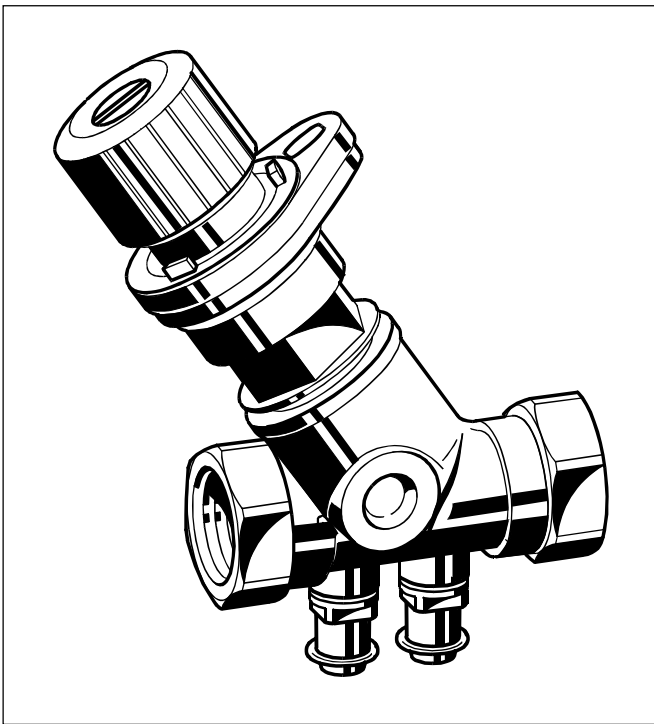


Kombi Valves

V5032 Kombi-2-plus

BALANCING AND SHUT-OFF VALVE

PRODUCT DATA



Design

The Kombi-2-plus valve consists of:

- Valve body with pressure test cocks and internal threads DN 10–DN 20 to ISO 7 (DIN 2999) for threaded pipe or copper and precision steel pipe 10–20 mm (see Accessories), or
- Valve body DN 25 to DN 80 with pressure test cocks and internal threads to ISO 7 (DIN 2999) for threaded pipe
- Valve insert
- Blue handwheel with pre-setting dial and display

Materials

- Valve housing made of red bronze Rg5 according to DIN 1705 (G-CuSn5ZnPb)
- Valve insert and pressure test cocks made of brass (CuZn39Pb3)
- O-rings and soft seals made of EPDM
- Handwheel, pre-setting dial and display made of plastic

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Application

The Kombi-2-plus is installed in the return mains of pump driven warm water heating systems and cold water cooling systems to regulate the hydronic balance and as shut-off valve. The Kombi-2-plus has an O-ring spindle seal and is maintenance free. The valve body can be insulated easily and is equipped with pressure test cocks for differential pressure or flow measurement.

Further functions can be retrofitted without interrupting operation of the system: draining, filling and automatic regulation (in combination with a Kombi-3-plus BLACK valve in the supply and a Kombi-Diaphragm Unit).

Features

- **Maintenance free spindle with double O-ring sealings**
- **PTFE seat sealing**
- **High accuracy of the pre-setting because of individual adjustment**
- **Valve body PN 16**
- **Dimensions DN 15 to DN 40 can be retrofitted with a Kombi-Diaphragm Unit**
- **Robust valve body made of corrosion resistant red bronze**
- **Available in sizes up to DN 80**
- **Visible pre-setting dial with concealed pre-setting wheel**

Specifications

Medium	Water, water-glycole mixture
Operating temperature	2 to 130 °C (36 to 266 °F)
Operating pressure	max. 16 bar (232 p.s.i.)
Differential pressure	max. 2,0 bar (29 p.s.i.) – see NOTE below
k_{vs}-values	see table on page 2

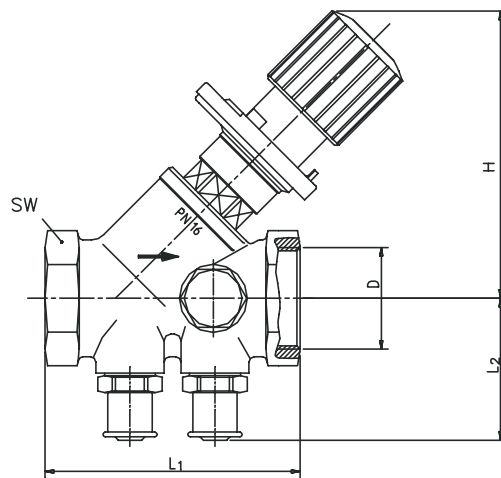
NOTE: Differential pressure: Closing pressure for Kombi-2-plus with installed Kombi-Diaphragm Unit. Regarding noise generation the conditions, requirements and installation design have to be taken into account.

Function

The hydronic balance is a significant requirement for the efficient operation of a hydronic heating or cooling installation. In an unbalanced system under or over provision of hot water to individual radiators or circuits can occur. Apart from the correct selection of radiator valves, regulation of individual circuits is also necessary and in some cases, such as in DIN 18 380, VOB part C, is required by national standards.

This requirement is met with the shutoff and balancing valve Kombi-2-plus. The Kombi-2-plus for the return has the functions shutoff, pre-setting, regulation (with diaphragm unit, accessory), draining and filling (draining adapter, accessory).

Dimensions, k_{vs}-values and ordering information




Type	R (=D)	DN	k _{vs} -value	H	Dimensions			OS-No.
					L1	L2	SW	
Internal threads	1/2"	15	2,7	85	65	41	27	V5032Y0015
Internal threads	3/4"	20	6,4	100	75	42	32	V5032Y0020
Internal threads	1"	25	6,8	100	90	45	41	V5032Y0025
Internal threads	1 1/4"	32	21,0	137	110	46	50	V5032Y0032
Internal threads	1 1/2"	40	22,0	137	120	49	55	V5032Y0040
Internal threads	2"	50	38,0	158	150	55	70	V5032Y0050
Internal threads	2 1/2"	65	47,7	195	180	68	85	V5032Y0065
Internal threads	3"	80	71,0	210	200	75	100	V5032Y0080

NOTE: All values in mm if not stated otherwise. Dimension 'H' refers to fully open valve.

