

STAF-SG – ANSI flanges



Balancing valves

Size 3/4" - 16"

STAF-SG – ANSI flanges

A flanged, ductile iron balancing valve that delivers accurate hydronic performance in an impressive range of applications. The 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 sizes 2 1/2" - 6" 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

Application:

Heating (not steam) and cooling systems

Functions:

Balancing
Presetting
Measuring
Shut-off (The balancing cone for valve sizes 4" - 16" is pressure released).

Dimensions:

3/4" - 16"

Pressure class:

Class 150
Temperature / Max. pressure:
14 to 100 °F / 250 psi
200 °F / 235 psi
248 °F / 225 psi

Temperature:

Max. working temperature: 248°F
Min. working temperature: 14°F

Media:

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

Material:

Body: Ductile iron, EN-GJS-400-15
(~ ASTM A536 Grade 60-40-18. ISO 1083 Grade 400-15).

Size 3/4" - 6":
Bonnet, cone and spindle of AMETAL®.
Size 8" - 12":
Bonnet and cone of ductile iron
EN-GJS-400-15, and spindle of AMETAL®.
Size 14" - 16":
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 sizes 4" - 16": PTFE coated.

Seals: EPDM.
Slip washer: PTFE.
Bonnet bolts: Surface treated steel.
Measuring points: AMETAL® and EPDM.
Handwheel: Size 3/4"-2" polyamide and
TPE, size 2 1/2"-6" polyamide, size 8"-16"
aluminium.

AMETAL® is the dezincification resistant alloy of IMI Hydronic Engineering.

Surface treatment:

Size 3/4" - 8": Epoxy painting.
Size 10" - 16": Duasolid painting.

Marking:

Size 3/4" - 2": TA, PN, DN (mm), 400-15 (material) and flow direction arrow.
Size 2 1/2" - 16": TA, Class 150, size (inch), 60-40-18 (material), casting date and flow direction arrow.
CE-marking:
CE: STAF-SG (Class 150) size 2 1/2" - 6".
CE 0409*: STAF-SG (Class 150) size 8" - 12".
*) Notified body.

Flanges:

Size 3/4" - 2": ISO 7005-2 and EN 1092-2.
Bolt circle according to Class 150 ASME/ANSI B16.42.
Size 2 1/2" - 16": Class 150 ASME/ANSI B16.42 (~ PN 20 according to ISO 7005-2).

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 Cv value or use the diagram.

$$Cv = 1.52 \frac{q}{\sqrt{\Delta p}} \quad q \text{ in GPM, } \Delta p \text{ in ft WG}$$

$$Cv = \frac{q}{\sqrt{\Delta p}} \quad q \text{ in GPM, } \Delta p \text{ in psi}$$

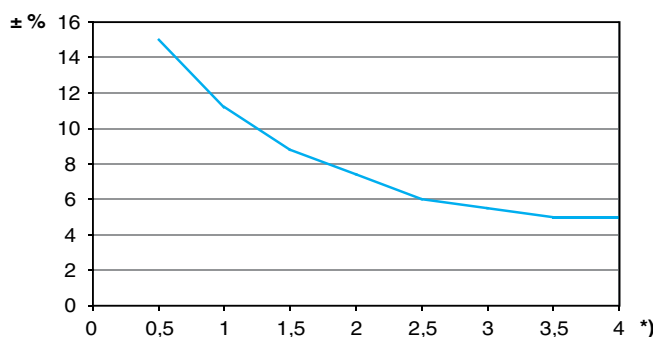
Measuring accuracy

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

Deviation of flow at different settings

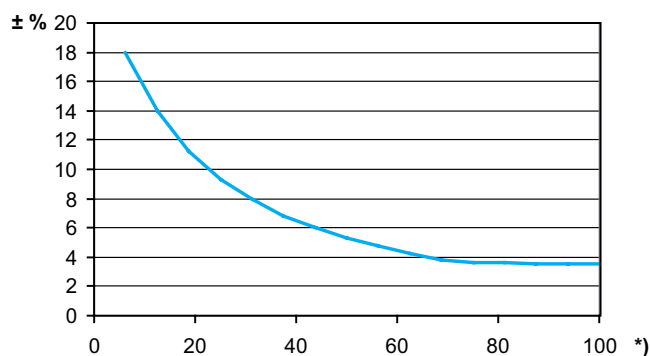
The curve holds for valves with the correct flow direction, straight pipe distances (Fig. 1) and normal pipe fittings.

