Climate
Control

IMI TA

STAF, STAF-SG



Balancing valves

PN 16 and PN 25 – DN 20-400

Breakthrough
engineering for
a better world

STAF, STAF-SG

A flanged, cast iron (STAF) and ductile iron (STAF-SG) balancing valve that delivers accurate hydronic performance in an impressive range of applications. The STAF/STAF-SG is ideal for use mainly on the secondary side in heating and cooling systems.



Key features

Handwheel
Equipped with a digital read-out, the handwheel ensures accurate and straightforward balancing.
Handwheel for DN 65-150 with side reading makes the read-out easy from any angle.

Accurate and precise
Provides high accuracy of measurement.

Self-sealing measuring points
For simple, accurate balancing.

Positive shut-off function
For easy maintenance.

Technical description

Applications:
Heating and cooling systems.

Functions:
Balancing
Presetting
Measuring
Shut-off (The balancing cone for valves DN 100-400 is pressure released).

Dimensions:
STAF: DN 65-150
STAF-SG: DN 20-400

Pressure class:
STAF: PN 16
STAF-SG: PN 16 and PN 25 (see each product)

Temperature:
Max. working temperature: 120°C
Min. working temperature: -10°C

Media:
Water or neutral fluids, water-glycol mixtures (0-57%).

Material:
Body, STAF: Cast iron EN-GJL-250 (GG 25).
Body, STAF-SG: Ductile iron EN-GJS-400-15.

DN 20-150:
Bonnet, cone and spindle of AMETAL®.
DN 200-300:
Bonnet and cone of ductile iron EN-GJS-400-15, and spindle of AMETAL®.
DN 350-400:
CE marked products: Bonnet of ductile iron EN-GJS-400-15, cone of ductile iron EN-GJS-400-15 and gunmetal CuSn5Zn5Pb5 (EN 1982), and spindle of AMETAL®.
Not CE marked products: Bonnet of ductile iron EN-GJS-400-15, cone of silicon brass CuZn16Si4-C (EN 1982) and gunmetal CuSn5Zn5Pb5 (EN 1982), and spindle of AMETAL®.

Cone DN 100-400: PTFE coated.

Seals: EPDM.
Slip washer: PTFE.
Bonnet bolts: Surface treated steel.
Measuring points: AMETAL® and EPDM.
Handwheel: DN 20-50 polyamide and TPE, DN 65-150 polyamide, DN 200-400 aluminium.

AMETAL® is the dezincification resistant alloy of IMI.

Surface treatment:
DN 20-200: Epoxy painting.
DN 250-400: Duasolid painting.

Marking:
Body: TA, PN, DN, flow direction arrow, material and casting date (year, month, day).
CE-marking:
CE: STAF (PN 16) DN 65-150, STAF-SG (PN 16) DN 200, STAF-SG (PN 25) DN 50-125.
CE 0409*: STAF-SG (PN 16) DN 250-400, STAF-SG (PN 25) DN 150-400.
*) Notified body.

Flanges:
ISO 7005-2, EN 1092-2.

Face to face length:
ISO 5752 series 1, EN 558-1 series 1.

Measuring points

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

Sizing

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

$$Kv = 0{,}01 \frac{q}{\sqrt{\Delta p}}$$ q l/h, Δp kPa

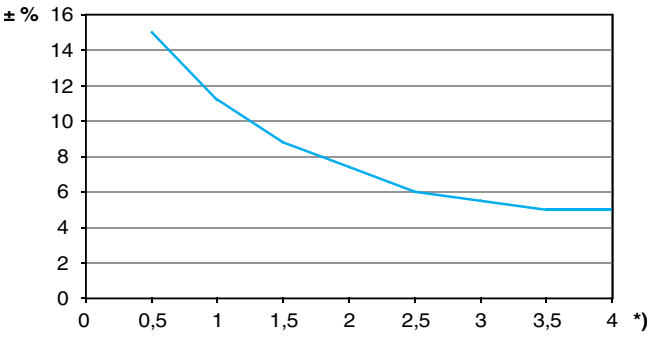
$$Kv = 36 \frac{q}{\sqrt{\Delta p}}$$ q l/s, Δp kPa

