Balancing and Shut-off Valve

BOA-Control SBV

Type Series Booklet

KSB

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Type Series Booklet BOA-Control SBV

Contents

Control Valves / Measurement Valves

Balancing and Shut-off Valves to DIN/EN

BOA-Control SBV

Main applications

- Hot-water heating systems
- Air-conditioning systems
- Cooling circuits

Fluids handled

- Water
- Water/glycol mixtures (glycol content ≤ 50 %)
- Other fluids on request.

Operating data

Table 1: Operating properties

Characteristic	Value
Nominal pressure	25
Nominal size	15- 50
Max. permissible pressure [bar]	25
Min. permissible temperature [°C]	≥ -10
Max. permissible temperature [°C]	≤ +120

Valve body materials

Table 2: Overview of available materials

Material	Temperature limit
CW602N	≤ 120 °C

Design details

Design

- Static balancing valve
- Straight-way Y-pattern valve with female threaded ends
- Non-rising handwheel
- Rotating stem
- Adjustable travel stop
- Fixed measuring orifice
- Two self-sealing pressure measurement connection branches with cap for direct pressure and flow measurement
- Digital position indicator with 40 settings and indication of full rotations and one-tenth of a rotation, can be read from all angles

Volume flow rate measurement

- A differential pressure gauge is required for measuring volume flow rate and temperature.[1)]

Product benefits

- The flow rate can be precisely adjusted and read from all angles as the scale on the handwheel is printed on all sides.
- Materials suitable for all applications in heating or cooling systems
- Suitable as a partner valve for differential pressure control valves by connecting a capillary tube
- Fixed orifice plate for flow measurement independent of valve travel position

Product information

Product information as per Regulation No. 1907/2006 (REACH)

For information as per chemicals Regulation (EC) No. 1907/2006 (REACH), see https://www.ksb.com/ksb-en/About-KSB/Corporate-responsibility/reach/ .

Product information as per Pressure Equipment Directive 2014/68/EU (PED)

The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Group 2.

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1 A measuring kit can be hired on request.

Related documents

Table 3: Information/documents

Document	Reference number
Operating manual	7130.8
Quick-reference operating manual	7130.81
BOA-Control SBV typical tender	7130.521

Purchase order specifications

Please specify the following information in all enquiries or purchase orders:

1. Type
2. Nominal pressure
3. Nominal size
4. Reference number

Pressure/temperature ratings

Table 4: Test pressure and operating pressure

PN	DN	Shell test	Seat tightness test	Permissible operating pressure[2)]	
		With water			
		Tests P10 and P11 to DIN EN 12266-1	Test P12, leakage rate A to DIN EN 12266-1	-10°C to +100°C	120 °C
		[bar]	[bar]	[bar]	[bar]
25	15-50	37,5	27,5	25	21

Materials

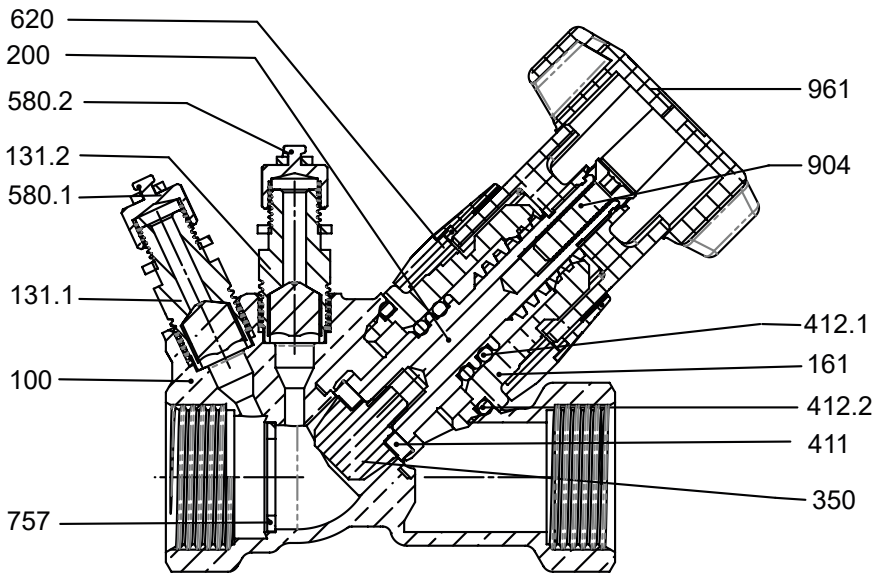

Fig. 1: Sectional drawing

Table 5: Overview of available materials

Part No.	Description	Material	Note
100	Body	CW602N	-
131.1/.2	Pressure measurement connection branch	CW617N	-
161	Body bonnet	CW602N	-
200	Stem	CW602N	-
350	Valve disc	CW602N	-
411	Joint ring	EPDM 70	-
412.1/.2	O-ring	EPDM 70	-
580.1/.2	Cap	CW617N	Red (580.1), blue (580.2)
620	Position indicator	Glass fibre reinforced plastics	-
757	Throttling element (measuring orifice)	CW602N	-
904	Grub screw (travel stop)	Steel	-
961	Handwheel	Glass fibre reinforced plastics	-

