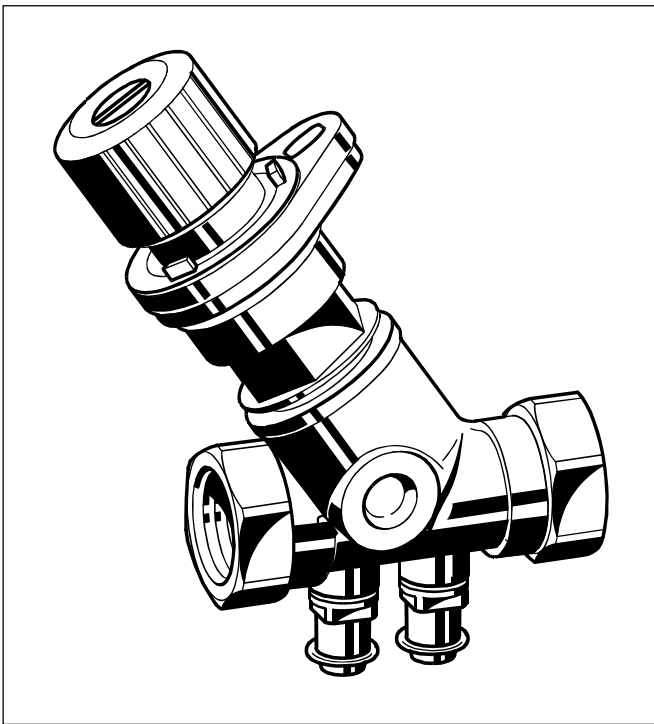


Kombi Valves

V5032 Kombi-2-plus

BALANCING AND SHUTOFF VALVE

PRODUCT DATA



Design

The Kombi-2-plus valve consists of:

- Valve body with pressure test cocks and internal threads DN10...DN20 to DIN2999 (ISO7) for threaded pipe or copper and precision steel pipe 10...20 mm (see Accessories), or
- Valve body DN25...DN80 with pressure test cocks and internal threads to DIN2999 (ISO7) for threaded pipe
- Valve insert
- Blue handwheel with pre-setting dial and display

Materials

- Valve housing made of red bronze
- Valve insert and pressure test cocks made of brass
- 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 shutoff 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 PN16**
- **Dimensions DN15 to DN40 can be retrofitted with a Kombi-Diaphragm Unit**
- **Robust valve body made of corrosion resistant red bronze**
- **Available in sizes up to DN80**
- **Visible pre-setting dial with concealed pre-setting wheel**

Specifications

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

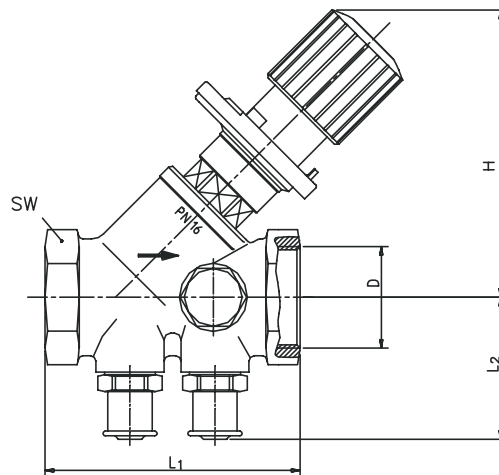
NOTE: Differential pressure: Closing pressure for Kombi-2-plus with installed Kombi-Diaphragm Unit. Regarding noise generation the conditions, requirements and installation design have to be taken into account.

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



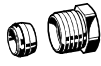
Type	DN	k _{vs} (cv)-value	Dimensions					OS-No.
			D	H	L ₁	L ₂	SW	
Internal threads	15	2,7 (3,16)	Rp1/2"	85	65	41	27	V5032Y0015
Internal threads	20	6,4 (7,49)	Rp3/4"	100	75	42	32	V5032Y0015
Internal threads	25	6,8 (7,96)	Rp1"	100	90	45	41	V5032Y0015
Internal threads	32	21,0 (24,6)	Rp1 1/4"	137	110	46	50	V5032Y0015
Internal threads	40	22,0 (25,7)	Rp1 1/2"	137	120	49	55	V5032Y0015
Internal threads	50	38,0 (44,5)	Rp2"	158	150	55	70	V5032Y0015
Internal threads	65	47,7 (55,8)	Rp2 1/2"	195	180	68	85	V5032Y0015
Internal threads	80	71,0 (83,1)	Rp3"	210	200	75	100	V5032Y0015

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	VA650A1210
	1/2" x 12 mm	VA650A1212
	1/2" x 14 mm	VA650A1214
	1/2" x 15 mm	VA650A1215
	1/2" x 16 mm	VA650A1216
	3/4" x 18 mm	VA650A2018
	3/4" x 22 mm	VA650A2022

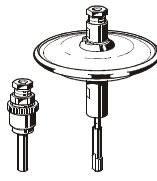
NOTE: Support inserts have to be used for soft copper and steel pipe (wall thickness 1 mm).

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

	1/2" x 12 mm	VA651A1212
	1/2" x 15 mm	VA651A1215
	1/2" x 16 mm	VA651A1216
	3/4" x 18 mm	VA651A2018

Accessories

Kombi-DU Diaphragm Unit (V5012) for valves DN15...DN40

	Setting range 0,1...0,3 bar (1,45...4,35 psi) differential pressure	V5012A0103
	Setting range 0,3...0,6 bar (4,35...8,7 psi) differential pressure	V5012A0306

NOTE: For product information and diagrams see product data sheet 'V5012 Kombi-DU'.

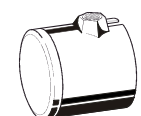
The Kombi-2-plus valve must be pre-set to 1.5 (for DN15...25) or 1.0 (DN32...40) when used with the Kombi-Diaphragm Unit.

Pump pressure: max. 2 bar (29 psi)


Kombi-3-plus BLACK (V5100) as shutoff valve and Kombi-DU connection point in the supply

	DN15	V5100Y0015
	DN20	V5100Y0020
	DN25	V5100Y0025
	DN32	V5100Y0032
	DN40	V5100Y0040

Tamper-proof cap

	for valves DN15...DN25	VA2501A010
	for valves DN32...DN50	VA2501A032

Adapter for actuators with M 30 x 1,5 connection

	for valves DN15...DN40	VA2500A001
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Kvs-values for Kombi-2-plus with installed adapter:

DN	15	20	25	32	40
kvs-value	1,50	3,50	3,50	5,50	5,50
cv-value	1,76	4,1	4,1	6,44	6,44

NOTE: The Kombi-2-plus valve must be pre-set to 1.5 (for DN15...25) or 1.0 (DN32...40) when used with actuator.

Pump pressure: max. 2 bar (29 psi)

Draining adapter


	for all sizes	VA3500A001
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Measuring equipment

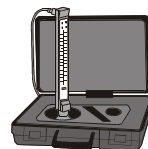
Extension piece for pressure test cocks, length 45 mm – for use with insulated Kombi-2-plus

	for all sizes	VA2601A008
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Measuring adapters (2 pcs)

	for all sizes	VS3600A008
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Flow meter

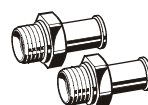
	for all sizes	VM200A1001
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'BasicMES' handheld measuring computer

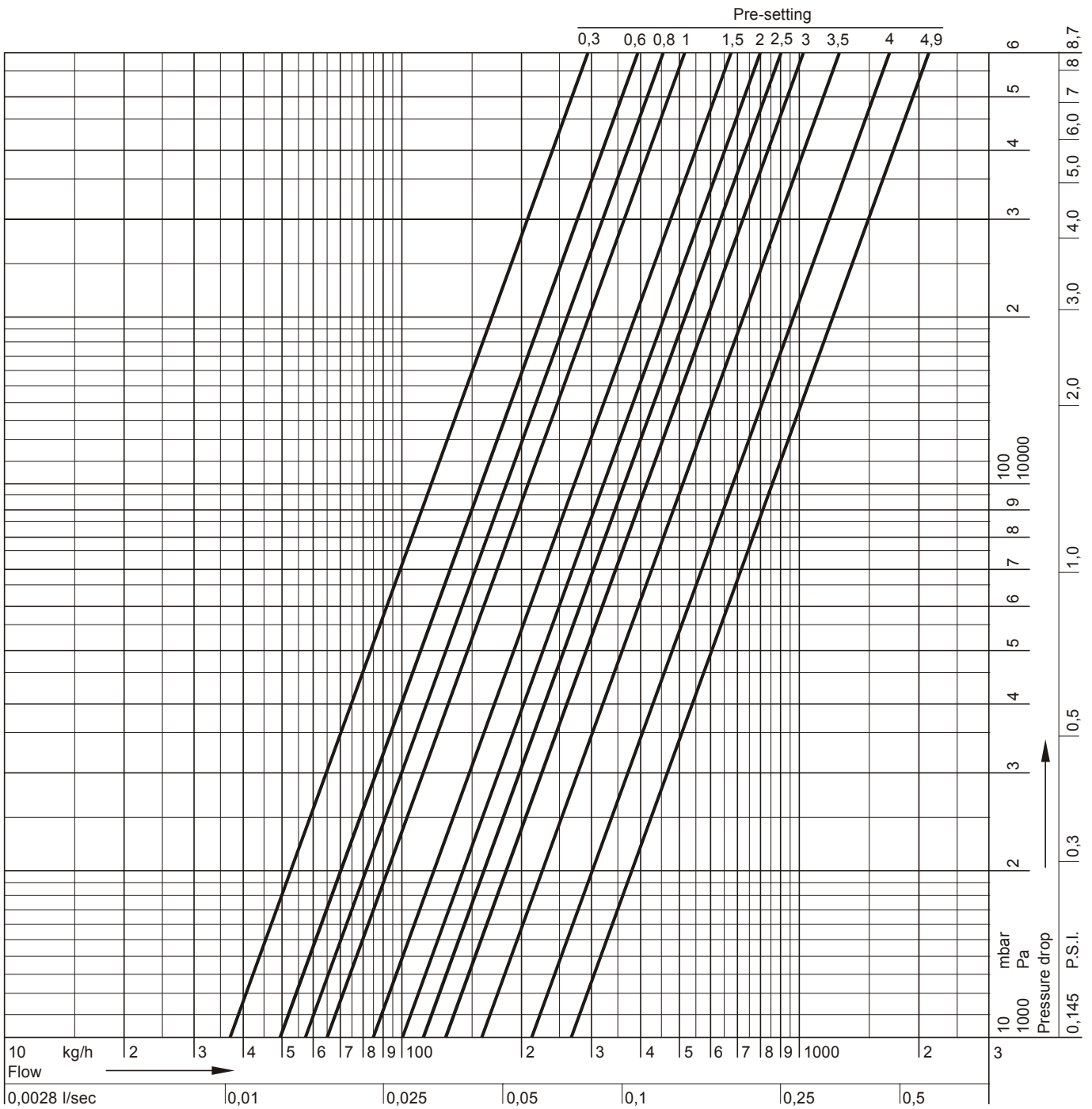
	for all sizes; computer is supplied with case and accessories	VM241A1002
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Spare parts

Pressure test cocks (2 pcs)

	for all sizes	VA2600A008
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Flow Data DN15

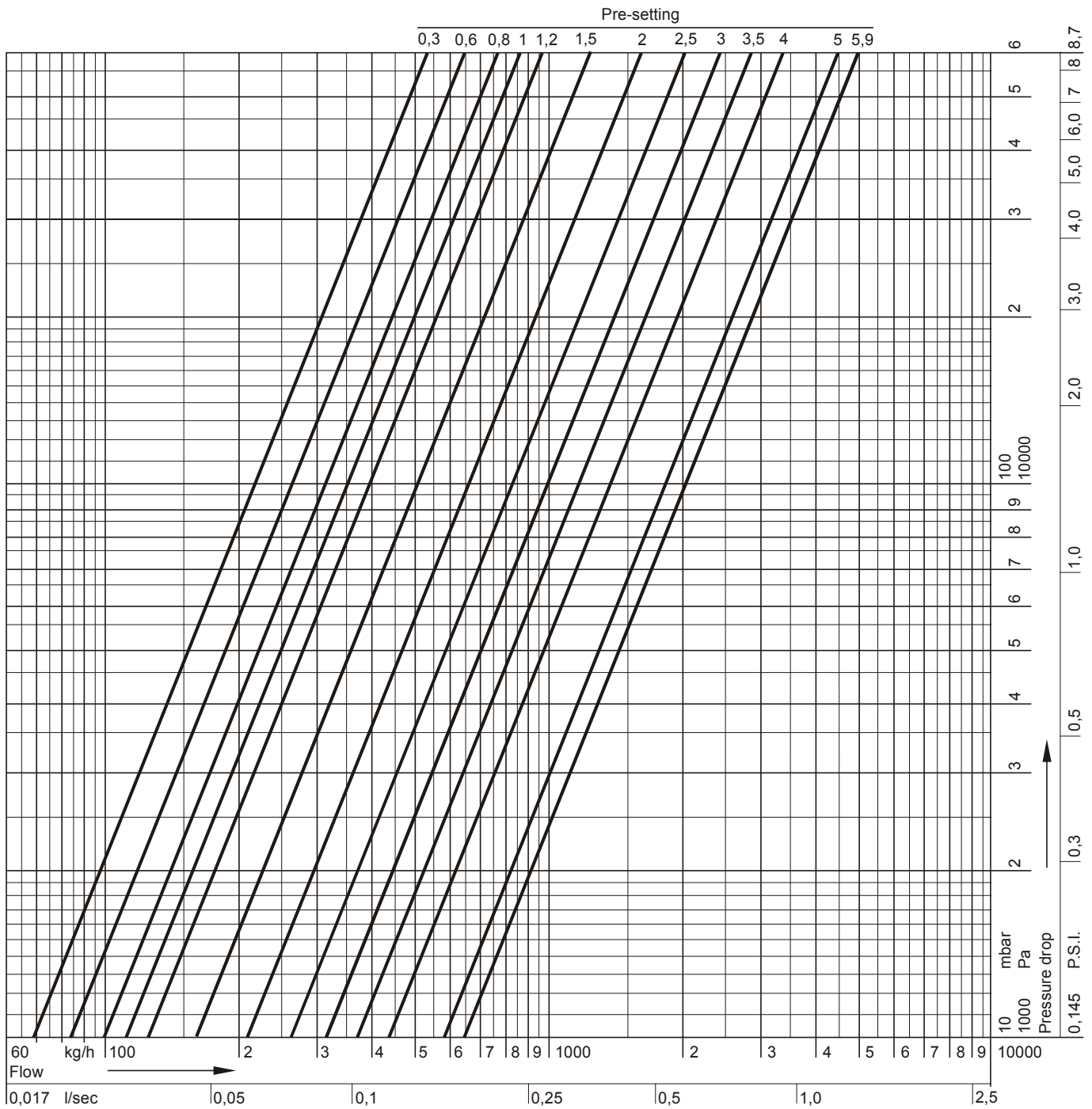


Pre-setting	0,3	0,4	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6
k_v-value	0,37	0,43	0,49	0,57	0,65	0,73	0,81	0,88	0,94	1,00	1,05	1,10	1,16	1,22	1,32	1,42	1,57	1,74
cv-value	0,43	0,50	0,57	0,67	0,76	0,85	0,95	1,03	1,10	1,17	1,23	1,29	1,36	1,43	1,54	1,66	1,84	2,04