Accessories


Connections

Set of compression ring and nut

	1/2" x 10 mm	1 01 01 13 015 000
	1/2" x 12 mm	1 01 01 14 015 000
	1/2" x 14 mm	1 01 01 18 015 000
	1/2" x 15 mm	1 01 01 24 015 000
	1/2" x 16 mm	1 01 01 20 015 000
	3/4" x 18 mm	1 01 01 38 020 000
	3/4" x 22 mm	1 01 01 24 020 000

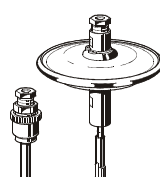
NOTE: For soft copper and steel pipe support inserts have to be used.

Set of compression ring, nut and support insert (2 pcs each)

	1/2" x 12 mm	1 01 01 35 120 000
	1/2" x 15 mm	1 01 01 35 150 000
	1/2" x 16 mm	1 01 01 35 160 000
	3/4" x 18 mm	1 01 01 36 180 000


Accessories

Kombi-Diaphragm Unit

	Setting range 0,1 to 0,3 bar differential pressure; for valves DN 15–DN 40	1 81 10 00 000 000
	Setting range 0,3 to 0,6 bar differential pressure; for valve DN 15–DN 40	1 81 30 00 000 000

NOTE: For product information and diagrams see product data sheet 'Kombi-Diaphragm Unit'.
The Kombi-3-plus BLUE valve must be pre-set to 1.5 (for DN 10–25) or 1.0 (DN 32–40) when used with the Kombi-Diaphragm Unit.


Kombi-3-plus BLACK as shut-off valve and Kombi-Diaphragm Unit connection point in the supply

	DN 15	V5100Y0015
	DN 20	V5100Y0020
	DN 25	V5100Y0025
	DN 32	V5100Y0032
	DN 40	V5100Y0040


Draining adapter

	for all sizes	1 00 96 06 000 000
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Tamper-proof cap

	for valves DN 15–DN 25	1 01 01 64 010 000
	for valves DN 32–DN 50	1 01 01 64 032 000

Adapter for actuators with M 30 x 1,5 connection

	for valves DN 10–DN 40	0 01 01 70 069 000
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kvs-values for Kombi-2-plus with installed adapter:


DN	15	20	25	32	40
kvs-value	1,5	3,5	3,5	5,5	5,5

NOTE: The Kombi-2-plus valve must be pre-set to 1.5 (for DN 15–25) or 1.0 (DN 32–40) when used with actuator.

Actuator adapter can only be used with DN 10 valve housings with 'H' marking (valve housings since 10/1999).

Measuring equipment


Extension piece for pressure test cocks, length 45 mm – for use with insulated Kombi-2-plus

	for all sizes	0 21 10 05 008 000
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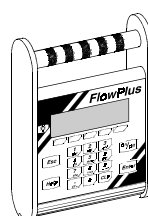
Measuring adapters (2 pcs)

	for all sizes	1 01 01 35 008 000
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Flow meter

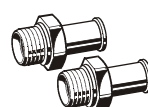
	for all sizes	1 86 00 17 000 000
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'FlowPlus' measuring computer, 230 V

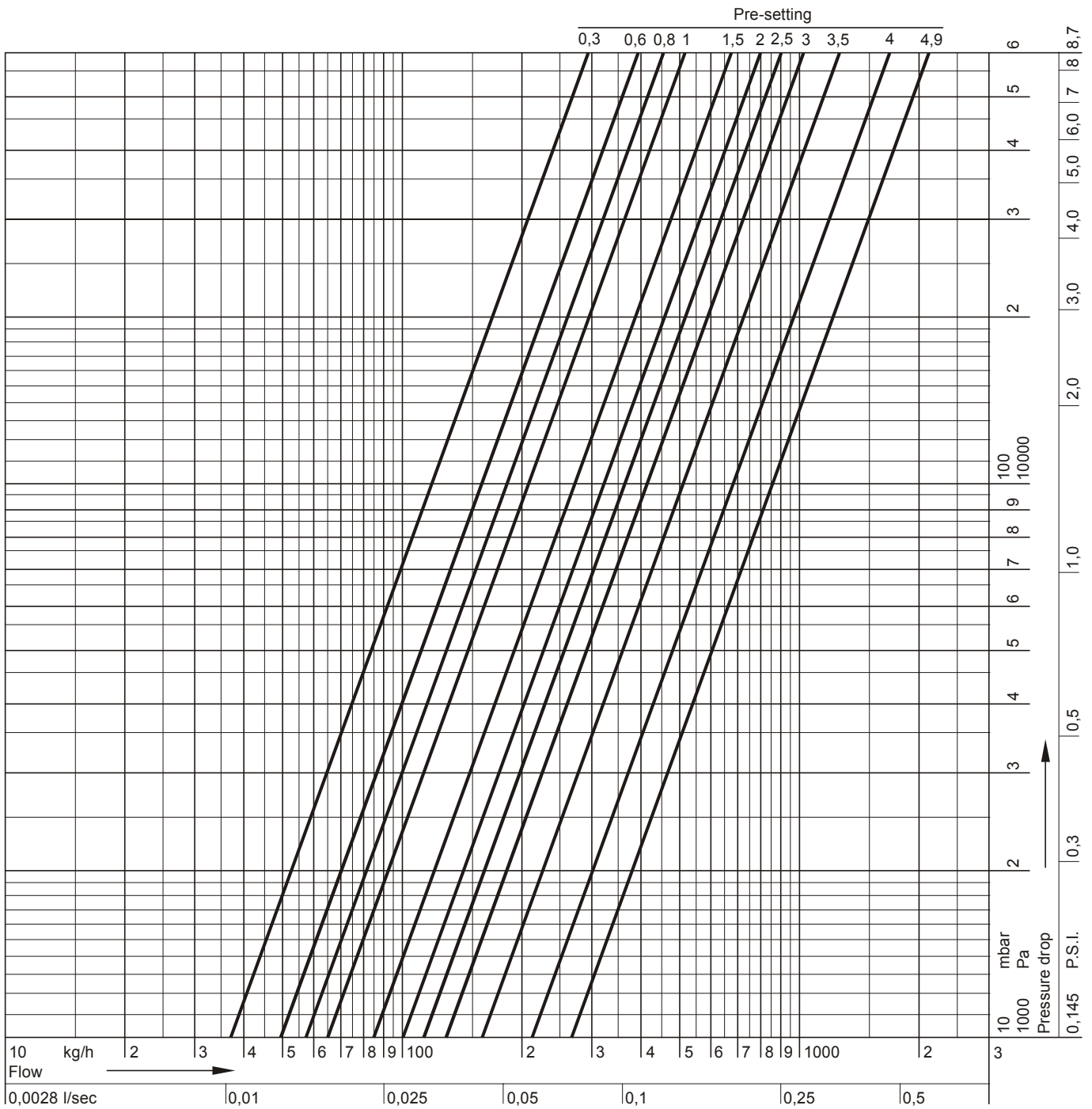
	for all sizes, with pressure sensors 0-10 bar	6 86 10 05 100 000
	for all sizes, with pressure sensors 0-20 bar	6 86 10 05 200 000

