

Differential pressure regulator with flow limiting device "Hydromat max."

Tender specification:

Oventrop differential pressure regulator with flow limiting device consisting of a bronze oblique pattern valve fitted with a diaphragm regulator complete with a flow limiting device. It is designed for use in both heating or chilled water a/c systems. It allows the constant regulation of differential pressure and works without auxiliary energy as proportional regulator with a fixed nominal pressure (0.1; 0.15, 0.2 or 0.3 bar). The differential pressure regulator has a presetting with memory position, a pressure balanced valve disc and a bronze straight pattern valve with female thread according to DIN 2999 or male thread. Stem, valve spring and spring for nominal pressure made of corrosion-resistant steel. Diaphragm, ring gaskets and washers made of EPDM. Installation in either the supply or the return pipe with the direction of flow conforming with the direction of the arrow on the valve body. The installation may be drained and filled by means of the isolating valves of the capillary. The diaphragm regulator and the spring for nominal pressure are replaceable inline with the valve under pressure.

Max. working pressure: 10 bar
 Max. differential pressure: 5 bar
 Max. working temperature: 120 °C

Function:

The Oventrop differential pressure regulators with flow limiting device are proportional regulators working without auxiliary energy. They consist of the diaphragm regulator and the valve. They are designed for use in heating or chilled water a/c systems to maintain a constant differential pressure within a necessary proportional band.

The diaphragm regulator is provided with a spring that determines the fixed nominal pressure. The spring is replaceable so that the fixed nominal pressure (0.1; 0.15; 0.2 and 0.3 bar) can be changed. The capillary from the supply pipe must always be connected to the outer chamber of the diaphragm regulator, and the capillary from the return pipe to the inner chamber. With the differential pressure in the installation increasing, the valve disc closes down and opens as the differential pressure falls. The regulation of the design flow is made by means of the reproducible presetting of the diaphragm regulator. If the actual flow is lower than the design flow, the pressure difference is regulated automatically. An actual flow rate exceeding the design flow is thus avoided by the flow limiting device.

Application:

The Oventrop differential pressure regulators with flow limiting device can be used in existing or new buildings for a decentral or central regulation of differential pressure. Installation is possible in either the supply or the return pipe, but due to the effects of high temperatures, installation in the return pipe is recommended. The differential pressure is determined by the choice of the corresponding spring for nominal pressure (0.1; 0.15; 0.2 or 0.3 bar). It can, however, be changed by replacing the spring for nominal pressure without the necessity to drain the system. A hydronic balancing of the pipework is made by means of the presetting with memory position.

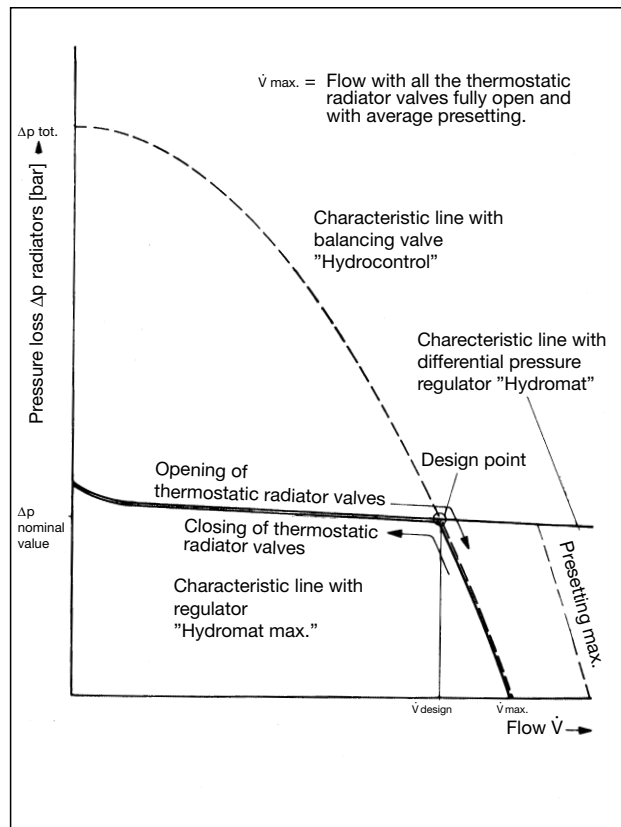
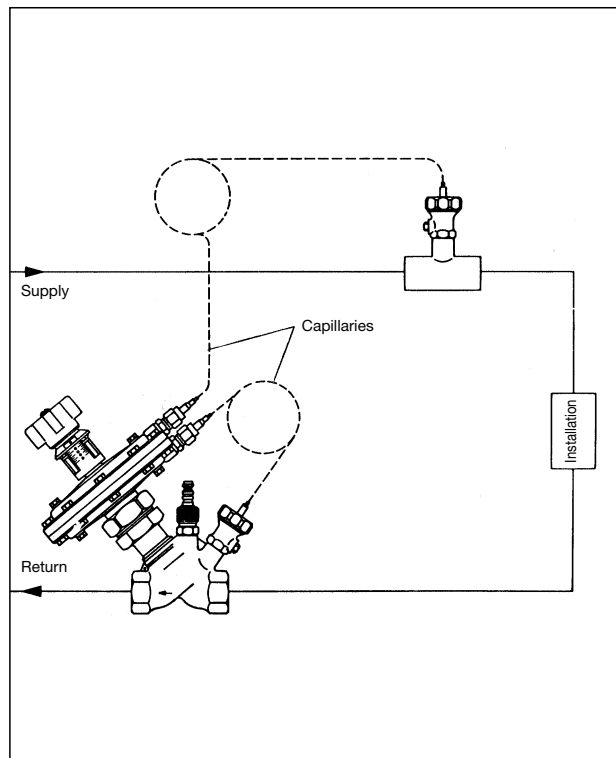