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
cv-value	2,25	2,48	2,70	2,91	3,08	3,12	3,16

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

Flow Data DN20

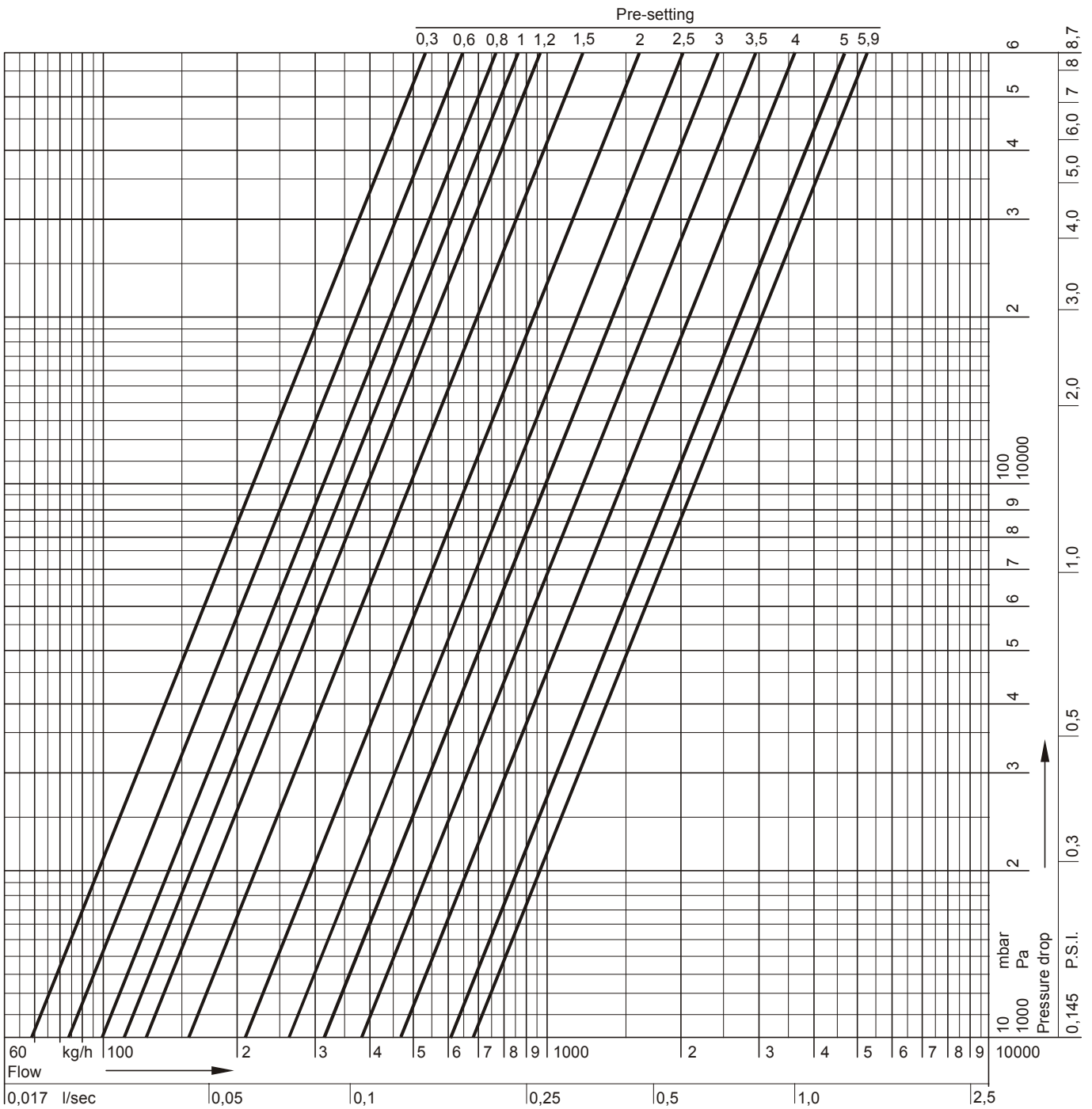


Pre-setting	0,3	0,4	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6
k _v -value	0,68	0,72	0,84	0,97	1,10	1,30	1,50	1,70	1,90	2,10	2,30	2,50	2,70	2,91	3,12	3,36	3,60	3,86
cv-value	0,80	0,84	0,98	1,13	1,29	1,52	1,76	1,99	2,22	2,46	2,69	2,93	3,16	3,40	3,65	3,93	4,21	4,52

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
k _v -value	4,12	4,40	4,69	4,99	5,28	5,57	5,84	6,07	6,26	6,32	6,38	k _{vs} = 6,40
cv-value	4,82	5,15	5,49	5,84	6,18	6,52	6,83	7,10	7,32	7,39	7,46	7,49

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

Flow Data DN25

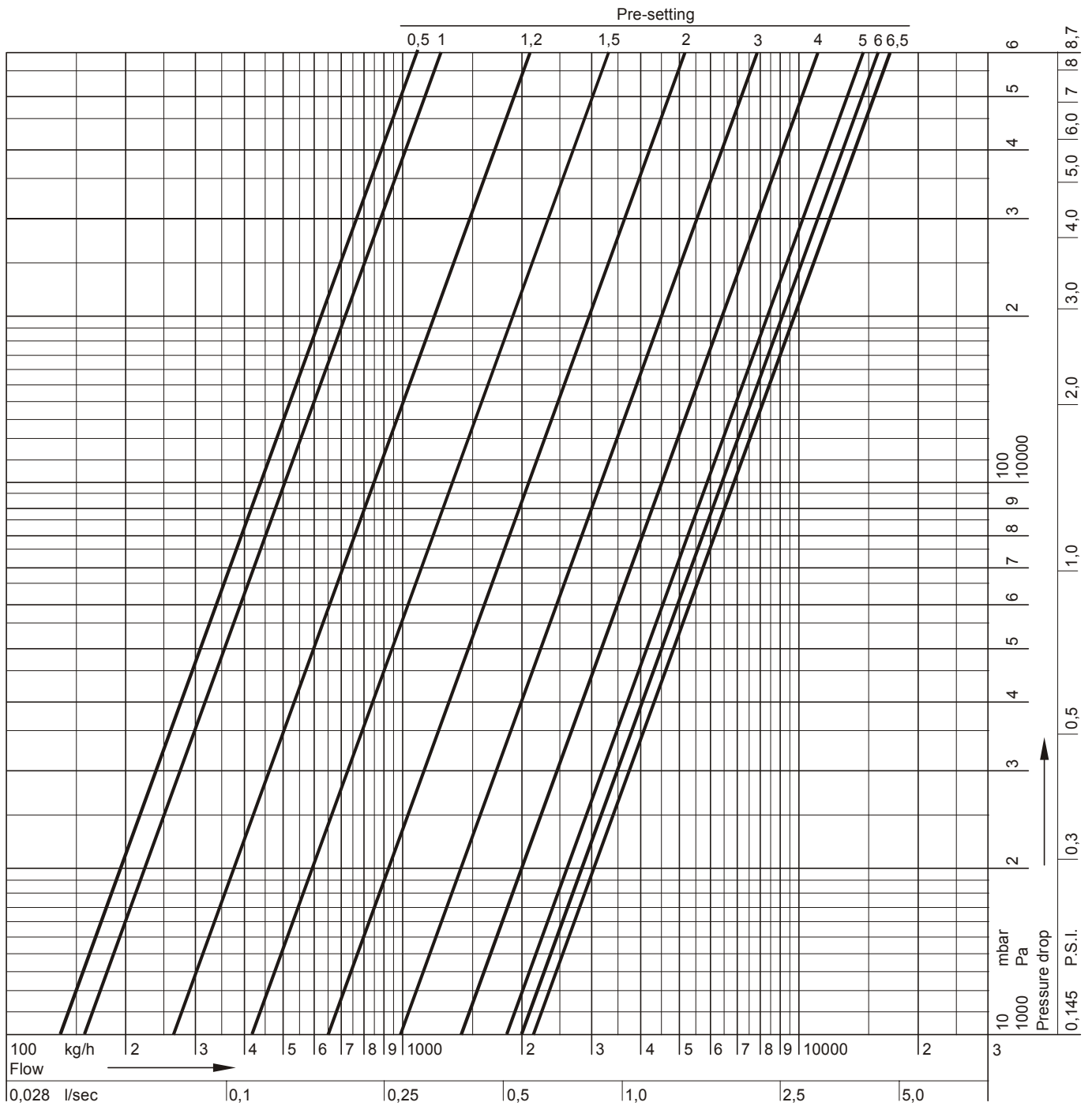


Pre-setting	0,3	0,4	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6
k_v-value	0,68	0,72	0,84	0,97	1,10	1,30	1,50	1,70	1,90	2,10	2,30	2,50	2,70	2,95	3,20	3,48	3,76	4,05
cv-value	0,80	0,84	0,98	1,13	1,29	1,52	1,76	1,99	2,22	2,46	2,69	2,93	3,16	3,45	3,74	4,07	4,40	4,74

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
k_v-value	4,34	4,64	4,94	5,24	5,52	5,80	6,06	6,30	6,50	6,65	6,75	k _{vs} = 6,80
cv-value	5,08	5,43	5,78	6,13	6,46	6,79	7,09	7,37	7,61	7,78	7,90	7,96

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

Flow Data DN32

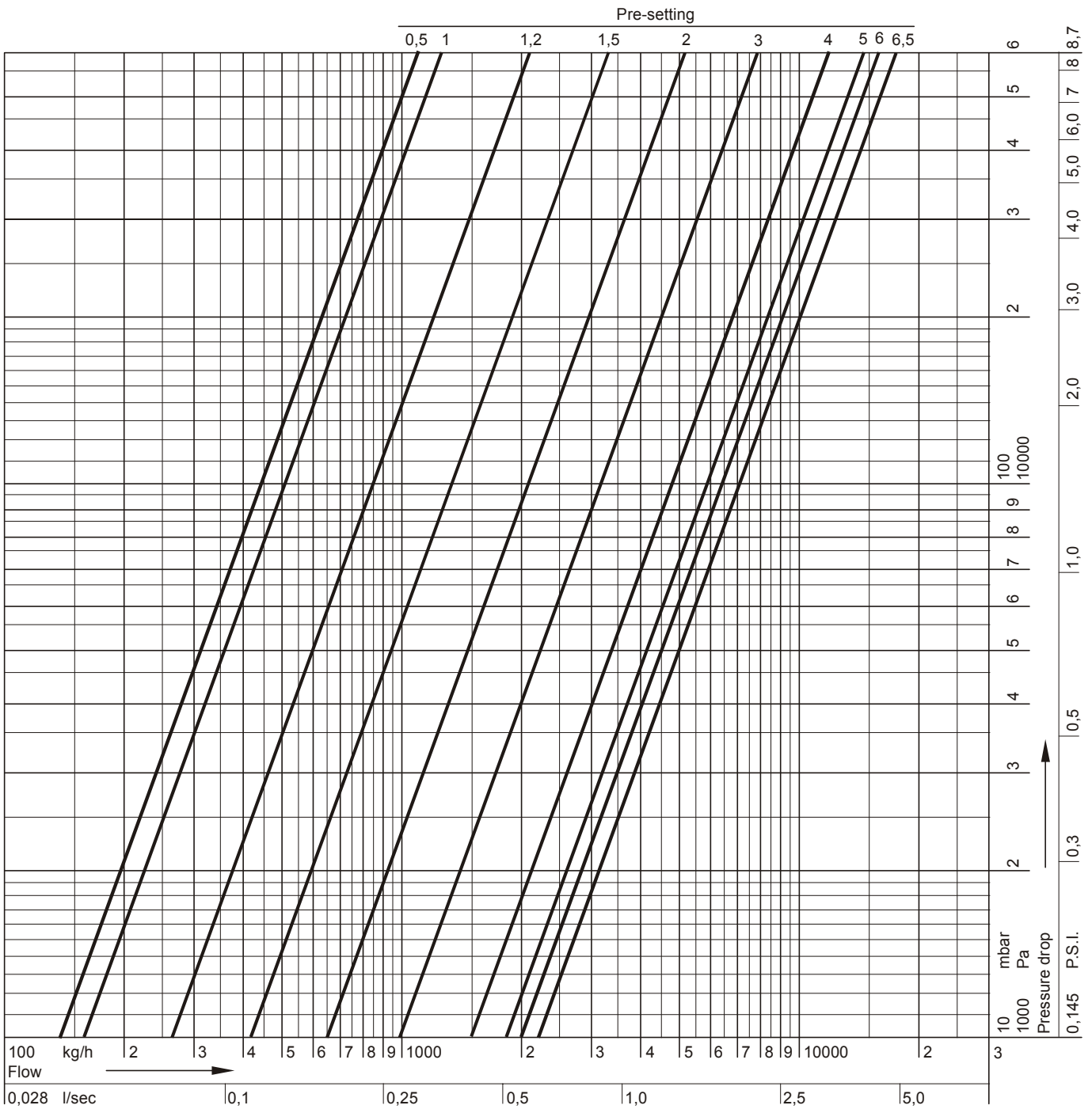


Pre-setting	0,5	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	3,8
k _v -value	1,40	1,45	1,55	1,60	2,60	3,70	4,80	5,90	6,50	6,90	7,50	8,30	9,20	10,2	11,2	12,2	13,2	14,1
cv-value	1,64	1,70	1,81	1,87	3,04	4,33	5,62	6,90	7,61	8,07	8,78	9,71	10,8	11,9	13,1	14,3	15,4	16,5

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
cv-value	17,6	18,5	19,3	20,0	20,7	21,3	21,8	22,2	22,7	23,0	23,4	23,9	24,3	24,6