2 Static load

Dimensions and weights

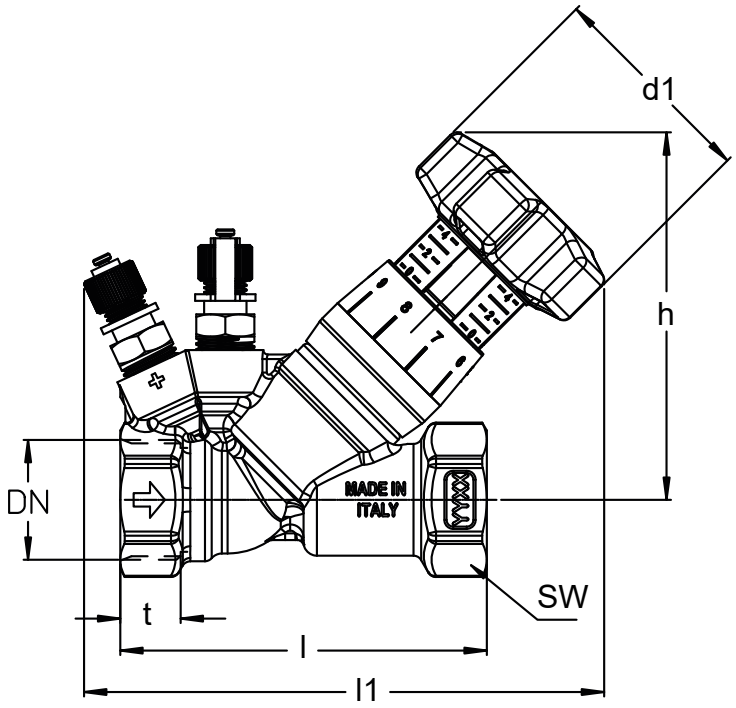

Fig. 2: Dimensions

Table 6: Dimensions and weights

PN	DN	NPS	d1	h	l	l1	t	SW	[kg]
		[inch]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
25	15	1/2	50	83	72,5	113	12,5	25	0,38
	20	3/4	50	82	82	116,5	12,5	31	0,43
	25	1	50	84	95	130	14,5	38	0,52
	32	1 1/4	50	87	122	131	16	47	0,86
	40	1 1/2	50	107	138	149	16	55	1,34
	50	2	50	103	161	164	16	66	1,47

Mating dimensions as per standard

Threaded ends: ISO 228

Installation information

The valves can be installed in supply lines and return lines. If the fluid handled is clean, the valve can be installed in any position in the system. If the fluid handled contains particles, the valve must not be installed with the handwheel pointing downwards.

For the measurement process, the flow through the valves must be in the direction indicated by the flow direction arrow cast onto the valve body.

For optimum measuring results, a minimum upstream stabilisation distance of 5x DN must be maintained upstream of the valve (10x DN downstream of a pump) and a minimum downstream stabilisation distance of 2x DN must be maintained downstream of the valve.

For adjusting the volume flow rate, a measuring kit can be hired on request.

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Selection information

1. Calculate the required differential pressure across the valve.
2. Calculate the Kv value.
3. Using selection tables, (⇨ Page 8) and Kv value, determine the permissible nominal valve sizes.
4. For the position indicator presettings refer to the (⇨ Page 8) . When selecting the nominal valve size, make sure that the valve will be open as far as possible (within the upper half of valve travel). Select a presetting between 2 and 4.

Selection example

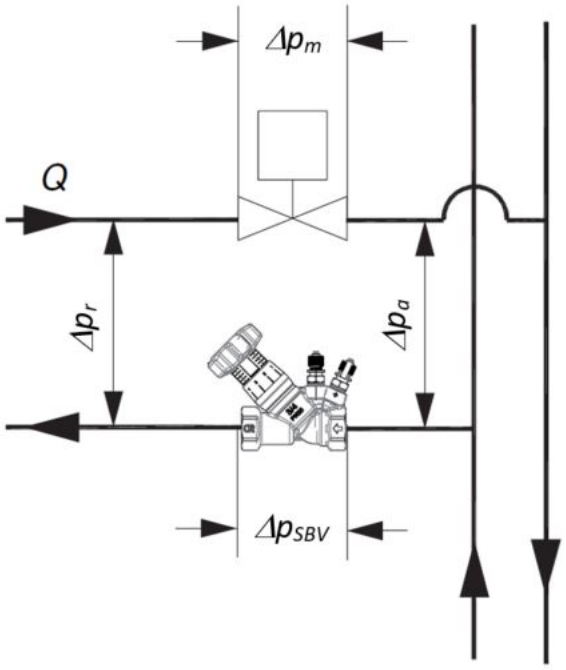

Fig. 3: Simplified heating circuit

Task:

Select the valve on the basis of the heating circuit variables given:

- Available branch pressure: Δp_a = 35 kPa
- Required pressure for pipe section and, e.g., radiators: Δp_r = 13 kPa
- Pressure of additional consumer installations, e.g. control valve: Δp_m = 10 kPa
- Calculated volume flow rate: Q = 3 m³/h = 0.833 l/s
- Relative density of water as fluid handled: r = 1

Solution:

Required differential pressure across the valve:
$\Delta p_{SBV} = \Delta p_a - \Delta p_r - \Delta p_m$ = 35 kPa - 13 kPa - 10 kPa = 12 kPa = 0.12 bar

Inserting r = 1 for water as fluid handled and Δp = 1 bar, the Kv value is calculated as:

$$Kv = Q \cdot \sqrt{\frac{r}{\Delta pr}} = 3 \cdot \sqrt{\frac{1}{0{,}12}} = 8{,}66\ m^3/h$$

Using the flow characteristics provided and based on a differential pressure of 1 bar across the valve, the suitable nominal valve sizes must be set as follows:

Table 7: Selection example, position indicator presetting

DN	Position indicator presetting
32	2,3
40	1,3
50	0,7

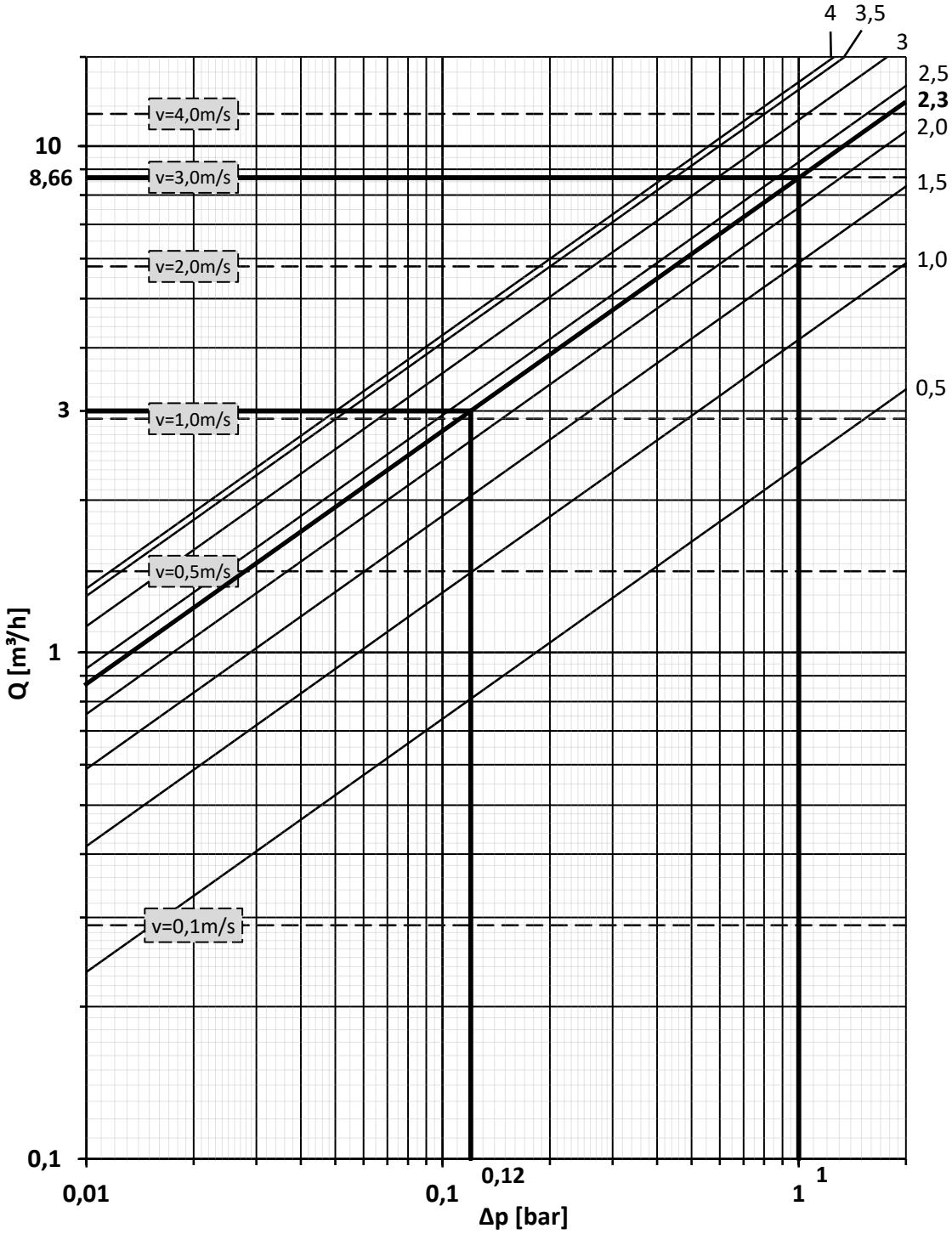

Fig. 4: Selection example, position indicator for DN32

Flow characteristics

The characteristic curves are based on water with a temperature of 5 to 30 °C and show the volume flow rate through the valve up to a flow velocity (pipeline) of 4 m/s.