Chart characteristic lines

Installation example:

Installation in the return

Installation:

Oventrop differential pressure regulators with flow limiting device can be installed in either the supply or the return pipe, but due to the effects of high temperatures, installation in the return pipe is recommended. Installation is possible in any position provided the direction of flow conforms with the direction of the arrow on the valve body. Before installing the regulator into the pipework, it is advisable to flush the latter thoroughly. The installation of an Oventrop "Y" type strainer is recommended. The capillaries should always be connected laterally to the supply or the return pipe.

Installation in the return pipe:

First of all the ball valve is screwed in the tapping point (thread $\frac{1}{4}$ ") of the valve body situated towards the installation and is connected to the inner chamber of the diaphragm regulator by means of the capillary. The second tapping point is closed with a blind plug. Next, a second ball valve must be fitted to a suitable tapping point in the supply pipe and is connected to the outer chamber of the diaphragm regulator by means of the capillary. Both ball valves are then opened, the installation is filled and the two chambers of the diaphragm regulator are deaerated.

Installation in the supply pipe:

First of all the ball valve is screwed in the threaded port (thread $\frac{1}{4}$ ") of the valve body situated towards the installation and is connected to the outer chamber of the diaphragm regulator by means of the capillary. The second threaded port is closed with a blind plug. Next, a second ball valve must be fitted to a suitable tapping point in the return pipe and is connected to the inner chamber of the diaphragm regulator by means of the capillary. Both ball valves are then opened, the installation is filled and the two chambers of the diaphragm regulator are deaerated.

Deaeration of the chambers of the diaphragm regulator:

Before setting the installation into operation, the diaphragm regulator has to be deaerated. This is done by loosening the two vent screws situated at the highest point of the regulator (if necessary, the diaphragm regulator must be repositioned after having unscrewed the collar nut).

Function of the manual isolation:

The Oventrop differential pressure regulator with flow limiting device may be isolated manually and additionally works as an isolating valve. The presetting remains unchanged.

Draining and filling of the installation:

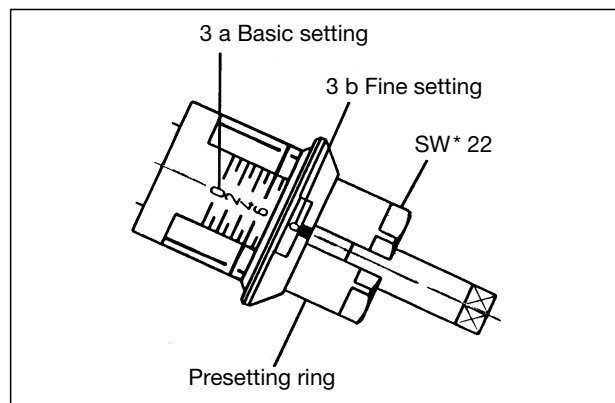
The installation may be drained or filled by means of the ball valves $\frac{1}{4}$ ". The ball valves have a $\frac{1}{2}$ " hose connection.

Draining of the installation:

First close the ball valve and detach the capillary. A small quantity of water may escape. Fit a $\frac{1}{2}$ " hose to the ball valve and open the ball valve to drain the installation.

Filling of the installation:

First fit a $\frac{1}{2}$ " hose to the ball valve, open the ball valve and fill the installation. Once the installation is filled, the ball valve is closed, the hose is removed and the capillary is connected again. Finally the ball valve has to be reopened and the chambers of the diaphragm regulator have to be deaerated.