Measuring accuracy

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

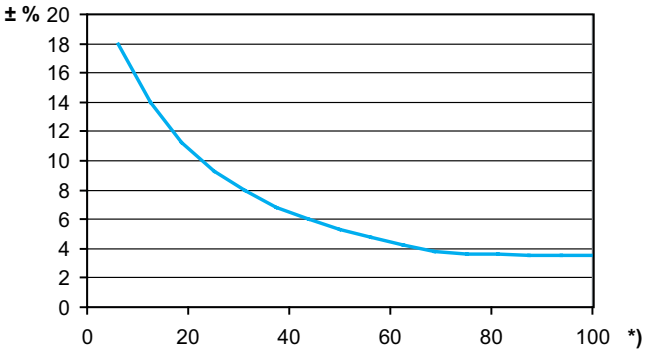
Deviation of flow at different settings
The curve holds for valves with the correct flow direction, straight pipe distances (Fig. 1) and normal pipe fittings.

DN 20-50



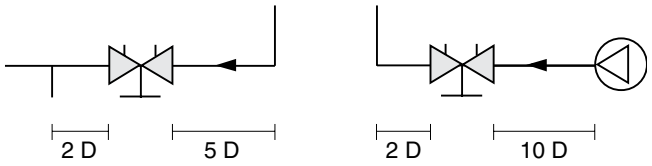
*) Setting, No. of turns.

DN 65-400

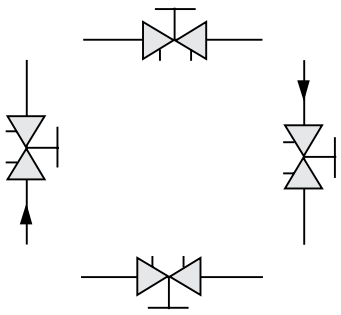


*) Setting (%) of fully open valve.

Fig. 1



D = Valve DN



Correction factors

The flow calculations are valid for water (+20°C). For other liquids with approximately 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 HySelect or directly in our balancing instruments.

Kv values

DN 20-50

Turns	DN 20	DN 25	DN 32	DN 40	DN 50
0.5	0,511	0,60	1,14	1,75	2,56
1	0,757	1,03	1,90	3,30	4,2
1.5	1,19	2,10	3,10	4,60	7,2
2	1,90	3,62	4,66	6,10	11,7
2.5	2,80	5,30	7,10	8,80	16,2
3	3,87	6,90	9,50	12,6	21,5
3.5	4,75	8,00	11,8	16,0	26,5
4	5,70	8,70	14,2	19,2	33

DN 65-150

Turns	DN 65	DN 80	DN 100	DN 125	DN 150
0.5	1,02	2,33	2,54	5,99	5,39
1	2,39	4,25	5,59	10,9	13,3
1.5	3,77	6,20	8,64	15,7	22,8
2	5,18	8,47	11,5	21,5	41
2.5	6,52	11,4	15,5	29,1	65,7
3	8,18	15	26,2	37,5	92,6
3.5	11,6	20,8	42,8	54,2	127
4	18,6	29,9	66	85,2	176
4.5	29,9	43,3	91,7	118	214
5	39,6	57,5	108	148	249
5.5	47,9	69,6	119	168	281
6	57,5	81,2	136	198	307
6.5	66,3	92,8	151	232	332
7	74,2	104	164	255	353
7.5	80	114	174	275	374
8	85	123	185	294	400

NOTE: In softwares (HySelect, HyTools) and balancing instrument (TA-SCOPE) the STAF/STAF-SG, DN 65-150, is named STAF* resp. STAF-SG*.

DN 200-400

Turns	DN 200	DN 250	DN 300	DN 350	DN 400
0.5	-	-	-	-	-
1	-	-	-	-	-
1.5	-	-	-	-	-
2	40	90	-	-	-
2.5	50	110	-	-	-
3	65	140	150	109	125
3.5	90	195	230	129	148
4	120	255	300	148	171
4.5	165	320	370	170	208
5	225	385	450	207	264
5.5	285	445	535	254	326
6	340	500	620	302	386
6.5	400	545	690	352	449
7	435	590	750	404	515
7.5	470	660	815	471	590
8	515	725	890	556	680
9	595	820	970	784	894
10	650	940	1040	957	1140
11	710	1050	1120	1100	1250
12	765	1185	1200	1260	1400
13	-	-	1320	1420	1560
14	-	-	1370	1610	1730
15	-	-	1400	1760	1940
16	-	-	1450	1870	2140
17	-	-	-	1960	2280
18	-	-	-	2040	2410
19	-	-	-	2130	2530
20	-	-	-	2200	2630
21	-	-	-	-	2710
22	-	-	-	-	2780

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,
16 turns for DN 300,
20 turns for DN 350 and
22 turns for DN 400.