Table 8: Description of units

Unit	Description
Q	Volume flow rate in m³/h
v	Flow velocity in m/s

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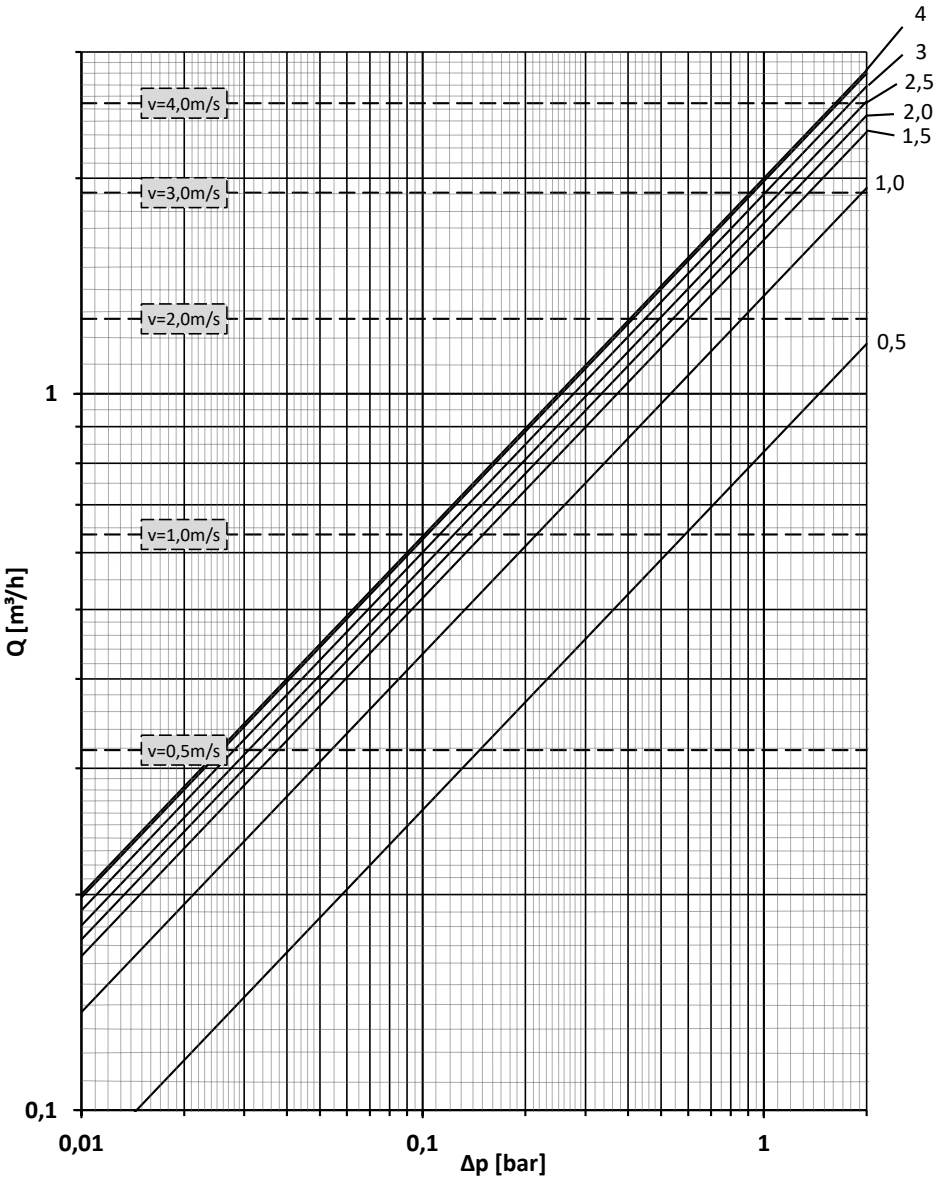
DN 15, PN 25

