STS, STAM, STA, STAD, STADA, STA-DR

5-5-10

Balancing valves

2001.04

General

Draining optional
Valves with draining for 1/2" or 3/4" hose connection.
Valves without draining have a sleeve. This sleeve can temporarily be removed and a draining kit is fitted, which is available as an accessory. (Not for STA-DR).

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

STA-DR valves for renovation
Frequently, valves of the same dimension as the pipes are installed, and this may cause settings in the lower range. For the same pipe size, an STA-DR renovation valve (with a reduced Kv) gives a larger valve opening and thus improved flow accuracy.

Prefab instulation
See catalogue leaflet under section 5.

Technical description

Application:
Heating- and cooling systems.
Tap water systems.

Functions:
STS
Shut-off, draining (optional).
STAM
Flow measuring, pressure reading, shut-off, draining (optional).
STA
Pre-setting of flow, shut-off, draining (optional).
STAD, STADA, STA-DR
Pre-setting of flow, flow measuring, pressure reading, shut-off, draining (optional).

Pressure class:
PN 20

Temperature:
Max. working temperature: 120°C
For higher temperatures (max.150°C), contact TA.
Min. working temperature: -20°C

Material:
The valves are made of AMETAL®.
Seat seal: Stem with EPDM O-ring
Spindle seal: EPDM O-ring
Handwheel: Polyamide

AMETAL® is the dezincification resistant alloy of TA Hydronics.

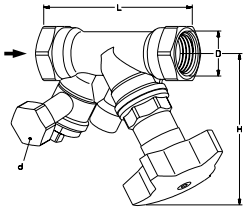
Marking:
Body: PN 20/150, DN and inch size.
Handwheel: Valve type and DN.

Approvals:
STA (52 150-0XX) and STAD (52 151-0XX) are WRc approved for tap water systems. WRc No. 9602029.

5

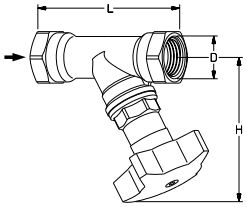
STS: Shut-off, draining

With draining



TA No	TA No	DN	D**	L	H	Kvs
d = 1/2	**d = 3/4**					
52 149-215*	52 149-615*	15	G1/2	90	100	4,4
52 149-220*	52 149-620*	20	G3/4	97	100	6,8
52 149-225	52 149-625	25	G1	110	105	9,8
52 149-232	52 149-632	32	G1 1/4	124	110	18,3
52 149-240	52 149-640	40	G1 1/2	130	120	25,4
52 149-250	52 149-650	50	G2	155	120	42,4

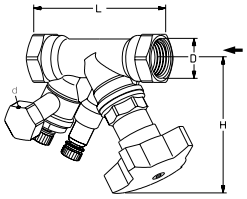
Excl. draining



TA No	DN	D**	L	H	Kvs
52 149-015*	15	G1/2	90	100	4,4
52 149-020*	20	G3/4	97	100	6,8
52 149-025	25	G1	110	105	9,8
52 149-032	32	G1 1/4	124	110	18,3
52 149-040	40	G1 1/2	130	120	25,4
52 149-050	50	G2	155	120	42,4

STAM: Flow measuring, pressure reading, shut off, draining

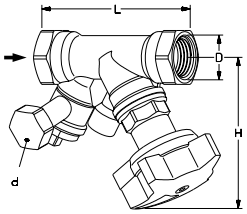
With draining



TA No	TA No	DN	D**	L	H	Kvs
d = 1/2	**d = 3/4**					
52 149-315*	52 149-815*	15	G1/2	90	100	4,01
52 149-320*	52 149-820*	20	G3/4	97	100	5,95
52 149-325	52 149-825	25	G1	110	105	8,26
52 149-332	52 149-832	32	G1 1/4	124	110	14,6
52 149-340	52 149-840	40	G1 1/2	130	120	20,7
52 149-350	52 149-850	50	G2	155	120	32,9

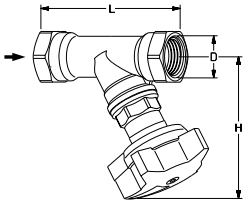
STA: Pre-setting of flow, shut-off, draining