Size 3/4" - 2"



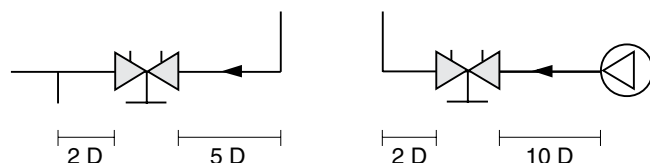
*) Setting, No. of turns.

Size 2 1/2" - 16"

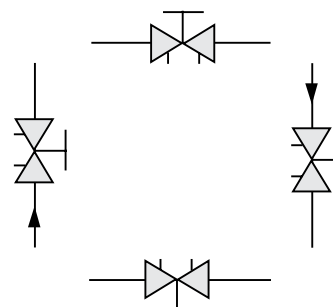


*) Setting (%) of fully open valve.

Fig. 1



D = Valve size



Correction factors

The flow calculations are valid for water (68°F). 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.

Cv values

Size 3/4" - 2"

Turns	3/4"	1"	1 1/4"	1 1/2"	2"
0.5	0.593	0.696	1.32	2.03	2.97
1	0.878	1.19	2.20	3.83	4.87
1.5	1.38	2.44	3.60	5.34	8.35
2	2.20	4.20	5.41	7.08	13.6
2.5	3.25	6.15	8.24	10.2	18.8
3	4.49	8.00	11.0	14.6	24.9
3.5	5.51	9.28	13.7	18.6	30.7
4	6.61	10.1	16.5	22.3	38.3

Size 2 1/2" - 6"

Turns	2 1/2"	3"	4"	5"	6"
0.5	1.18	2.69	2.94	6.92	6.24
1	2.76	4.92	6.47	12.6	15.4
1.5	4.36	7.17	9.98	18.1	26.3
2	5.99	9.80	13.3	24.8	47.4
2.5	7.53	13.2	18.0	33.7	76.0
3	9.46	17.4	30.2	43.4	107
3.5	13.4	24.1	49.5	62.6	147
4	21.5	34.6	76.3	98.4	204
4.5	34.5	50.0	106	136	247
5	45.8	66.5	125	171	288
5.5	55.3	80.4	137	194	325
6	66.4	93.8	157	229	354
6.5	76.7	107	175	268	384
7	85.8	120	189	295	408
7.5	92.5	132	202	318	433
8	98.3	142	214	340	462

NOTE: In softwares (HySelect, HyTools) and balancing instrument (TA-SCOPE) the STAF-SG, sizes 2 1/2" - 6", is named STAF-SG*.

Size 8" - 16"

Turns	8"	10"	12"	14"	16"
0.5	-	-	-	-	-
1	-	-	-	-	-
1.5	-	-	-	-	-
2	46.4	104	-	-	-
2.5	58.0	128	-	-	-
3	75.4	162	174	126	145
3.5	104	226	267	150	172
4	139	296	348	172	198
4.5	191	371	429	197	241
5	261	447	522	240	306
5.5	331	516	621	295	378
6	394	580	719	350	448
6.5	464	632	800	408	521
7	505	684	870	469	597
7.5	545	766	945	546	684
8	597	841	1032	645	789
9	690	951	1125	909	1037
10	754	1090	1206	1110	1322
11	824	1218	1299	1276	1450
12	887	1375	1392	1462	1624
13	-	-	1531	1647	1810
14	-	-	1589	1868	2007
15	-	-	1624	2042	2250
16	-	-	1682	2169	2482
17	-	-	-	2274	2645
18	-	-	-	2366	2796
19	-	-	-	2471	2935
20	-	-	-	2552	3051
21	-	-	-	-	3144
22	-	-	-	-	3225

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 3/4" - 2",
- 8 turns for 2 1/2" - 6",
- 12 turns for 8" - 10",
- 16 turns for 12",
- 20 turns for 14" and
- 22 turns for 16".