Spare parts

Pressure test cocks (2 pcs)

	for all sizes	1 01 01 10 008 000
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Flow diagram DN 15

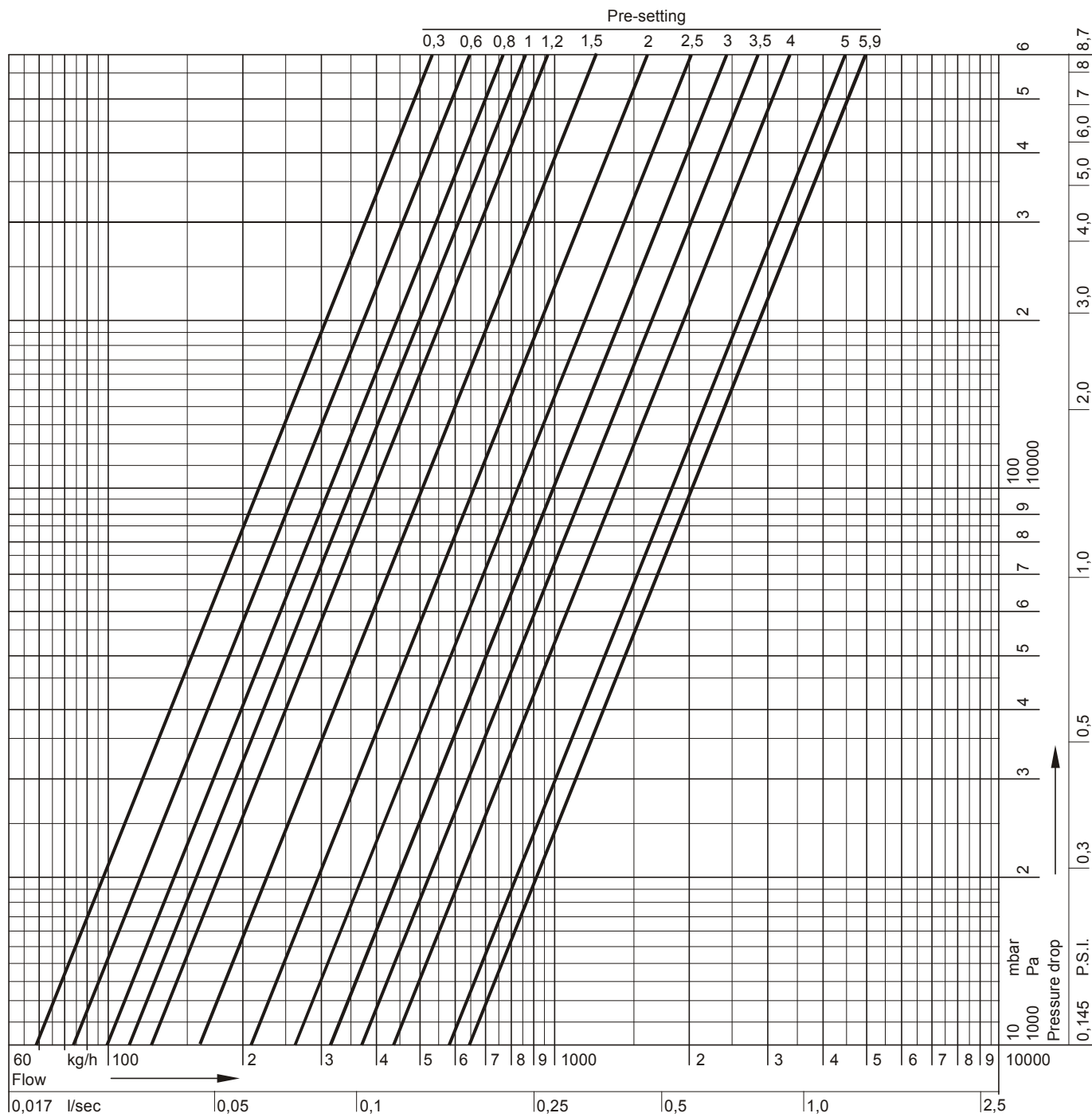


Pre-setting	0,3	0,4	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6
k_v-value	0,37	0,43	0,49	0,57	0,65	0,73	0,81	0,88	0,94	1,00	1,05	1,10	1,16	1,22	1,32	1,42	1,57	1,74

Pre-setting	3,8	4,0	4,2	4,4	4,6	4,8	4,9 = open
k_v-value	1,92	2,12	2,31	2,49	2,63	2,67	k _{vs} = 2,70

NOTE: Flow diagram is ONLY valid for valve WITHOUT installed actuator (-adapter) or Kombi-Diaphragm Unit.

