

STAF, STAF-SG

Balancing valve – PN 16 and PN 25 – DN 20-400



Pressurisation & Water Quality › Balancing & Control › Thermostatic Control

ENGINEERING ADVANTAGE

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.

> Handwheel

Equipped with a digital read-out, the handwheel ensures accurate and straightforward balancing.

> Self-sealing measuring points

For simple, accurate balancing.

> Positive shut-off function

For easy maintenance.



> Technical description

Applications:

Heating and cooling systems.

Functions:

Balancing

Pre-setting

Measuring

Shut-off (The balancing cone for valve DN 65-400 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

For higher temperatures (max. 150°C), please contact the nearest sales office.

Min. working temperature:

STAF: -10°C

STAF-SG: -20°C

Material:

Body, STAF: Cast iron EN-GJL-250 (GG 25).

Body, STAF-SG: Ductile iron EN-GJS-400-15.

DN 20-150: Bonnet, restriction cone and spindle of AMETAL®.

DN 200-300: Bonnet of ductile iron, cone of Bronze and spindle of AMETAL®.

DN 350-400: Bonnet of ductile iron, cone of silicon brass CuZn16Si4-C (EN 1982) or brass CuZn35Pb2Al-C-GS (EN 1982) and spindle of AMETAL®.

Seat seal: Cone with EPDM ring.

Bonnet bolts: Chromed steel.

Handwheel: DN 20-150 polyamide, DN 200-400 aluminium.

AMETAL® is the dezincification resistant alloy of TA.

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 according to table:

Marking	STAF	STAF-SG (PN 16)	STAF-SG (PN 25)
CE CE 0409*	DN 65-150	DN 200 DN 250-400	DN 50-125 DN 150-400

*) Notified body.

Face to face length:

ISO 5752 series 1, BS 2080 and EN 558-1 series 1.

Measuring points

Measuring point 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.

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

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

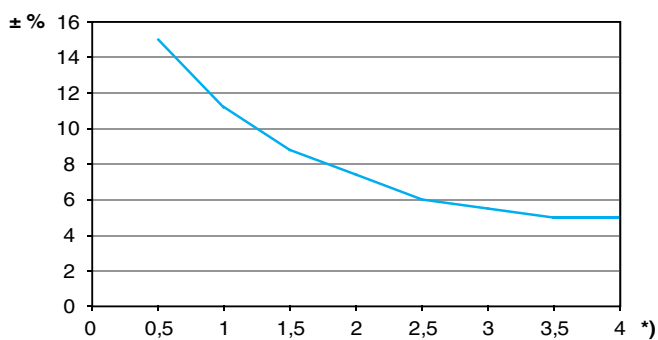
Measuring accuracy

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

Deviation of flow at different settings

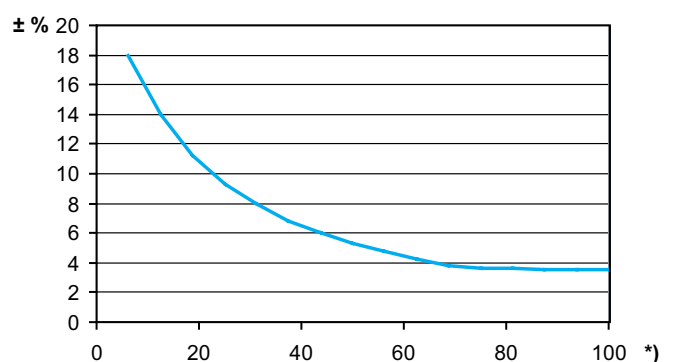
The curve (Fig. 3) holds for valves with the correct flow direction, straight pipe distances (Fig. 4) and normal pipe fittings.

Fig. 3
DN 20-50



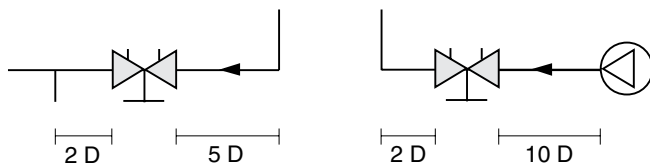
*) Setting, No. of turns.