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 size 2 1/2"

Fig. 1 Valve closed

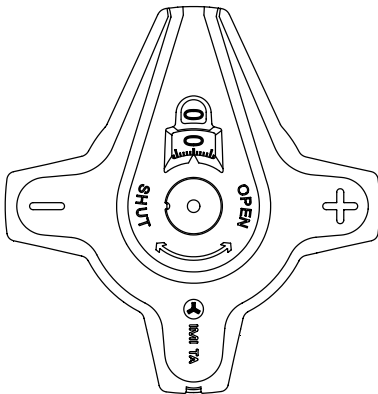


Fig. 2a The valve is set at 2.3

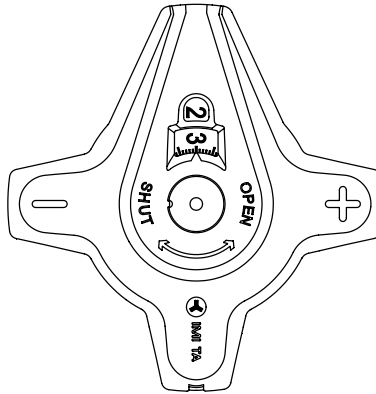
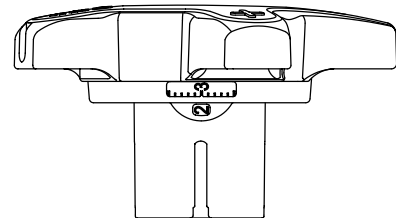


Fig. 2b Setting 2.3 side view



Example size 8"

Fig. 1 Valve closed

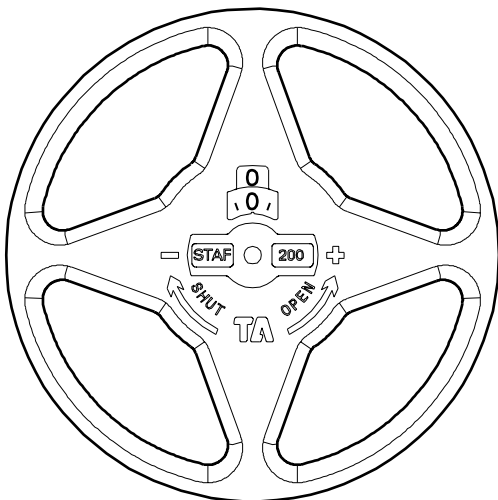
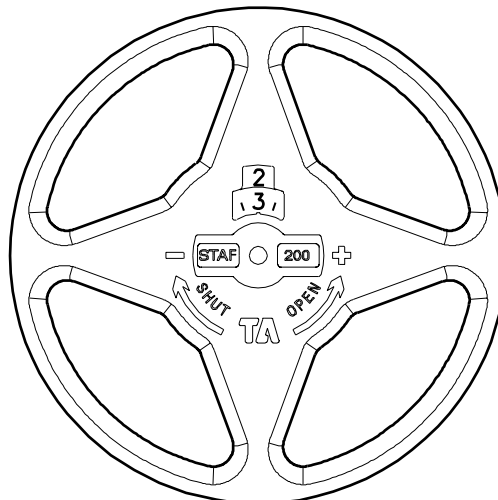


