STAF-SG with ANSI flanges

5-5-16

Balancing valves

2007.04

Technical description

Application:
Heating and cooling systems

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

Pressure class:
Class 150

Temperature:
Max. working temperature: 120°C
Min. working temperature: -20°C

Material:
Body: Ductile iron, EN-GJS-400-15 (~ ASTM A536 Grade 60-40-18. ISO 1083 Grade 400-15).
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:
DN 20-150: Epoxy painting.
DN 200-300: Duasolid painting.

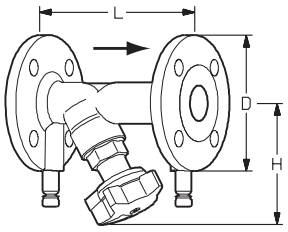
Marking:
DN 20-50: TA, PN, DN (mm), 400-15 (material).
DN 65-300: TA, Class 150, size (inch), 60-40-18 (material).

Flanges:
DN 20-50: ISO 7005-2 and SS-EN 1092-2. Bolt circle according to Class 150 ASME/ANSI B16.42.
DN 65-300: Class 150 ASME/ANSI B16.42.

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

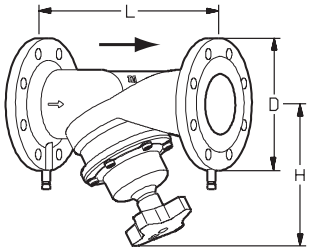
STAF-SG with ANSI flanges

Threaded bonnet



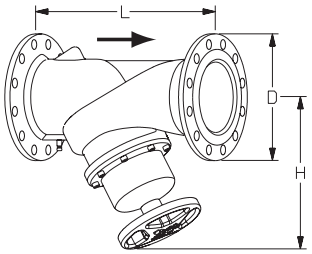
TA No	DN	(Size)	Number of bolt holes	L	H	D	Kvs	Kg
52 182-920	20	3/4”	4	150	100	105	5.7	2.3
52 182-925	25	1”	4	160	109	115	8.7	2.9
52 182-932	32	1 1/4”	4	180	111	140	14.2	4.3
52 182-940	40	1 1/2”	4	200	122	150	19.2	5.2
52 182-950	50	2”	4	230	122	165	33	6.6

Bolted bonnet



TA No	DN	(Size)	Number of bolt holes	L	H	D	Kvs	Kg
52 182-965	65	2 1/2”	4	290	205	180	85	11
52 182-980	80	3”	4	310	220	190	120	14
52 182-990	100	4”	8	350	240	230	190	19.6
52 182-991	125	5”	8	400	275	255	300	28.1
52 182-992	150	6”	8	480	285	280	420	37.1

Bolted bonnet
Measurement points on body



TA No	DN	(Size)	Number of bolt holes	L	H	D	Kvs	Kg
52 182-993	200	8”	8	600	430	345	765	76
52 182-994	250	10”	12	730	420	406	1185	122
52 182-995	300	12”	12	850	480	483	1450	163

Kvs = m^3/h at a pressure drop of 1 bar and fully open valve.

→ = Flow direction

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).

Example DN 65 (2 1/2")
Fig. 1 Valve closed

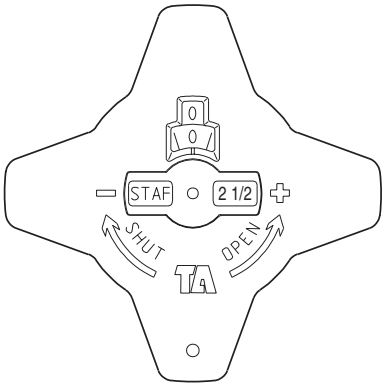
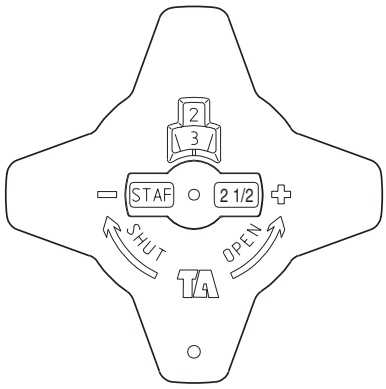


Fig. 2 The valve is set at 2.3



Example DN 200 (8")
Fig. 1 Valve closed

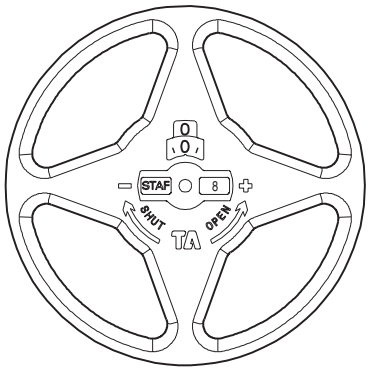
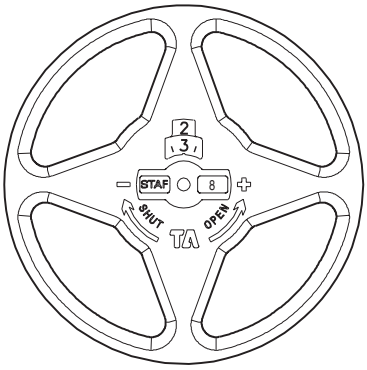