**Presetting:**

1. Close the valve.
2. Remove the handwheel.
3. Adjust the presetting ring to the value taken from the appropriate flow chart.
 - a. Basic setting:
The bottom edge of the presetting ring coincides with the longitudinal scale. Each graduation represents one full turn of the presetting ring.
 - b. Fine setting:
Turning the presetting ring makes the required figure visible. Setting it at "0" corresponds to the full value of the longitudinal scale (i.e. full turns from closed). Each subdivision on the peripheral scale represents 1/10th of a turn of the presetting ring.
4. Refit the handwheel
5. Open the valve until stop.

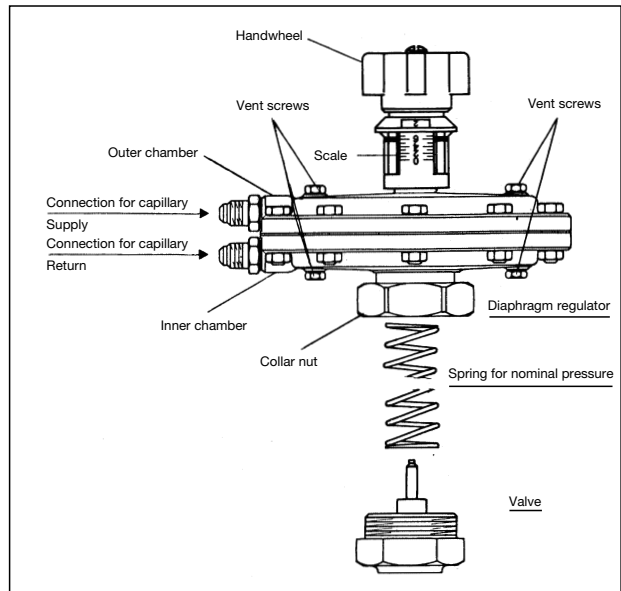
*SW = spanner size

Alteration of the nominal pressure:

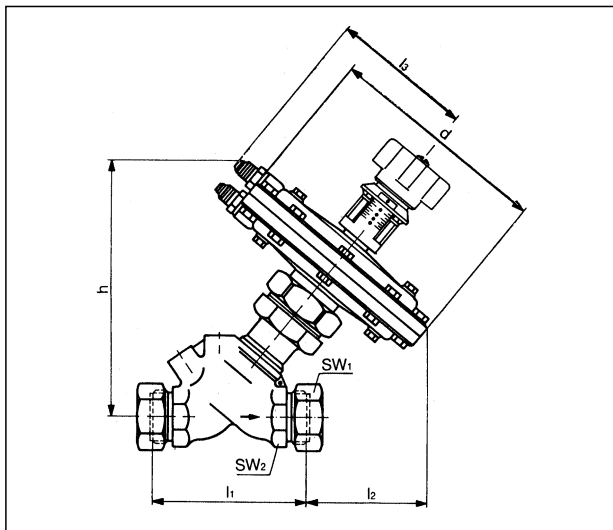
The nominal pressure of the Oventrop differential pressure regulator with limiting device can be changed subsequently by replacing the spring for nominal pressure, without the need to drain the system.

First, the capillary between the return pipe and the inner (lower) chamber has to be shut off. The diaphragm regulator can then be detached after loosening the collar nut with a 46 mm spanner. Next, the spring for nominal pressure and the identification tag can be replaced. The diaphragm regulator is then refitted taking care not to damage the O-ring seal.

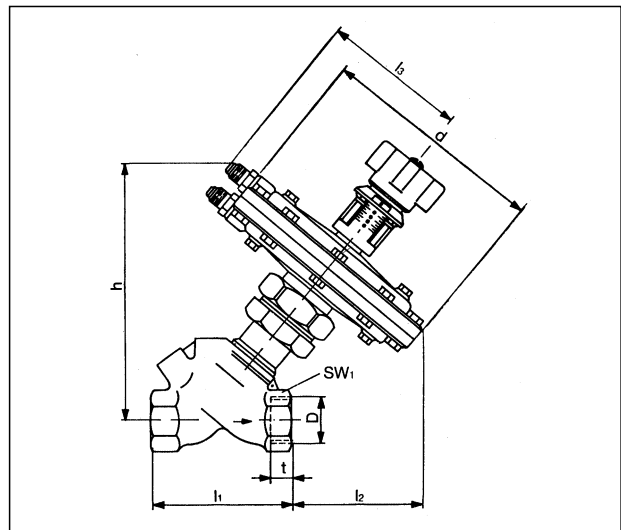
It is essential that the diaphragm regulator is positioned so that two of the four vent screws are located at the highest point. Finally, reopen the capillary and deaerate the chambers of the diaphragm regulator.



