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

5-5-10

Balancing valves

2004.10

General

Draining optional
Valves with draining for G1/2 or G3/4 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 STAD-C and STA-DR).

Measuring points
Measuring points are self-sealed. Remove the cap and insert the probe through the seal.
The measuring points on the STAD-C are double-secured.

STA-DR valves for renovation
In older plants, the pipes are generally oversized which gives unnecessary low settings if one installs valves with the same size as the pipes. STA-DR renovation valve has a reduced Kv and gives, for the same pipe size, bigger settings and thus higher accuracy.

Prefab instulation
See catalogue leaflet Prefab insulations.

Technical description

Application:
Heating and cooling systems
Tapwater systems

Functions:

	STAD/ STADA/ STA-DR	STAD-C	STA	STAM	STS
Balancing	x	x			
Pre-setting	x	x	x		
Measuring	x	x		x	
Shut-off	x	x	x	x	x
Draining (optional)	x		x	x	x

Pressure class:
PN 20

Temperature:
Max. working temperature:
STAD, STADA, STA-DR, STA, STAM, STS: 120°C.
(For higher temperatures max. 150°C, please contact closest sales office).
STAD-C: 150°C (At temperatures higher than 120°C, the handwheel should be removed.)
Min. working temperature: -20°C

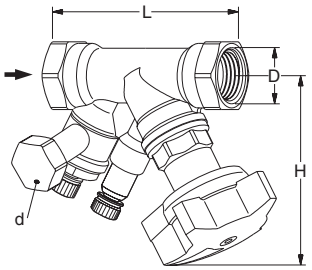
Material:
The valves are made of AMETAL®.
Seat seal: Stem with EPDM O-ring
Spindle seal: EPDM O-ring
Handwheel: Polyamide

AMETAL® is the dezincification resistant alloy of TA.

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

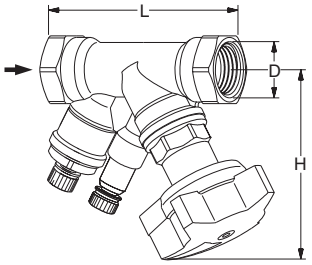
STAD: Balancing, pre-setting, measuring, shut-off, draining (optional)

With draining



TA No	TA No	DN	D**	L	H	Kvs
d = G1/2	**d = G3/4**					
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

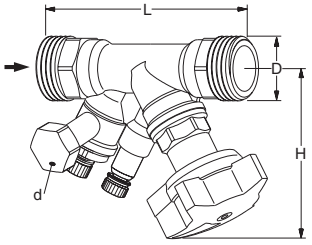
➡ = Flow direction

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

*) Can be connected to smooth pipes by KOMBI compression coupling. See catalogue leaflet KOMBI under section Couplings.
**) Thread length according to ISO7/1

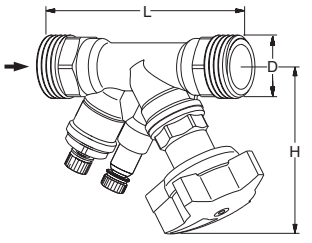
STADA: Balancing, pre-setting, measuring, shut-off, draining (optional)

With draining



TA No	TA No	DN	D***	L	H	Kvs
d = G1/2	**d = G3/4**					
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

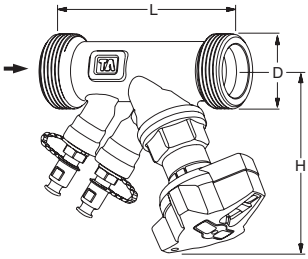
➡ = Flow direction

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

***) Thread length according to DIN 3546.

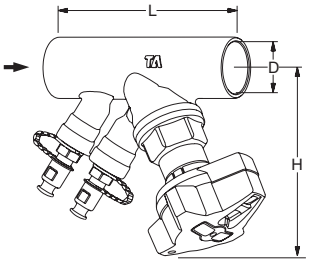
STAD-C: Balancing, pre-setting, measuring, shut-off. Double-secured measuring points

Excl. draining
Male thread



TA No	DN	D***	L	H	Kvs
52 156-014	15/14	G3/4	90	100	2,52
52 156-020	20	G1	100	100	5,70
52 156-025	25	G1 1/4	115	105	8,70
52 156-032	32	G1 1/2	134	110	14,2
52 156-040	40	G2	150	120	19,2
52 156-050	50	G2 1/2	168	120	33,0