Table 9: Selection table

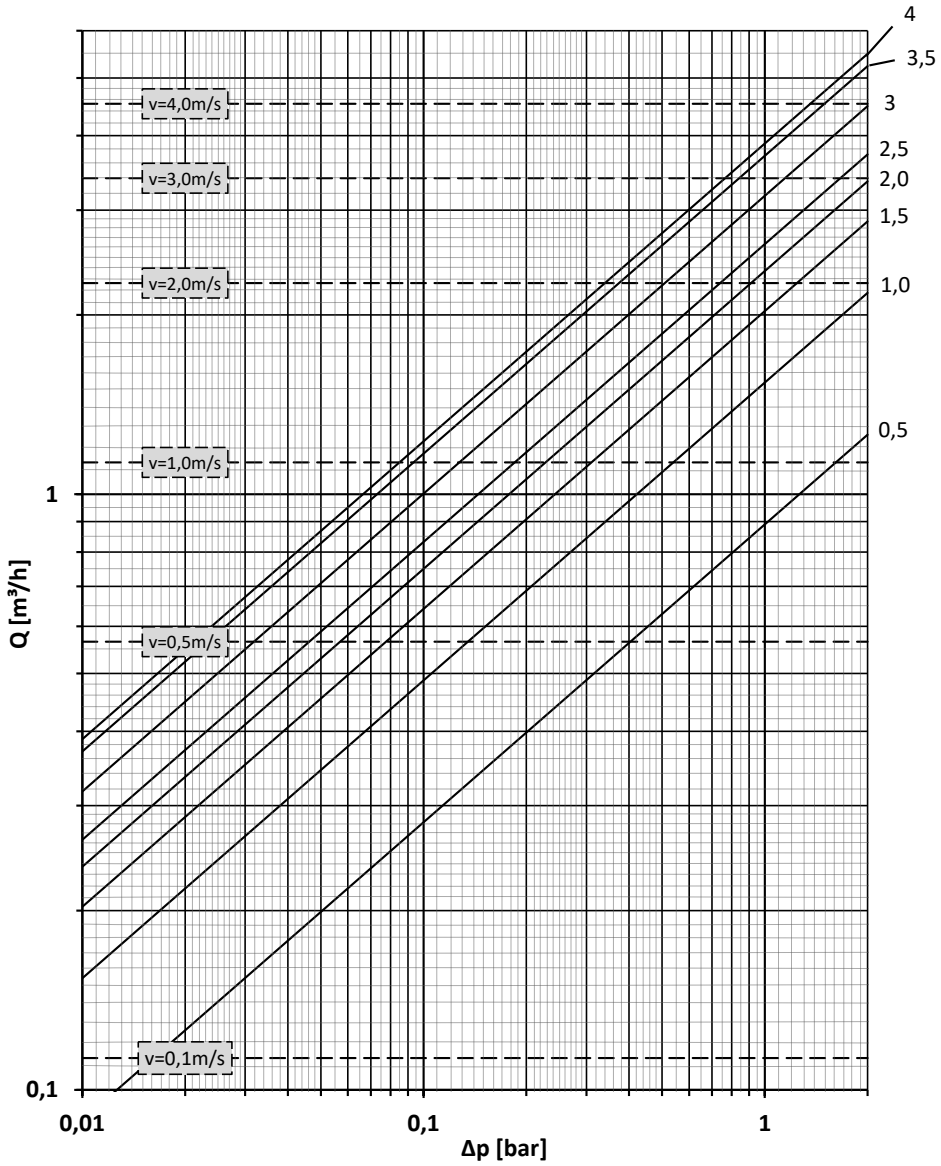
Kv (Δp = 1 bar) [m³/h]	Resistance coefficient [ζ]	Handwheel turns
2	1021,9	4,0
1,98	1042,6	3,5
1,9	1132,3	3,0
1,81	1247,7	2,5
1,73	1365,7	2
1,64	1519,7	1,5
1,37	2177,8	1
0,83	5933,4	0,5



DN 20, PN 25

Table 10: Selection table

Kv (Δp = 1 bar) [m³/h]	Resistance coefficient [ζ]	Handwheel turns
3,88	271,5	4,0
3,7	298,6	3,5
3,17	406,8	3,0
2,63	590,9	2,5
2,37	727,7	2
2,03	991,9	1,5
1,54	1723,5	1
0,89	5160,3	0,5