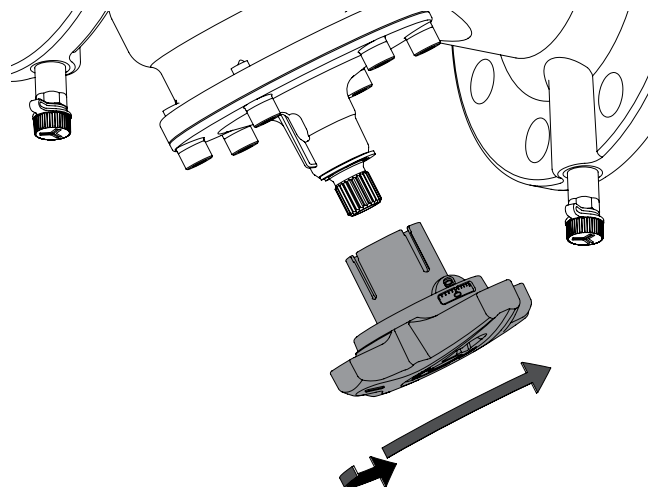
Fig. 2 The valve is set at 2.3



Change of handwheel position sizes 2 1/2" - 6"

The handwheel on valve sizes 2 1/2" - 6" 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 sizes 2 1/2" - 6"

The spindle can be extended on valve sizes 2 1/2" - 6" to make more room for insulation if needed. An extension kit is included with the valves sizes 2 1/2" - 6".

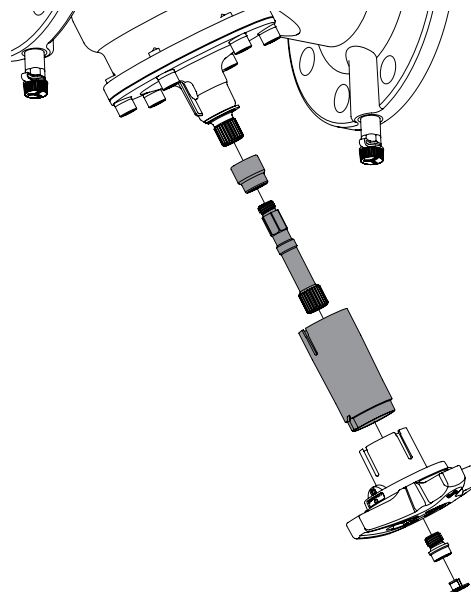


Diagram example

Wanted:

Presetting for size 1" at a desired flow rate of 7 gpm and a pressure drop of 1.4 psi.