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 an Allen key, turn the inner spindle clockwise until the stop position.
4. The valve is now 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

Fig. 1 Valve closed

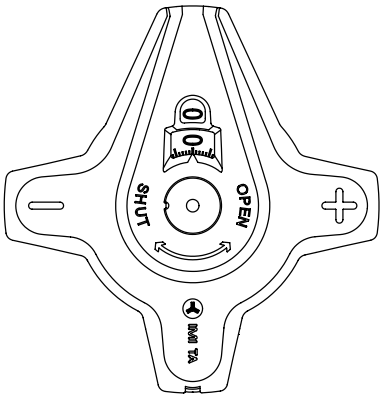


Fig. 2a The valve is set at 2.3

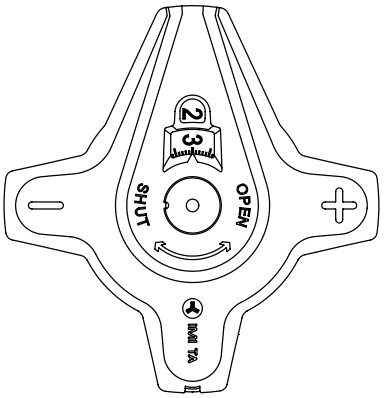
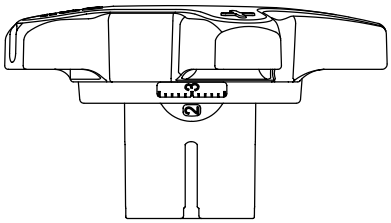


Fig. 2b Setting 2.3 side view



Example DN 200

Fig. 1 Valve closed

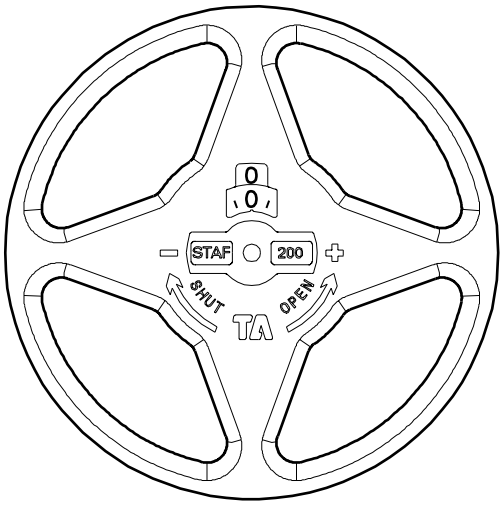
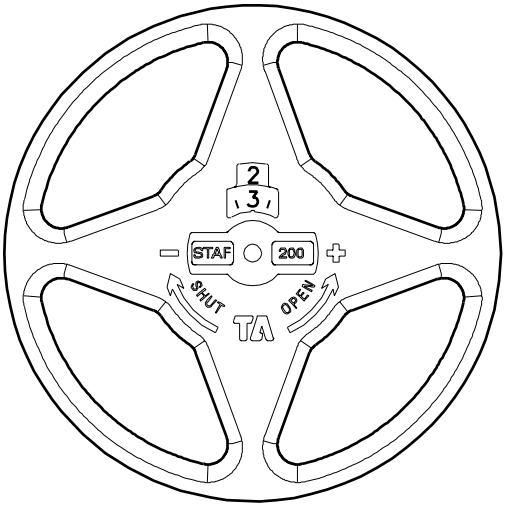
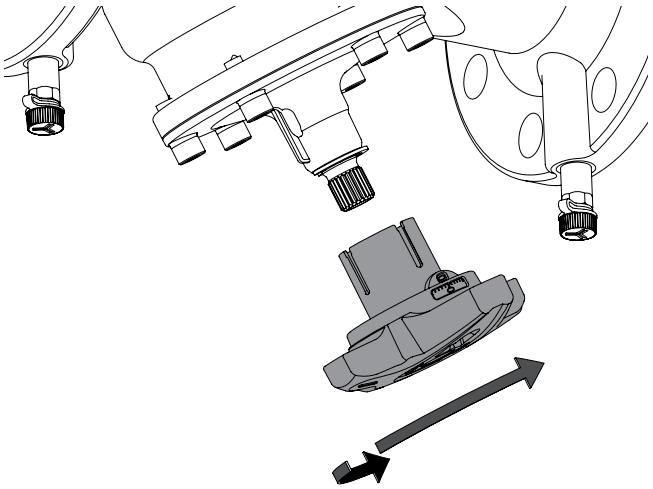


Fig. 2 The valve is set at 2.3



Change of handwheel position DN 65-150

The handwheel on DN 65-150 have a reading on the side as well as on the top of the handwheel to make it easier to read. The handwheel can be rotated to have the side view reading in three different positions.