Male thread:



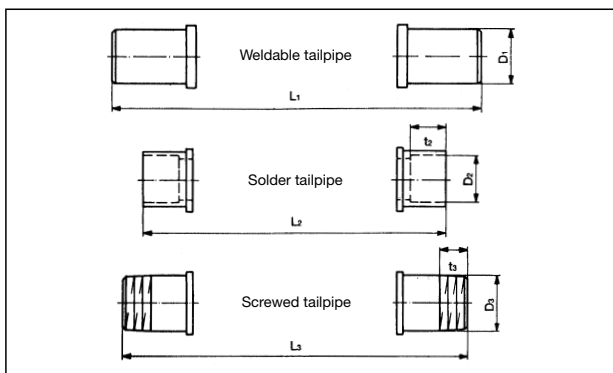
Female thread:



Measures:

DN	D DIN 2999	SW ₁ *	SW ₂ *	t	h	l ₁	l ₂	l ₃	d
15	1/2"	30	27	13.2	155	88	76	87	136
20	3/4"	37	32	14.5	160	93	78	87	136
25	1"	46	41	16.8	168	110	73	87	136
32	1 1/4"	52	50	19.1	181	110	79	87	136
40	1 1/2"	58	55	19.1	191	120	79	87	136

Accessories:



Measures:

Weldable tailpipe		Solder tailpipe			Screwed tailpipe		
L ₁	D ₁	L ₂	D ₂	t ₂	L ₃	D ₃ DIN 2999	t ₃
192	20.5	128	15	12	154	1/2"	13.2
197	26	145	22	17	165	3/4"	14.5
234	33	168	28	20	194	1"	16.8
234	41	178	35	25	206	1 1/4"	19.1
254	47.5	198	42	29	222	1 1/2"	19.1

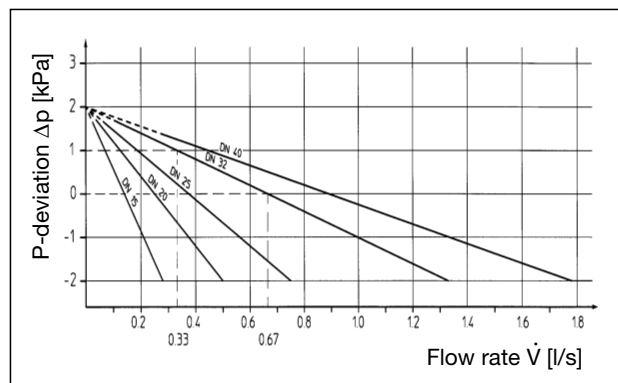
*SW = spanner size

Performance data:

Size DN	15	20	25	32	40
kvs-value	3.1	5.5	9.2	17.0	22.7
Recommended capacity m ³ /h	0.1 to 1.0	0.15 to 1.80	0.25 to 2.70	0.40 to 4.80	1.00 to 6.40
capacity l/s	0.028 to 0.28	0.042 to 0.50	0.069 to 1.75	0.11 to 1.33	0.28 to 1.78
Nominal value bar 0,1; 0,15; 0,2; 0,3					

P-deviation:

this shows the deviation from the nominal differential pressure, depending on the flow, Δp total = 0.7 bar.



E.g. DN 32 valve with 0.3 bar (30 kPa) nominal pressure
 Flow rate 0.67 l/s Δp = 30 kPa (0 kPa P-deviation)
 Flow rate 0.33 l/s Δp = 31 kPa (1 kPa P-deviation)

Differential pressure regulator item no's:

Female thread

Nominal value	0.1 bar	0.15 bar	0.2 bar	0.3 bar
DN 15	106 31 61	106 34 61	106 32 61	106 33 61
DN 20	106 31 62	106 34 62	106 32 62	106 33 62
DN 25	106 31 63	106 34 63	106 32 63	106 33 63
DN 32	106 31 64	106 34 64	106 32 64	106 33 64
DN 40	106 31 65	106 34 65	106 32 65	106 33 65