Excl. draining
Soldering ends



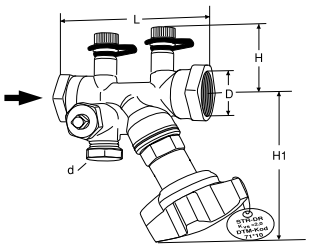
TA No	DN	D	L	H	Kvs
52 153-014	15/14	15	90	100	2,52
52 153-020	20	22	91	100	5,70
52 153-025	25	28	110	105	8,70
52 153-032	32	35	124	110	14,2
52 153-040	40	42	130	120	19,2
52 153-050	50	54	155	120	33,0

➡ = Flow direction

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

***) Thread length according to DIN 3546.

STA-DR: Balancing, pre-setting, measuring, shut-off, draining (optional). Reduced Kv



TA No	TA No	DN	D**	L	H	H1	Kvs
d = G1/2	**d = G3/4**						
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

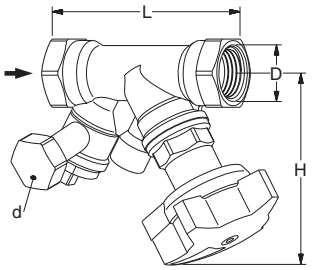
➡ = Flow direction

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

*) Can be connected to smooth pipes by KOMBI compression coupling. See catalogue leaflet KOMBI under section Couplings.
**) Thread length according to ISO7/1

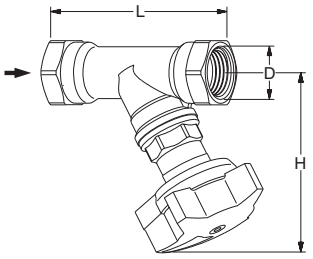
STA: Pre-setting, shut-off, draining (optional)

With draining



TA No	TA No	DN	D**	L	H	Kvs
d = G1/2	**d = G3/4**					
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

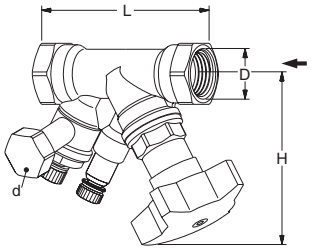
= Flow direction

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

*) Can be connected to smooth pipes by KOMBI compression coupling. See catalogue leaflet KOMBI under section Couplings.
**) Thread length according to ISO7/1

STAM: Measuring, shut-off, draining (optional)

With draining



TA No	TA No	DN	D**	L	H	Kvs
d = G1/2	**d = G3/4**					
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

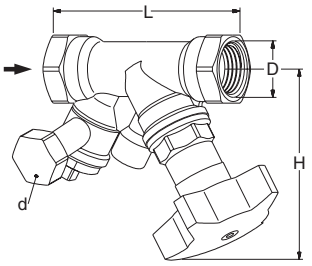
= Flow direction

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

*) Can be connected to smooth pipes by KOMBI compression coupling. See catalogue leaflet KOMBI under section Couplings.
**) Thread length according to ISO7/1

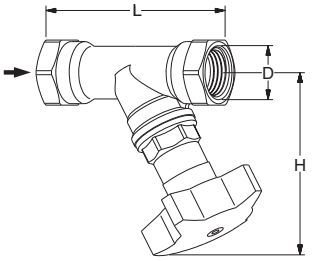
STS: Shut-off, draining

With draining



TA No	TA No	DN	D**	L	H	Kvs
d = G1/2	**d = G3/4**					
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

= Flow direction

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

*) Can be connected to smooth pipes by KOMBI compression coupling. See catalogue leaflet KOMBI under section Couplings.
**) Thread length according to ISO7/1

Setting STAD, STADA, STAD-C, STA

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 set.

To check the setting: Close the valve, the indicator shows 0.0. Open it to the stop position. The indicator then shows the set 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 set at 2.3

Fig. 3.
Fully open valve

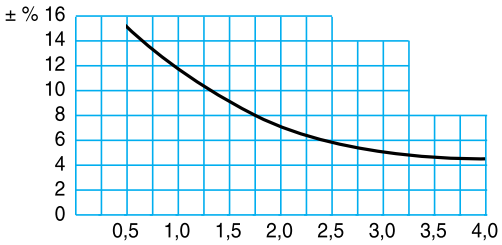
Measuring accuracy

The zero position is calibrated and must not be changed.

Deviation of flow at different settings
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.

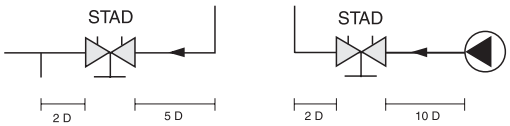
STAM: Flow variations at the four different settings are less than ±7%.
This applies for valves fitted to operate in their specified direction of flow, with normal pipe connections.

Fig 4



Setting, No. of turns.