Flow diagram DN 20

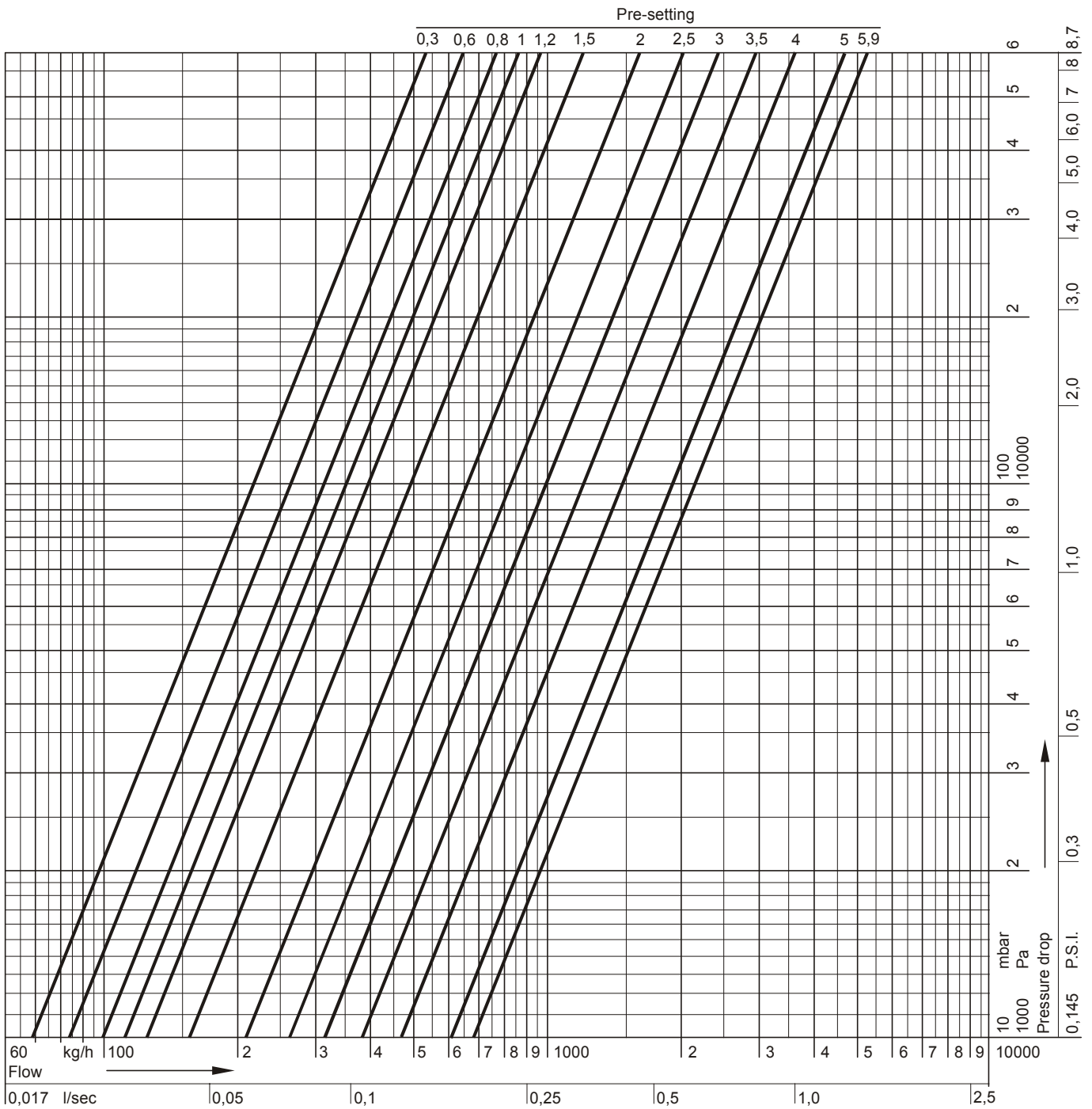


Pre-setting	0,3	0,4	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6
kv-value	0,68	0,72	0,84	0,97	1,10	1,30	1,50	1,70	1,90	2,10	2,30	2,50	2,70	2,91	3,12	3,36	3,60	3,86

Pre-setting	3,8	4,0	4,2	4,4	4,6	4,8	5,0	5,2	5,4	5,6	5,8	5,9 = open
kv-value	4,12	4,40	4,69	4,99	5,28	5,57	5,84	6,07	6,26	6,32	6,38	Kvs = 6,40

NOTE: Flow diagram is ONLY valid for valve WITHOUT installed actuator (-adapter) or Kombi-Diaphragm Unit.

