STAF, STAF-SG, STAF-R, STAG

5-5-15

Balancing valves

2002.08

Technical description

Applications:
STAF, STAF-SG, STAG:
Heating- and cooling systems
STAF-R:
Heating- and cooling systems
Tap water systems

Functions:
Balancing
Pre-setting
Measuring
Shut-off (The balancing cone for valve DN 65-300 is pressure released).

Pressure class:
STAF, STAF-R: PN 16
STAF-SG, STAG: PN 25

Temperature:
Max. working temperature: 120°C
For higher temperatures (max.150°C), please contact closest sales office.
Min. working temperature:
STAF: -10°C
STAF-SG, STAG, STAF-R: -20°C

Material:
Body:
STAF: Cast iron EN-GJL-250 (GG 25).
STAF-SG/STAG: Ductile iron EN-GJS-400-15.
STAF-R: Bronze CuSn5Zn5Pb5.
Bonnet, restriction cone and spindle of AMETAL® (DN 200-300 has bonnet made of ductile iron and cone made of Bronze).
Seat seal: Cone with EPDM ring.
Bonnet bolts: Chromed steel.
Digital handwheel: DN 20-150 are fitted with a red Polyamide plastic handwheel, DN 200-300 with a red aluminium handwheel.

AMETAL® is the dezincification resistant alloy of TA.

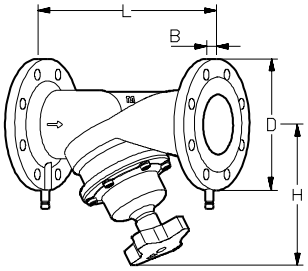
Surface treatment:
STAF, STAF-SG and STAG:
DN 20-150: Epoxy painting.
DN 200-300: Duasolid painting.

Face to face dimensions:
ISO 5752 series 1, BS 2080

Measuring points
Measuring points are self-sealed. Remove the cap and insert the probe through the seal.

STAF: Cast iron

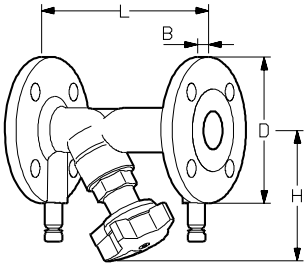
Bolted bonnet
PN 16, ISO 7005-2



TA No	DN	*)	L	H	D	B	Kvs	Kg
52 181-065	65-2	4	290	205	185	20	85	12.4
52 181-080	80	8	310	220	200	22	120	15.9
52 181-090	100	8	350	240	220	22	190	22
52 181-091	125	8	400	275	250	24	300	32.7
52 181-092	150	8	480	285	285	24	420	42.4

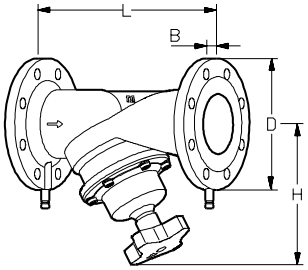
STAF-SG: Ductile iron

Threaded bonnet
PN 25, ISO 7005-2**



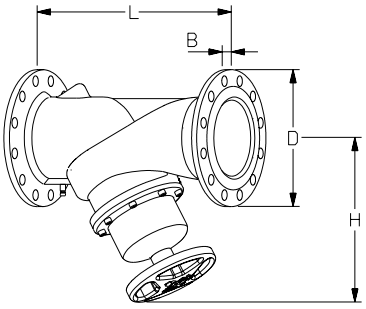
TA No	DN	*)	L	H	D	B	Kvs	Kg
52 182-020	20	4	150	100	105	16	5.7	2.3
52 182-025	25	4	160	109	115	16	8.7	2.9
52 182-032	32	4	180	111	140	18	14.2	4.3
52 182-040	40	4	200	122	150	19	19.2	5.2
52 182-050	50	4	230	122	165	19	33	6.6

Bolted bonnet
PN 25, ISO 7005-2



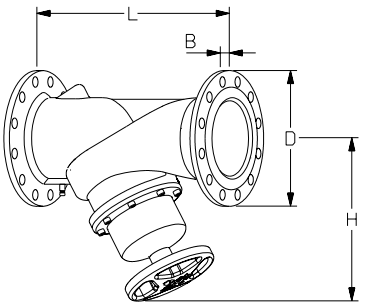
TA No	DN	*)	L	H	D	B	Kvs	Kg
52 182-065	65-2	8	290	205	185	19	85	11
52 182-080	80	8	310	220	200	19	120	14
52 182-090	100	8	350	240	235	19	190	19.6
52 182-091	125	8	400	275	270	19	300	28.1
52 182-092	150	8	480	285	300	20	420	37.1