DN 65-400



*) Setting (%) of fully open valve.

Fig. 4



Correction factors

The flow calculations are valid for water (+20°C). For other liquids with approximately the same viscosity as water ($\leq 20 \text{ cSt} = 3^\circ \text{E} = 100 \text{ S.U.}$), 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 directly in TA's 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 65-2	DN 80	DN 100	DN 125	DN 150
0.5	1,8	2	2,5	5,5	6,5
1	3,4	4	6	10,5	12
1.5	4,9	6	9	15,5	22
2	6,5	8	11,5	21,5	40
2.5	9,3	11	16	27	65
3	16,3	14	26	36	100
3.5	25,6	19,5	44	55	135
4	35,3	29	63	83	169
4.5	44,5	41	80	114	207
5	52	55	98	141	242
5.5	60,5	68	115	167	279
6	68	80	132	197	312
6.5	73	92	145	220	340
7	77	103	159	249	367
7.5	80,5	113	175	276	391
8	85	120	190	300	420

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

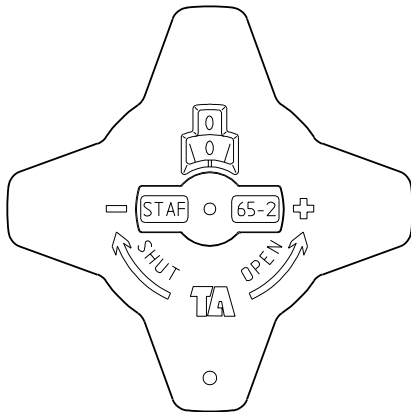
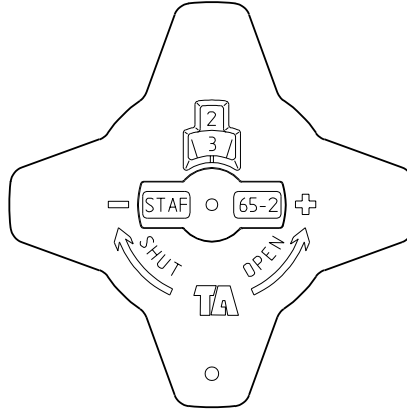


Fig. 2 The valve is set at 2.3



Example DN 200

Fig. 1 Valve closed

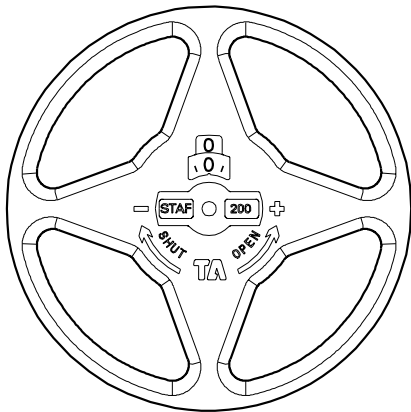


Fig. 2 The valve is set at 2.3

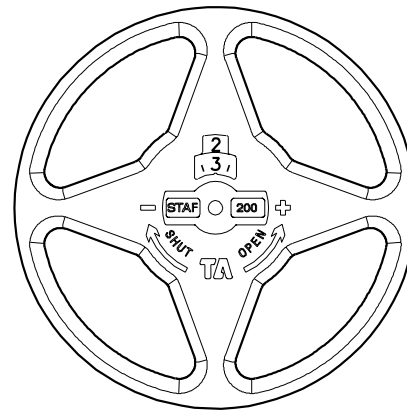


Diagram example

Wanted:

Presetting for DN 25 at a desired flow rate of $1.8 \text{ m}^3/\text{h}$ and a pressure drop of 20 kPa.

Solution:

Draw a straight line joining $1.8 \text{ m}^3/\text{h}$ and 20 kPa. This gives $K_v=4$.