With draining



TA No	TA No	DN	D**	L	H	Kvs
d = 1/2	**d = 3/4**					
52 150-214*	52 150-614*	15/14	G1/2	90	100	2,52
52 150-220*	52 150-620*	20	G3/4	97	100	5,70
52 150-225	52 150-625	25	G1	110	105	8,70
52 150-232	52 150-632	32	G1 1/4	124	110	14,2
52 150-240	52 150-640	40	G1 1/2	130	120	19,2
52 150-250	52 150-650	50	G2	155	120	33,0

Excl. draining



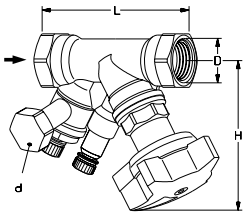
TA No	DN	D**	L	H	Kvs
52 150-314*	15	G1/2	90	100	2,52
52 150-320*	20	G3/4	97	100	5,70
52 150-325	25	G1	110	105	8,70
52 150-332	32	G1 1/4	124	110	14,2
52 150-340	40	G1 1/2	130	120	19,2
52 150-350	50	G2	155	120	33,0

= Flow direction

Kvs = m^3/h at a pressure drop of 1 bar and fully open valve.
*) Can be connected to smooth tubes by KOMBI compression coupling
**) Pipe thread according to ISO7/1

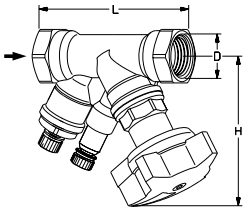
STAD: Pre-setting of flow, flow measuring and pressure reading, shut-off, draining

With draining



TA No	TA No	DN	D**	L	H	Kvs
d = 1/2	**d = 3/4**					
52 151-209*	52 151-609*	10/09	G3/8	83	100	1,47
52 151-214*	52 151-614*	15/14	G1/2	90	100	2,52
52 151-220*	52 151-620*	20	G3/4	97	100	5,70
52 151-225	52 151-625	25	G1	110	105	8,70
52 151-232	52 151-632	32	G1 1/4	124	110	14,2
52 151-240	52 151-640	40	G1 1/2	130	120	19,2
52 151-250	52 151-650	50	G2	155	120	33,0

Excl. draining

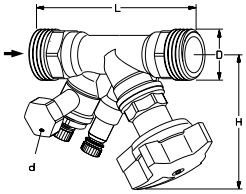


TA No	DN	D**	L	H	Kvs
52 151-009*	10/09	G3/8	83	100	1,47
52 151-014*	15/14	G1/2	90	100	2,52
52 151-020*	20	G3/4	97	100	5,70
52 151-025	25	G1	110	105	8,70
52 151-032	32	G1 1/4	124	110	14,2
52 151-040	40	G1 1/2	130	120	19,2
52 151-050	50	G2	155	120	33,0

Draining can be installed during operation

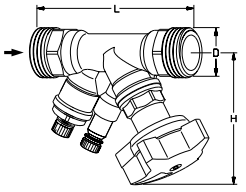
STADA: Functions as for STAD. With male thread for connection sets.

With draining



TA No	TA No	DN	D***	L	H	Kvs
d = 1/2	**d = 3/4**					
52 152-209	52 152-609	10/09	G1/2	105	100	1,47
52 152-214	52 152-614	15/14	G3/4	114	100	2,52
52 152-220	52 152-620	20	G1	125	100	5,70
52 152-225	52 152-625	25	G1 1/4	142	105	8,70
52 152-232	52 152-632	32	G1 1/2	160	110	14,2
52 152-240	52 152-640	40	G2	170	120	19,2
52 152-250	52 152-650	50	G2 1/2	200	120	33,0

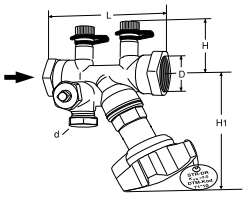
Excl. draining



TA No	DN	D***	L	H	Kvs
52 152-009	10/09	G1/2	105	100	1,47
52 152-014	15/14	G3/4	114	100	2,52
52 152-020	20	G1	125	100	5,70
52 152-025	25	G1 1/4	142	105	8,70
52 152-032	32	G1 1/2	160	110	14,2
52 152-040	40	G2	170	120	19,2
52 152-050	50	G2 1/2	200	120	33,0

Draining can be installed during operation

STA-DR: Functions as for STAD. Reduced Kv.