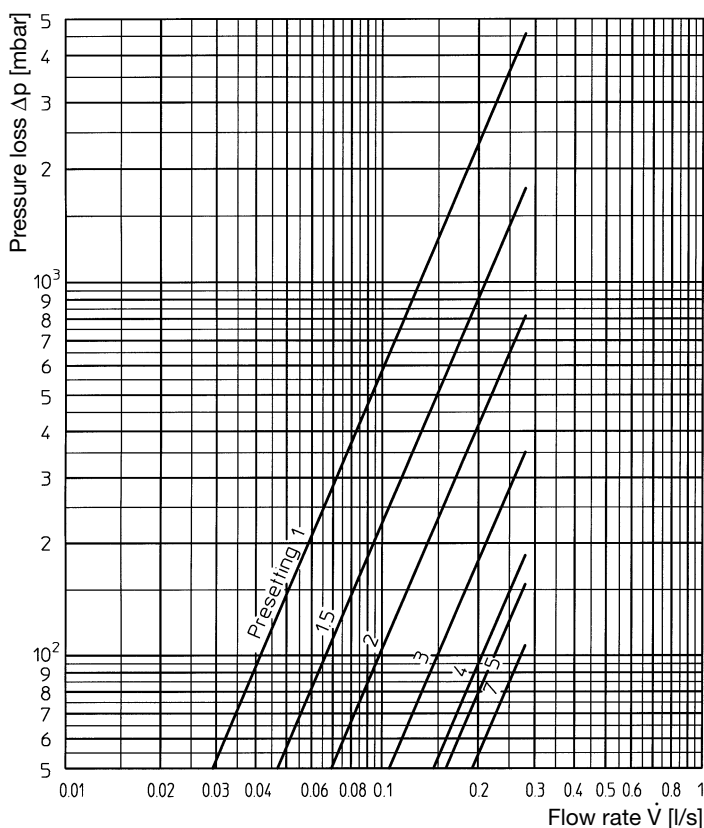
Male thread

Nominal value	0.1 bar	0.15 bar	0.2 bar	0.3 bar
DN 15	106 35 61	106 38 61	106 36 61	106 37 61
DN 20	106 35 62	106 38 62	106 36 62	106 37 62
DN 25	106 35 63	106 38 63	106 36 63	106 37 63
DN 32	106 35 64	106 38 64	106 36 64	106 37 64
DN 40	106 35 65	106 38 65	106 36 65	106 37 65

Accessories item no's:

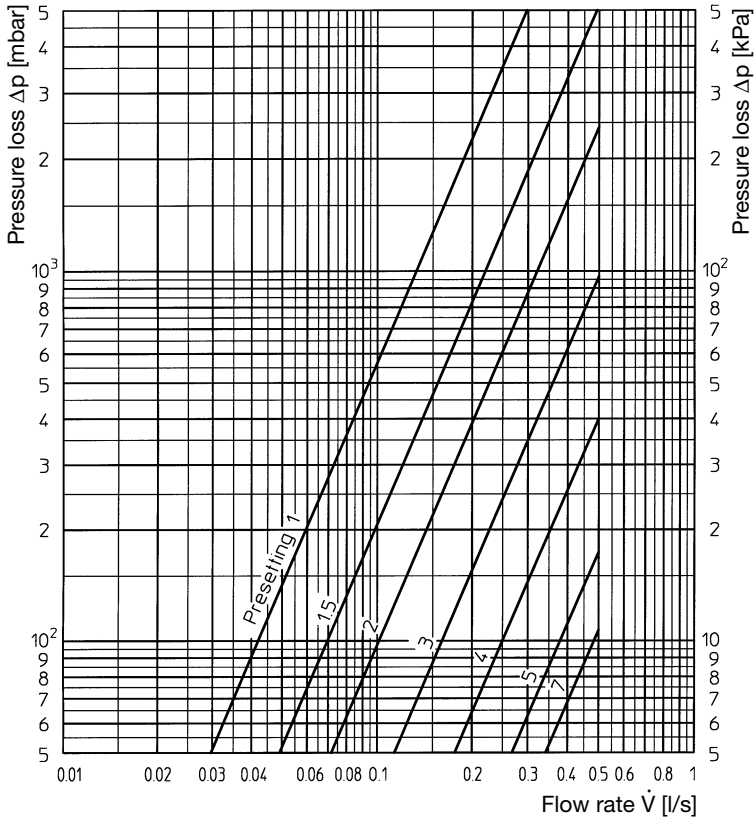
Diaphragm regulator		106 31 93
Spring for nominal pressure	0.1 bar	106 31 91
	0.15 bar	106 34 91
	0.2 bar	106 32 91
	0.3 bar	106 33 91
Connection set, consisting of:		106 31 95
1 capillary 0.5 m		
1 capillary 1.0 m		
2 isolating valves for capillary (ball valves)		
1 blind plug with O-ring seal 1/4"		