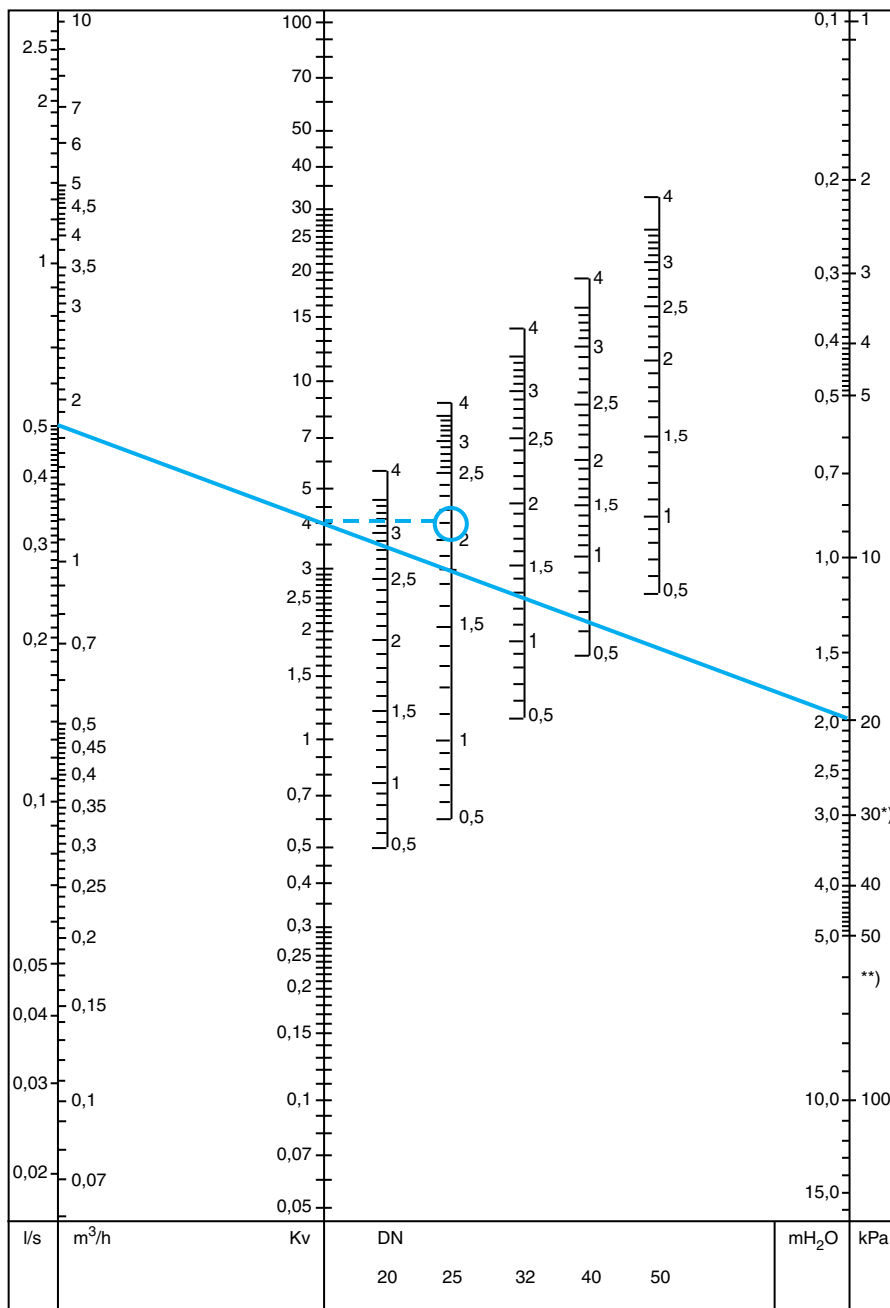
Now draw a horizontal line from $K_v=4$.

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, $K_v = 4$ and flowrate $1.8 \text{ m}^3/\text{h}$. At 20 kPa and $K_v = 0.4$ we get the flow-rate $0.18 \text{ m}^3/\text{h}$, and at $K_v = 40$, we get $18 \text{ m}^3/\text{h}$. That is, for a given pressure drop, it is possible to read 10 times or 0.1 times the flow and K_v -values.

