pressure . . . . . 30 bar
Working temperature . . . . . -20°C to 120°C
Working area . . . . . 10-100% of the k_{VS}-value

The valve body is made of DZR brass or Eco brass.
The ball is made of chromium plated brass.
O-rings are made from EPDM rubber.

MSV-BD and MSV-BD PURE are equal valves in all respects excluding the brass material. MSV-BD are made of DZR brass (CW602N) and MSV-BD PURE valves are made of Eco brass (CW724R). All remaining valve properties are unchanged.

Danfoss A/S
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