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

Flow Data DN40

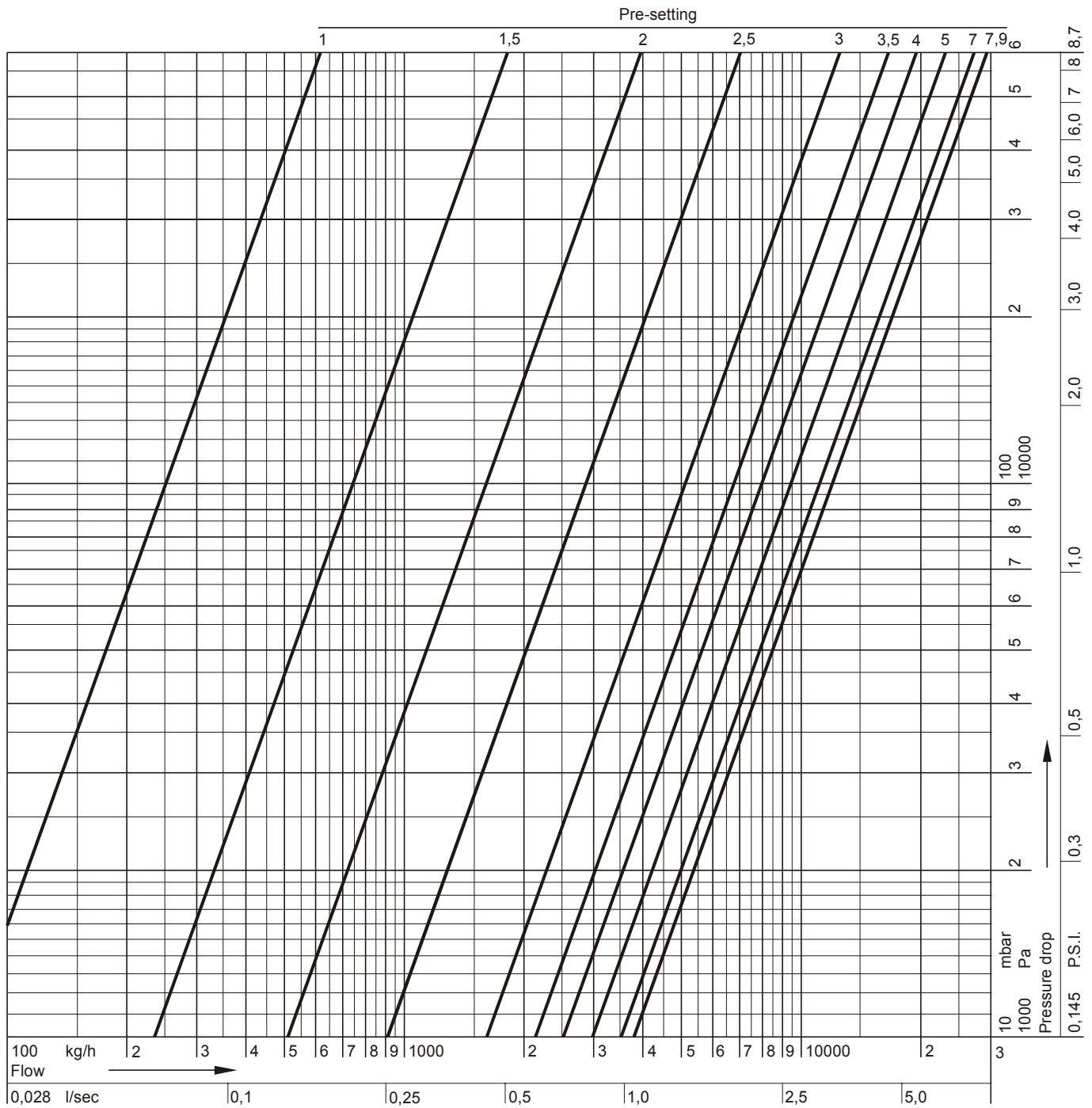


Pre-setting	0,5	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	3,8
k_v-value	1,40	1,45	1,55	1,60	2,60	3,70	4,80	5,90	6,50	6,90	7,50	8,30	9,20	10,2	11,2	12,2	13,2	14,1
cv-value	1,64	1,70	1,81	1,87	3,04	4,33	5,62	6,90	7,61	8,07	8,78	9,71	10,8	11,9	13,1	14,3	15,4	16,5

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
cv-value	17,6	18,5	19,3	20,0	20,7	21,3	21,8	22,2	22,7	23,0	23,4	24,3	25,3	25,7

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

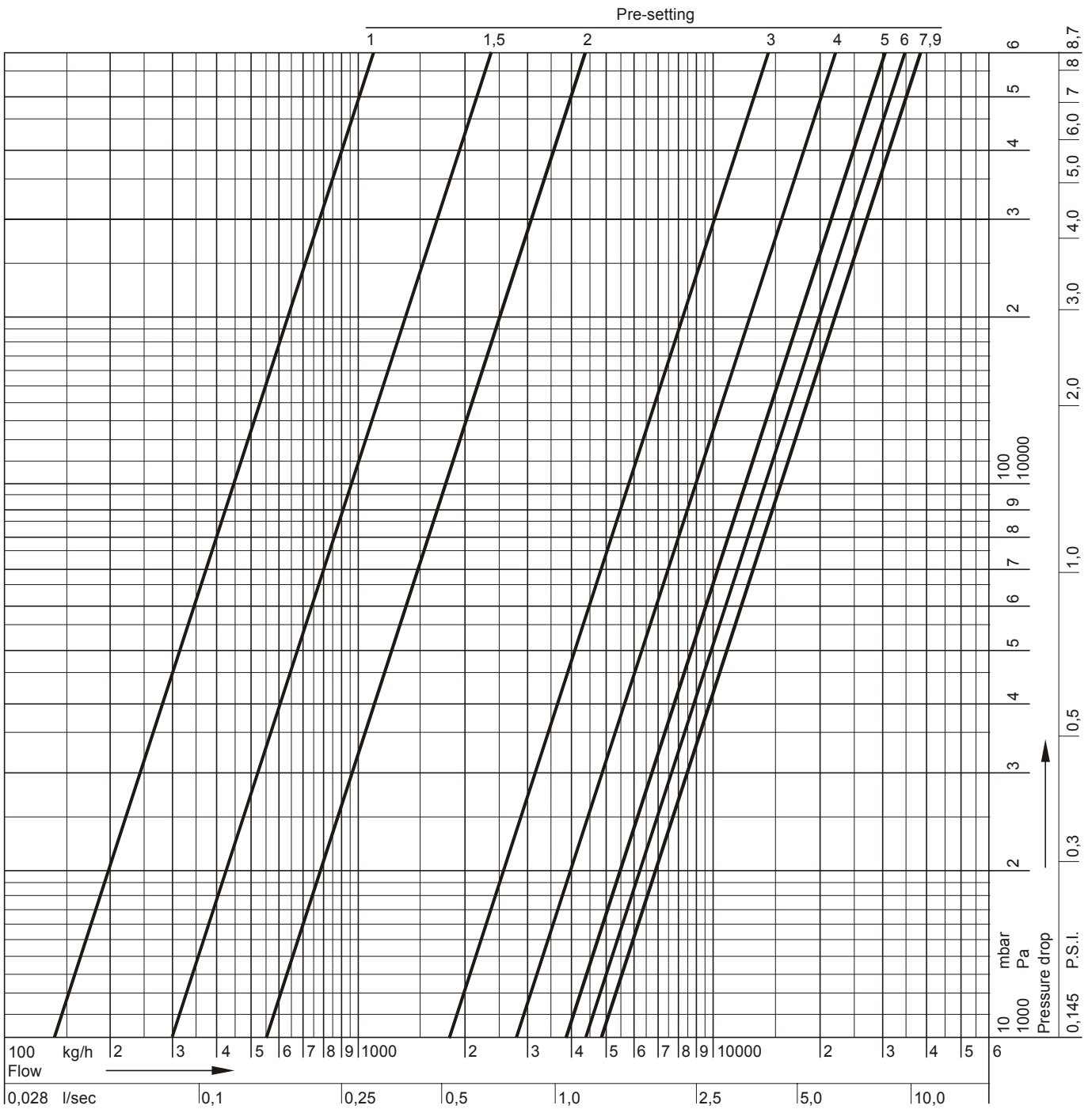
Flow Data DN50



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
cv-value	0,94	1,46	2,20	3,18	4,42	5,97	7,82	9,99	12,5	15,2	18,3	21,9	24,6	26,7	28,4	29,7	30,9	31,8

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
cv-value	32,8	33,7	34,5	35,3	36,3	37,1	37,9	38,6	39,3	39,9	40,5	41,0	41,4	41,9	42,4	43,1	44,5

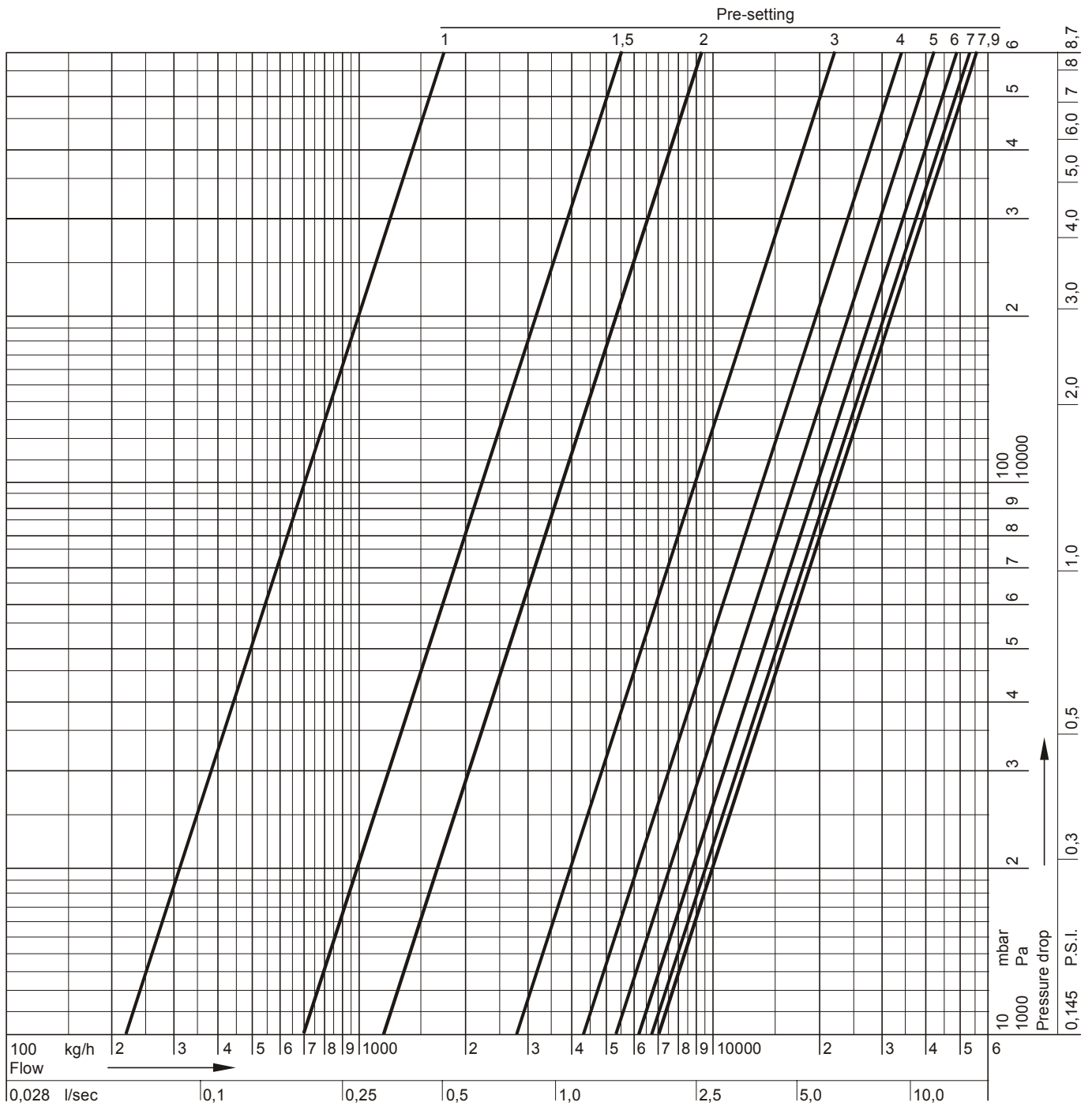
Flow Data DN65



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
cv-value	1,64	1,76	2,93	4,10	5,27	6,44	9,01	11,7	14,3	17,0	19,5	22,2	24,9	27,7	30,4	33,1	35,2	37,3

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
cv-value	39,3	41,4	43,5	45,2	46,9	48,6	50,3	51,5	52,5	53,1	53,8	54,4	55,0	55,0	55,3	55,5	55,8

Flow Data DN80



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
k_v-value	2,57	4,91	7,25	9,48	11,8	14,2	17,9	21,6	25,3	29,0	32,8	36,1	39,7	43,1	46,6	50,0	52,5	55,0
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	
k_v-value	57,6	60,0	62,6	64,6	66,7	68,7	70,8	72,8	74,2	75,5	76,9	78,2	79,6	80,3	81,0	81,7	83,1	

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 psi) 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:

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

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:

$$Kv_{Medium} = Kv_0 \times \frac{1}{\sqrt{f}}$$

$$\Delta p_{Medium} = \Delta p_0 \times f$$

$$m_{Medium} = m_0 \times \frac{1}{\sqrt{f}}$$

Table 1. Values for correction factor f

Medium	water part	Correction factor f					
		5°C (41°F)	20°C (68°F)	35°C (95°F)	50°C (122°F)	65°C (149°F)	80°C (176°F)
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
e.g. 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
e.g. Antifrogen L	50%	1,053	1,044	1,035	1,025	1,014	1,002

Honeywell

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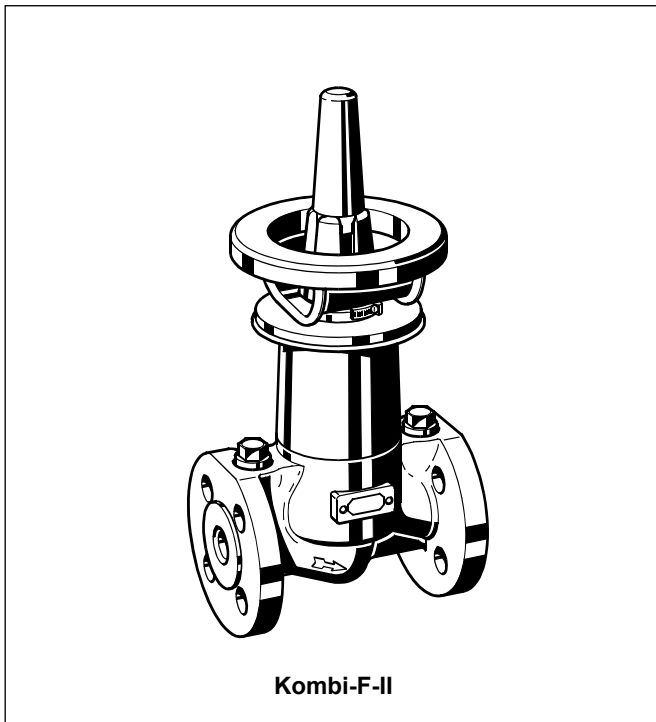
V6000

Kombi Valves

Kombi-F-II, Kombi-F

FLANGED BALANCING AND SHUTOFF VALVES

PRODUCT DATA



Kombi-F-II

Design

- Valve body with flanges drilled to DIN
- Valve insert with handwheel and pre-setting display
- Pressure test cocks

Materials

- Valve housing made of cast iron GG25, painted blue
- Valve insert made of stainless steel with seat sealing made of PTFE
- Pressure test cocks made of brass
- Handwheel made of steel, painted black
- Fairing made of plastic, black

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Application

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 Kombi-F-II and Kombi-F shutoff and balancing valves.

Kombi-F-II and Kombi-F have functions shut-off, pre-setting and measuring.