Diagram DN 20-50

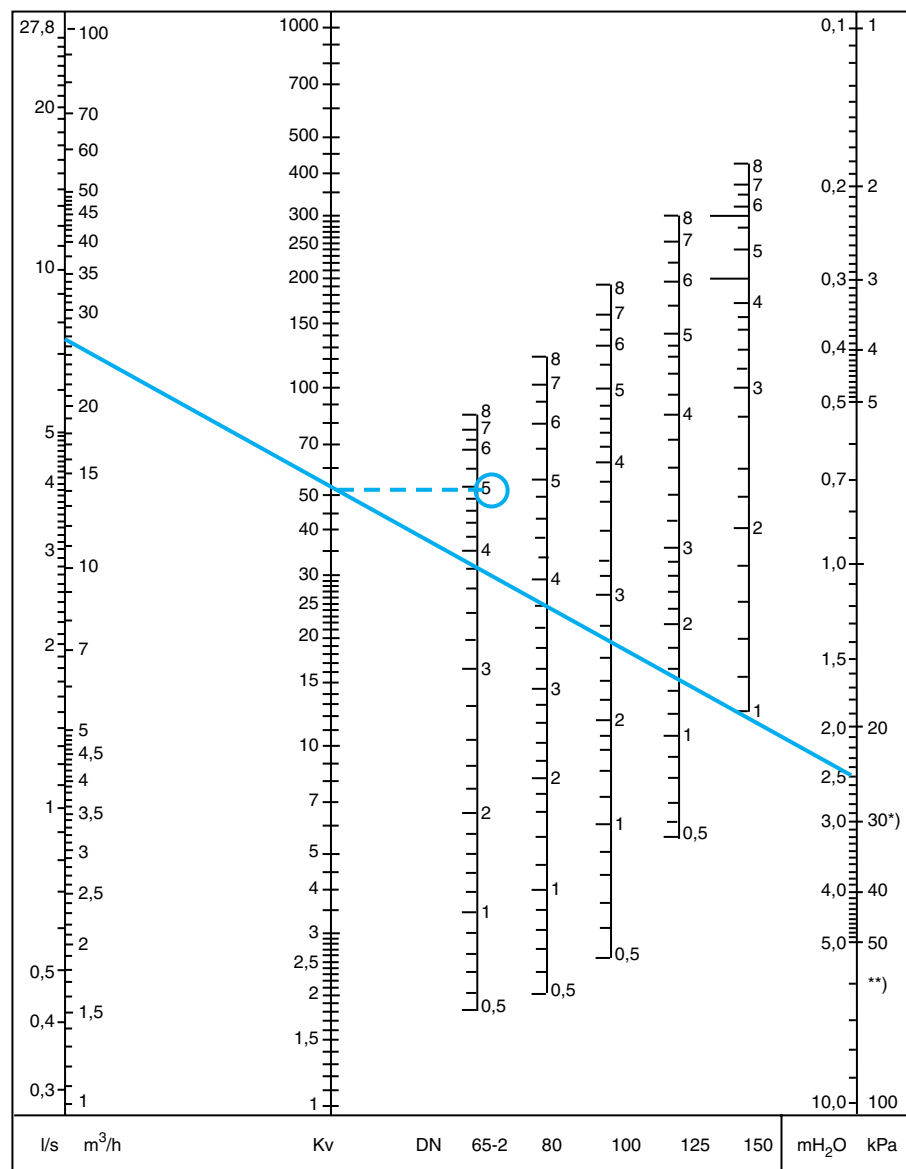


*) 25 db (A)