TA No	TA No	DN	D**	L	H	H1	Kvs
d = 1/2	**d = 3/4**						
52 173-015*	52 173-615*	15	G1/2	94	50	92	2,0
52 173-020*	52 173-620*	20	G3/4	104	50	92	2,0
52 173-025	52 173-625	25	G1	104	53	94	4,01

= Flow direction

Kvs = m^3/h at a pressure drop of 1 bar and fully open valve.
*) Can be connected to smooth tubes by KOMBI compression coupling
**) Pipe thread according to ISO7/1
***) Pipe thread according to DIN 3546

Pre-setting STA, STAD, STADA

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 2.3 turns (Fig. 2).

3. Using a 3 mm Allen key, turn the inner spindle clockwise until stop.

4. The valve is now pre-set.

To check the pre-setting: Close the valve, the indicator shows 0.0. Open it to the stop position. The indicator then shows the pre-setting value, in this case 2.3 (Fig. 2).
Diagrams showing the pressure drop for each valve size at different settings and flow rates are available to help determine the correct valve size and pre-setting (pressure drop). Four turns corresponds to fully opened valve (see Fig. 3). Opening it further will not increase the capacity.

Fig. 1. Valve closed

Fig. 2 The valve is preset 2.3

Fig. 3. Fully open valve

Measuring accuracy

The zero position is calibrated and must not be changed.

Deviation concerning flow at different pre-setting
The curve (Fig. 4) is valid for valves with normal pipe fittings* (Fig. 5). Try also to avoid mounting taps and pumps, immediately before the valve.

STAM: Flow variations at the four different settings are less than ±7%.
This applies for valves fitted to operate in their specified direction of flow, with normal pipe connections.

Fig. 4

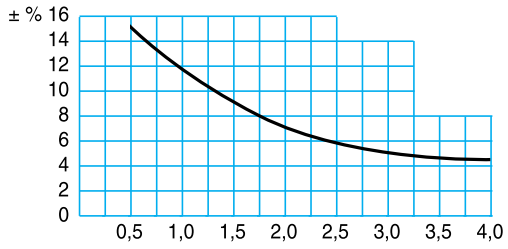
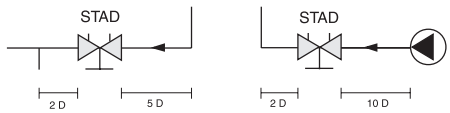


Fig. 5



*) The valve can be installed with the opposite flow direction. The specified flow details also valid for this direction although tolerances can be greater (maximum 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 CBI[II].

Sizing a balancing valve

When Δp and the design flow are known, use the formula to calculate the Kv-value or graph on page 6.

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

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

Support material

Computer programs
TA Select: Makes it easy to choose the right balancing valves by taking into account the desired flow, pressure drop and flow rate. Avaliable on the CD-catalogue or Internet: www.tahydronics.com

Measuring instruments
Use the 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. See Section 7 for further information on 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.

Balancing
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

The values below or the diagram on page 6 may be used when calculating a piping system.