DN 15



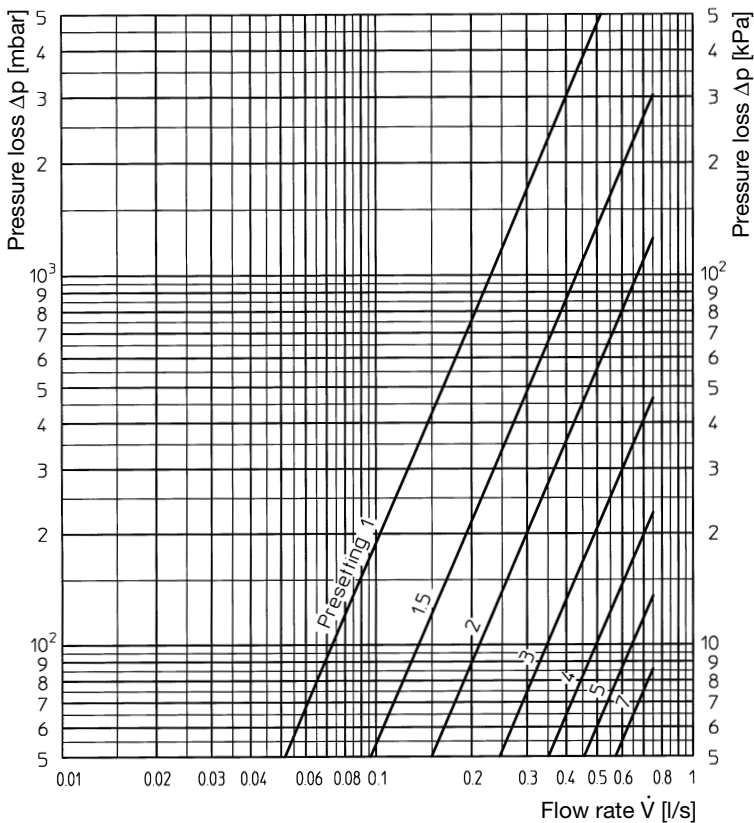
Turn	k _v -value	Zeta-value	Turn	k _v -value	Zeta-value
1.0	0,47	473	4.0	2,33	19
1.1	0,53	372	4.1	2,35	19
1.2	0,59	300	4.2	2,38	18
1.3	0,64	255	4.3	2,40	18
1.4	0,70	213	4.4	2,42	18
1.5	0,76	181	4.5	2,44	18
1.6	0,84	148	4.6	2,46	17
1.7	0,91	127	4.7	2,48	17
1.8	0,98	109	4.8	2,50	17
1.9	1,06	93	4.9	2,52	16
2.0	1,13	82	5.0	2,55	16
2.1	1,18	75	5.1	2,57	16
2.2	1,23	69	5.2	2,60	15
2.3	1,28	64	5.3	2,63	15
2.4	1,32	60	5.4	2,66	15
2.5	1,37	56	5.5	2,69	14
2.6	1,44	50	5.6	2,72	14
2.7	1,50	46	5.7	2,74	14
2.8	1,57	42	5.8	2,77	14
2.9	1,63	39	5.9	2,80	13
3.0	1,70	36	6.0	2,83	13
3.1	1,75	34	6.1	2,86	13
3.2	1,81	32	6.2	2,88	13
3.3	1,87	30	6.3	2,91	12
3.4	1,92	28	6.4	2,94	12
3.5	1,98	27	6.5	2,97	12
3.6	2,05	25	6.6	3,00	12
3.7	2,12	23	6.7	3,03	11
3.8	2,19	22	6.8	3,05	11
3.9	2,26	20	6.9	3,08	11
			7.0	3,10	11