Features

- **Balancing through stroke limitation with digital pre-setting and visible pre-setting indicator**
- **Equipped with 2 pressure test cocks for differential pressure measurement**
- **Non rising spindle with EDD**
- **Pre-setting isn't altered when handwheel is turned**
- **Stroke limitation-screw protected by protection cap**
- **PTFE seat sealing**
- **Spindle made of stainless steel**
- **Valve body made of corrosion resistant cast iron**
- **Available in dimensions up to DN400**

Specifications

Medium	Water, water-glycol mixture
Operating temperature	-10...120°C (14...248°F) short run 130°C (266°F)
Operating pressure	max. 16 bar (232 psi)
k_{vs} (cv)-values	see table below and flow diagrams

Dimensions and Ordering Information

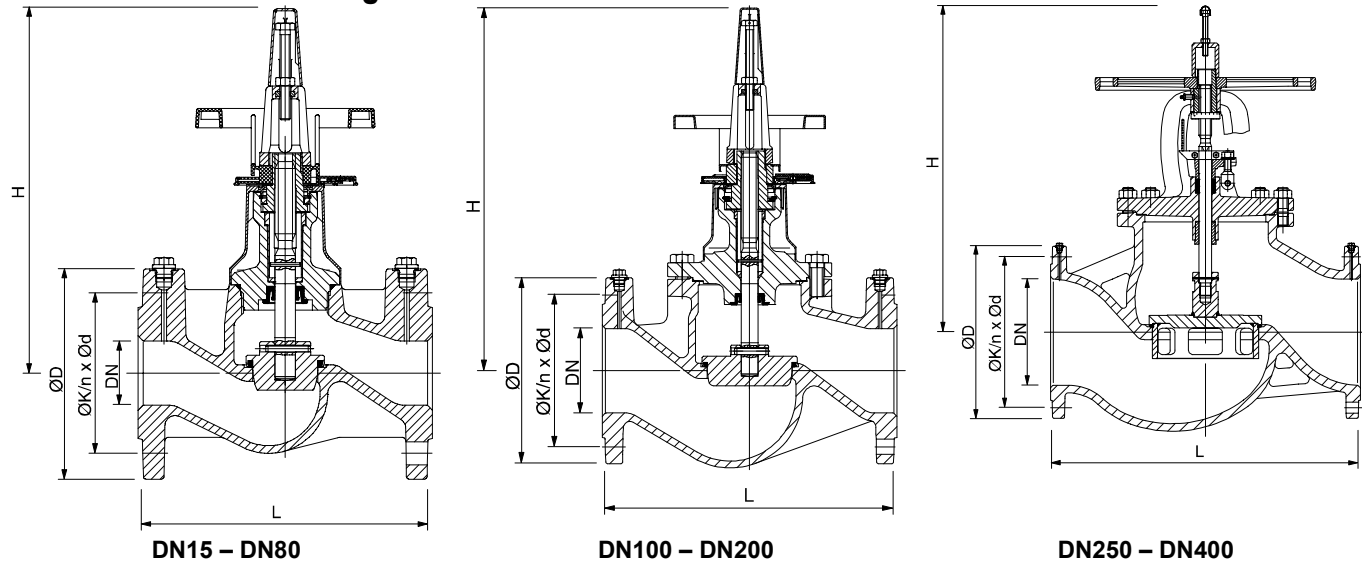


Fig. 1. Dimensions

Table 1. Dimensions Kombi-F-II

DN	(R)	k _{vs} (cv)-value	L	H	Ø D	Ø K	n x Ø d	Weight	OS-No.
15	1/2"	4,50 (5,27)	130	225	95	65	4 x 14	3,5 kg	V6000D0015
20	3/4"	6,60 (7,72)	150	225	105	75	4 x 14	4,1 kg	V6000D0020
25	1"	9,80 (11,5)	160	225	115	85	4 x 14	4,8 kg	V6000D0025
32	1 1/4"	15,1 (17,7)	180	225	140	100	4 x 18	6,6 kg	V6000D0032
40	1 1/2"	24,9 (29,1)	200	280	150	110	4 x 18	9,0 kg	V6000D0040
50	2"	48,5 (56,7)	230	280	165	125	4 x 18	11,5 kg	V6000D0050
65	2 1/2"	74,4 (87,0)	290	365	185	145	4 x 18	18,5 kg	V6000D0065
80	3"	111 (130)	310	395	200	160	8 x 18	24,5 kg	V6000D0080
100	4"	165 (193)	350	430	220	180	8 x 18	40,0 kg	V6000D0100
125	5"	242 (283)	400	495	250	210	8 x 18	79,0 kg	V6000D0125
150	6"	372 (435)	480	530	285	240	8 x 22	91,0 kg	V6000D0150
200	8"	704 (824)	600	665	340	295	8 x 22	170 kg	V6000D0200

Table 2. Dimensions Kombi-F

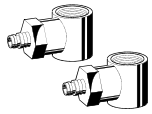
DN	(R)	k _{vs} (cv)-value	L	H	Ø D	Ø K	n x Ø d	Weight	OS-No.
250	10"	812 (950)	730	600	405	355	12 x 22	265 kg	V6000D0250
300	12"	1.380 (1.615)	850	685	460	410	12 x 26	360 kg	V6000D0300
350	14"	1.651 (1.932)	980	775	520	470	16 x 26	535 kg	V6000D0350
400	16"	2.389 (2.795)	1.100	790	580	525	16 x 30	765 kg	V6000D0400

NOTE: All dimensions in mm if not stated otherwise.

Accessories

Measuring Equipment

Set of 2 measuring adapters

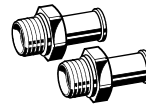


for all dimensions

VA3600A008

Spare Parts

Spare set of 2 pressure test cocks G1/4"



for all dimensions

VA2600A008

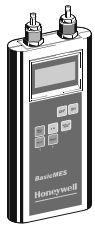
Extension piece for pressure test cocks, length 45 mm, for insulated Kombi-F-II and Kombi-F



for all dimensions

VA2601A008

'BasicMES' handheld measuring computer



for all dimensions;
computer is supplied with
case and accessories

VM241A1002

Installation Example

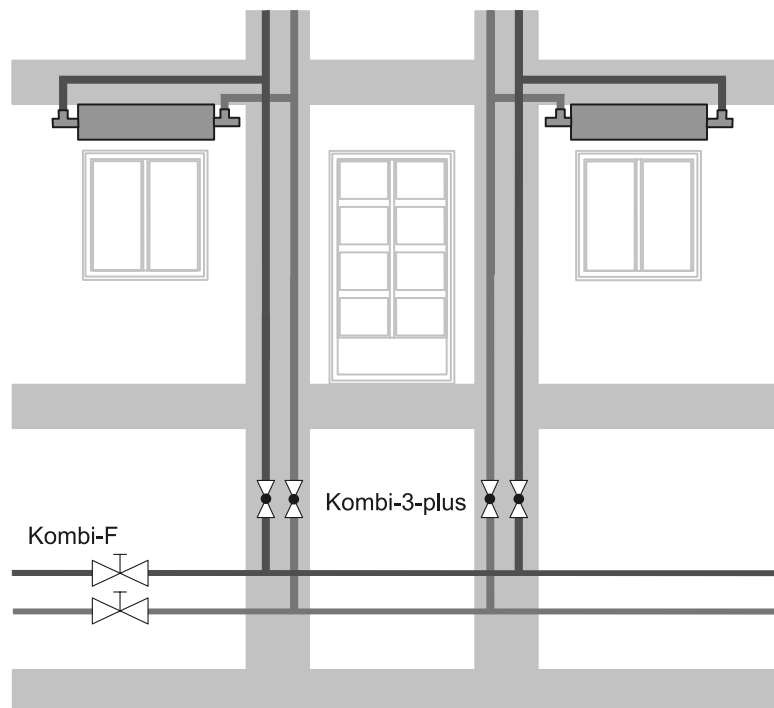
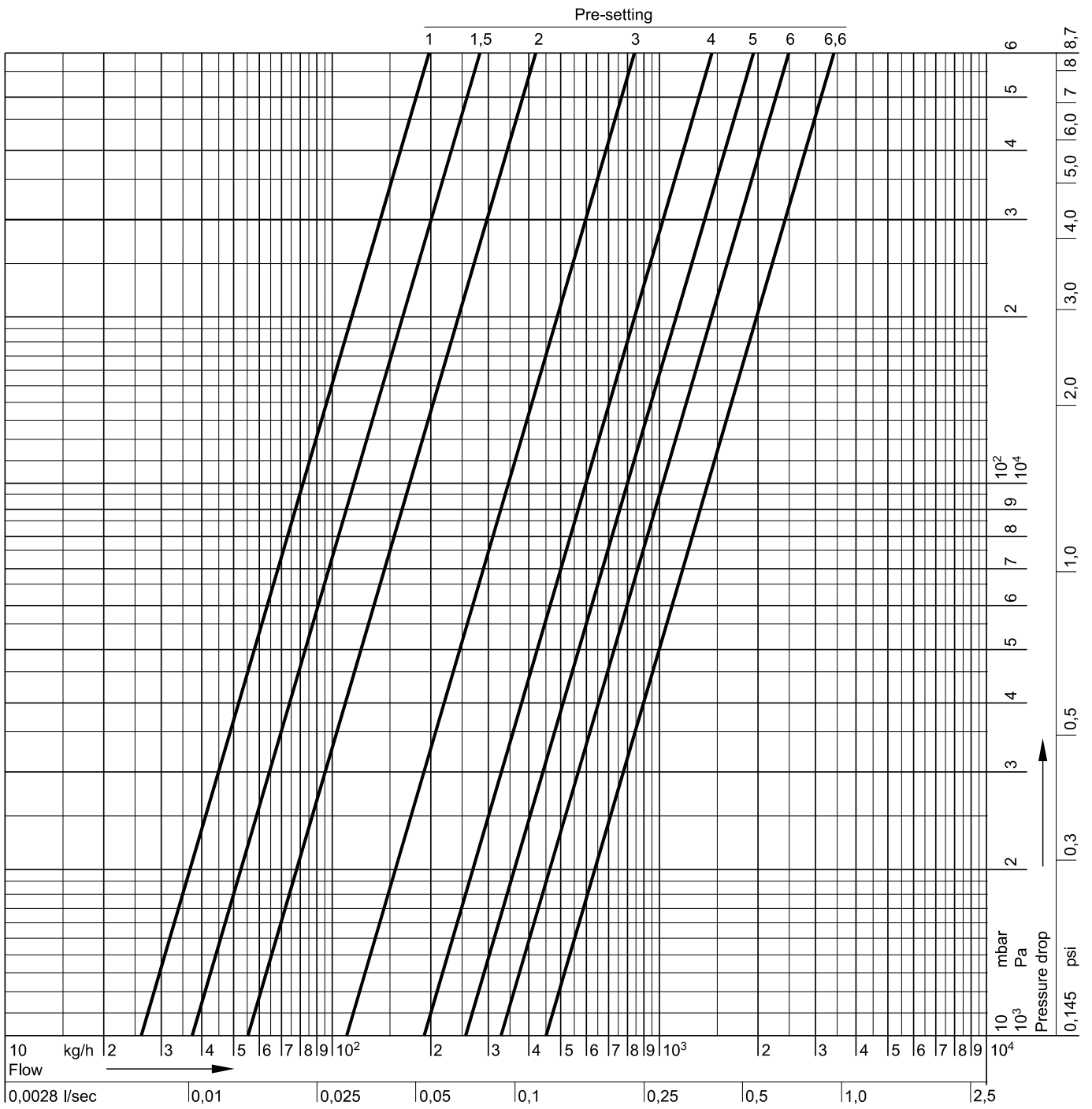