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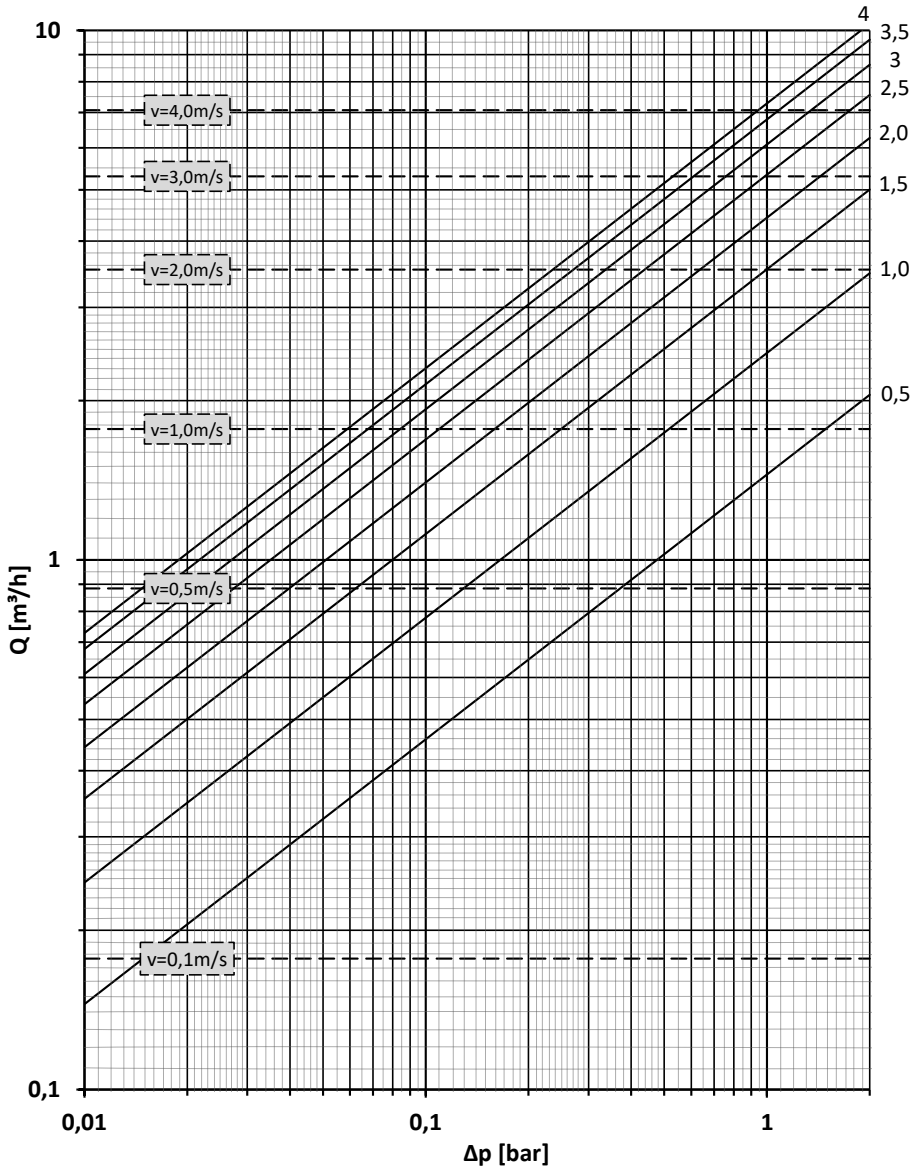
DN 25, PN 25

Table 11: Selection table

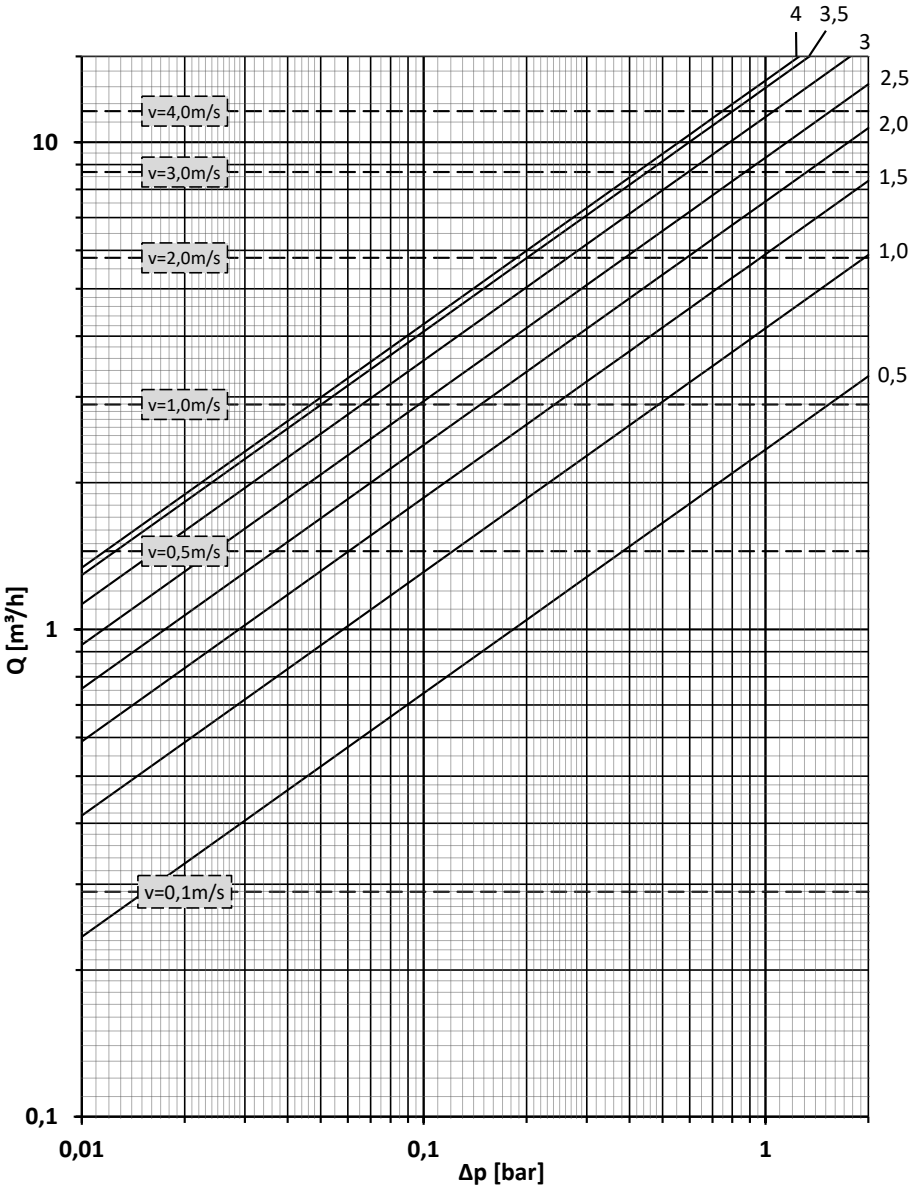
Kv (Δp = 1 bar) [m³/h]	Resistance coefficient [ζ]	Handwheel turns
7,28	77,1	4,0
6,79	88,7	3,5
6,09	110,2	3,0
5,34	143,3	2,5
4,43	208,3	2
3,54	326,2	1,5
2,46	675,4	1
1,45	1944,1	0,5