DN 20



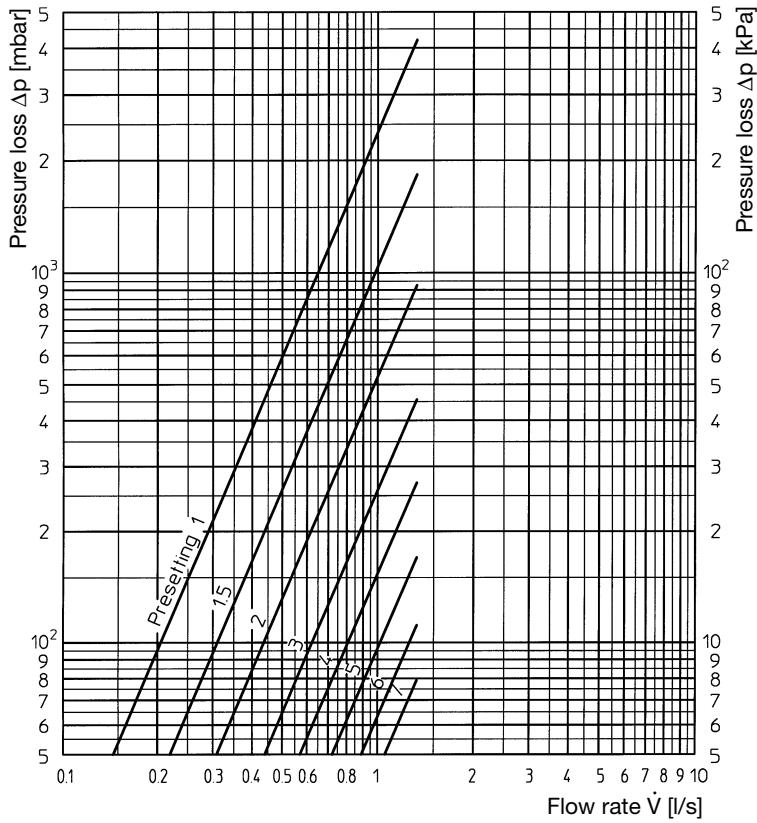
Turn	k_V -value	Zeta-value	Turn	k_V -value	Zeta-value
1.0	0,48	1511	4.0	2,83	43
1.1	0,54	1193	4.1	2,98	39
1.2	0,61	935	4.2	3,13	36
1.3	0,67	775	4.3	3,27	33
1.4	0,73	653	4.4	3,42	30
1.5	0,79	558	4.5	3,57	27
1.6	0,86	470	4.6	3,72	25
1.7	0,93	402	4.7	3,87	23
1.8	1,00	348	4.8	4,02	22
1.9	1,07	304	4.9	4,16	20
2.0	1,15	263	5.0	4,31	19
2.1	1,20	242	5.1	4,37	18
2.2	1,25	223	5.2	4,43	18
2.3	1,31	203	5.3	4,49	17
2.4	1,36	188	5.4	4,55	17
2.5	1,41	175	5.5	4,61	16
2.6	1,50	155	5.6	4,67	16
2.7	1,58	139	5.7	4,73	16
2.8	1,67	125	5.8	4,79	15
2.9	1,75	114	5.9	4,85	15
3.0	1,84	103	6.0	4,91	14
3.1	1,91	95	6.1	4,97	14
3.2	1,98	89	6.2	5,03	14
3.3	2,05	83	6.3	5,09	13
3.4	2,12	77	6.4	5,15	13
3.5	2,19	73	6.5	5,21	13
3.6	2,32	65	6.6	5,28	12
3.7	2,45	58	6.7	5,34	12
3.8	2,57	53	6.8	5,40	12
3.9	2,70	48	6.9	5,46	12
			7.0	5,50	11

DN 25



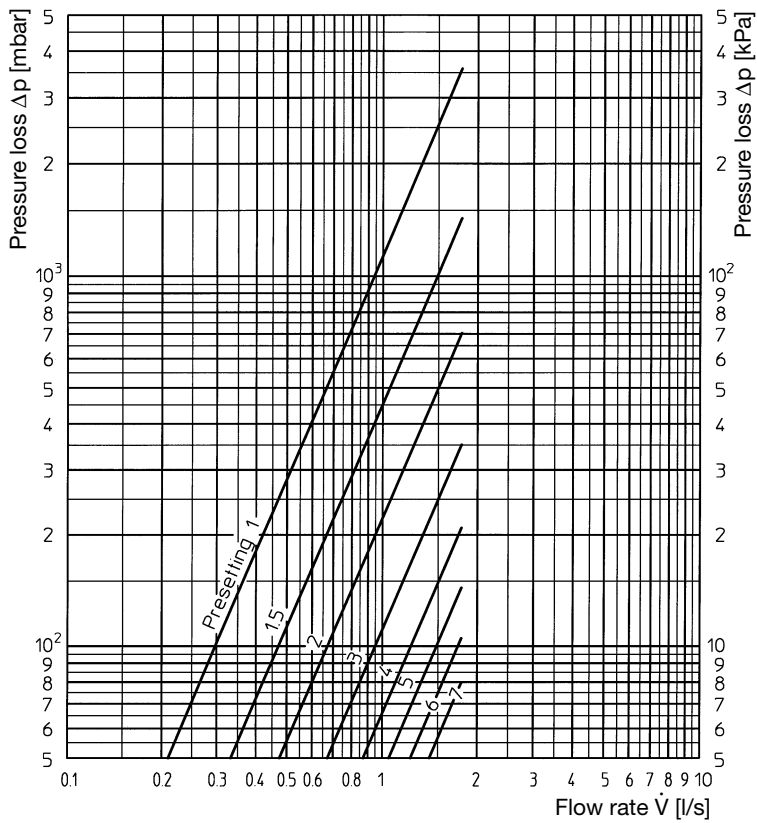
Turn	k_V -value	Zeta-value	Turn	k_V -value	Zeta-value
1.0	0,82	1340	4.0	5,66	28
1.1	0,97	958	4.1	5,83	27
1.2	1,11	731	4.2	6,00	25
1.3	1,26	568	4.3	6,17	24
1.4	1,41	453	4.4	6,34	22
1.5	1,56	370	4.5	6,51	21
1.6	1,73	301	4.6	6,68	20
1.7	1,90	250	4.7	6,84	19
1.8	2,06	212	4.8	7,01	18
1.9	2,23	181	4.9	7,18	17
2.0	2,40	156	5.0	7,35	17
2.1	2,60	133	5.1	7,45	16
2.2	2,80	115	5.2	7,54	16
2.3	3,00	100	5.3	7,63	15
2.4	3,20	88	5.4	7,72	15
2.5	3,39	78	5.5	7,81	15
2.6	3,51	73	5.6	7,91	14
2.7	3,62	69	5.7	8,00	14
2.8	3,73	65	5.8	8,09	14
2.9	3,85	61	5.9	8,18	13
3.0	3,96	57	6.0	8,27	13
3.1	4,13	53	6.1	8,37	13
3.2	4,30	49	6.2	8,46	13
3.3	4,47	45	6.3	8,55	12
3.4	4,64	42	6.4	8,64	12
3.5	4,81	39	6.5	8,73	12
3.6	4,98	36	6.6	8,82	12
3.7	5,15	34	6.7	8,92	11
3.8	5,32	32	6.8	9,01	11
3.9	5,49	30	6.9	9,10	11
			7.0	9,20	11