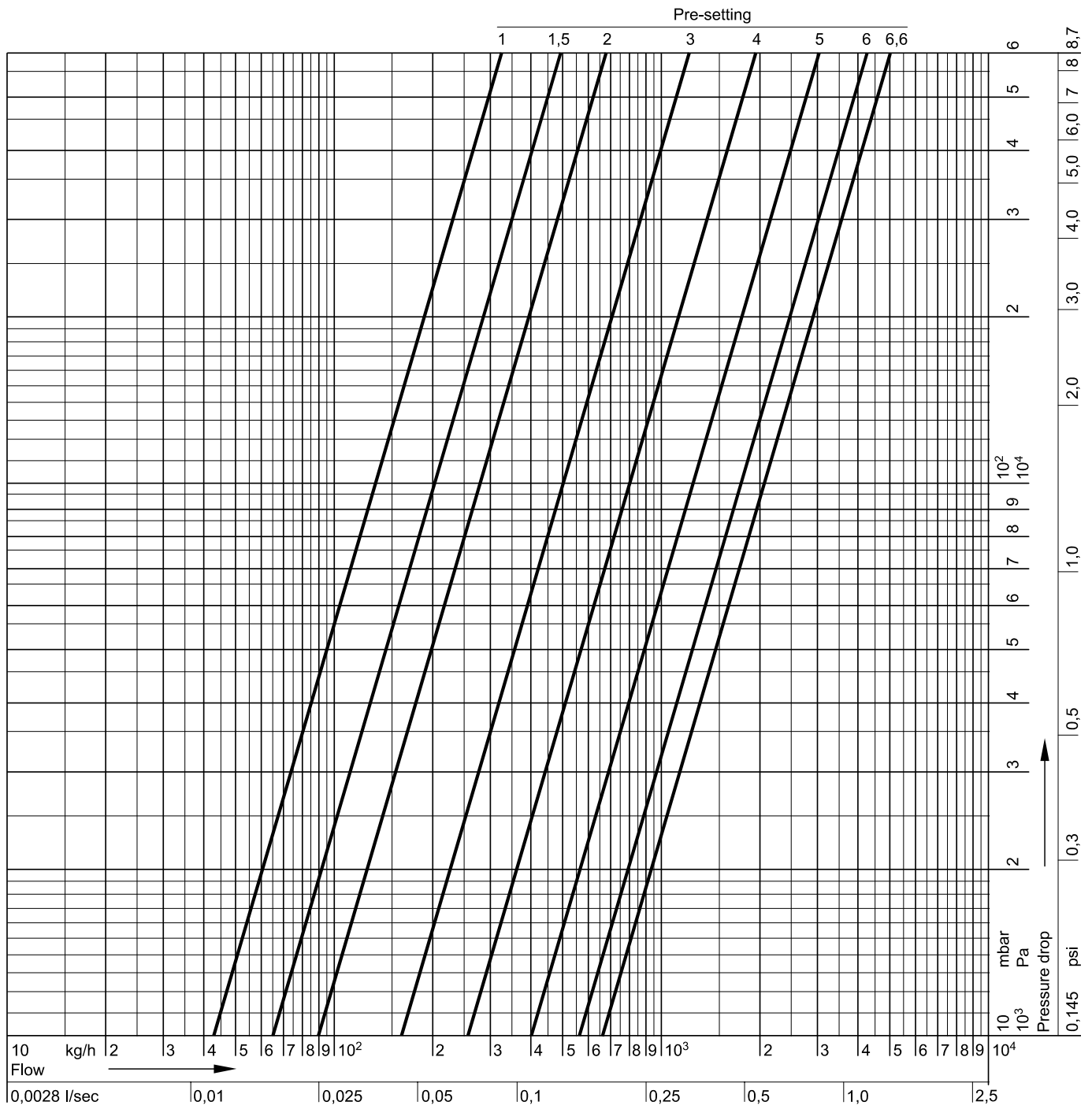
Fig. 3. Kombi-F in a cooling system

Flow Data Kombi-F-II, DN15



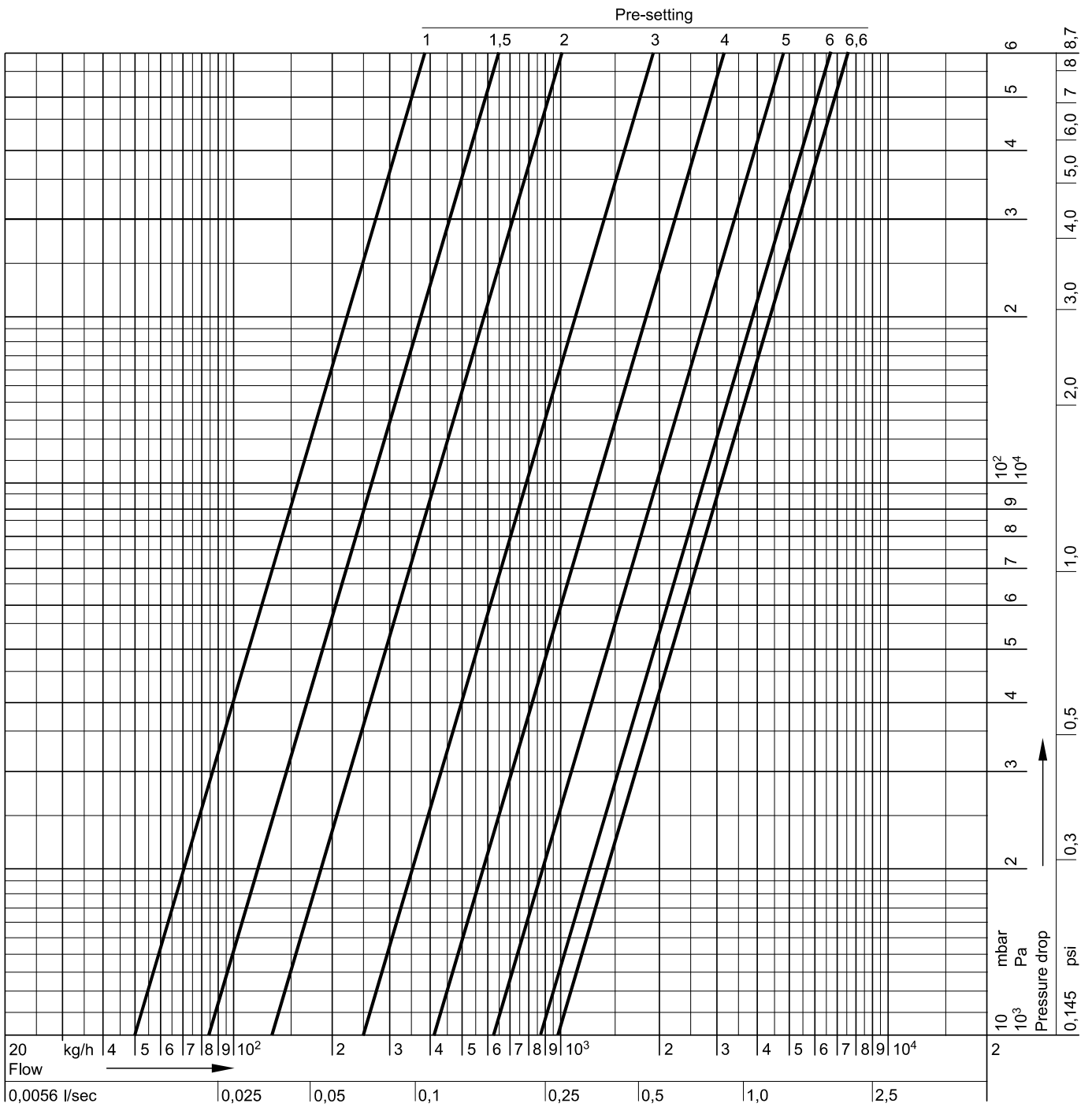
Pre-setting	0,5	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	6,6 = open
k_v-value	0,13	0,26	0,37	0,55	0,80	1,10	1,50	1,90	2,30	2,60	2,90	3,30	4,20	k _{vs} = 4,50
cv-value	0,15	0,30	0,43	0,64	0,94	1,29	1,76	2,22	2,69	3,04	3,39	3,86	4,91	5,27

Flow Data Kombi-F-II, DN20



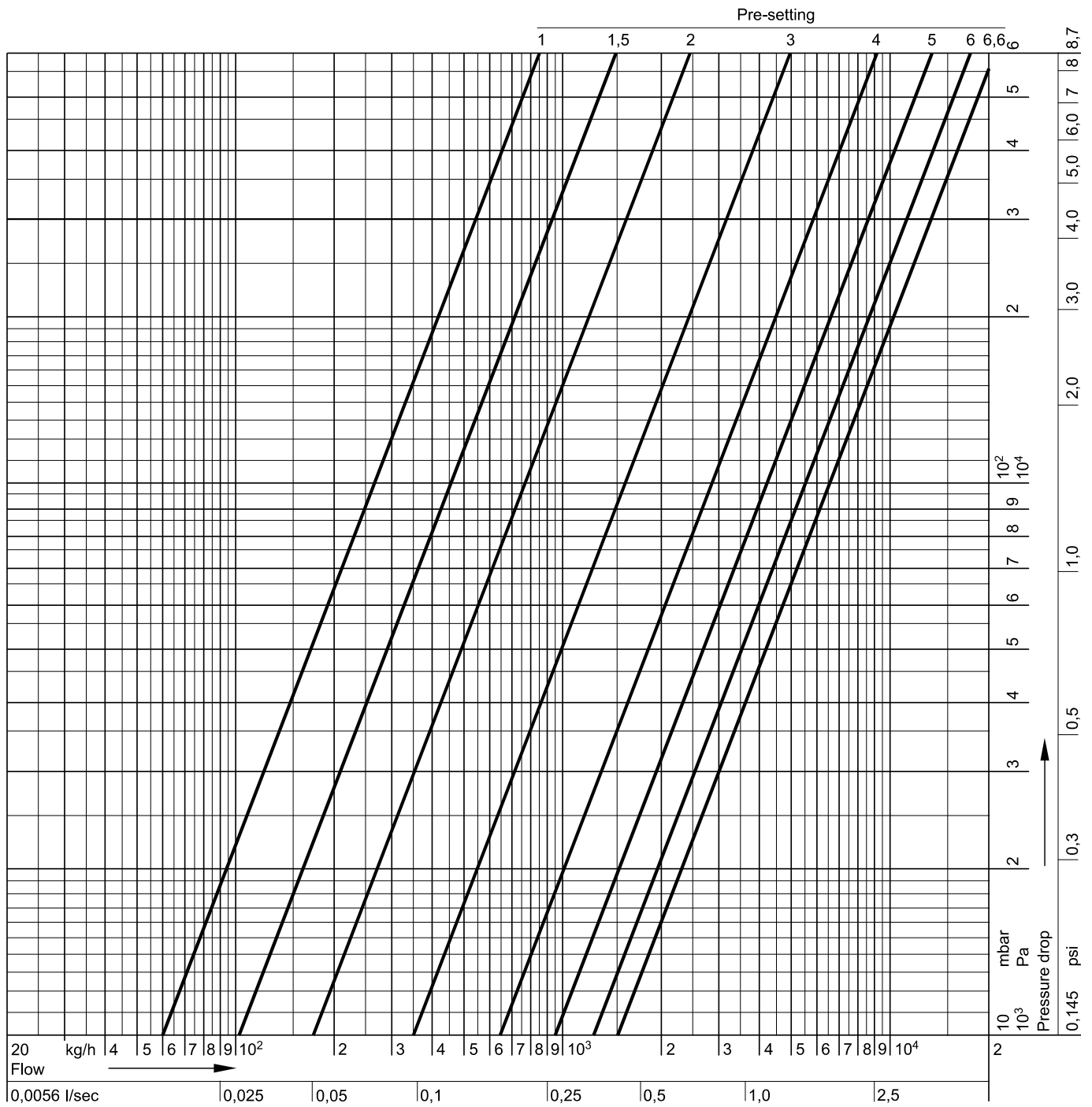
Pre-setting	0,5	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	6,6 = open
k_v-value	0,22	0,43	0,65	0,90	1,15	1,60	2,06	2,60	3,26	4,00	4,79	5,60	6,43	k _{vs} = 6,60
cv-value	0,26	0,50	0,76	1,05	1,35	1,87	2,41	3,04	3,81	4,68	5,60	6,55	7,52	7,72

Flow Data Kombi-F-II, DN25



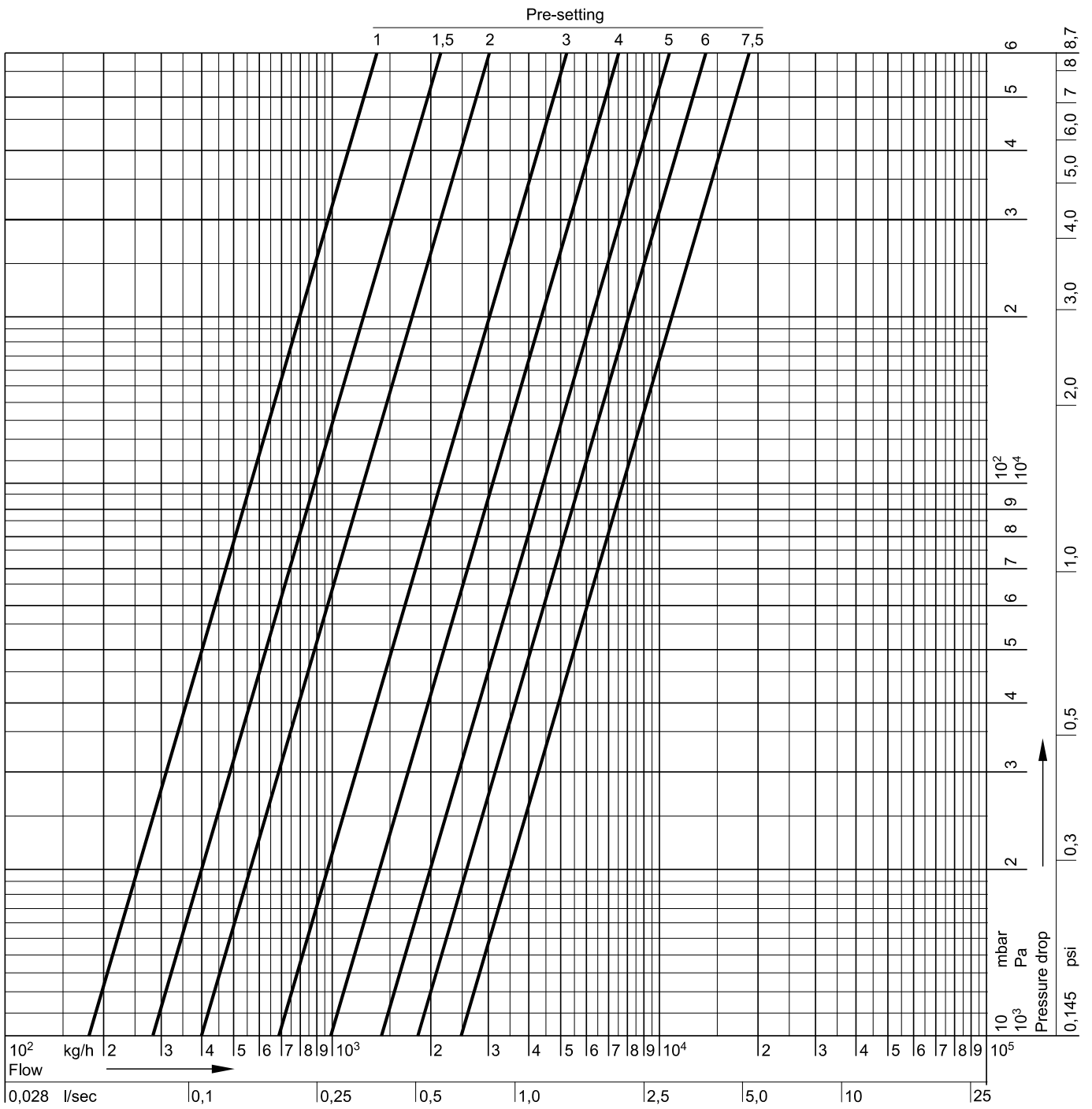
Pre-setting	0,5	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	6,6 = open
k_v-value	0,22	0,49	0,84	1,30	1,85	2,50	3,25	4,10	5,07	6,20	7,50	8,70	9,63	k _{vs} = 9,80
cv-value	0,26	0,57	0,98	1,52	2,16	2,93	3,80	4,80	5,93	7,25	8,78	10,2	11,3	11,5

Flow Data Kombi-F-II, DN32



Pre-setting	0,5	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	6,6 = open
k_v-value	0,28	0,60	1,06	1,68	2,48	3,54	4,91	6,46	7,97	9,47	11,0	12,8	14,7	k _{vs} = 15,1
cv-value	0,33	0,70	1,24	1,97	2,90	4,14	5,74	7,56	9,32	11,1	12,9	15,0	17,2	17,7

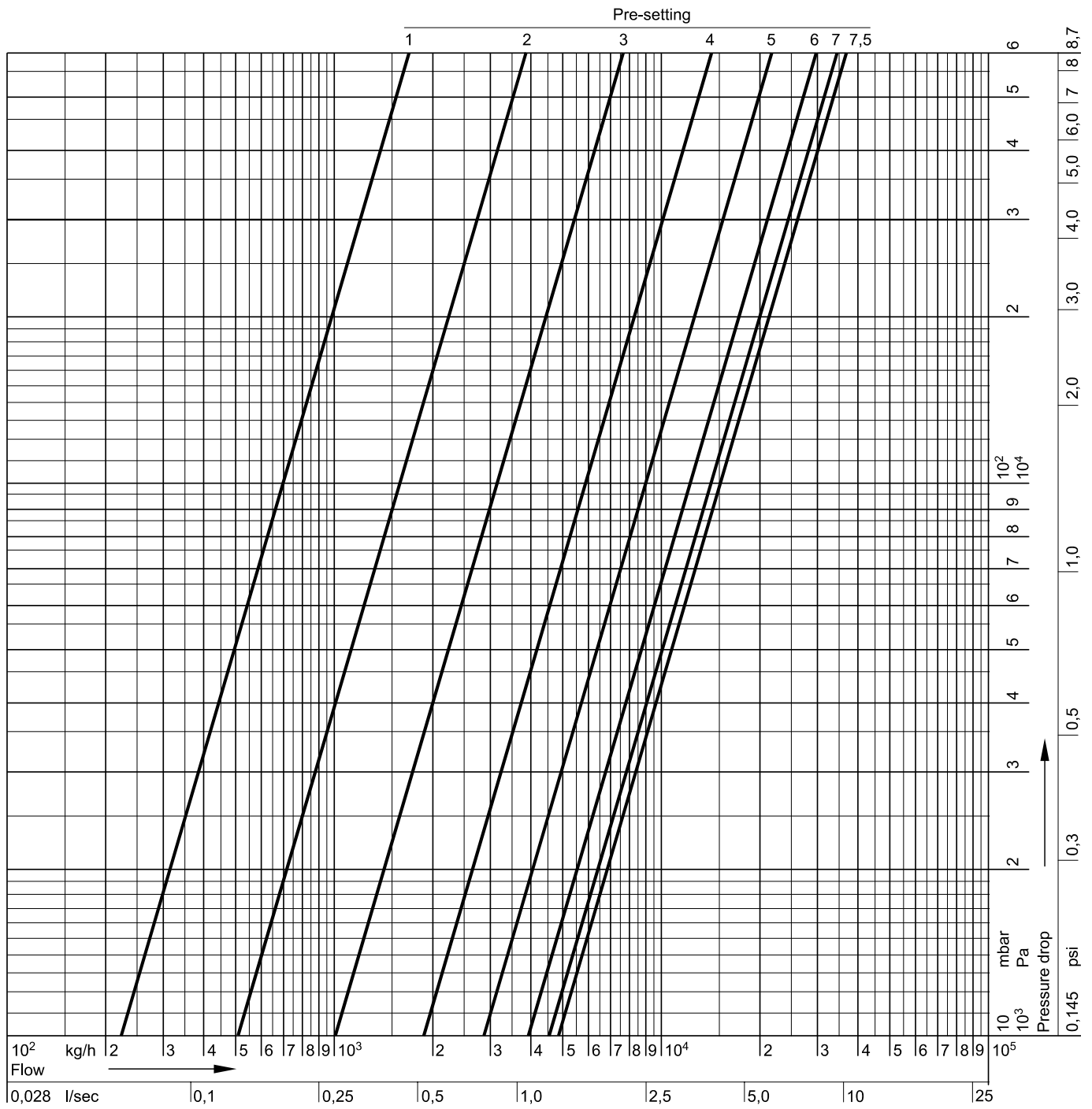
Flow Data Kombi-F-II, DN40



Pre-setting	0,5	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	7,0
k_v-value	0,88	1,80	2,80	4,00	5,42	6,90	8,31	9,90	11,9	14,3	16,8	18,8	20,4	22,2
cv-value	1,03	2,11	3,28	4,68	6,34	8,07	9,72	11,6	13,9	16,7	19,7	22,0	23,9	26,0