Fig. 2 The valve is set at 2.3

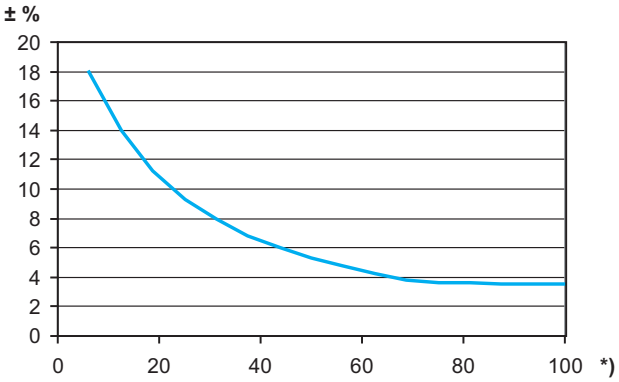


Measuring accuracy

The handwheel zero position is calibrated and must not be changed.

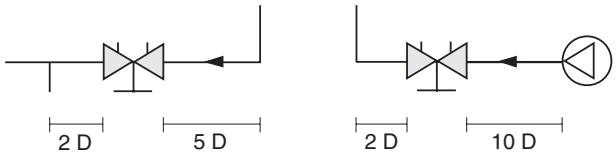
Deviation of flow at different settings
The curve (Fig. 3) holds for valves with the correct flow direction, straight pipe distances (Fig. 4) and normal pipe fittings.

Fig. 3
DN 20-300



*) Setting (%) of fully open valve.

Fig. 4



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 balancing instrument TA-CBI. 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 of radiator systems
Manual no. 4: Hydronic balancing with differential pressure controllers