Spindle extension DN 65-150

The spindle can be extended on DN 65-150 to make more room for insulation if needed. An extension kit is included with the DN 65-150 valves.

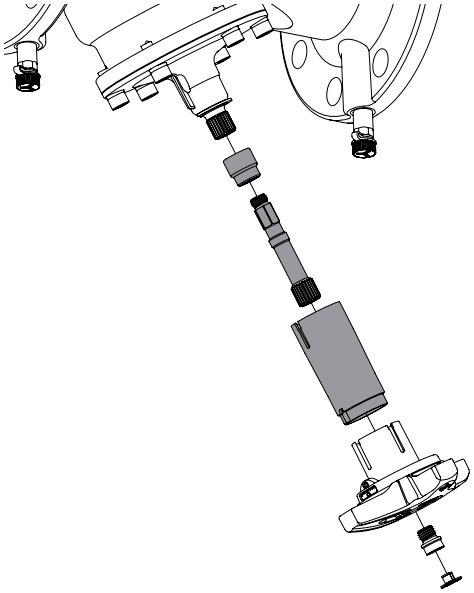


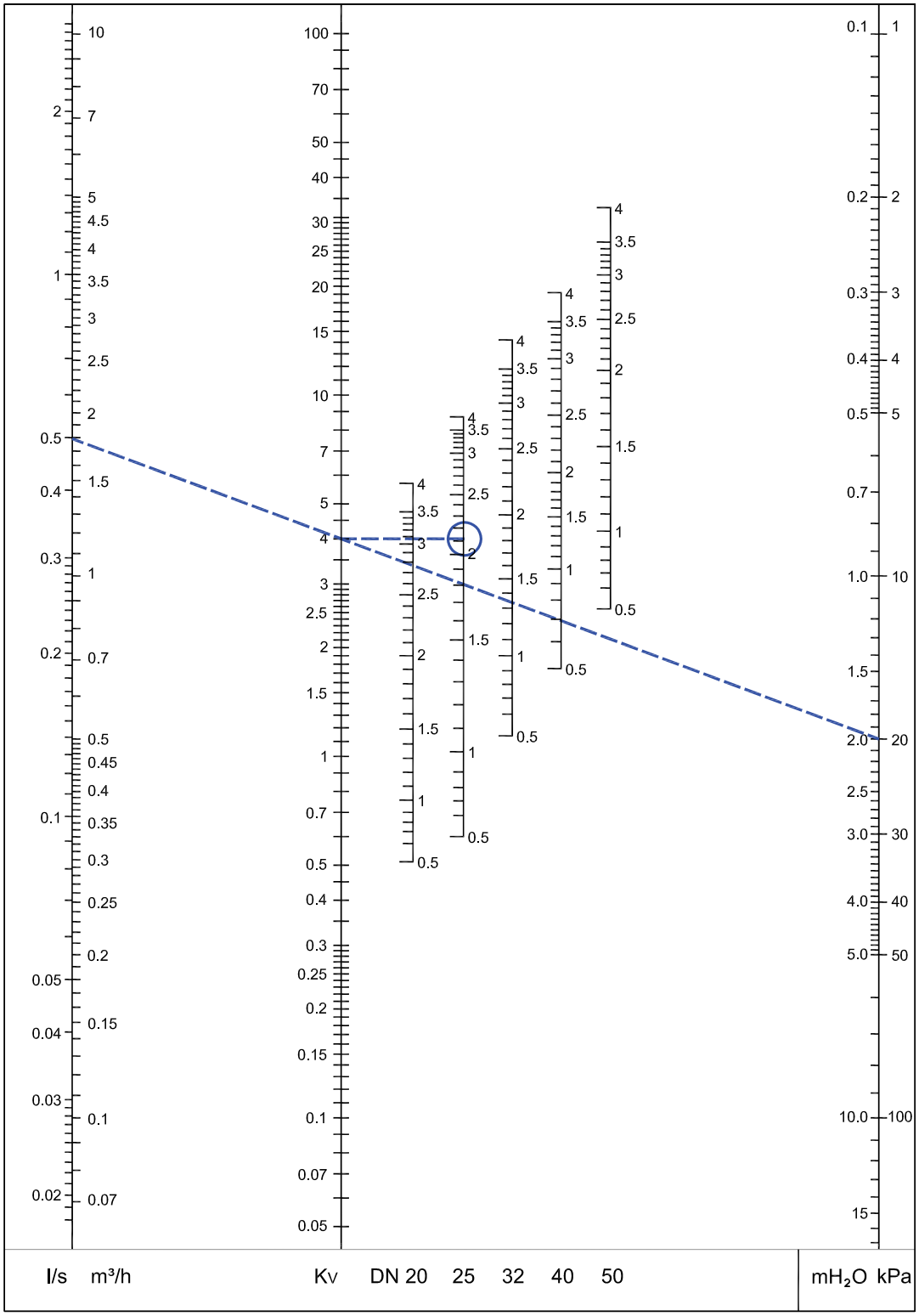
Diagram example

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.

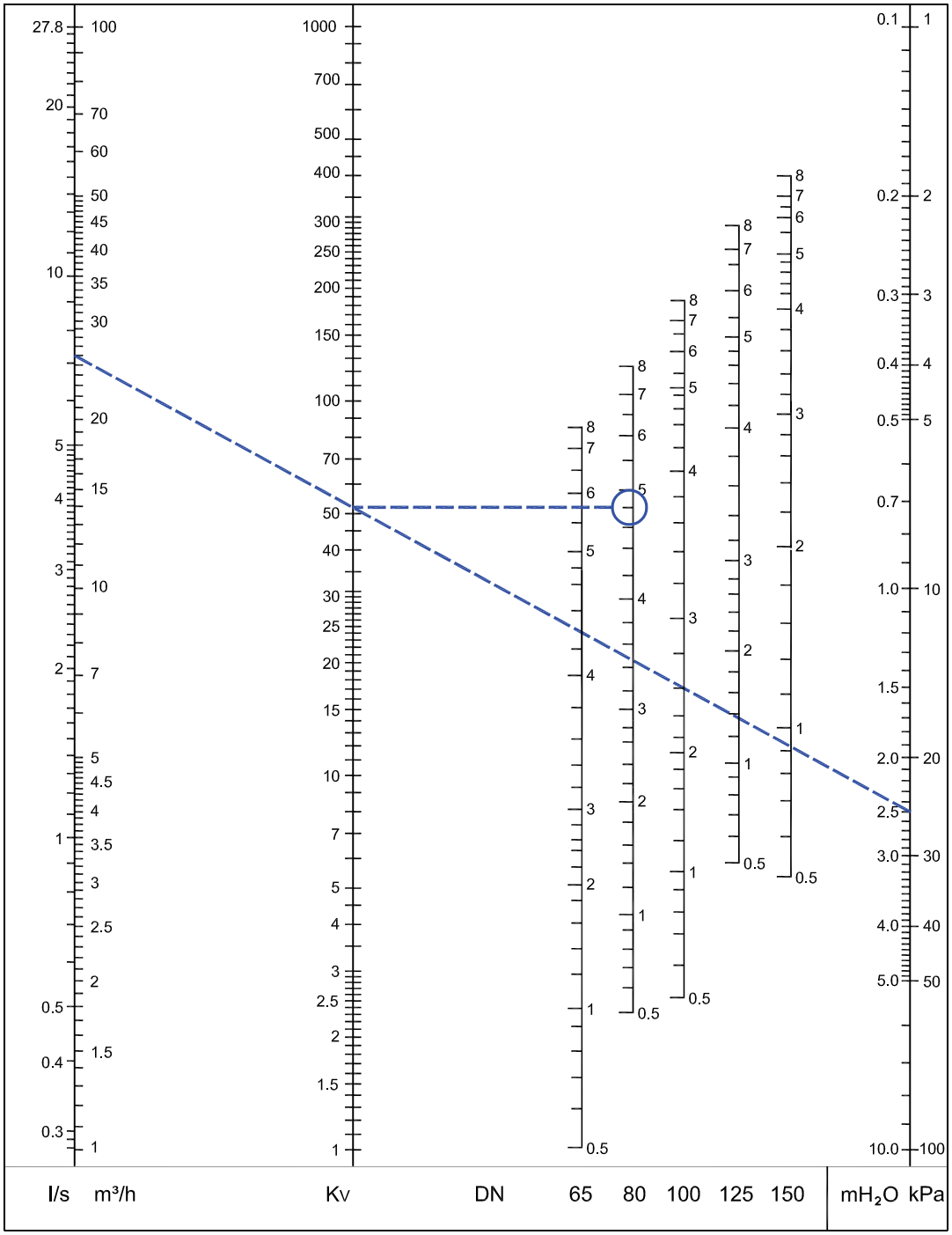
NOTE:
If the flow rate falls outside the scale in the diagram, the reading can be made as follows: Starting with the example above, we get 20 kPa, Kv = 4 and flowrate 1.8 m^3/h. At 20 kPa and Kv = 0.4 we get the flow-rate 0.18 m^3/h, and at Kv = 40, we get 18 m^3/h. That is, for a given pressure drop,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