DN 32



Turn	k_V -value	Zeta-value	Turn	k_V -value	Zeta-value
1.0	2,33	489	4.0	9,19	31
1.1	2,57	402	4.1	9,43	30
1.2	2,81	336	4.2	9,67	28
1.3	3,05	285	4.3	9,91	27
1.4	3,30	244	4.4	10,15	26
1.5	3,54	212	4.5	10,39	25
1.6	3,82	182	4.6	10,63	24
1.7	4,10	158	4.7	10,88	22
1.8	4,38	138	4.8	11,12	21
1.9	4,67	122	4.9	11,36	21
2.0	4,95	108	5.0	11,60	20
2.1	5,12	101	5.1	11,87	19
2.2	5,29	95	5.2	12,13	18
2.3	5,46	89	5.3	12,40	17
2.4	5,63	84	5.4	12,67	17
2.5	5,80	79	5.5	12,94	16
2.6	6,05	73	5.6	13,21	15
2.7	6,31	67	5.7	13,48	15
2.8	6,56	62	5.8	13,75	14
2.9	6,82	57	5.9	14,01	14
3.0	7,07	53	6.0	14,28	13
3.1	7,30	50	6.1	14,55	13
3.2	7,52	47	6.2	14,82	11,7
3.3	7,75	44	6.3	15,09	11,2
3.4	7,98	42	6.4	15,36	10,9
3.5	8,20	39	6.5	15,63	10,5
3.6	8,40	38	6.6	15,90	11
3.7	8,60	36	6.7	16,16	10
3.8	8,80	34	6.8	16,43	10
3.9	8,99	33	6.9	16,70	10
			7.0	17,0	9

DN 40



Turn	k_V -value	Zeta-value	Turn	k_V -value	Zeta-value
1.0	3,39	425	4.0	14,00	25
1.1	3,79	340	4.1	14,30	24
1.2	4,19	278	4.2	14,59	23
1.3	4,58	233	4.3	14,89	22
1.4	4,98	197	4.4	15,19	21
1.5	5,37	169	4.5	15,49	20
1.6	5,83	144	4.6	15,78	20
1.7	6,28	124	4.7	16,08	19
1.8	6,73	108	4.8	16,38	18
1.9	7,18	95	4.9	16,67	18
2.0	7,64	84	5.0	16,97	17
2.1	7,89	78	5.1	17,25	16
2.2	8,15	73	5.2	17,54	16
2.3	8,40	69	5.3	17,82	15
2.4	8,65	65	5.4	18,10	15
2.5	8,91	61	5.5	18,38	14
2.6	9,28	57	5.6	18,67	14
2.7	9,64	53	5.7	18,95	14
2.8	10,01	49	5.8	19,23	13
2.9	10,38	45	5.9	19,52	13
3.0	10,75	42	6.0	19,80	12
3.1	11,00	40	6.1	20,08	12
3.2	11,26	39	6.2	20,36	12
3.3	11,51	37	6.3	20,65	11
3.4	11,77	35	6.4	20,93	11
3.5	12,02	34	6.5	21,21	11
3.6	12,42	32	6.6	21,50	11
3.7	12,81	30	6.7	21,78	10
3.8	13,21	28	6.8	22,06	10
3.9	13,60	26	6.9	22,34	10
			7.00	22,70	10

Subject to technical modification without notice.

Product range 3
ti 62-1/10/7.98/MW