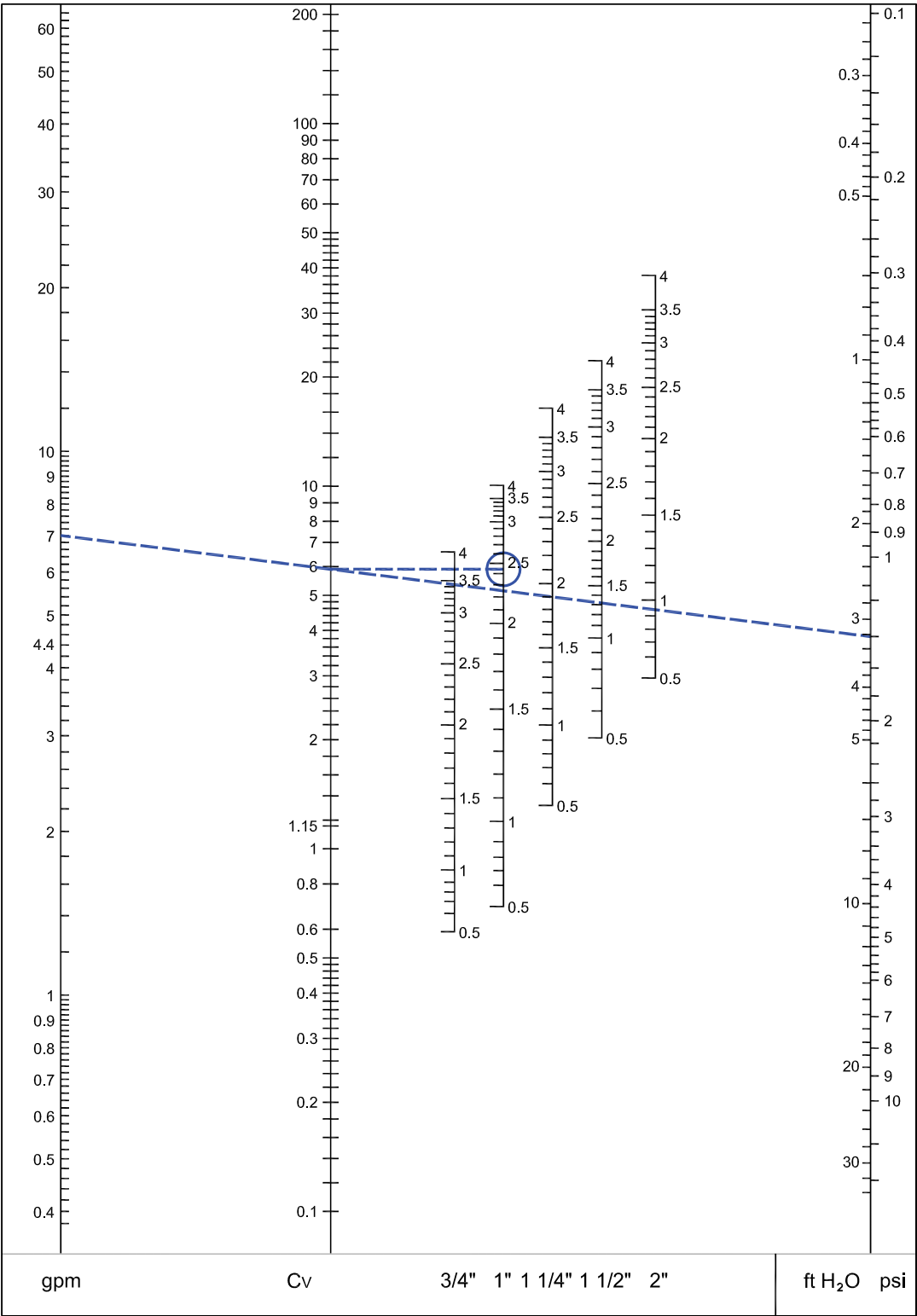
Solution:

Draw a straight line joining 7 gpm and 1.4 psi. This gives $C_v = 6$. Now draw a horizontal line from $C_v = 6$. This intersects the bar for size 1" at the desired presetting of 2.45 turns.

NOTE:

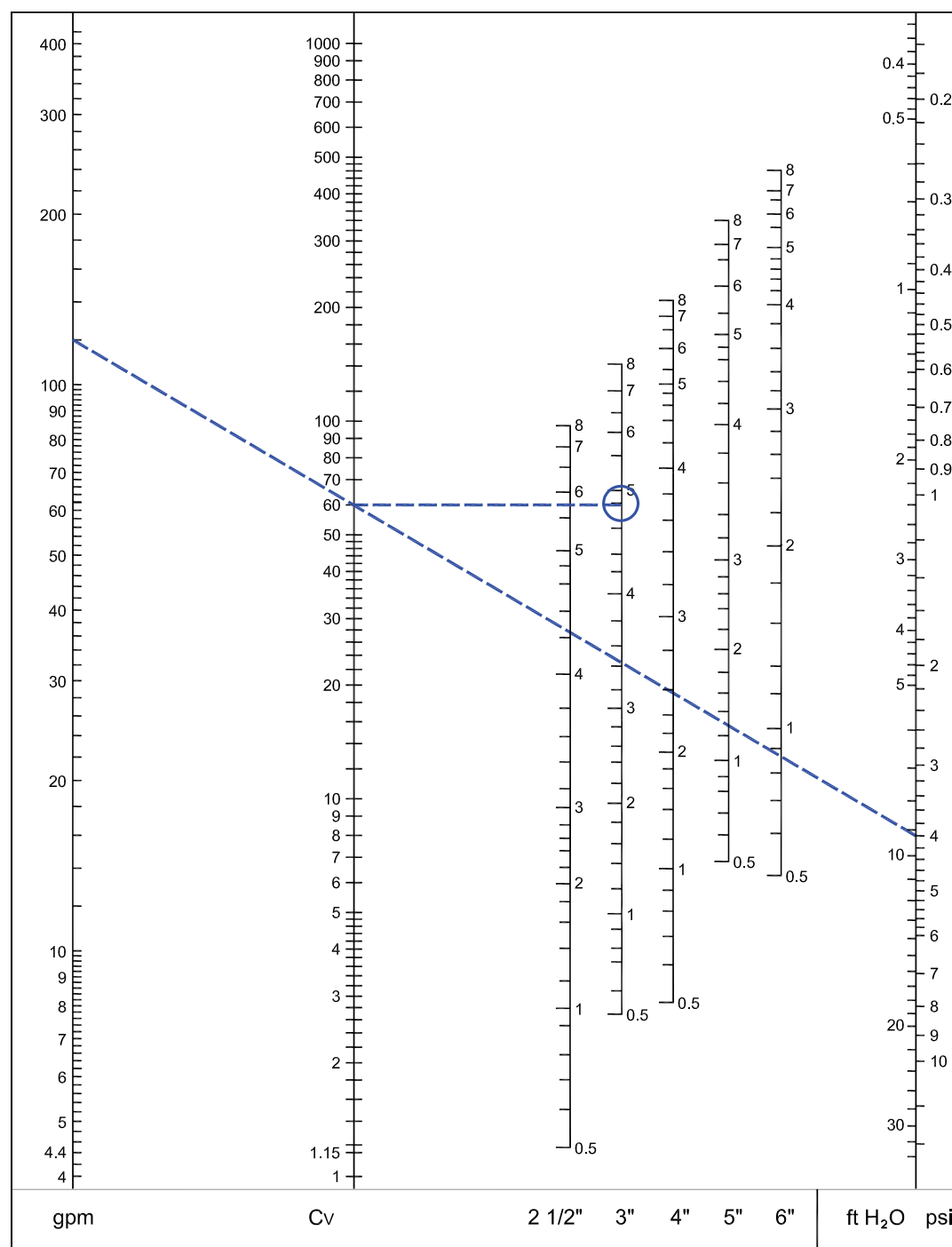
If the flow rate falls outside the scale in the diagram, the reading can be made as follows: Starting with the example above, we get 1.4 psi, $C_v = 6$ and flowrate 7 gpm. At 1.4 psi and $C_v = 0.6$ we get the flow-rate 0.7 gpm, and at $C_v = 60$, we get 70 gpm. That is, for a given pressure drop, it is possible to read 0.1 times or 10 times the flow and C_v -values.

Diagram size 3/4" - 2"