Bolted bonnet
Measuring points on body
PN 16, ISO 7005-2



TA No	DN	*)	L	H	D	B	Kvs	Kg
52 181-093	200	12	600	430	360	21	765	76
52 181-094	250	12	730	420	425	23.5	1185	122
52 181-095	300	12	850	480	485	24.5	1450	163

PN 25, ISO 7005-2

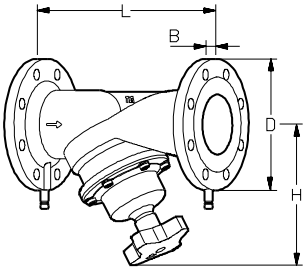


TA No	DN	*)	L	H	D	B	Kvs	Kg
52 182-093	200	12	600	430	360	21	765	76
52 182-094	250	12	730	420	425	23,5	1185	122
52 182-095	300	16	850	480	485	24,6	1450	163

*) Number of bolt holes.
**) DN 20-50 also fit PN 16 flanges.
Kvs = m^3/h at a pressure drop of 1 bar and fully open valve.

STAF-R: Bronze

Bolted bonnet
PN 16, ISO 7005-3

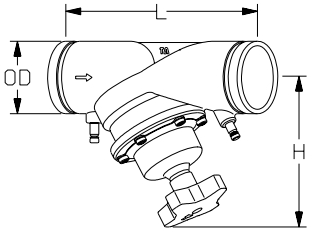


TA No	DN	*)	L	H	D	B	Kvs	Kg
52 181-765	65-2	4	290	205	185	17	85	14.3
52 181-780	80	8	310	220	200	19	120	18.7
52 181-790	100	8	350	240	220	21	190	24.6
52 181-791	125	8	400	275	250	22	300	36.8
52 181-792	150	8	480	285	285	22	420	52

*) Number of bolt holes.
Kvs = m^3/h at a pressure drop of 1 bar and fully open valve.

STAG: Ductile iron, groove end (Victaulic)

Bolted bonnet
Measuring points on body
PN 25, ISO 4200



TA No	DN	L	H	ØD	Kvs	Kg
52 183-073	65-2	290	205	73.0	85	6.4
52 183-076	65-2	290	205	76.1	85	6.4
52 183-089	80	310	220	88.9	120	9.1
52 183-114	100	350	240	114.3	190	14
52 183-140	125	400	275	139.7	300	22.7
52 183-141	125	400	275	141.3	300	22.7
52 183-165[1]	150	480	285	165.1	420	31.3
52 183-168	150	480	285	168.3	420	31.3
52 183-219	200	600	430	219.1	765	63.5
52 183-273	250	730	420	273	1185	92
52 183-324	300	850	480	323.9	1450	127

1) Not comforming to ISO 4200.
Kvs = m^3/h at a pressure drop of 1 bar and fully open valve.

Example DN 65 and DN 200

Example DN 65
Fig. 1 Valve closed

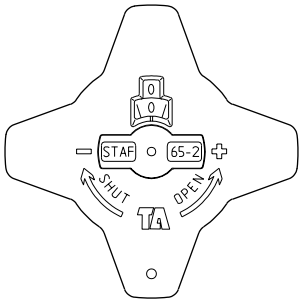
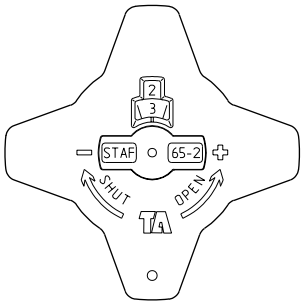