Kv values

No. of 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

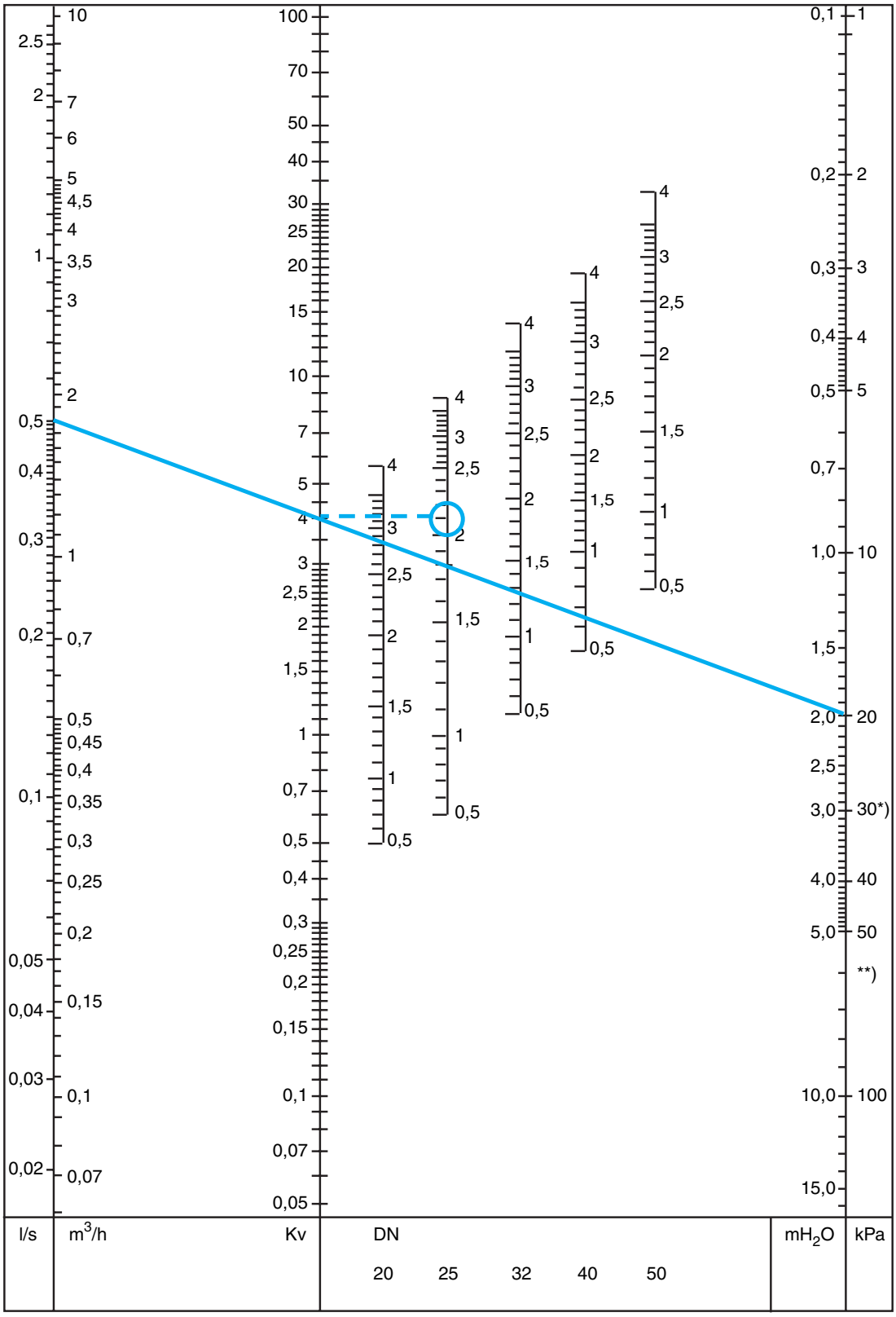
Example

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.

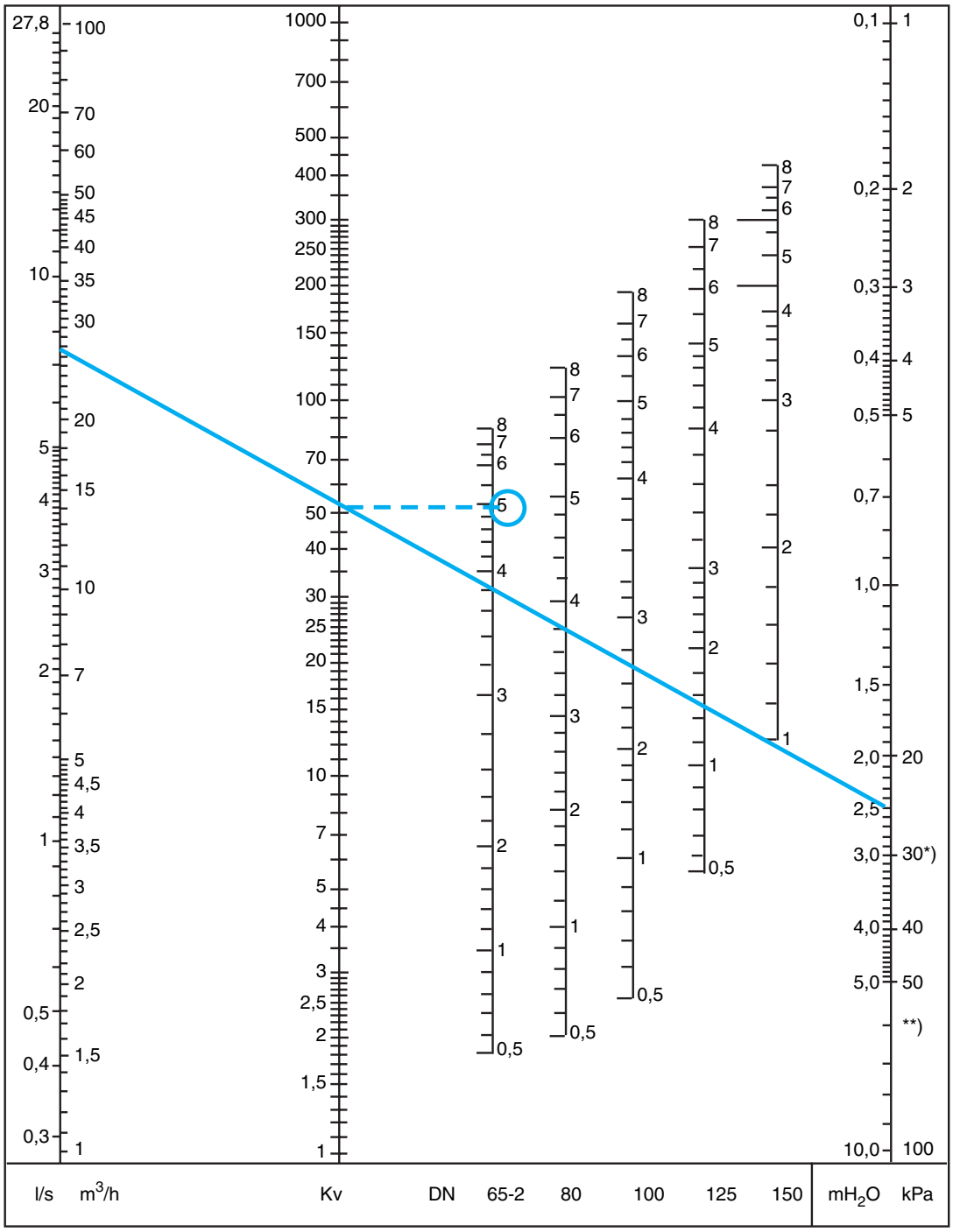
Diagram DN 20-50



*) 25 db (A)
**) 35 db (A)

Recommended area: See Fig. 3 under ”Measuring accuracy”.