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

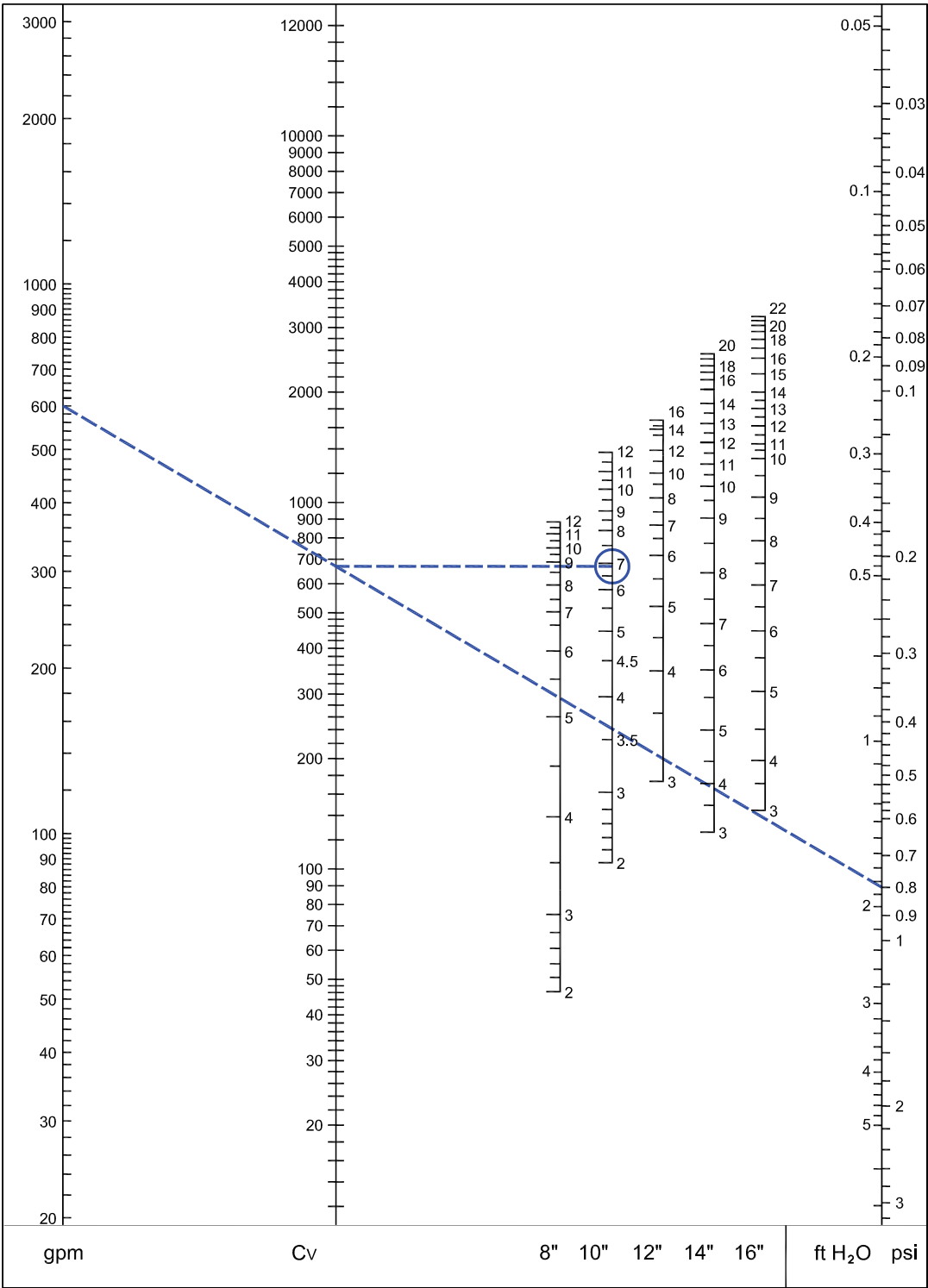
Diagram size 2 1/2" - 6"



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

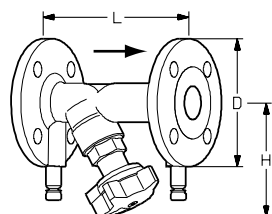
NOTE: In softwares (HySelect, HyTools) and balancing instrument (TA-SCOPE) the STAF-SG, sizes 2 1/2" - 6", is named STAF-SG*.

Diagram size 8” - 16”



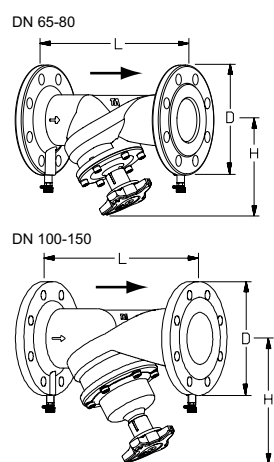
Recommended area: See Fig. 3 under “Measuring accuracy”.

Articles



Threaded bonnet

Size	Number of bolt holes	L [in]	H [in]	D [in]	Cvs	lb	Article No ** North America	Article No International
3/4"	4	5.91	3.94	4.13	6.61	5.1	-	52 182-920
1"	4	6.30	4.29	4.53	10.1	6.4	-	52 182-925
1 1/4"	4	7.09	4.37	5.51	16.5	9.5	-	52 182-932
1 1/2"	4	7.87	4.80	5.91	22.3	11.5	-	52 182-940
2"	4	9.06	4.80	6.50	38.3	15	-	52 182-950



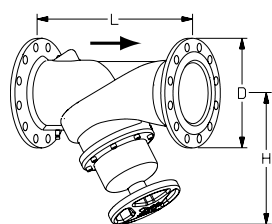
Bolted bonnet

Spindle extension for sizes 2 1/2" - 6" is included.