Pre-setting	7,5 = open
k_v-value	k _{vs} = 24,9
cv-value	29,1

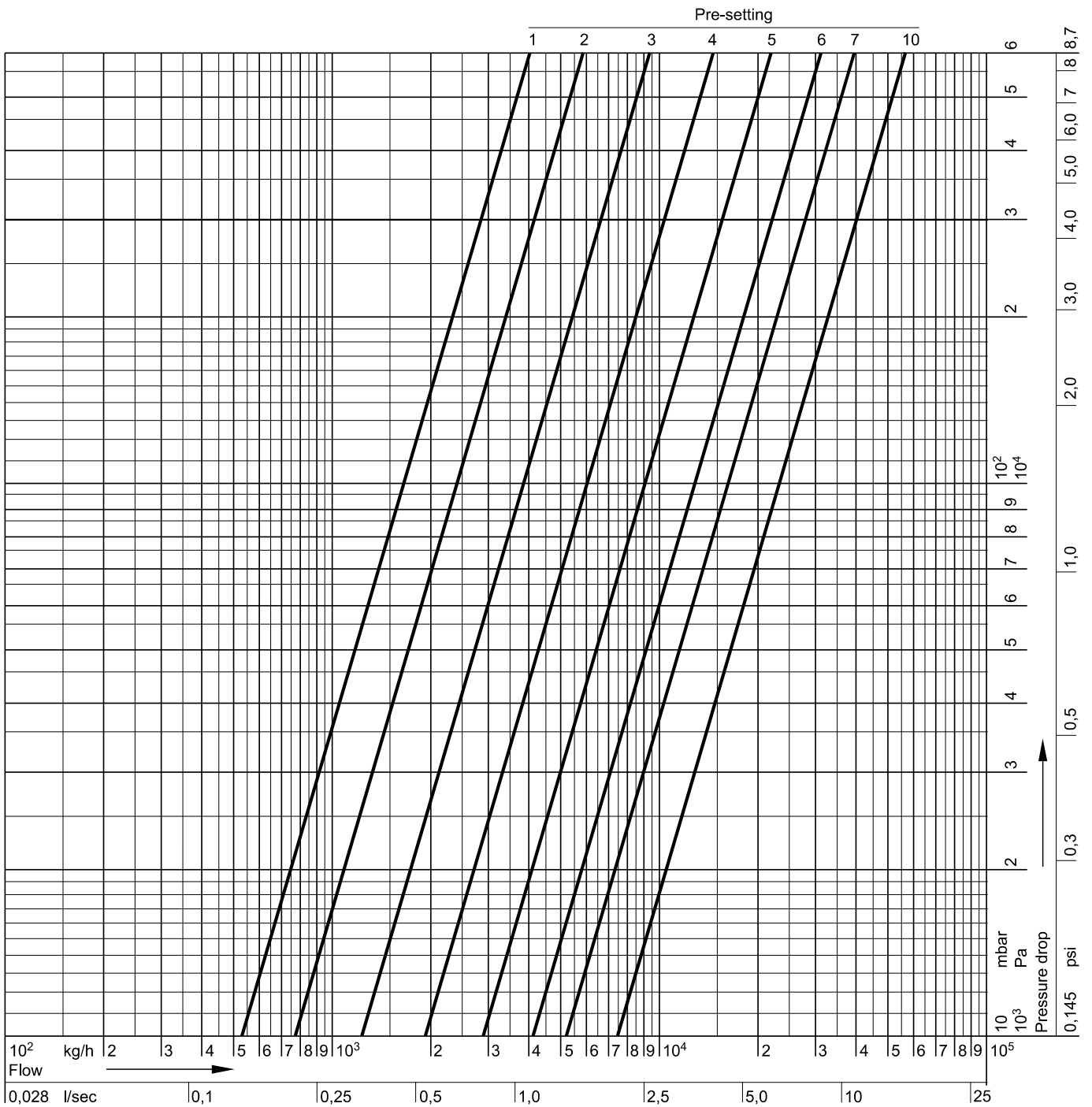
Flow Data Kombi-F-II, DN50



Pre-setting	0,5	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	7,0
k_v-value	1,07	2,20	3,46	5,10	7,36	10,3	13,9	18,1	22,7	28,0	34,1	39,3	42,8	45,6
cv-value	1,25	2,57	4,05	5,97	8,61	12,1	16,3	21,2	26,6	32,8	39,9	46,0	50,1	53,4

Pre-setting	7,5 = open
k_v-value	k _{vs} = 48,5
cv-value	56,7

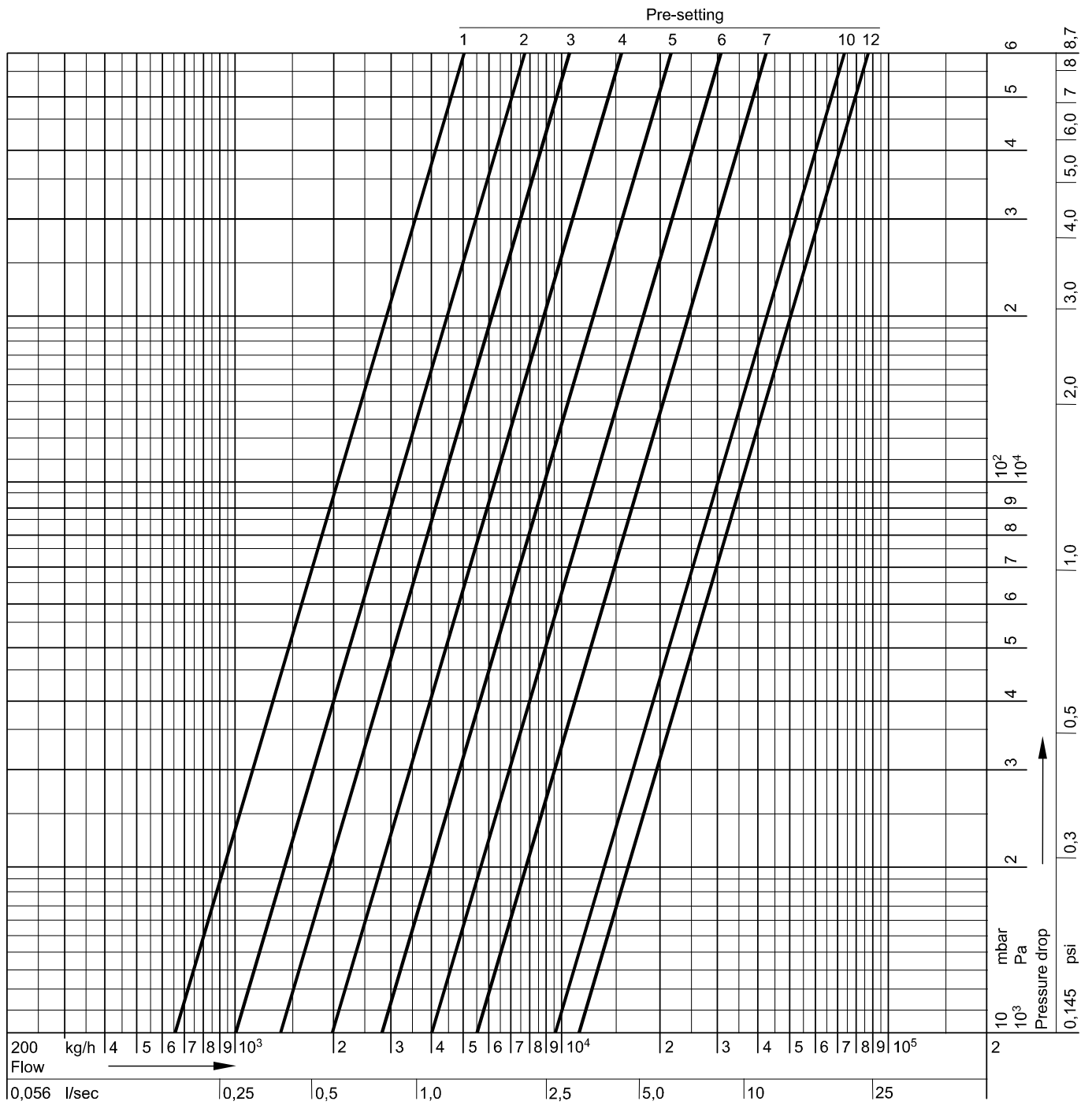
Flow Data Kombi-F-II, DN65



Pre-setting	0,5	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	7,0	8,0
k_v-value	2,98	5,30	6,64	7,80	9,60	12,1	15,2	19,0	23,6	29,1	35,2	41,3	47,0	52,1	60,7
cv-value	3,49	6,20	7,77	9,13	11,2	14,2	17,8	22,2	27,6	34,0	41,2	48,3	55,0	61,0	71,0

Pre-setting	9,0	10,0 = open
k_v-value	67,9	k _{vs} = 74,4
cv-value	79,4	87,0

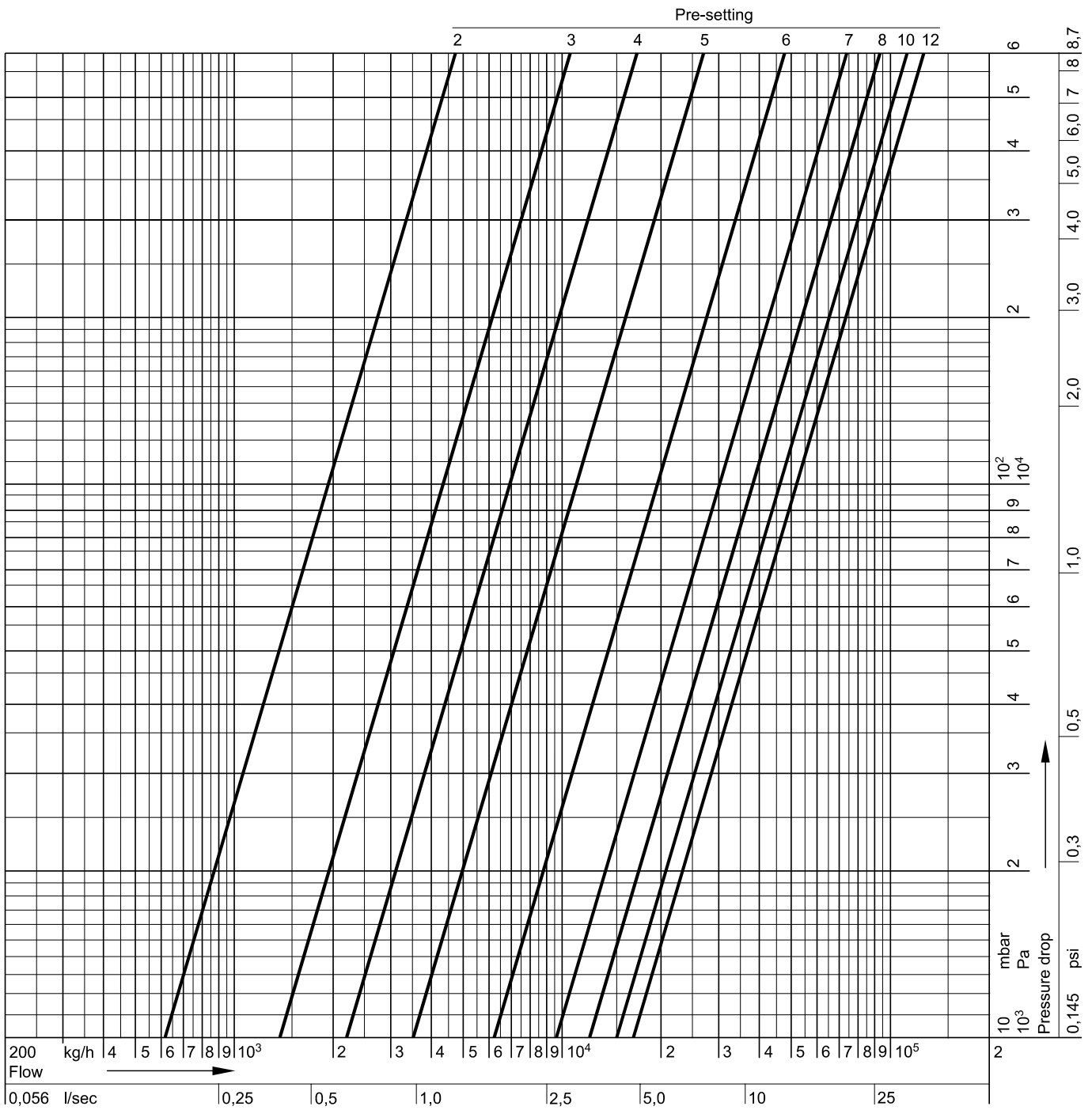
Flow Data Kombi-F-II, DN80



Pre-setting	0,5	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	6,0	7,0	8,0	9,0	10,0
k_v-value	3,65	6,60	8,52	10,0	11,7	13,7	16,1	19,2	23,2	28,1	40,4	55,4	70,9	84,8	96,1
cv-value	4,27	7,72	9,97	11,7	13,7	16,0	18,8	22,5	27,1	32,9	47,3	64,8	83,0	99,2	112