Diagram DN 65-150

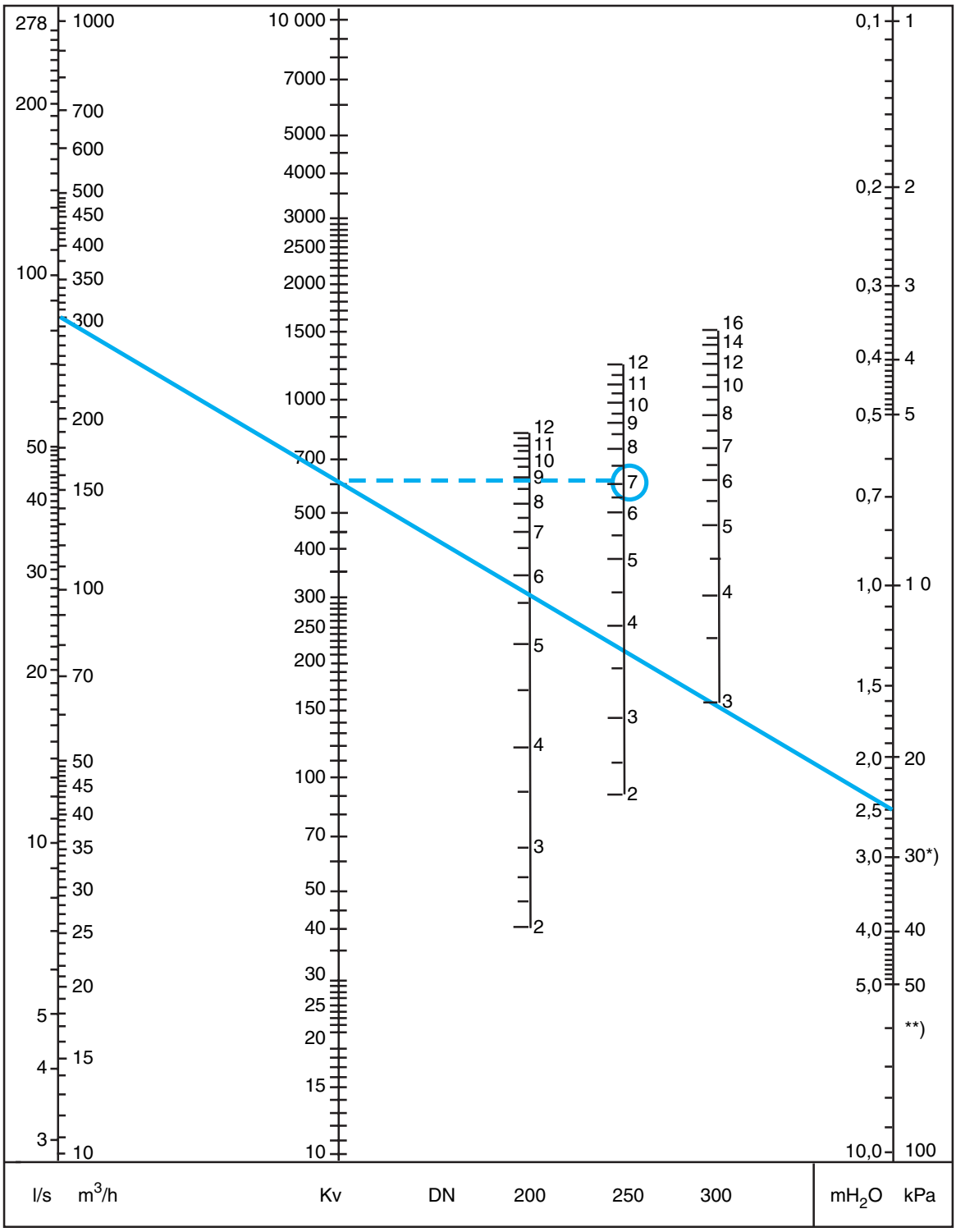


*)
2

5 db (A)
**) 35 db (A)

Recommended area: See Fig. 3 under ”Measuring accuracy”.

Diagram DN 200-300



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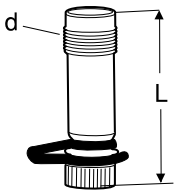
**) 35 db (A)

Recommended area: See Fig. 3 under ”Measuring accuracy”.

Accessories

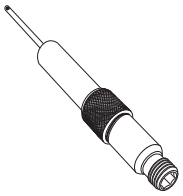
Measurement point



TA No	d	L
DN 20-50		
52 179-009	R1/4	39
52 179-609	R1/4	103
DN 65-300		
52 179-008	R3/8	39
52 179-608	R3/8	103

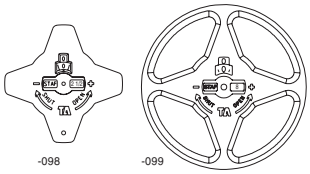
Measuring point, extension 60 mm

Can be installed without draining of the system.