Fig 5



*) The valve can be installed with the opposite flow direction. The specified flow details also are 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 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

STAD, STADA, STAD-C, STA

Turns	DN 10/09	DN 15/14	DN 20	DN 25	DN 32	DN 40	DN 50
0.5	-	0.127	0.511	0.60	1.14	1.75	2.56
1	0.090	0.212	0.757	1.03	1.90	3.30	4.20
1.5	0.137	0.314	1.19	2.10	3.10	4.60	7.20
2	0.260	0.571	1.90	3.62	4.66	6.10	11.7
2.5	0.480	0.877	2.80	5.30	7.10	8.80	16.2
3	0.826	1.38	3.87	6.90	9.50	12.6	21.5
3.5	1.26	1.98	4.75	8.00	11.8	16.0	26.5
4	1.47	2.52	5.70	8.70	14.2	19.2	33.0

STA-DR

Turns	DN 15, 20	DN 25
0.5	-	0.210
1	0.107	0.361
1.5	0.172	0.520
2	0.362	1.02
2.5	0.645	1.85
3	1.16	3.00
3.5	1.78	3.70
4	2.00	4.01

STAM

Turns	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
1	0.36	2.19	3.07	4.45	6.92	9.49
2	1.02	4.13	5.82	9.75	13.4	18.4
3	3.00	5.15	7.51	12.9	18.2	26.2
4	4.01	5.95	8.26	14.6	20.7	32.9

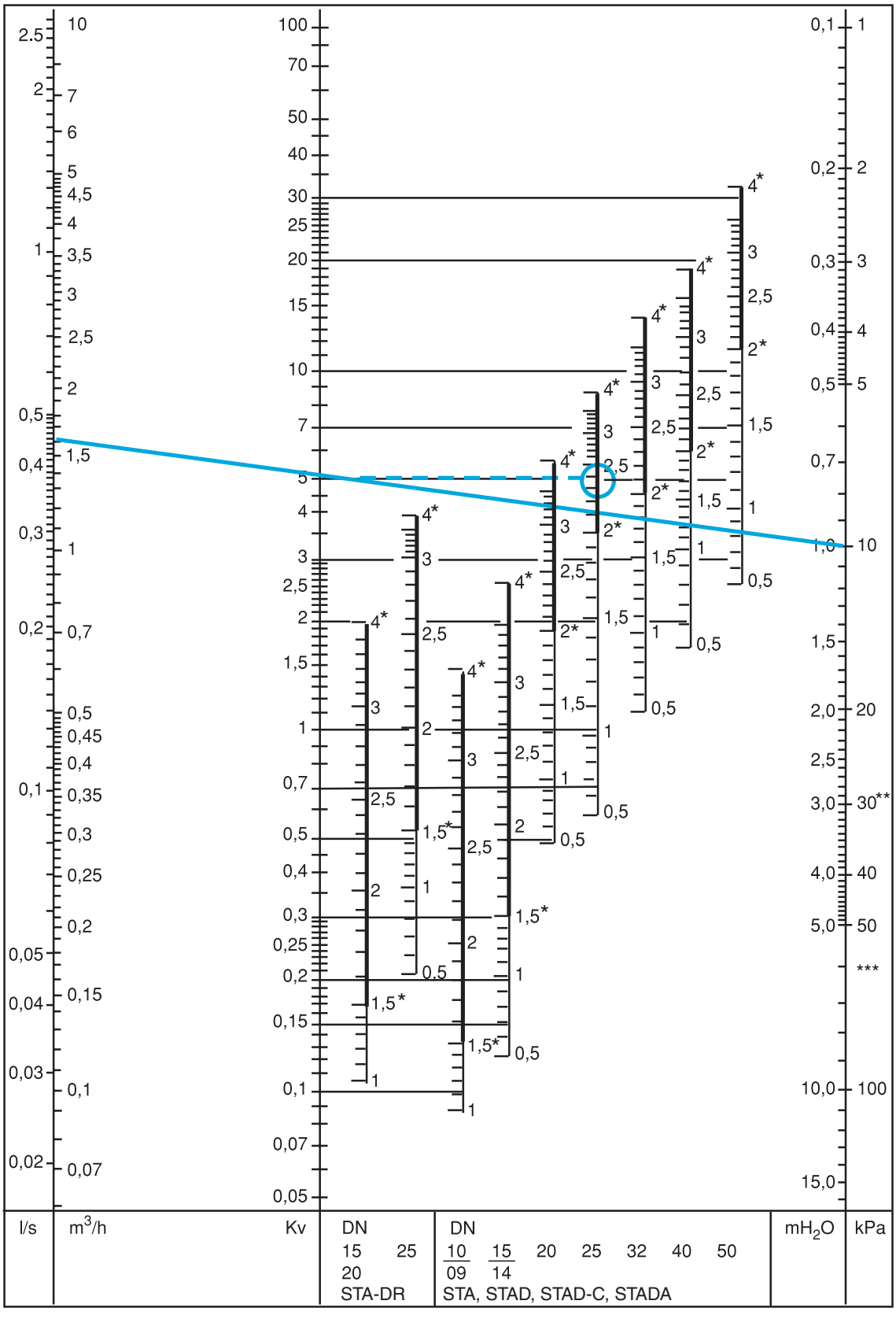
Example

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.