Diagram DN 20-50



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

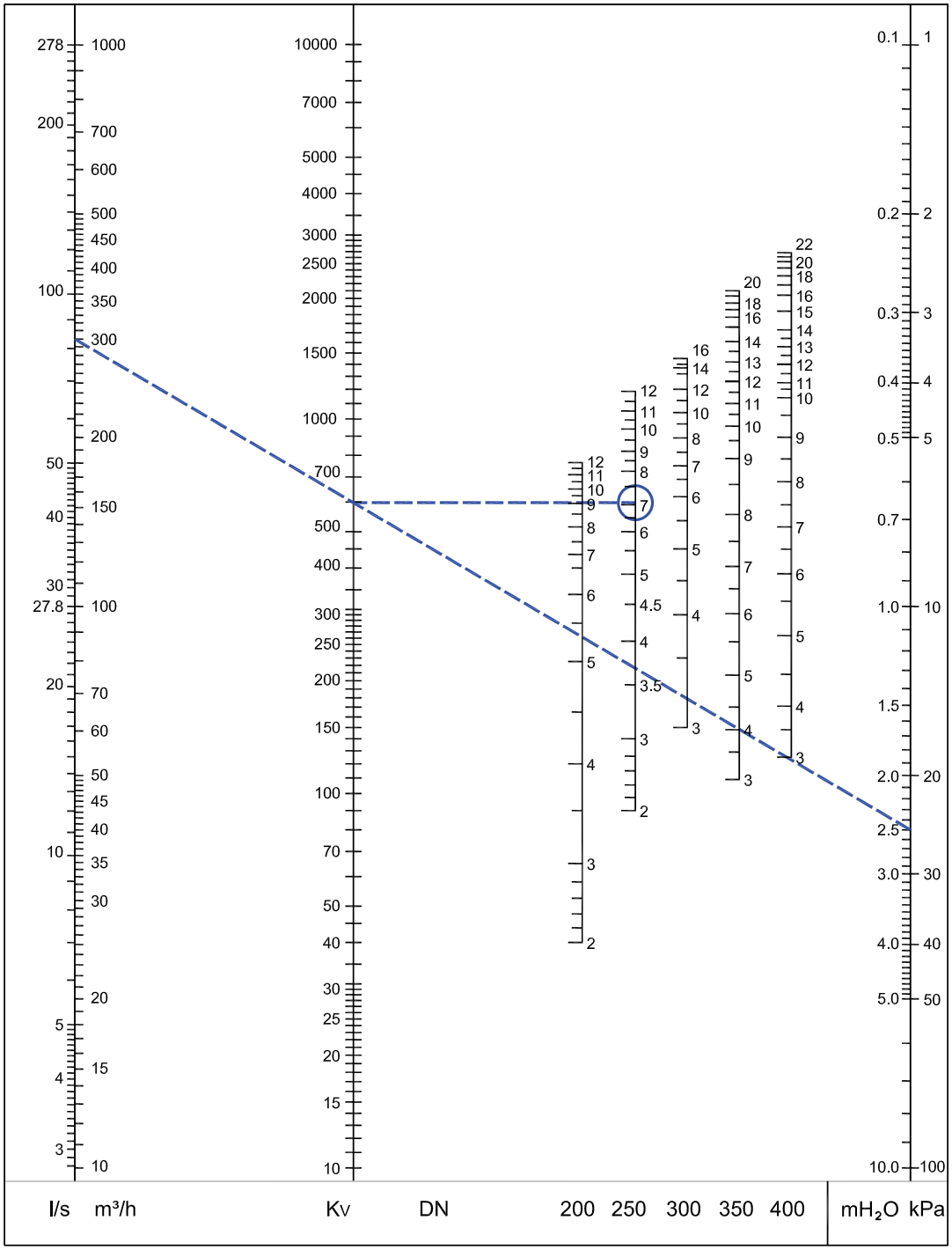
Diagram DN 65-150



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

NOTE: In softwares (HySelect, HyTools) and balancing instrument (TA-SCOPE) the STAF/STAF-SG, DN 65-150, is named STAF* resp. STAF-SG*.