TA No
52 179-006

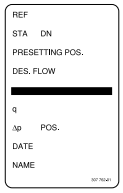
Complete digital handwheel



TA No	For DN
-	20-50
52 186-098	65-150
52 186-099	200-300

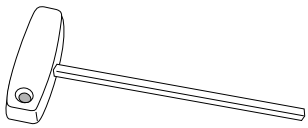
Identification tag

(incl 1 pc per valve)



TA No
52 161-990

Allen key



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

STAF-SG with ANSI flanges

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Balancing valves

2007.04

Technical description

Application:
Heating and cooling systems

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

Pressure class:
Class 150

Temperature:
Max. working temperature: 120°C
Min. working temperature: -20°C

Material:
Body: Ductile iron, EN-GJS-400-15 (~ ASTM A536 Grade 60-40-18. ISO 1083 Grade 400-15).
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:
DN 20-150: Epoxy painting.
DN 200-300: Duasolid painting.

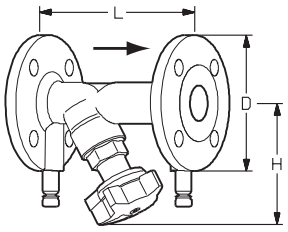
Marking:
DN 20-50: TA, PN, DN (mm), 400-15 (material).
DN 65-300: TA, Class 150, size (inch), 60-40-18 (material).

Flanges:
DN 20-50: ISO 7005-2 and SS-EN 1092-2. Bolt circle according to Class 150 ASME/ANSI B16.42.
DN 65-300: Class 150 ASME/ANSI B16.42.

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

STAF-SG with ANSI flanges

Threaded bonnet



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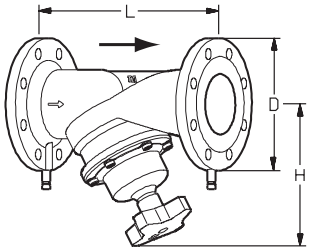
Bolted bonnet



TA No	DN	(Size)	Number of bolt holes	L	H	D	Kvs	Kg
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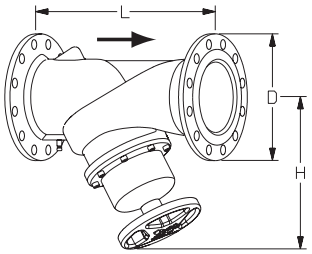
Bolted bonnet
Measurement points on body



TA No	DN	(Size)	Number of bolt holes	L	H	D	Kvs	Kg
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52 182-995	300	12”	12	850	480	483	1450	163

Kvs = m^3/h at a pressure drop of 1 bar and fully open valve.

→ = Flow direction

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.

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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).

Example DN 65 (2 1/2")
Fig. 1 Valve closed

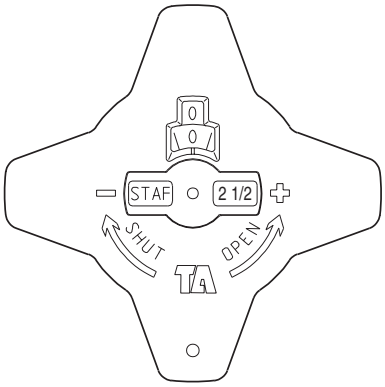
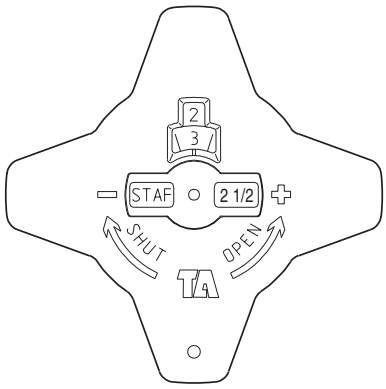


Fig. 2 The valve is set at 2.3



Example DN 200 (8")
Fig. 1 Valve closed

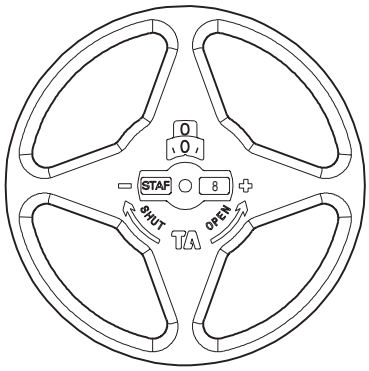
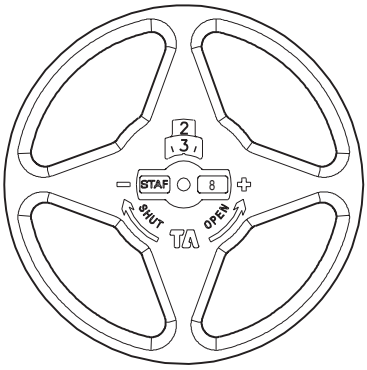


Fig. 2 The valve is set at 2.3



Measuring accuracy

The handwheel zero position is calibrated and must not be changed.