Flow diagram DN 25

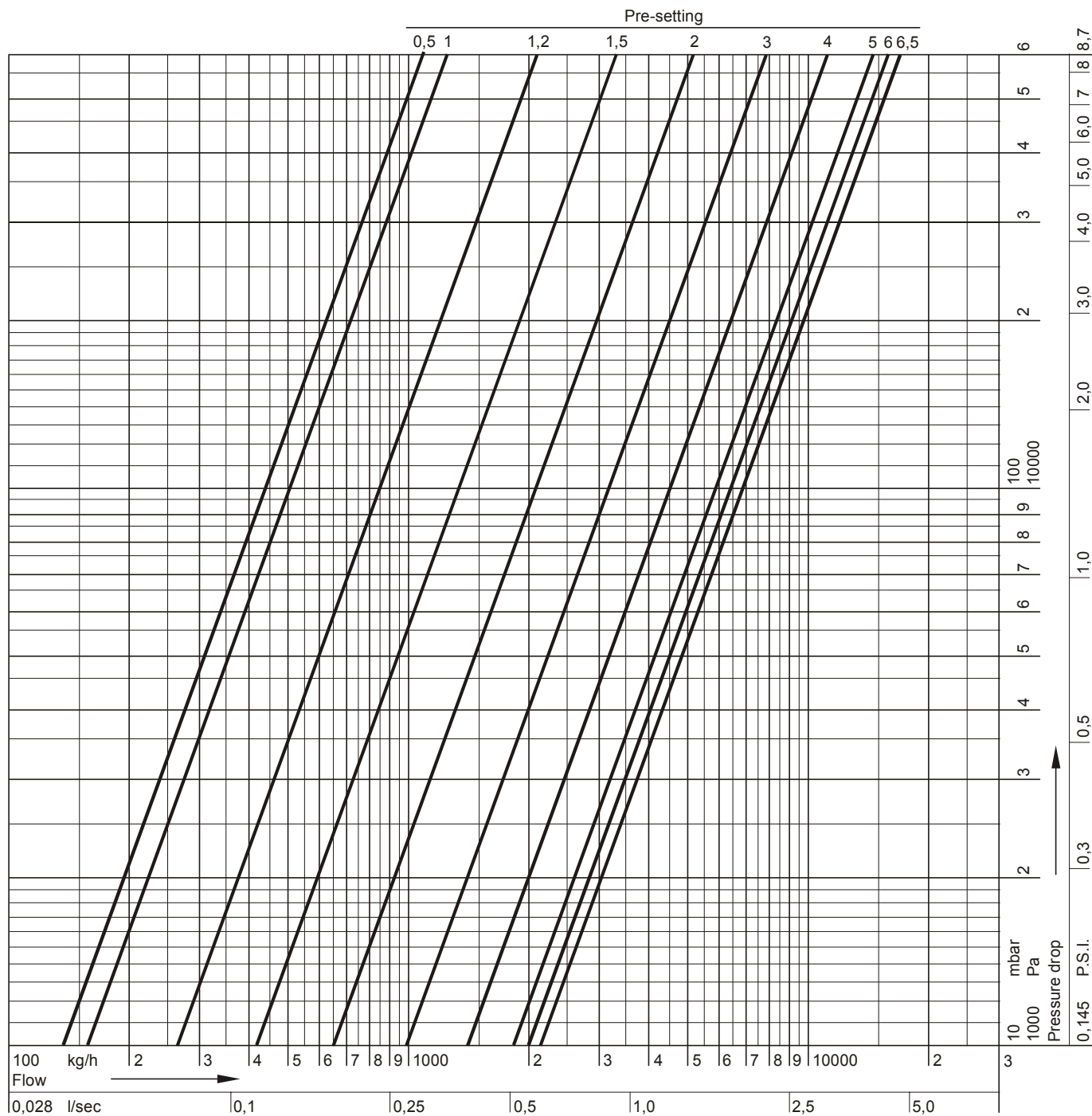


Pre-setting	0,3	0,4	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6
kv-value	0,68	0,72	0,84	0,97	1,10	1,30	1,50	1,70	1,90	2,10	2,30	2,50	2,70	2,95	3,20	3,48	3,76	4,05

Pre-setting	3,8	4,0	4,2	4,4	4,6	4,8	5,0	5,2	5,4	5,6	5,8	5,9 = open
kv-value	4,34	4,64	4,94	5,24	5,52	5,80	6,06	6,30	6,50	6,65	6,75	kv _s = 6,80

NOTE: Flow diagram is ONLY valid for valve WITHOUT installed actuator (-adapter) or Kombi-Diaphragm Unit.