DN / Turns	STA-DR		STA, STAD, STADA							STAM					
	15, 20	25	10/09	15/14	20	25	32	40	50	15	20	25	32	40	50
0.5	-	0.210	-	0.127	0.511	0.60	1.14	1.75	2.56	-	-	-	-	-	-
1	0.107	0.361	0.090	0.212	0.757	1.03	1.90	3.30	4.20	0,36	2,19	3,07	4,45	6,92	9,49
1.5	0.172	0.520	0.137	0.314	1.19	2.10	3.10	4.60	7.20	-	-	-	-	-	-
2	0.362	1.02	0.260	0.571	1.90	3.62	4.66	6.10	11.7	1,02	4,13	5,82	9,75	13,4	18,4
2.5	0.645	1.85	0.480	0.877	2.80	5.30	7.10	8.80	16.2	-	-	-	-	-	-
3	1.16	3.00	0.826	1.38	3.87	6.90	9.50	12.6	21.5	3,00	5,15	7,51	12,9	18,2	26,2
3.5	1.78	3.70	1.26	1.98	4.75	8.00	11.8	16.0	26.5	-	-	-	-	-	-
4	2.00	4.01	1.47	2.52	5.70	8.70	14.2	19.2	33.0	4,01	5,95	8,26	14,6	20,7	32,9

Example

Wanted:
Presetting for DN 25 at a desired flow rate of 1,6 m^3/h and a pressure drop of 10 kPa.

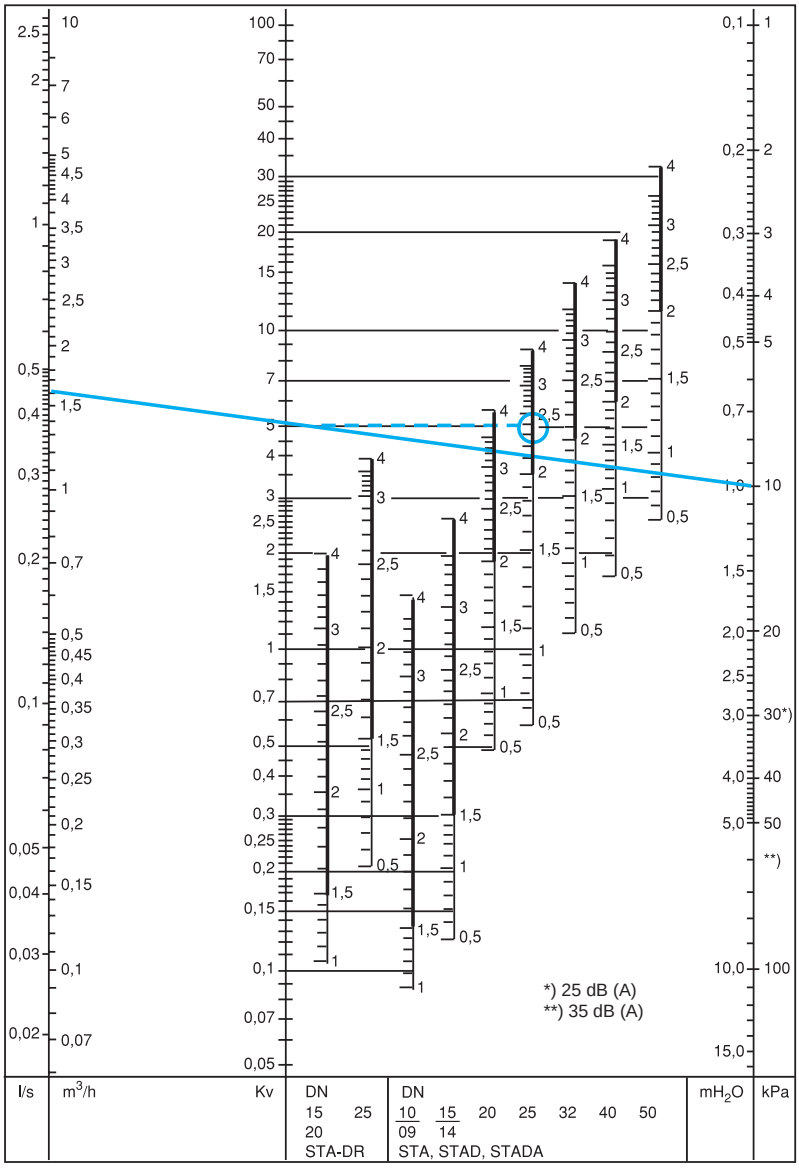
Solution:
Draw a straight line joining 1,6 m^3/h and 10 kPa. This gives Kv=5. Now draw a horizontal line from Kv=5.
This intersects the bar for DN 25 which gives 2,35 turns.