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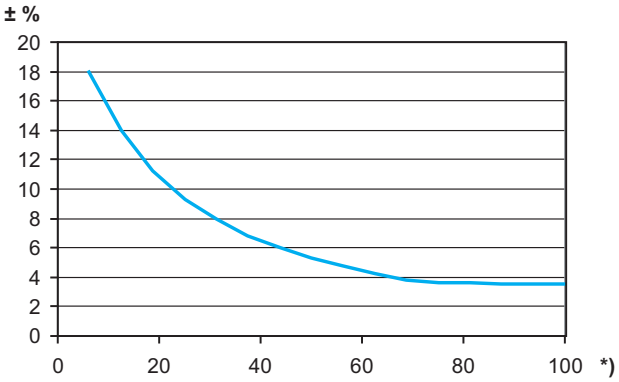
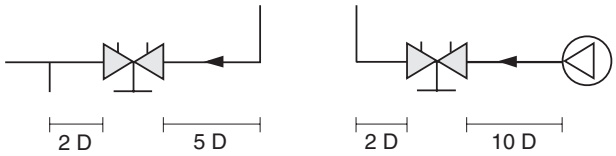
Fig. 3
DN 20-300



*) Setting (%) of fully open valve.

Fig. 4



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Total hydronic balancing
Manual no. 1: Balancing control circuits
Manual no. 2: Balancing distribution systems
Manual no. 3: Balancing of radiator systems
Manual no. 4: Hydronic balancing with differential pressure controllers

Kv values

No. of 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

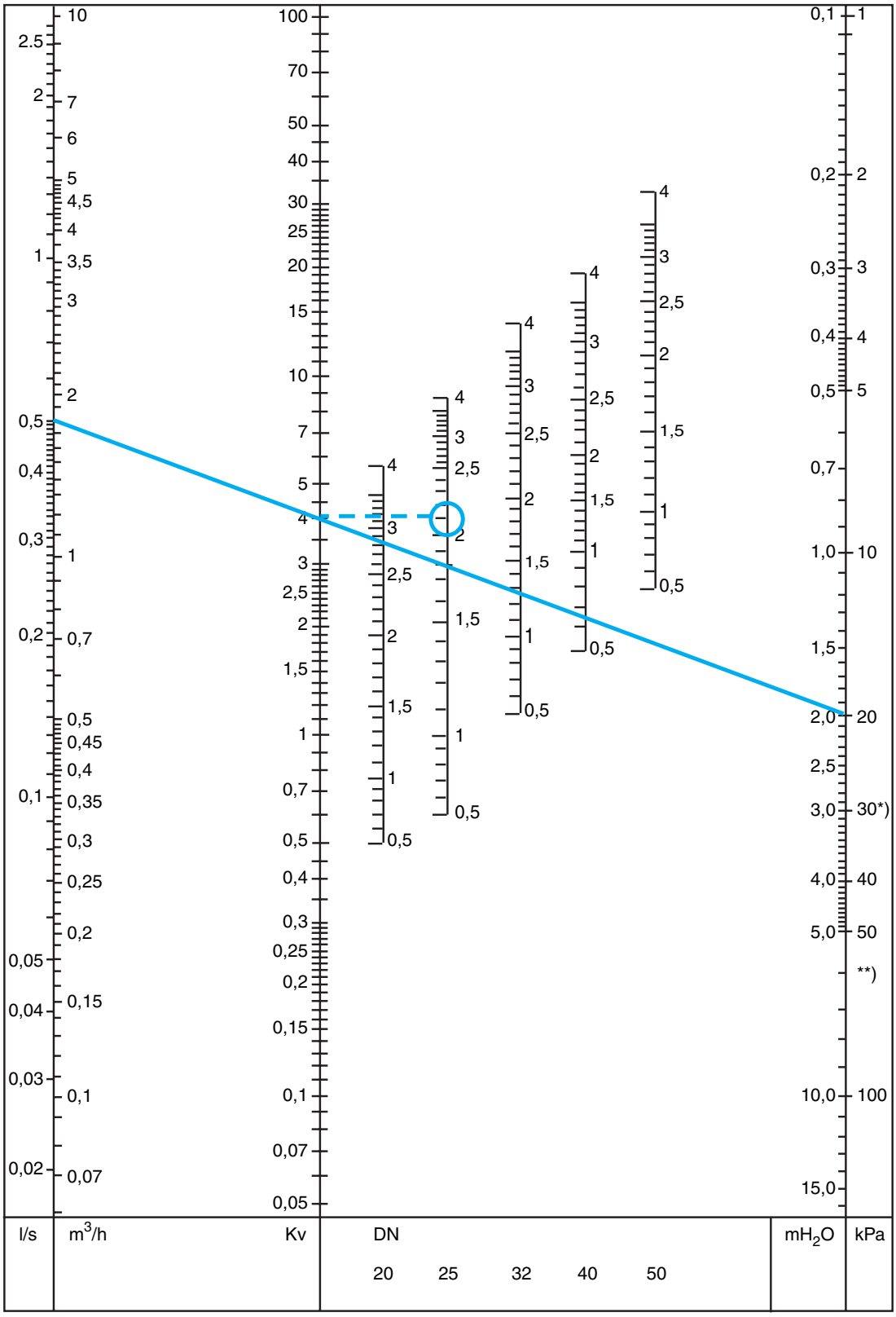
Example

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.