Size	Number of bolt holes	L [in]	H [in]	H ¹⁾ [in]	D [in]	Cvs	lb	Article No ** North America	Article No International
2 1/2"	4	11.42	6.42	8.78	7.09	98.3	22.0	52 172-965	52 187-965
3"	4	12.20	6.77	9.13	7.48	142	37.3	52 172-980	52 187-980
4"	8	13.78	8.78	11.14	9.06	214	39.5	52 172-990	52 187-990
5"	8	15.75	10.20	12.56	10.04	340	56.2	52 172-991	52 187-991
6"	8	18.90	10.75	13.11	11.02	462	77.2	52 172-992	52 187-992

1) Height with spindle extension

NOTE: In softwares (HySelect, HyTools) and balancing instrument (TA-SCOPE) the STAF-SG, sizes 2 1/2" - 6", is named STAF-SG*.



Bolted bonnet

Measuring points on body

Size	Number of bolt holes	L [in]	H [in]	D [in]	Cvs	lb	Article No ** North America	Article No International
8"	8	23.62	16.93	13.58	887	167.5	52 167-993	52 182-993
10"	12	28.74	16.54	15.98	1375	269.0	52 167-994	52 182-994
12"	12	33.46	18.90	19.02	1682	359.4	52 167-995	52 182-995
14" *	12	38.58	23.03	20.98	2552	654.8	52 182-996 *	52 182-996 *
16" *	16	43.31	25.20	23.50	3225	895.1	52 182-997 *	52 182-997 *

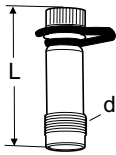
*) **NOTE:** Not CE marked products. Not allowed to be installed in EU or EFTA countries.

**) Distributed by Victaulic.

→ = Flow direction

Cvs = gpm at a pressure drop of 1 psi and fully open valve.

Accessories



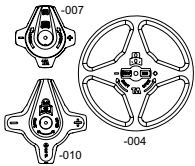
Measuring point
AMETAL®/EPDM

d	L [in]	Article No
Size 3/4" - 2"		
R1/4	1.535	52 179-009
R1/4	4.055	52 179-609
Size 2 1/2" - 16"		
R3/8	1.772	52 179-008
R3/8	3.976	52 179-608



Measuring point, extension 2.36 in.
(not for 52 179-000/-601)
Can be installed without draining of the system.
AMETAL®/Stainless steel/EPDM

Article No
52 179-006



Handwheel

Size	Article No
3/4" - 2"	52 186-007
2 1/2" - 6"	52 186-010
8" - 16"	52 186-004



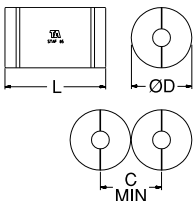
Identification tag

Article No
52 161-990



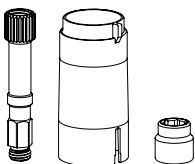
Allen key
For locking of setting.

[mm]	For size	Article No
3	3/4" - 6"	52 187-103
5	8" - 16"	52 187-105



Insulation
For heating/cooling
CFC-free polyurethane. Covered with grey PVC.
See catalogue leaflet "Prefab insulations" for complete details.

For size	L [in]	D [in]	C [in]	Article No
2"	15.4	9.84	9.91	52 189-850
2 1/2"	17.7	10.6	10.7	52 189-865
3"	18.9	11.4	11.5	52 189-880
4"	20.5	12.6	12.7	52 189-890
5"	22.4	13.8	13.9	52 189-891
6"	26.0	15.0	15.0	52 189-892



Spindle extension
Spare part.
Included in valve sizes 2 1/2" - 6".
Needed on sizes 2 1/2" - 6" when using TA prefab insulations (52 189-8xx).

For size	Article No
2 1/2" - 6"	52 186-015

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