Fig. 2 The valve is set at 2.3



Example DN 200
Fig. 1 Valve closed

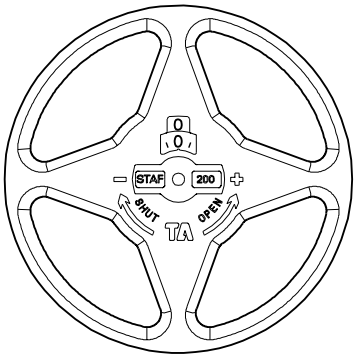
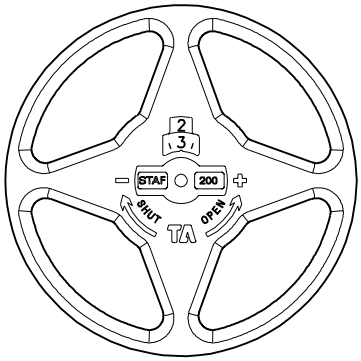


Fig. 2 The valve is set at 2.3



Setting

It is possible to read the set value on the handwheel. The number of turns between the fully open and closed positions is:
4 turns for DN 20-50,
8 turns for DN 65-150,
12 turns for DN 200-250 and
16 turns for DN 300.

Initial setting of a valve for a particular pressure drop, e g corresponding to 2.3 turns on the graph, is carried out as follows:
1. Close the valve fully (Fig 1)
2. Open the valve to 2.3 turns (Fig. 2).
3. Using a Allen key, turn the inner spindle clockwise until stop.
4. The valve is set.

To check the setting of a valve, first close the valve, then open it to the stop position; the indicator then shows the presetting number, in this case 2.3 (Fig. 2).

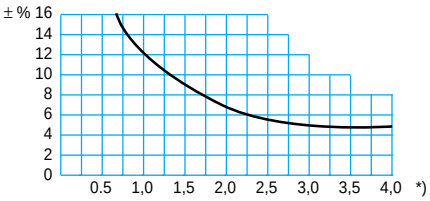
Measuring accuracy

The handwheel zero position is calibrated and must not be changed

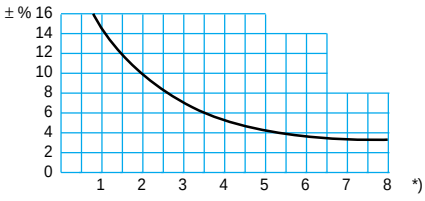
Deviation of flow at different settings
The curve (Fig. 4) holds for valves with normal pipe fittings**) (Fig. 5).
Try also to avoid mounting valves, restricting devices and pumps immediately before the valve.

Fig. 4

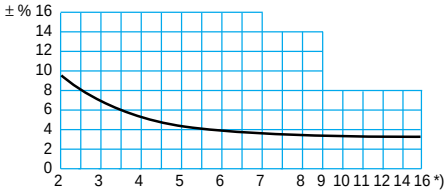
DN 20-50



DN 65-150

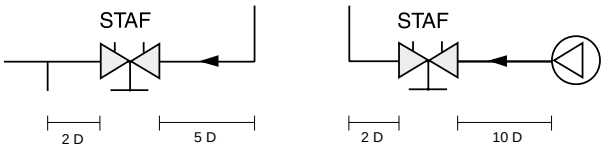


DN 200-300



*) Setting, No. of turns

Fig. 5



**) The valve can be installed with the opposite flow direction. The specified flow details are also valid for this direction, although tolerances can be greater (max 5% more).

Correction factors

The flow calculations are valid for water (+20°C). For other liquids with approx. the same viscosity as water(≤20 cSt = 3°E=100S.U.), it is only necessary to compensate for the specific density. However, at low temperatures, the viscosity increases and laminar flow may occur in the valves. This causes a flow deviation that increases with small valves, low settings and low differential pressures. Correction for this deviation can be made with the software TA Select or direct in TA-CBI.

Sizing

When Δp and the design flow are known, use the formula to calculate the Kv-value or use the diagram.

$$Kv = 0.01 \frac{q}{\sqrt{\Delta p}} \qquad q \text{ l/h, } \Delta p \text{ kPa}$$

$$Kv = 36 \frac{q}{\sqrt{\Delta p}} \qquad q \text{ l/s, } \Delta p \text{ kPa}$$

Support material

Software
TA Select: Makes it easy to choose the right balancing valves by taking into account the desired flow, pressure drop and flow rate.

Measuring instruments
Use the TA-CBI electronic instrument. It is programmed with valve characteristics for TA valves, enabling measured differential pressure to be read off directly as a flow rate. For further information on TA-CBI, see catalogue leaflet TA-CBI.