DN 32, PN 25

Table 12: Selection table

Kv (Δp = 1 bar) [m³/h]	Resistance coefficient [ζ]	Handwheel turns
13,39	22,8	4,0
12,93	24,4	3,5
11,27	32,2	3,0
9,3	47,3	2,5
7,56	71,5	2
5,89	117,8	1,5
4,15	237,3	1
2,34	746,5	0,5



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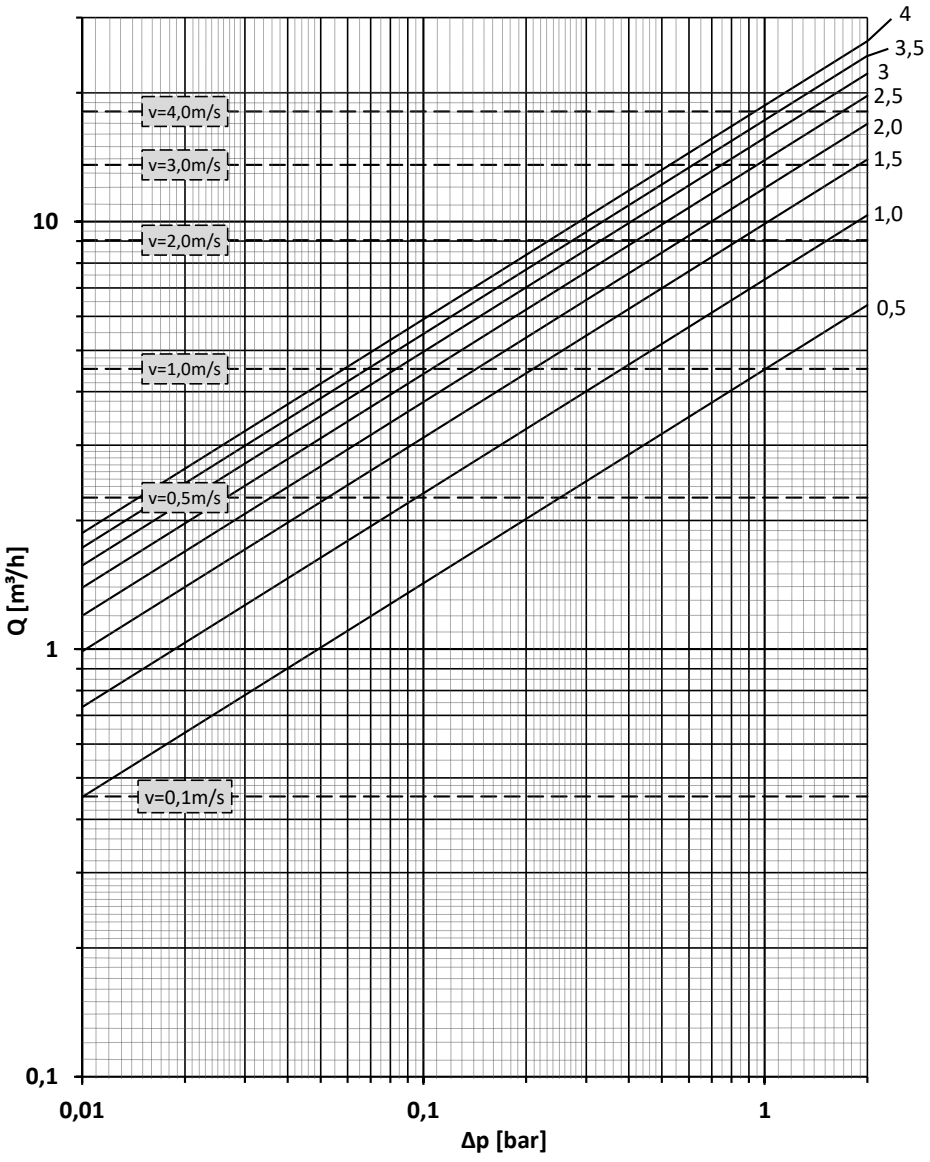
DN 40, PN 25