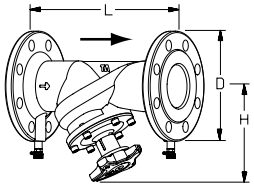
Diagram DN 200-400



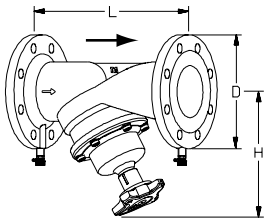
Recommended area: See Fig. 3 under “Measuring accuracy”.

STAF – Cast iron

DN 65-80



DN 100-150



Bolted bonnet
Spindle extension for DN 65-150 is included.

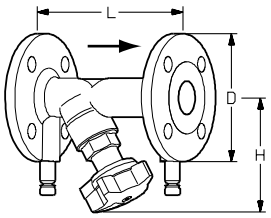
PN 16, ISO 7005-2, EN 1092-2

DN	Number of bolt holes	D	L	H	H [1]	Kvs	Kg	EAN	Article No
65	4	185	290	163	223	85	10,0	5902276805134	52 186-065
80	8	200	310	172	232	123	12,4	5902276805141	52 186-080
100	8	220	350	223	283	185	17,9	5902276805158	52 186-090
125	8	250	400	259	319	294	25,5	5902276805165	52 186-091
150	8	285	480	273	333	400	35,0	5902276805172	52 186-092

1) Height with spindle extension
→ = Flow direction
Kvs = m^3/h at a pressure drop of 1 bar and fully open valve.

NOTE: In softwares (HySelect, HyTools) and balancing instrument (TA-SCOPE) the STAF/STAF-SG, DN 65-150, is named STAF* resp. STAF-SG*.

STAF-SG – Ductile iron

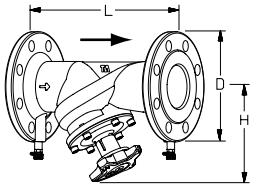


Threaded bonnet

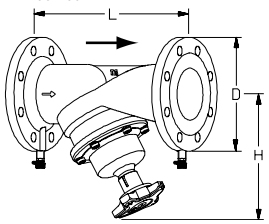
PN 25, ISO 7005-2, EN 1092-2 (DN 20-50 also fit PN 16 flanges)

DN	Number of bolt holes	D	L	H	Kvs	Kg	EAN	Article No
20	4	105	150	100	5,7	2,3	7318792825705	52 182-020
25	4	115	160	109	8,7	2,9	7318792825804	52 182-025
32	4	140	180	111	14,2	4,3	7318792825903	52 182-032
40	4	150	200	122	19,2	5,2	7318792826009	52 182-040
50	4	165	230	122	33	6,6	7318792826108	52 182-050

DN 65-80



DN 100-150



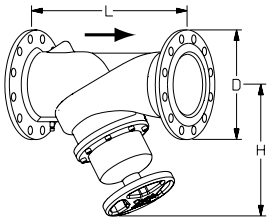
Bolted bonnet
Spindle extension for DN 65-150 is included.

PN 25, ISO 7005-2, EN 1092-2

DN	Number of bolt holes	D	L	H	H [1]	Kvs	Kg	EAN	Article No
65	8	185	290	163	223	85	10,0	5902276805233	52 187-065
80	8	200	310	172	232	123	12,4	5902276805240	52 187-080
100	8	235	350	223	283	185	17,9	5902276805257	52 187-090
125	8	270	400	259	319	294	25,5	5902276805264	52 187-091
150	8	300	480	273	333	400	35,0	5902276805271	52 187-092

1) Height with spindle extension
→ = Flow direction
Kvs = m^3/h at a pressure drop of 1 bar and fully open valve.

NOTE: In softwares (HySelect, HyTools) and balancing instrument (TA-SCOPE) the STAF/STAF-SG, DN 65-150, is named STAF* resp. STAF-SG*.