Conversion disc
By using the conversion disc it is easy to calculate the relationship between flow, pressure and setting values for all valve sizes.

Manuals
See the following manuals for descriptions of various balancing methods:
Total hydronic balancing
Manual no. 1: Balancing control circuits
Manual no. 2: Balancing distribution systems
Manual no. 3: Balancing radiator systems
Manual no. 4: Stabilising differential pressure

Kv values

Varv Turns	DN 20	25	32	40	50	65-2	80	100	125	150	200	250	300
0,5	0,511	0,60	1,14	1,75	2,56	1,8	2	2,5	5,5	6,5	-	-	-
1	0,757	1,03	1,90	3,30	4,2	3,4	4	6	10,5	12	-	-	-
1,5	1,19	2,10	3,10	4,60	7,2	4,9	6	9	15,5	22	-	-	-
2	1,90	3,62	4,66	6,10	11,7	6,5	8	11,5	21,5	40	40	90	-
2,5	2,80	5,30	7,10	8,80	16,2	9,3	11	16	27	65	50	110	-
3	3,87	6,90	9,50	12,6	21,5	16,3	14	26	36	100	65	140	150
3,5	4,75	8,00	11,8	16,0	26,5	25,6	19,5	44	55	135	90	195	230
4	5,70	8,70	14,2	19,2	33	35,3	29	63	83	169	120	255	300
4,5	-	-	-	-	-	44,5	41	80	114	207	165	320	370
5	-	-	-	-	-	52	55	98	141	242	225	385	450
5,5	-	-	-	-	-	60,5	68	115	167	279	285	445	535
6	-	-	-	-	-	68	80	132	197	312	340	500	620
6,5	-	-	-	-	-	73	92	145	220	340	400	545	690
7	-	-	-	-	-	77	103	159	249	367	435	590	750
7,5	-	-	-	-	-	80,5	113	175	276	391	470	660	815
8	-	-	-	-	-	85	120	190	300	420	515	725	890
9	-	-	-	-	-	-	-	-	-	-	595	820	970
10	-	-	-	-	-	-	-	-	-	-	650	940	1040
11	-	-	-	-	-	-	-	-	-	-	710	1050	1120
12	-	-	-	-	-	-	-	-	-	-	765	1185	1200
13	-	-	-	-	-	-	-	-	-	-	-	-	1320
14	-	-	-	-	-	-	-	-	-	-	-	-	1370
15	-	-	-	-	-	-	-	-	-	-	-	-	1400
16	-	-	-	-	-	-	-	-	-	-	-	-	1450