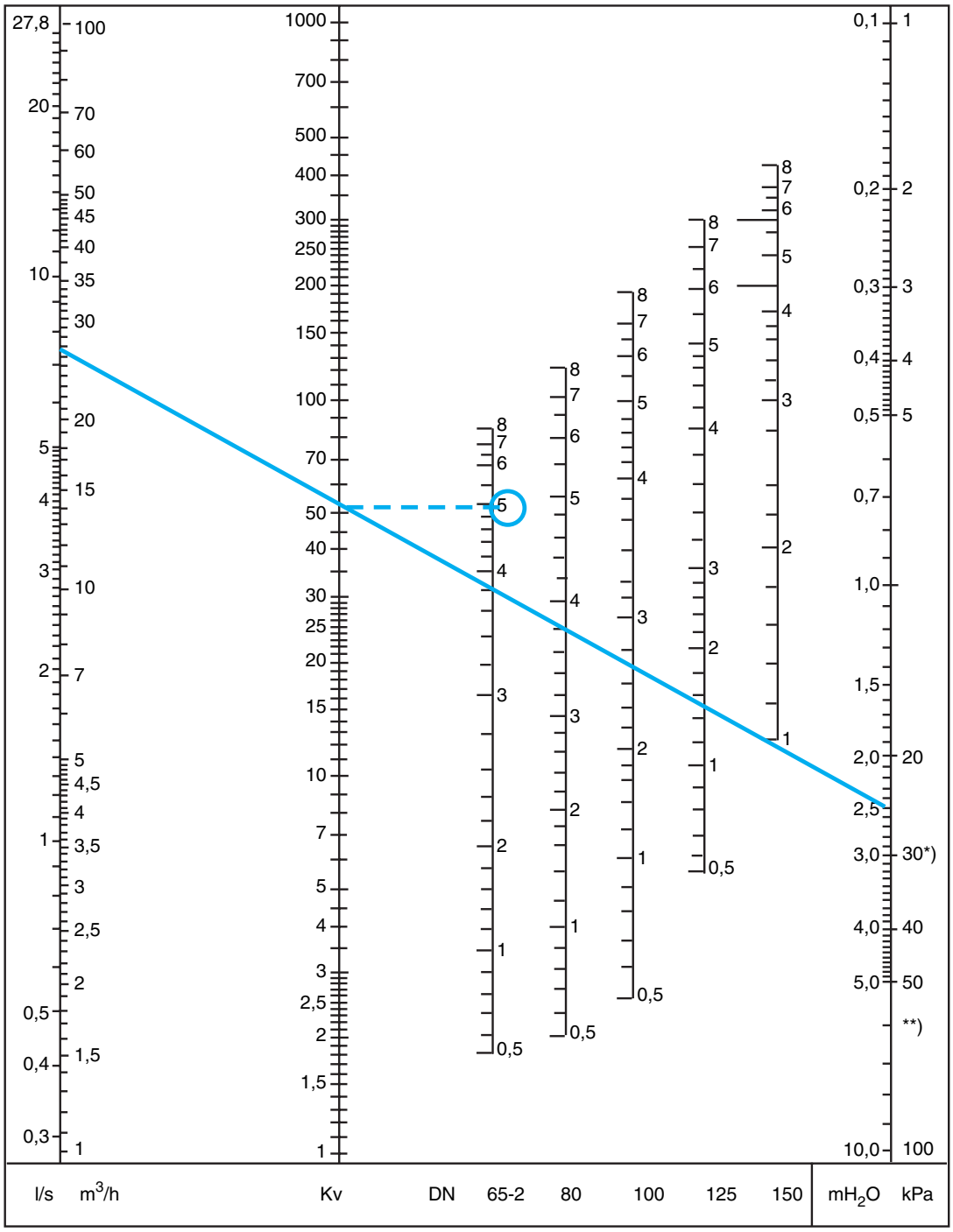
Diagram DN 20-50



*) 25 db (A)
**) 35 db (A)

Recommended area: See Fig. 3 under ”Measuring accuracy”.