Flow diagram DN 32

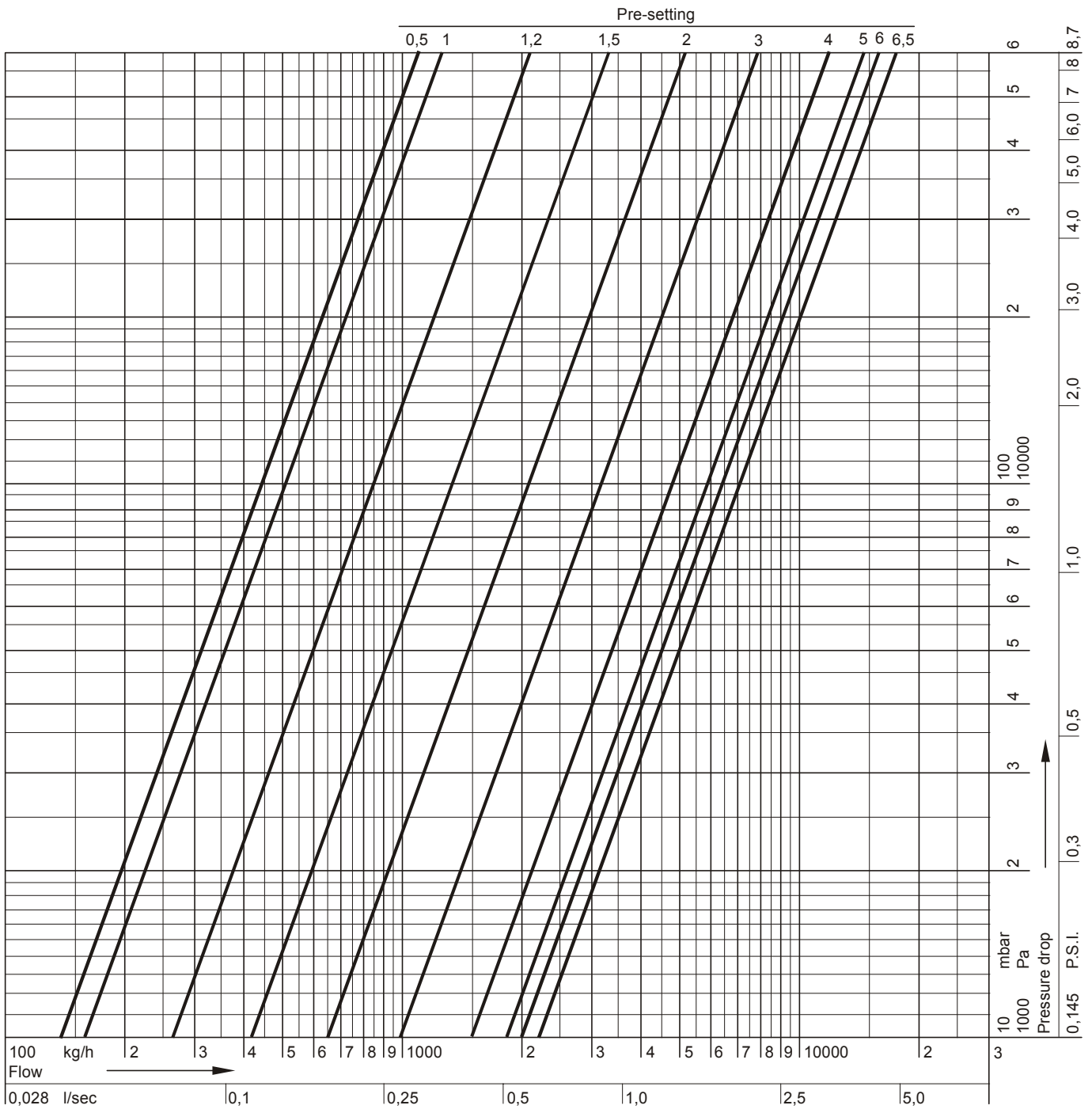


Pre-setting	0,5	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	3,8
k_v-value	1,40	1,45	1,55	1,60	2,60	3,70	4,80	5,90	6,50	6,90	7,50	8,30	9,20	10,2	11,2	12,2	13,2	14,1

Pre-setting	4,0	4,2	4,4	4,6	4,8	5,0	5,2	5,4	5,6	5,8	6,0	6,2	6,4	6,5 = open
k_v-value	15,0	15,8	16,5	17,1	17,7	18,2	18,6	19,0	19,4	19,7	20,0	20,4	20,8	k _{vs} = 21,0

NOTE: Flow diagram is ONLY valid for valve WITHOUT installed actuator (-adapter) or Kombi-Diaphragm Unit.

Flow diagram DN 40

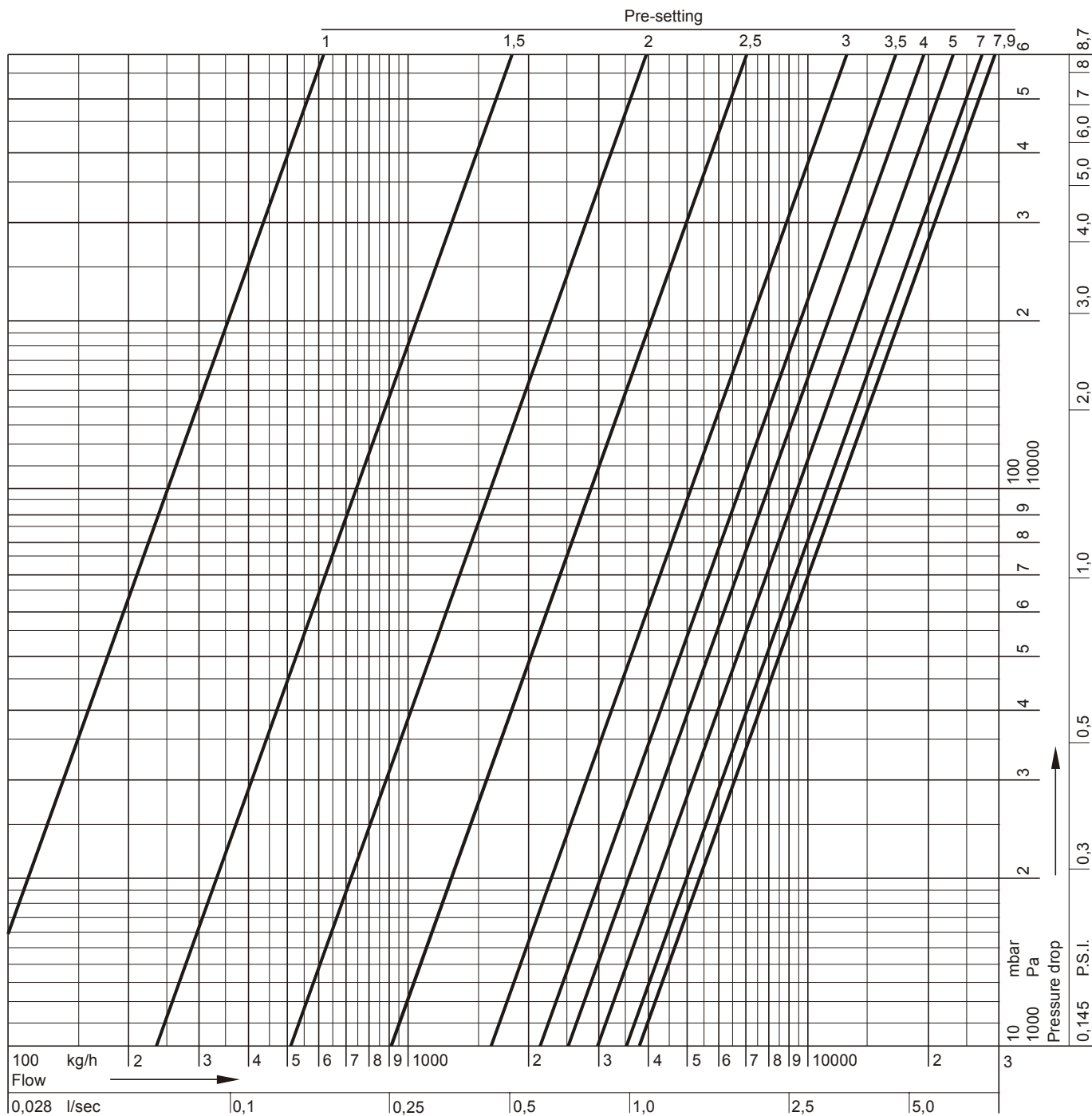


Pre-setting	0,5	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	3,8
k_v-value	1,40	1,45	1,55	1,60	2,60	3,70	4,80	5,90	6,50	6,90	7,50	8,30	9,20	10,2	11,2	12,2	13,2	14,1