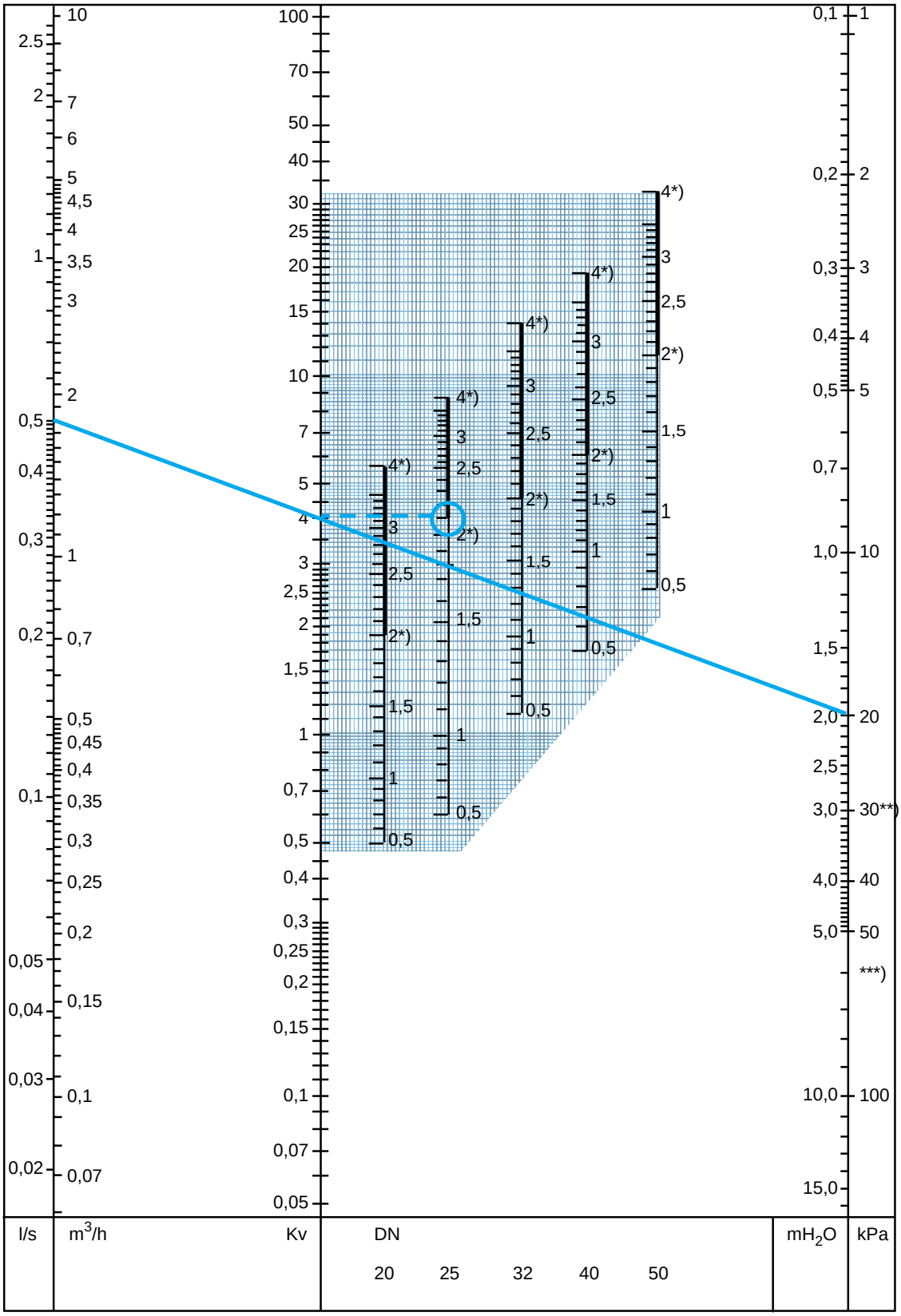
Example

Wanted:
Presetting for DN 25 at a desired flow rate of 1.8 m^3/h and a pressure drop of 20 kPa.

Solution:
Draw a straight line joining 1.8 m^3/h and 20 kPa. This gives Kv=4.
Now draw a horizontal line from Kv=4.
This intersects the bar for DN 25 at the desired presetting of 2.1 turns.