**) 35 db (A)

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

Diagram DN 65-150

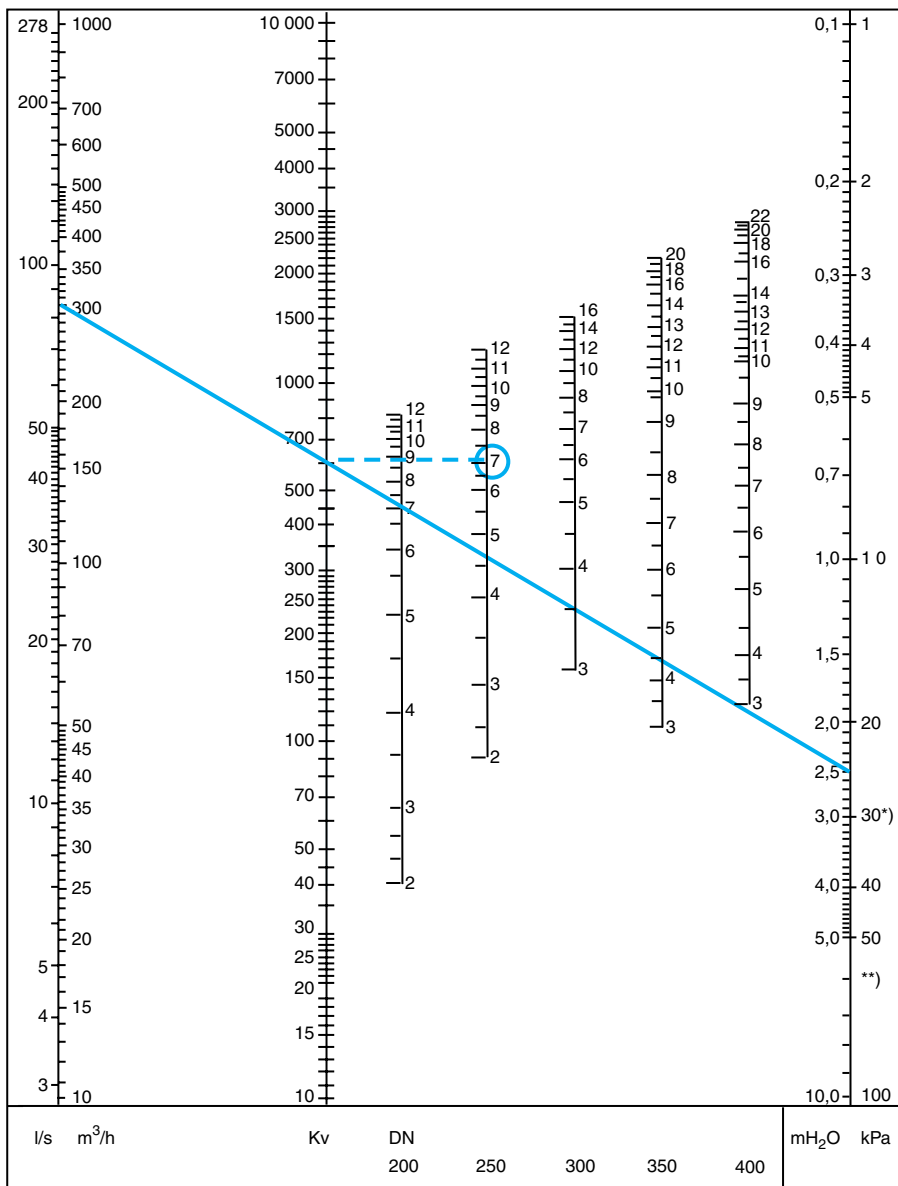


*) 25 db (A)

**) 35 db (A)

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

Diagram DN 200-400

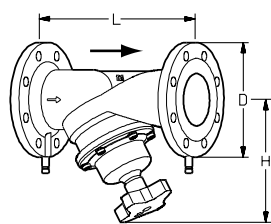


*) 25 db (A)

**) 35 db (A)

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

Articles – STAF (cast iron)

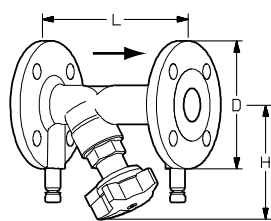


Bolted bonnet

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

Article No	EAN	DN	Number of bolt holes	D	L	H	Kvs	Kg
52 181-065	7318792823305	65-2	4	185	290	205	85	12.4
52 181-080	7318792823404	80	8	200	310	220	120	15.9
52 181-090	7318792823503	100	8	220	350	240	190	22
52 181-091	7318792823602	125	8	250	400	275	300	32.7
52 181-092	7318792823701	150	8	285	480	285	420	42.4

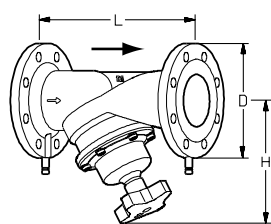
Articles – STAF-SG (ductile iron)