Pre-setting	4,0	4,2	4,4	4,6	4,8	5,0	5,2	5,4	5,6	5,8	6,0	6,2	6,4	6,5 = open
k_v-value	15,0	15,8	16,5	17,1	17,7	18,2	18,6	19,0	19,4	19,7	20,0	20,8	21,6	k _{vs} = 22,0

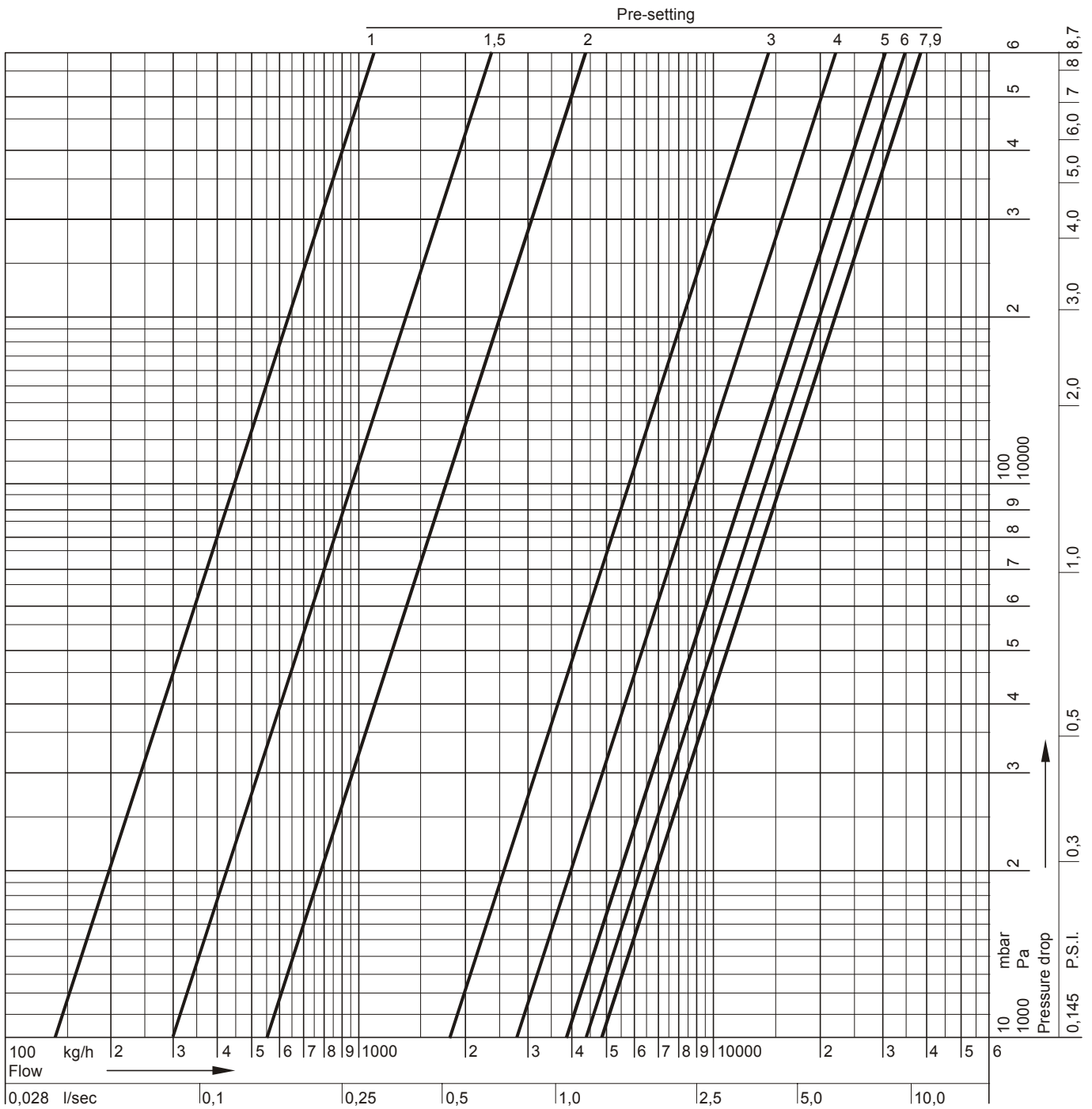
NOTE: Flow diagram is ONLY valid for valve WITHOUT installed actuator (-adapter) or Kombi-Diaphragm Unit.