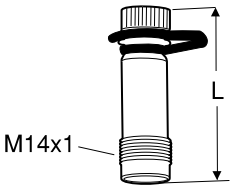
Diagram



*) Recommended area
**) 25 db (A)
***) 35 db (A)

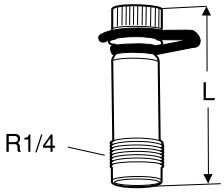
Accessories

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



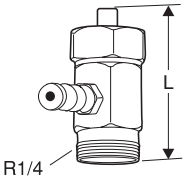
TA No	L
52 179-014	44

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



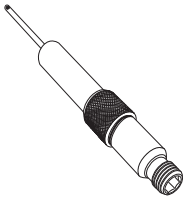
TA No	L
52 179-009	39
52 179-609	103

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



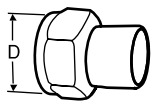
TA No	L
52 179-000	30
52 179-601	90

STAD, STADA, STA-DR, STAM
Measuring points, extensions 60 mm (not for 52 179-000/-601)
Can be installed without draining of the system.



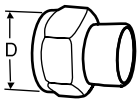
TA No
52 179-006

STADA, STAD-C
Welding connection
max 120°C



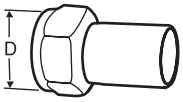
TA No	Valve DN	Thread D	Pipe DN
52 009-010	10	G1/2	10
52 009-015	15	G3/4	15
52 009-020	20	G1	20
52 009-025	25	G1 1/4	25
52 009-032	32	G1 1/2	32
52 009-040	40	G2	40
52 009-050	50	G2 1/2	50

STADA, STAD-C
Soldering connection
max 120°C



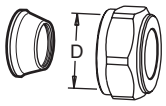
TA No	Valve DN	Thread D	Pipe Ø
52 009-510	10	G1/2	10
52 009-512	10	G1/2	12
52 009-515	15	G3/4	15
52 009-516	15	G3/4	16
52 009-518	20	G1	18
52 009-522	20	G1	22
52 009-528	25	G1 1/4	28
52 009-535	32	G1 1/2	35
52 009-542	40	G2	42
52 009-554	50	G2 1/2	54

STADA, STAD-C
Connection with smooth end
For connection with press coupling
max 120°C



TA No	Valve DN	Thread D	Pipe DN
52 009-312	10	G1/2	12
52 009-315	15	G3/4	15
52 009-318	20	G1	18
52 009-322	20	G1	22
52 009-328	25	G1 1/4	28
52 009-335	32	G1 1/2	35
52 009-342	40	G2	42
52 009-354	50	G2 1/2	54

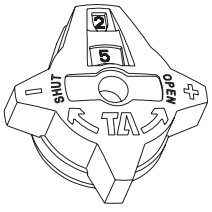
STADA, STAD-C
Compression connection
max 100°C



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
53 319-615	15	G3/4	15
53 319-618	15	G3/4	18
53 319-622	15	G3/4	22
53 319-922	20	G1	22
53 319-928	20	G1	28

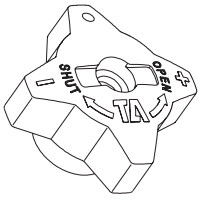
Support bushes shall be used, for more information see FPL, FPL-PX catalogue leaflet.

STAD, STADA, STAD-C, STA-DR, STA
Handwheel, complete



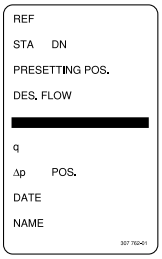
TA No
52 186-003

STAM, STS
Handwheel complete



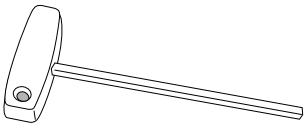
TA No
52 186-005

Identification tag
Incl 1 pc per valve



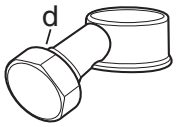
TA no
52 161-990

Allen key



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

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



TA No	d
52 179-990	G1/2
52 179-996	G3/4