Threaded bonnet

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

Article No	EAN	DN	Number of bolt holes	D	L	H	Kvs	Kg
52 182-020	7318792825705	20	4	105	150	100	5.7	2.3
52 182-025	7318792825804	25	4	115	160	109	8.7	2.9
52 182-032	7318792825903	32	4	140	180	111	14.2	4.3
52 182-040	7318792826009	40	4	150	200	122	19.2	5.2
52 182-050	7318792826108	50	4	165	230	122	33	6.6



Bolted bonnet

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

Article No	EAN	DN	Number of bolt holes	D	L	H	Kvs	Kg
52 182-065	7318792826207	65-2	8	185	290	205	85	11
52 182-080	7318792826306	80	8	200	310	220	120	14
52 182-090	7318792826405	100	8	235	350	240	190	19.6
52 182-091	7318792826504	125	8	270	400	275	300	28.1
52 182-092	7318792826603	150	8	300	480	285	420	37.1

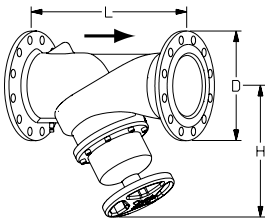
→ = Flow direction

Kvs = m³/h at a pressure drop of 1 bar and fully open valve.

Bolted bonnet

Measuring points on body

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



Article No	EAN	DN	Number of bolt holes	D	L	H	Kvs	Kg
52 181-093	7318792823800	200	12	340	600	430	765	76
52 181-094	7318792823909	250	12	425	730	420	1185	122
52 181-095	7318792824005	300	12	485	850	480	1450	163
52 181-096	7318793859402	350	16	520	980	585	2200	297
52 181-097	7318793859303	400	16	580	1100	640	2780	406

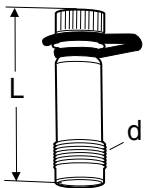
PN 25, ISO 7005-2, EN 1092-2

Article No	EAN	DN	Number of bolt holes	D	L	H	Kvs	Kg
52 182-093	7318792826702	200	12	360	600	430	765	76
52 182-094	7318792826801	250	12	425	730	420	1185	122
52 182-095	7318792826900	300	16	485	850	480	1450	163
52 182-096	7318793843401	350	16	555	980	585	2200	297
52 182-097	7318793843500	400	16	620	1100	640	2780	406

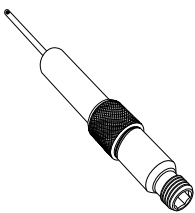
→ = Flow direction

Kvs = m³/h at a pressure drop of 1 bar and fully open valve.

Accessories

**Measuring points**

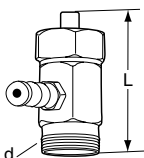
Article No	EAN	d	L
- DN 50			
52 179-009	7318792813108	1/4	39
52 179-609	7318792814600	1/4	103
DN 65 -			
52 179-008	7318792813009	3/8	47
52 179-608	7318792814501	3/8	103

**Measuring point**

Extensions 60 mm (not for 52 179-000/-601).

Can be installed without draining of the system.

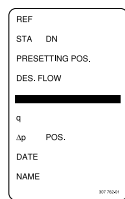
Article No	EAN
52 179-006	7318792812804

**Measuring point**

max 150°C

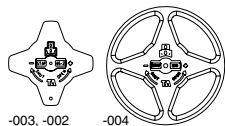
+ older STAD and STAF

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



Identification tag

Incl 1 pc per valve

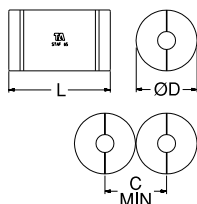


Handwheel

Complete



Allen key



Insulation

For heating/cooling
See catalogue leaflet Prefab insulations
for complete details.

Article No	EAN
52 161-990	7318792779206

Article No	EAN	DN
52 186-003	7318792834905	20 - 50
52 186-002	7318792834806	65 - 150
52 186-004	7318792835001	200 - 400

Article No	EAN	For DN
52 187-103	7318792836008	3 mm 20 - 50
52 187-105	7318792836107	5 mm 65 - 150
-	-	8 mm 200 - 400

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

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