Flow diagram DN 50



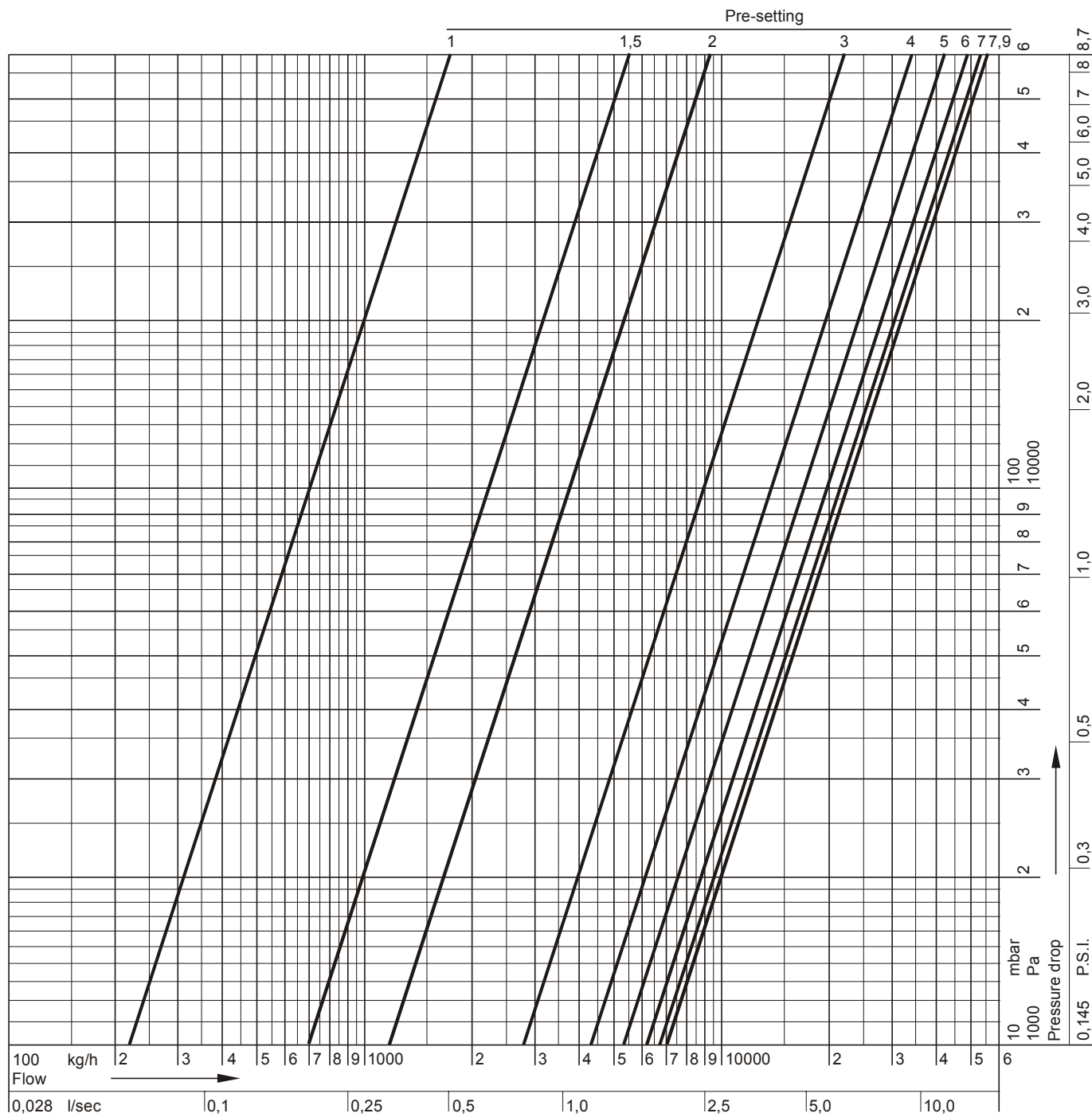
Pre-setting	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	3,8	4,0	4,2	4,4
k_v-value	0,80	1,25	1,88	2,72	3,78	5,10	6,68	8,54	10,7	13,0	15,6	18,7	21,0	22,8	24,3	25,4	26,4	27,2
Pre-setting	4,6	4,8	5,0	5,2	5,4	5,6	5,8	6,0	6,2	6,4	6,6	6,8	7,0	7,2	7,4	7,6	7,9 = open	
k_v-value	28,0	28,8	29,5	30,2	31,0	31,7	32,4	33,0	33,6	34,1	34,6	35,0	35,4	35,8	36,2	36,8	k _{vs} = 38,0	

Flow diagram DN 65



Pre-setting	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	3,8	4,0	4,2	4,4
k_v-value	1,40	1,50	2,50	3,50	4,50	5,50	7,70	10,0	12,2	14,5	16,7	19,0	21,3	23,7	26,0	28,3	30,1	31,9
Pre-setting	4,6	4,8	5,0	5,2	5,4	5,6	5,8	6,0	6,2	6,4	6,6	6,8	7,0	7,2	7,4	7,6	7,9 = open	
k_v-value	33,6	35,4	37,2	38,6	40,1	41,5	43,0	44,0	44,9	45,4	46,0	46,5	47,0	47,1	47,3	47,4	k _{vs} = 47,7	

Flow diagram DN 80



Pre-setting	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	3,8	4,0	4,2	4,4
k_v-value	2,20	4,20	6,20	8,10	10,1	12,1	15,3	18,5	21,6	24,8	28,0	30,9	33,9	36,8	39,8	42,7	44,9	47,0
Pre-setting	4,6	4,8	5,0	5,2	5,4	5,6	5,8	6,0	6,2	6,4	6,6	6,8	7,0	7,2	7,4	7,6	7,9 = open	
k_v-value	49,2	51,3	53,5	55,2	57,0	58,7	60,5	62,2	63,4	64,5	65,7	66,8	68,0	68,6	69,2	69,8	k _{vs} = 71,0	

Influence of coolants on flow values

The flow through a valve is defined by the k_v -value. The k_v -value is the flow m through a valve in [m³/h] at a differential pressure of 1 bar (14,5 P.S.I.) and is only valid for fluids with a density of $\rho_0 = 1000 \text{ kg/m}^3$. This condition is met by water at a temperature of 20°C (68°F). For fluids with another density the following formula can be applied:

$$K_{V_{Medium}} = \frac{m}{\sqrt{\Delta p}} \times \frac{\sqrt{\rho_{Medium}}}{\sqrt{\rho_0}}$$

Correction factor f

When the density σ is expressed in t/m³ instead of kg/m³ the correction factor f is the result. The correction factor f can be used to re-calculate k_v -value, pressure drop and flow:

$$K_{V_{Medium}} = K_{V_0} \times \frac{1}{\sqrt{f}} \qquad \Delta p_{Medium} = \Delta p_0 \times f \qquad m_{Medium} = m_0 \times \frac{1}{\sqrt{f}}$$

Table 1. Values for correction factor f

Medium	water part	Correction factor f					
		5°C	20°C	35°C	50°C	65°C	80°C
Normal water	100%	1,000	0,998	0,994	0,988	0,981	0,972
Ethylen glycol	70%	1,052	1,047	1,041	1,033	1,024	1,015
Antifrogen N	50%	1,086	1,079	1,070	1,061	1,052	1,042
Propylen glycol	70%	1,035	1,029	1,021	1,012	1,002	0,991
Antifrogen L	50%	1,053	1,044	1,035	1,025	1,014	1,002

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