Pre-setting	11,0	12,0 = open
k_v-value	104	k _{vs} = 111
cv-value	122	130

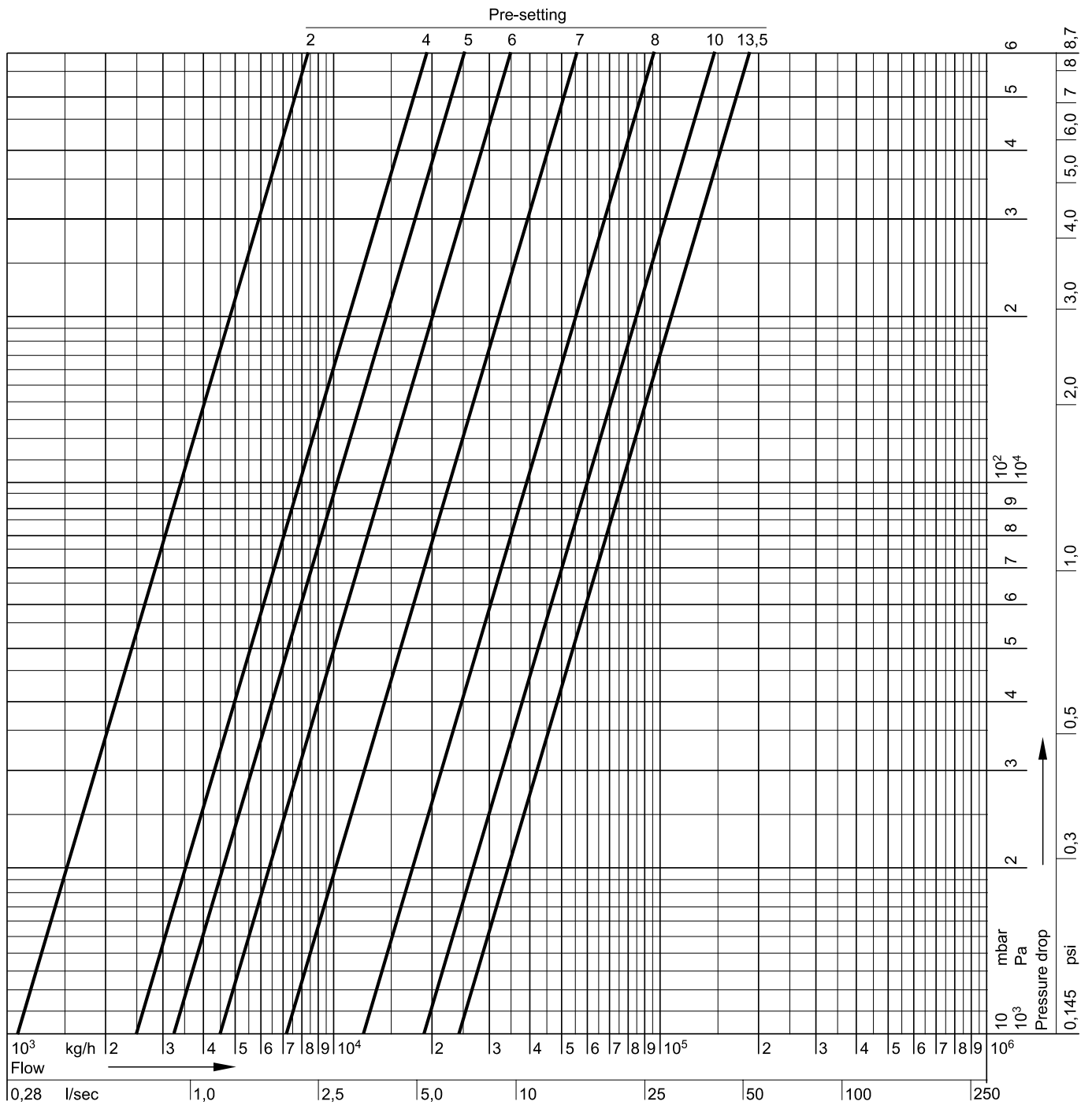
Flow Data Kombi-F-II, DN100



Pre-setting	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	7,0	7,5	8,0	9,0
k_v-value	3,80	6,20	9,60	13,4	17,3	21,8	27,6	35,7	47,2	62,4	79,3	96,6	110	121	137
cv-value	4,45	7,25	11,2	15,7	20,2	25,5	32,3	41,8	55,2	73,0	92,8	113	129	142	160

Pre-setting	10,0	11,0	12,0 = open
k_v-value	148	157	k _{vs} = 165
cv-value	173	184	193

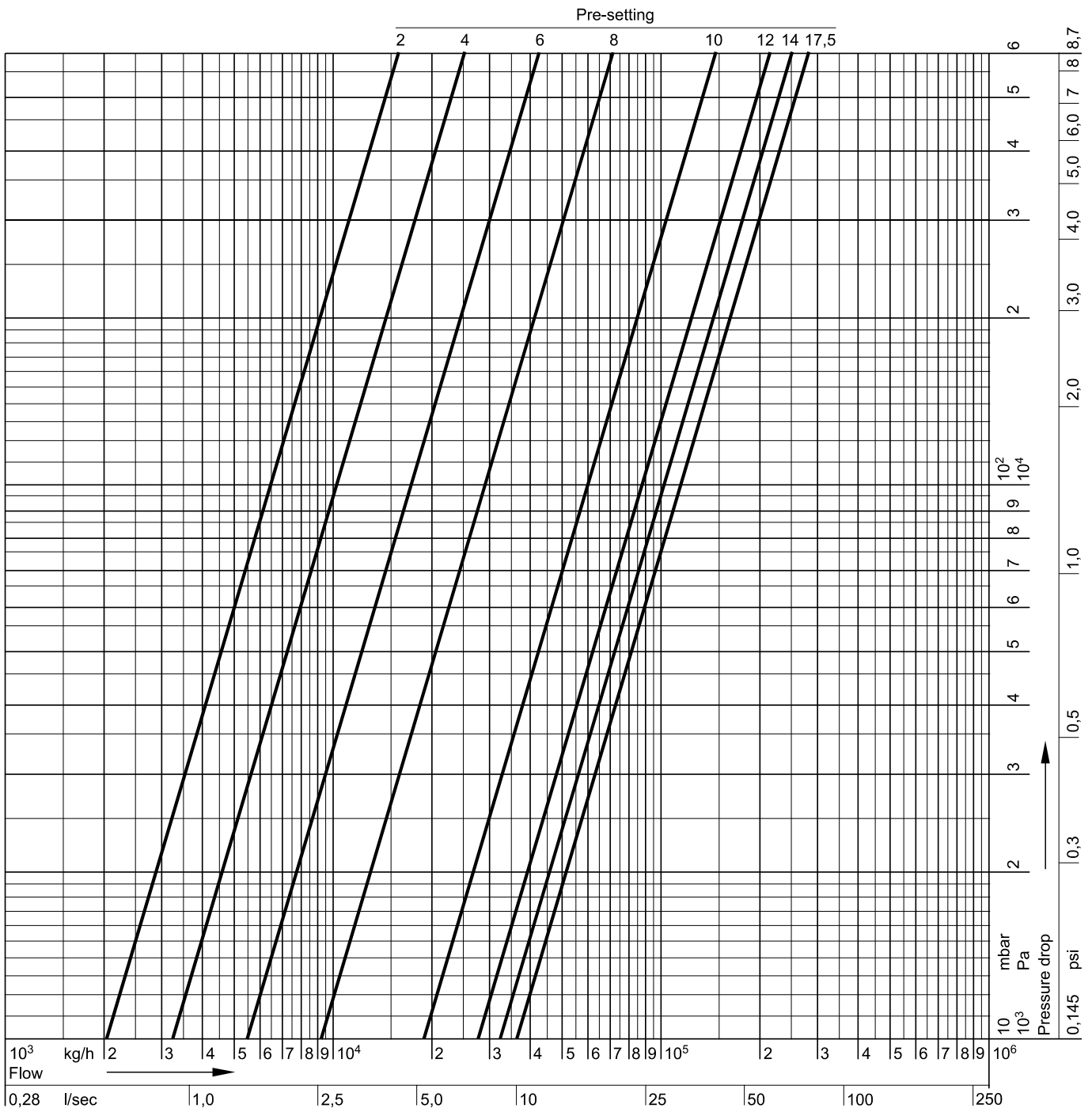
Flow Data Kombi-F-II, DN125



Pre-setting	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	7,0	7,5	8,0	9,0
k_v-value	8,30	11,3	14,4	17,7	21,1	24,6	28,2	32,3	37,4	44,9	56,1	72,5	93,2	120	162
cv-value	9,71	13,2	16,8	20,7	24,7	28,8	33,0	37,8	43,8	52,5	65,6	84,8	109	140	190

Pre-setting	10,0	11,0	12,0	13,0	13,5 = open
k_v-value	192	211	225	236	k _{vs} = 242
cv-value	225	247	263	276	283

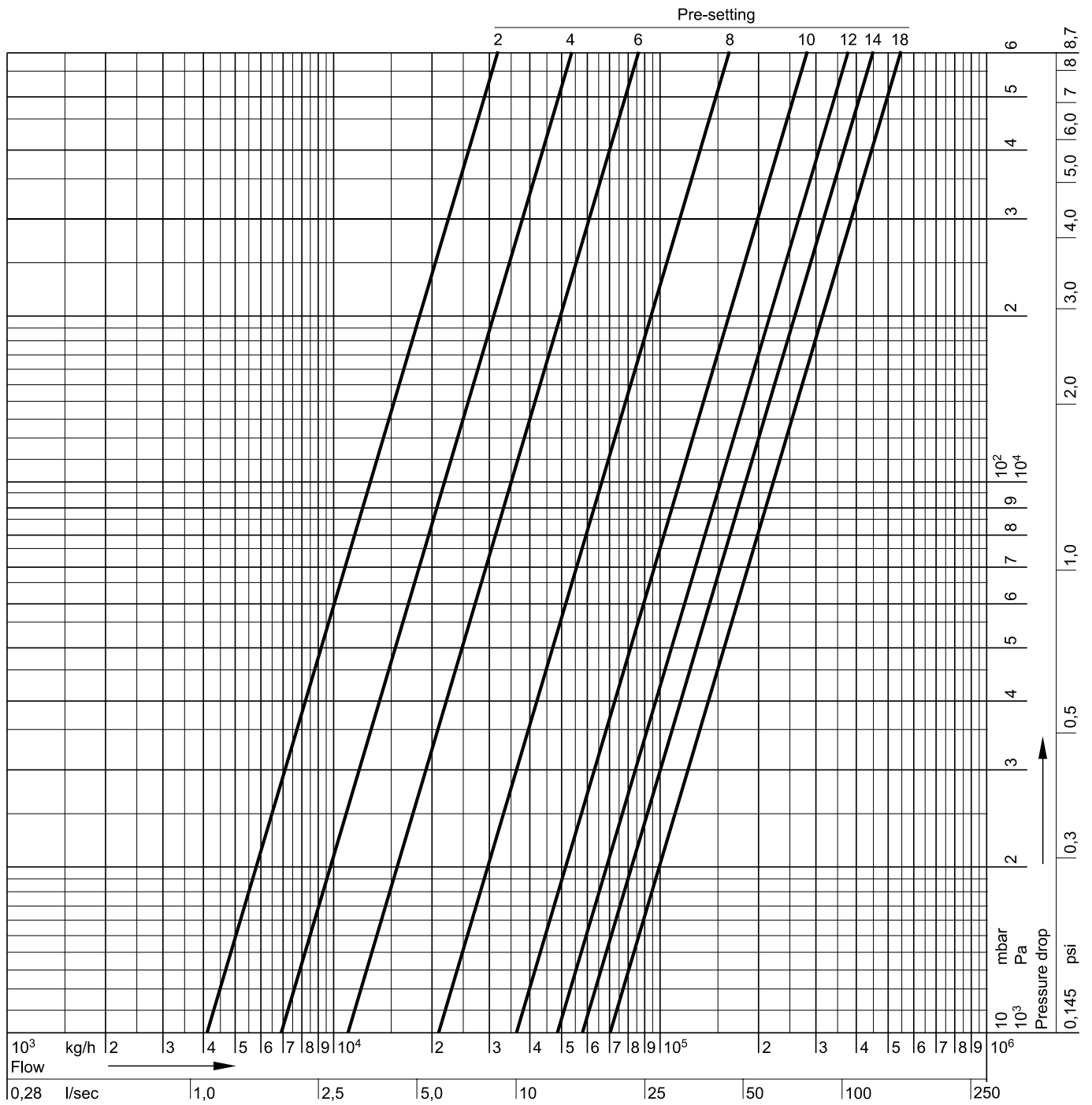
Flow Data Kombi-F-II, DN150



Pre-setting	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	7,0	7,5	8,0	9,0
k_v-value	16,2	20,4	23,8	26,7	29,5	33,0	37,6	42,3	48,0	54,5	61,5	69,6	80,0	92,9	136
cv-value	19,0	23,9	27,8	31,2	34,5	38,6	44,0	49,5	56,2	63,8	72,0	81,4	93,6	109	159

Pre-setting	10,0	11,0	12,0	13,0	14,0	15,0	16,0	17,0	17,5 = open
k_v-value	193	240	274	300	320	337	352	365	k _{vs} = 372
cv-value	226	281	321	351	374	394	412	427	435

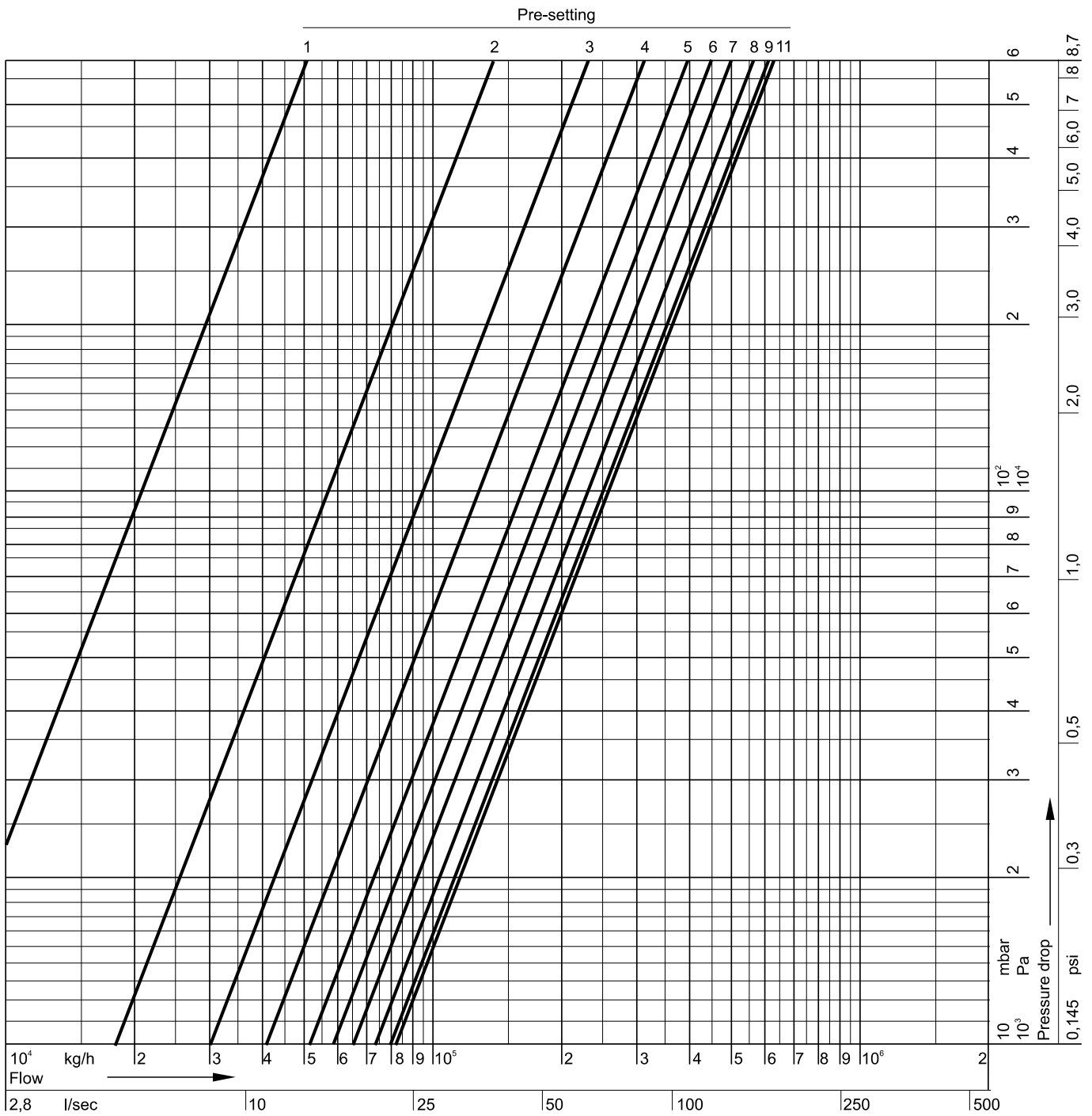
Flow Data Kombi-F-II, DN200



Pre-setting	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	7,0	7,5	8,0	9,0
k _v -value	32,5	41,3	48,9	55,5	62,1	69,3	77,8	88,1	101	115	133	154	179	208	284
cv-value	38,0	48,3	57,2	64,9	72,7	81,1	91,0	103	118	135	156	180	209	243	332