Diagram DN 65-150

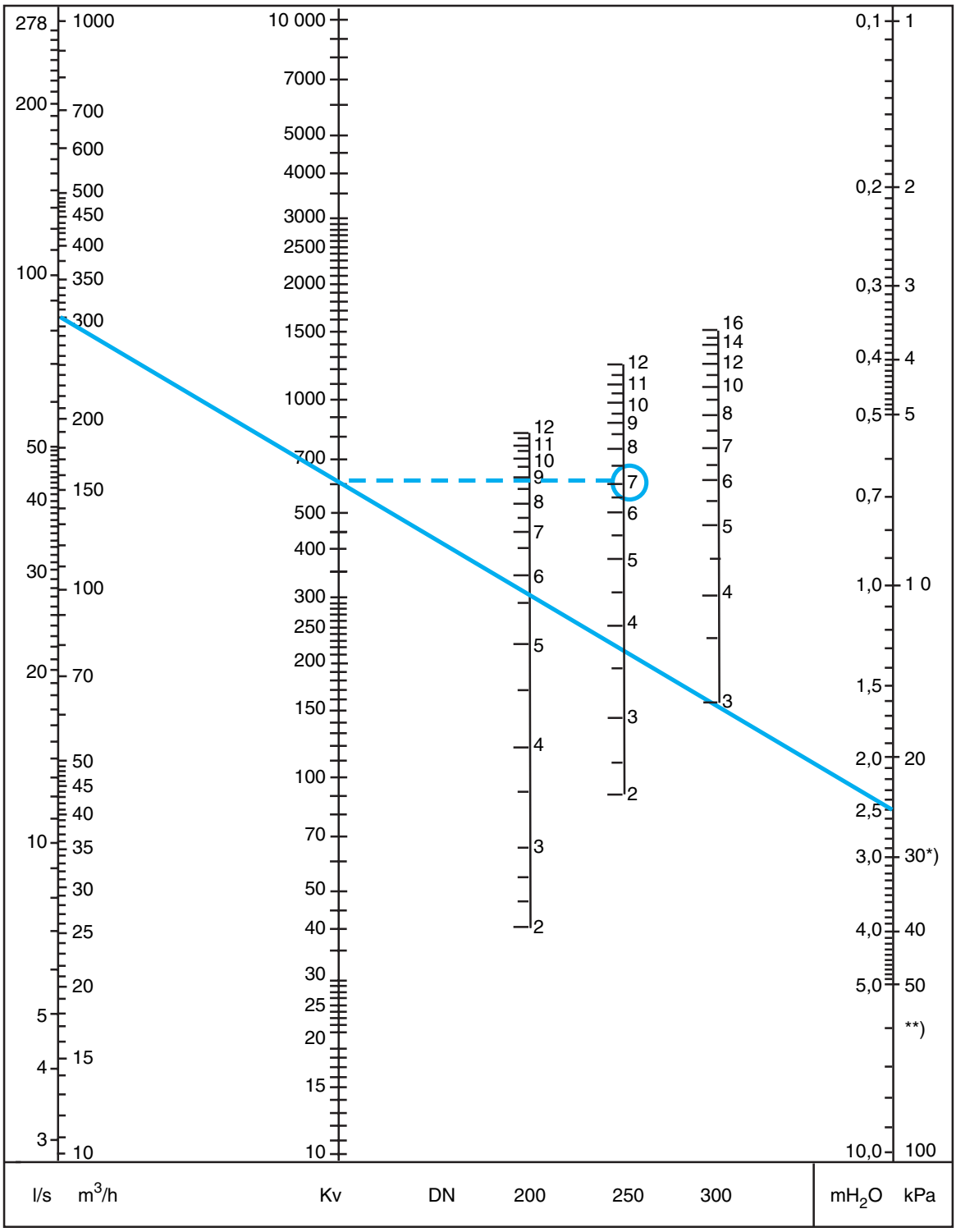


*)
2

5 db (A)
**) 35 db (A)

Recommended area: See Fig. 3 under ”Measuring accuracy”.

Diagram DN 200-300

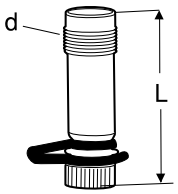


*) 25 db (A)
**) 35 db (A)

Recommended area: See Fig. 3 under ”Measuring accuracy”.

Accessories

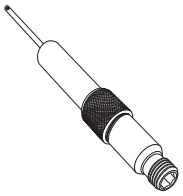
Measurement point



TA No	d	L
DN 20-50		
52 179-009	R1/4	39
52 179-609	R1/4	103
DN 65-300		
52 179-008	R3/8	39
52 179-608	R3/8	103

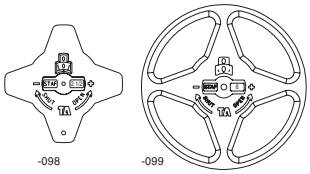
Measuring point, extension 60 mm

Can be installed without draining of the system.



TA No
52 179-006

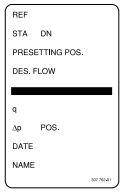
Complete digital handwheel



TA No	For DN
-	20-50
52 186-098	65-150
52 186-099	200-300

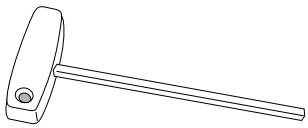
Identification tag

(incl 1 pc per valve)



TA No
52 161-990

Allen key



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