Bolted bonnet
Measuring points on body

PN 16, ISO 7005-2, EN 1092-2

DN	Number of bolt holes	D	L	H	Kvs	Kg	EAN	Article No
200	12	340	600	430	765	76	7318792823800	52 181-093
250	12	400	730	420	1185	122	7318792823909	52 181-094
300	12	455	850	480	1450	163	7318792824005	52 181-095
350	16	520	980	585	2200	287	7318793859402	52 181-096
400	16	580	1100	640	2780	391	7318793859303	52 181-097
Not CE marked products *								
350	16	520	980	585	2200	297	7318794004603	52 181-196
400	16	580	1100	640	2780	406	7318794004702	52 181-197

PN 25, ISO 7005-2, EN 1092-2

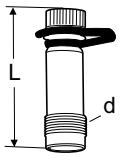
DN	Number of bolt holes	D	L	H	Kvs	Kg	EAN	Article No
200	12	360	600	430	765	76	7318792826702	52 182-093
250	12	425	730	420	1185	122	7318792826801	52 182-094
300	16	485	850	480	1450	163	7318792826900	52 182-095
350	16	555	980	585	2200	287	7318793843401	52 182-096
400	16	620	1100	640	2780	391	7318793843500	52 182-097
Not CE marked products *								
350	16	555	980	585	2200	297	7318794004801	52 182-196
400	16	620	1100	640	2780	406	7318794004900	52 182-197

*) **NOTE:** Not allowed to be installed in EU or EFTA countries.

→ = Flow direction

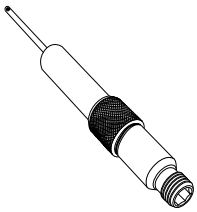
Kvs = m^3/h at a pressure drop of 1 bar and fully open valve.

Accessories



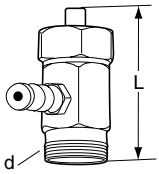
Measuring point
AMETAL®/EPDM

d	L	EAN	Article No
DN 20-50			
R1/4	39	7318792813108	52 179-009
R1/4	103	7318792814600	52 179-609
DN 65-400			
R3/8	45	7318792813009	52 179-008
R3/8	101	7318792814501	52 179-608



Measuring point, extension 60 mm
(not for 52 179-000/-601)
Can be installed without draining of the system.
AMETAL®/Stainless steel/EPDM

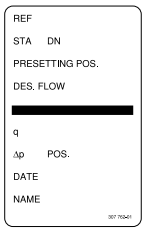
L	EAN	Article No
60	7318792812804	52 179-006



Measuring point

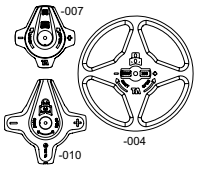
For older STAD and STAF
Max 150°C
AMETAL®/EPDM

d	L	EAN	Article No
DN 20-50			
R1/4	30	7318792812408	52 179-000
R1/4	90	7318792814303	52 179-601
DN 65-400			
R3/8	30	7318792812903	52 179-007
R3/8	90	7318792814402	52 179-607



Identification tag

EAN	Article No
7318792779206	52 161-990



Handwheel

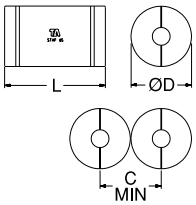
DN	EAN	Article No
20-50	7318794043503	52 186-007
65-150	5902276808968	52 186-010
200-400	7318792835001	52 186-004



Allen key

For locking of setting.

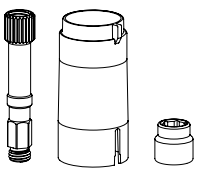
[mm]	For DN	EAN	Article No
3	20-150	7318792836008	52 187-103
5	200-400	7318792836107	52 187-105



Insulation

For heating/cooling
Material: EPP
Fire class: B2 (DIN 4102)
Max working temperature: 120°C
(intermittent 140°C)
Min working temperature: 12°C,
-8°C at sealed joints.

For DN	L	D	C	EAN	Article No
50	390	250	252	7318792840708	52 189-850
65	450	270	272	7318792840807	52 189-865
80	480	290	292	7318792840906	52 189-880
100	520	320	322	7318792841002	52 189-890
125	570	350	352	7318792841101	52 189-891
150	660	380	382	7318792841200	52 189-892



Spindle extension

Spare part.
Included in valves DN 65-150.
Needed on DN 65-80 when using IMI TA prefab insulations (52 189-8xx).

For DN	EAN	Article No
65-150	5902276808951	52 186-015

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