Table 13: Selection table

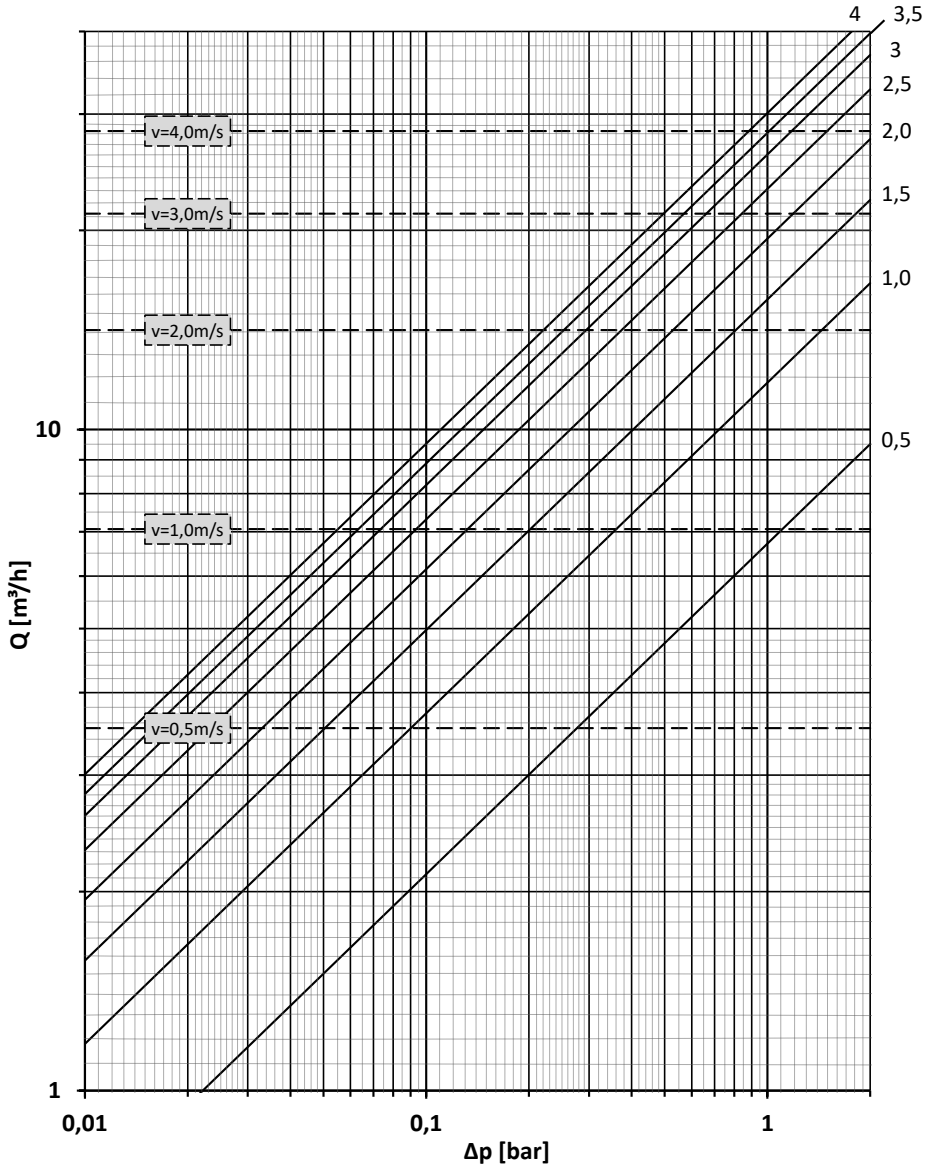
Kv (Δp = 1 bar) [m³/h]	Resistance coefficient [ζ]	Handwheel turns
18,69	11,7	4,0
17,27	13,7	3,5
15,69	16,6	3,0
13,92	21,1	2,5
11,97	28,5	2
9,88	41,9	1,5
7,32	76,3	1
4,51	201,0	0,5



DN 50, PN 25

Table 14: Selection table

Kv (Δp = 1 bar) [m³/h]	Resistance coefficient [ζ]	Handwheel turns
30,1	4,5	4,0
28,1	5,2	3,5
26,06	6,0	3,0
23,12	7,6	2,5
19,44	10,8	2
15,73	16,5	1,5
11,77	29,5	1
6,72	90,5	0,5



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