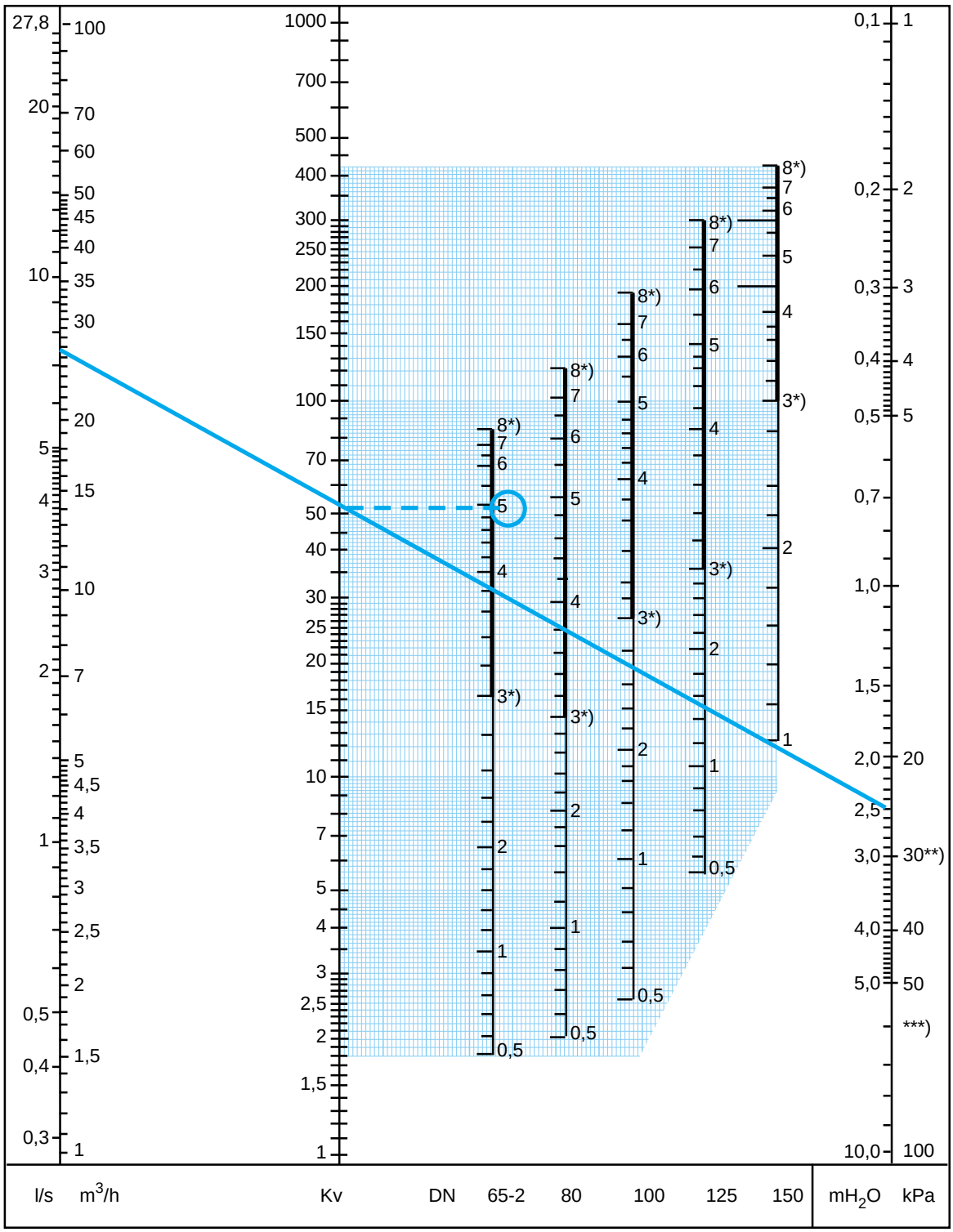
NOTE:
If the flow rate falls outside the scale in the diagram, the reading can be made as follows: Starting with the example above, we get 20 kPa, Kv = 4 and flowrate 1.8 m^3/h. At 20 kPa and Kv = 0.4 we get the flow-rate 0.18 m^3/h, and at Kv = 40, we get 18 m^3/h. That is, for a given pressure drop, it is possible to read 10 times or 0.1 times the flow and Kv-values.