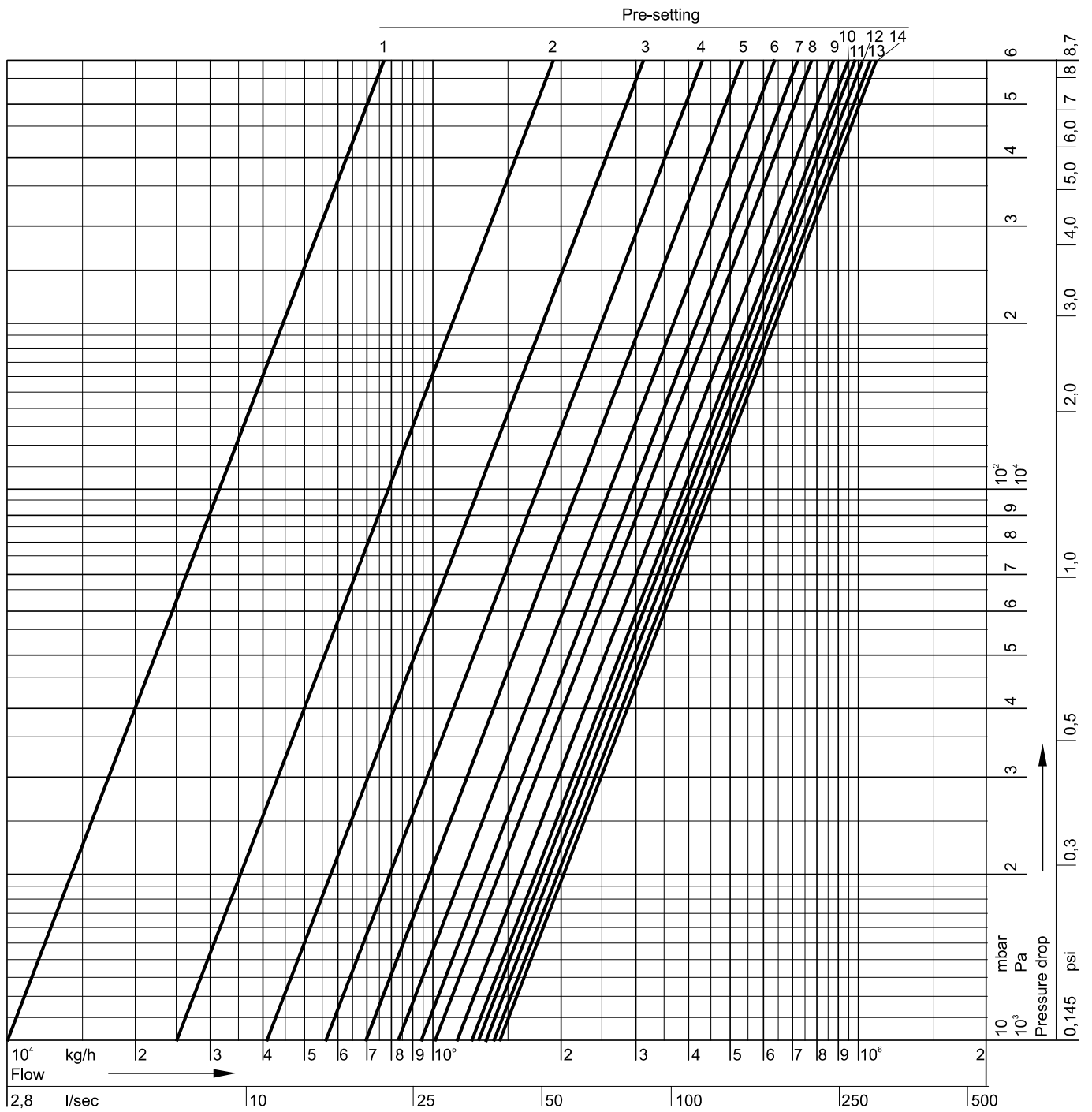
Pre-setting	10,0	11,0	12,0	13,0	14,0	15,0	16,0	17,0	18,0 = open
k _v -value	364	435	489	537	575	613	646	677	k _{vs} = 704
cv-value	426	509	572	628	673	717	756	792	824

Flow Data Kombi-F, DN250



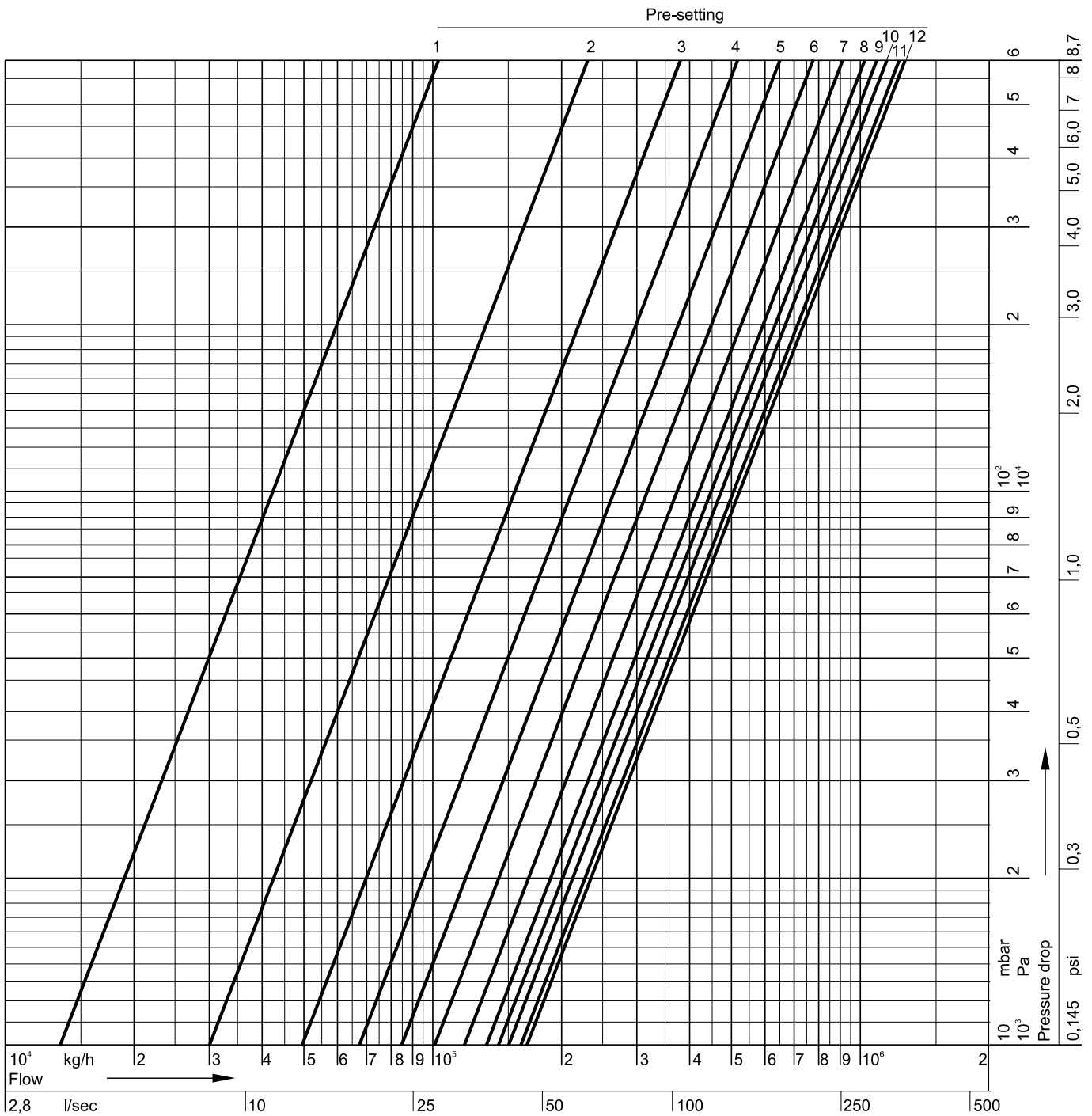
Pre-setting	1	2	3	4	5	6	7	8	9	11,0 = open
k_v-value	66	178	297	410	514	587	649	731	800	k _{vs} = 812
cv-value	77	208	347	480	601	687	759	855	936	950

Flow Data Kombi-F, DN300



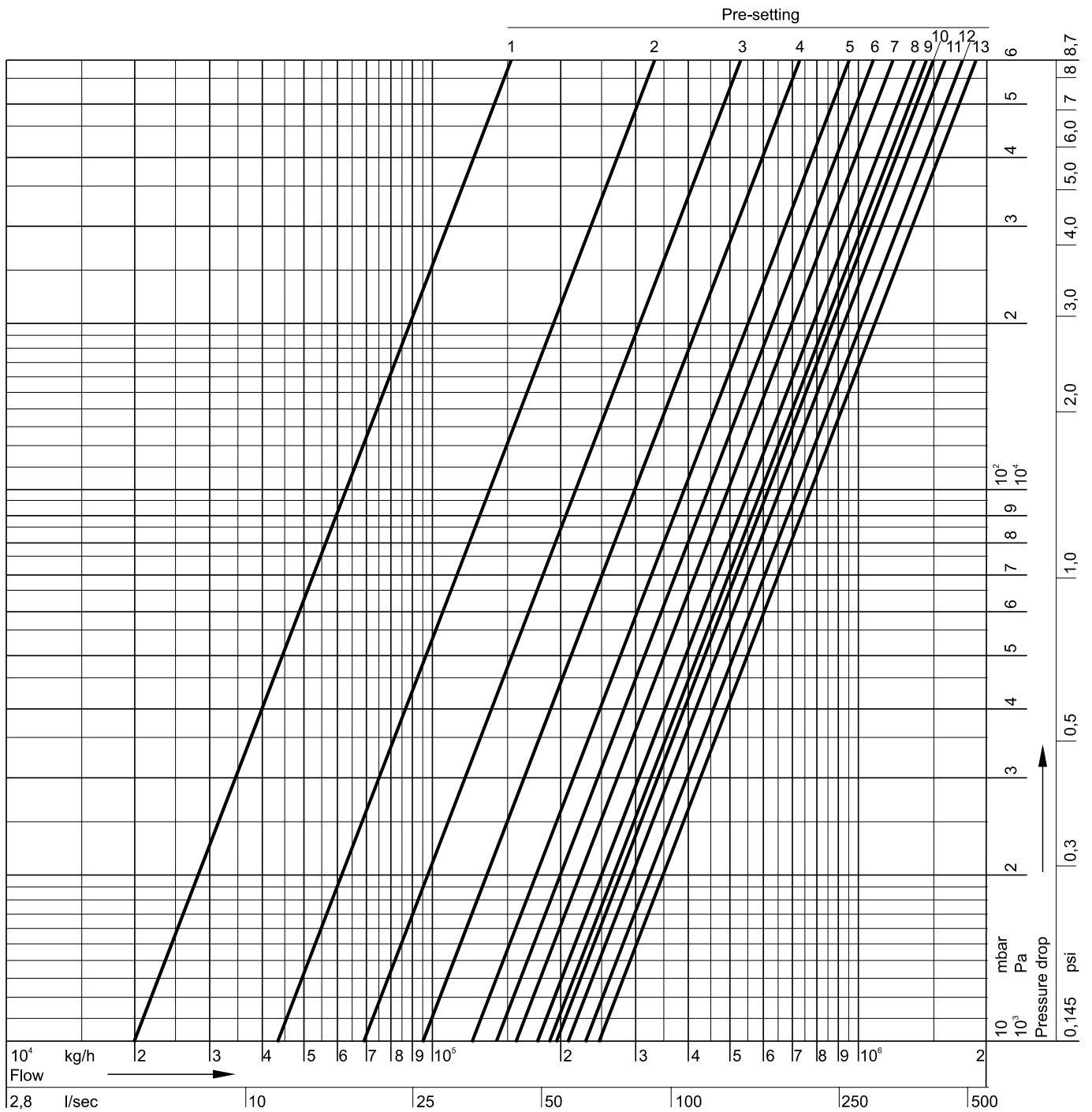
Pre-setting	1	2	3	4	5	6	7	8	9	10	11	12	13	14,0 = open
k_v-value	109	248	411	560	696	825	944	1044	1138	1226	1291	1324	1345	k _{vs} = 1380
cv-value	128	290	481	655	814	965	1104	1221	1331	1434	1510	1549	1573	1615

Flow Data Kombi-F, DN350



Pre-setting	1	2	3	4	5	6	7	8	9	10	11	12,0 = open
k_v-value	128	300	495	677	851	1019	1163	1272	1386	1513	1606	k _{vs} = 1651
cv-value	150	351	579	792	996	1192	1361	1488	1622	1770	1879	1932

Flow Data Kombi-F, DN400



Pre-setting	1	2	3	4	5	6	7	8	9	10	11	12	13.0 = open
k_v-value	201	430	690	946	1182	1409	1612	1752	1874	1991	2092	2256	k _{vs} = 2389
cv-value	235	503	807	1107	1383	1649	1886	2050	2193	2329	2448	2640	2795

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 psi) 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 (41°F)	20°C (68°F)	35°C (95°F)	50°C (122°F)	65°C (149°F)	80°C (176°F)
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	10,24	1,015
e.g. 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
e.g. Antifrogen L	50%	1,053	1,044	1,035	1,025	1,014	1,002

Honeywell

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