NOTE:
If the flow rate is out of the scale in the diagram, the reading can be made as follows: Starting with the example above, we get 10 kPa, Kv=5 and flow-rate 1.6 m^3/h. At 10 kPa and Kv=0,5 we get the flow-rate 0,16 m^3/h, and at Kv=50, we get 16 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

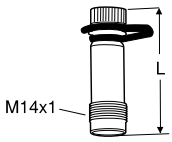
This graph shows the pressure drop over the pressure test point of the valve.
A straight line connecting the bars for flow rate, Kv and pressure drop shows the relationship between these variables.

The position for each valve size is arrived at by drawing a horizontal line from the Kv value obtained.



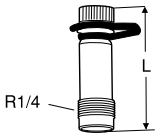
Accessories

STAM, STAD, STADA
Measuring points
Max 120°C (intermittent 150°C)



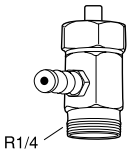
TA No	L
52 179-014	44 mm

STA-DR
Measuring points
max 120°C (Intermittent 150°C)



TA No	L
52 179-009	30 mm
52 179-609	90 mm

STA-DR
Measuring points
max 180°C
+ older STAD et STAF

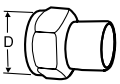


TA No	L
52 179-000	30 mm
52 179-601	90 mm

STAM, STAD, STADA, STA-DR
Measuring points, extensions 60 mm
(not for 52 179-00/-601)
Can be installed without draining of the system.

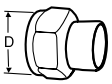
TA No
52 179-006

STADA
Welding connection
max 120°C



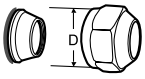
TA No	Valve DN	Thread D	Pipe DN
52 009-010	10	G1/2	10
52 009-015	15	G3/4	15
52 009-020	20	G1	20
52 009-025	25	G1 1/4	25
52 009-032	32	G2	32
52 009-040	40	G2	40
52 009-050	50	G2 1/2	50

STADA
Soldering connection
max 120°C



TA No	Valve DN	Thread D	Pipe Ø
52 009-510	10	G1/2	10
52 009-512	10	G1/2	12
52 009-515	15	G3/4	15
52 009-516	15	G3/4	16
52 009-518	20	G1	18
52 009-522	20	G1	22
52 009-528	25	G1 1/4	28
52 009-535	32	G1 1/2	35
52 009-542	40	G2	42
52 009-554	50	G2 1/2	54

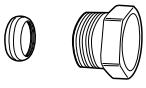
STADA
Compression connection
max 100°C



TA No	Valve DN	Thread D	Pipe Ø
53 319-208	10	G1/2	8
53 319-210	10	G1/2	10
53 319-212	10	G1/2	12
53 319-215	10	G1/2	15
53 319-216	10	G1/2	16
53 719-615	15	G3/4	15
53 719-618	15	G3/4	18
53 719-622	15	G3/4	22
53 719-922	20	G1	22
53 719-928	20	G1	28

Support bushes shall be used, for more information see FPL-catalogue leaflet.

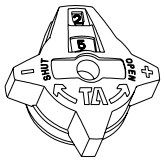
STS, STAM, STA, STAD, STA-DR



KOMBI compression connection
See catalogue leaflet under section 4.

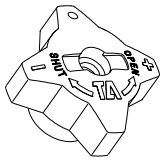
5

STA, STAD, STA-DR, STADA
Handwheel, complete
max 120°C



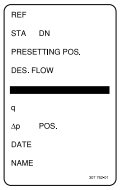
TA No
52 186-003

STS, STAM
Handwheel complete
Max 120°C



TA No
52 186-005

Identification tag
(incl 1 pc per valve)

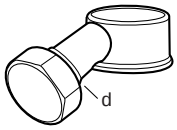


TA no
52 161 -990

Allen key

TA No		
52 187-103	3 mm	Presetting
52 187-105	5 mm	Draining

STS, STA, STAD, STADA
Draining kit
Can be installed during operation



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TA Hydronics retains the right to make changes to its products and specifications without prior notice.