Diagram DN 20-50



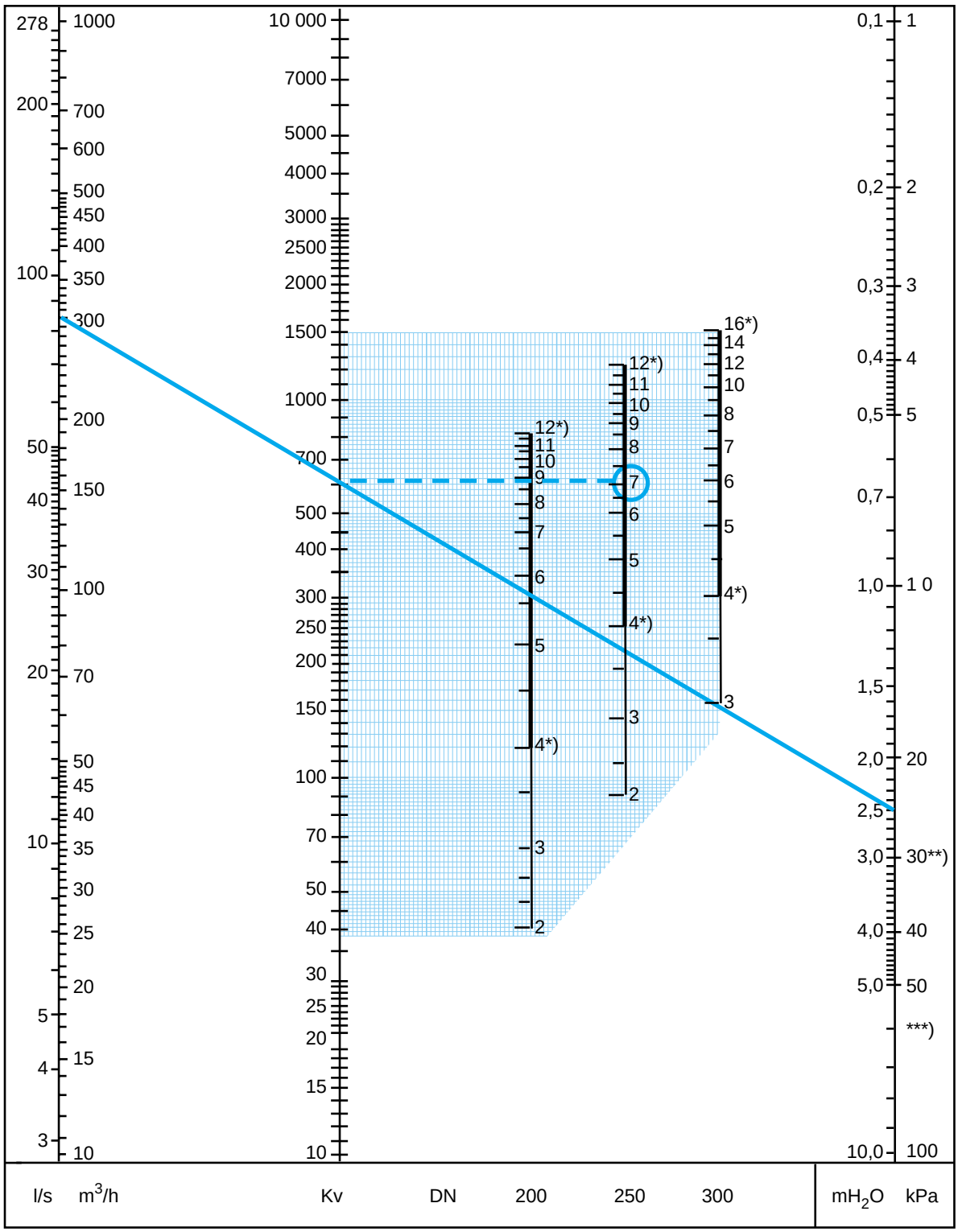
*) Recommended area
**) 25 db (A)
***) 35 db (A)

Diagram 65-150



*) Recommended area
**) 25 db(A)
***) 35 db (A)

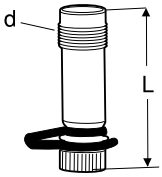
Diagram DN 200-300



*) Recommended area
**) 25 db (A)
***) 35 db (A)

Accessories

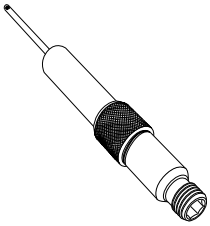
Measuring points



TA No	d	L
DN 20-50		
52 179-009	1/4	39
52 179-609	1/4	103
DN 65-300		
52 179-008	3/8	39
52 179-608	3/8	103

Measuring point

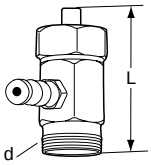
Extensions 60 mm (not for 52 179-000/-601)
Can be installed without draining of the system.



TA No
52 179-006

Measuring point

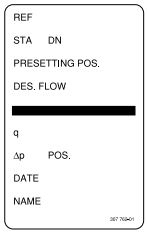
max 180°C
+ older STAD et STAF



TA No	d	L
DN 20-50		
52 179-000	R1/4	30
52 179-601	R1/4	90
DN 65-300		
52 179-007	R3/8	30
52 179-607	R3/8	90

Identification tag

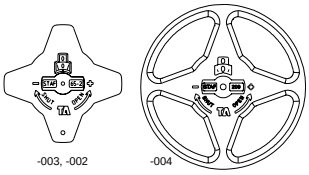
Incl 1 pc per valve



TA No
52 161-990

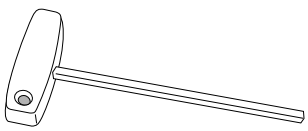
Handwheel

Complete



TA No	DN
52 186-003	20-50
52 186-002	65-150
52 186-004	200-300

Allen key



TA No		For DN
52 187-103	3 mm	20-50
52 187-105	5 mm	65-150
–	8 mm	200-300

Tour & Andersson retains the right to make changes to its products and specifications without prior notice.