

## 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, STA-DR, STA and STS).

### 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 insulation

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. **NOTE!** DN 25-50 with smooth ends max working temperature 120°C).  
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  
*Smooth ends:*  
Nipple: AMETAL®  
Sealing (DN 25-50): EPDM O-ring

AMETAL® is the dezincification resistant alloy of TA.

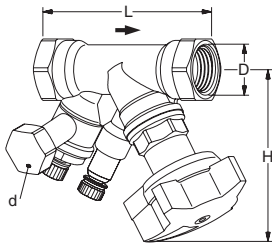
### Marking:

Body: TA, PN 20/150, DN, inch size and flow direction arrow.  
Handwheel: Valve type and DN.

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

### Female threads

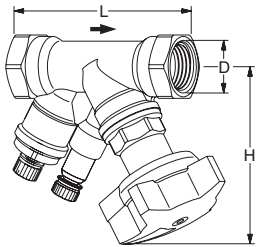
Thread length according to ISO7/1  
With draining



TA No	TA No	DN	D	L	H	Kvs	Kg
<b>d = G1/2</b>		<b>d = G3/4</b>					
52 151-209*	52 151-609*	10/09	G3/8	83	100	1,47	0,65
52 151-214*	52 151-614*	15/14	G1/2	90	100	2,52	0,68
52 151-220*	52 151-620*	20	G3/4	97	100	5,70	0,77
52 151-225	52 151-625	25	G1	110	105	8,70	0,93
52 151-232	52 151-632	32	G1 1/4	124	110	14,2	1,3
52 151-240	52 151-640	40	G1 1/2	130	120	19,2	1,6
52 151-250	52 151-650	50	G2	155	120	33,0	2,4

### Female threads

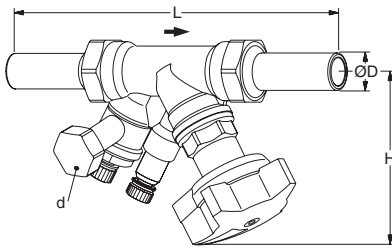
Thread length according to ISO7/1  
Excl. draining (can be installed during operation)



TA No	DN	D	L	H	Kvs	Kg
52 151-009*	10/09	G3/8	83	100	1,47	0,58
52 151-014*	15/14	G1/2	90	100	2,52	0,62
52 151-020*	20	G3/4	97	100	5,70	0,72
52 151-025	25	G1	110	105	8,70	0,88
52 151-032	32	G1 1/4	124	110	14,2	1,2
52 151-040	40	G1 1/2	130	120	19,2	1,4
52 151-050	50	G2	155	120	33,0	2,3

### Smooth ends

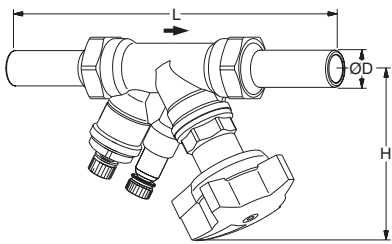
With draining



TA No	TA No	DN	D	L	H	Kvs	Kg
<b>d = G1/2</b>		<b>d = G3/4</b>					
52 451-209	52 451-609	10/09	12	141	100	1,47	0,71
52 451-214	52 451-614	15/14	15	154	100	2,52	0,78
52 451-220	52 451-620	20	22	179	100	5,70	0,93
52 451-225	52 451-625	25	28	208	105	8,70	1,2
52 451-232	52 451-632	32	35	233	110	14,2	1,7
52 451-240	52 451-640	40	42	260	120	19,2	2,1
52 451-250	52 451-650	50	54	305	120	33,0	3,2

### Smooth ends

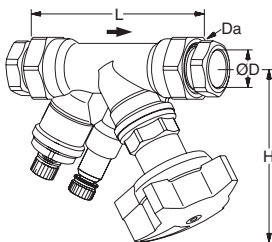
Excl. draining (can be installed during operation)



TA No	DN	D	L	H	Kvs	Kg
52 451-009	10/09	12	141	100	1,47	0,64
52 451-014	15/14	15	154	100	2,52	0,72
52 451-020	20	22	179	100	5,70	0,88
52 451-025	25	28	208	105	8,70	1,1
52 451-032	32	35	233	110	14,2	1,6
52 451-040	40	42	260	120	19,2	1,9
52 451-050	50	54	305	120	33,0	3,1

### With KOMBI compression couplings (not mounted)

Excl. draining (can be installed during operation)



TA No	DN	Da	D	L	H	Kvs	Kg
52 151-314	15/14	G1/2	12 mm x 2 / 15 mm x 2	90	100	2,52	0,76
52 151-320	20	G3/4	18 mm x 2 / 22 mm x 2	97	100	5,70	0,96

→ = Flow direction

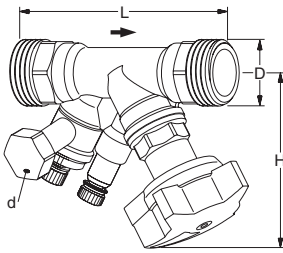
Kvs = m<sup>3</sup>/h at a pressure drop of 1 bar and fully open valve.

\*) Can be connected to smooth pipes by KOMBI compression coupling. See catalogue leaflet KOMBI under section Couplings.

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

### Male threads

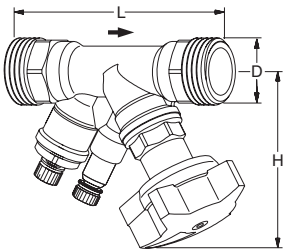
Thread length according to DIN 3546  
With draining



TA No	TA No	DN	D	L	H	Kvs	Kg
<b>d = G1/2</b>		<b>d = G3/4</b>					
52 152-209	52 152-609	10/09	G1/2	105	100	1,47	0,70
52 152-214	52 152-614	15/14	G3/4	114	100	2,52	0,73
52 152-220	52 152-620	20	G1	125	100	5,70	0,88
52 152-225	52 152-625	25	G1 1/4	142	105	8,70	1,2
52 152-232	52 152-632	32	G1 1/2	160	110	14,2	1,6
52 152-240	52 152-640	40	G2	170	120	19,2	2,2
52 152-250	52 152-650	50	G2 1/2	200	120	33,0	3,3

### Male threads

Thread length according to DIN 3546  
Excl. draining (can be installed during operation)



TA No	DN	D	L	H	Kvs	Kg
52 152-009	10/09	G1/2	105	100	1,47	0,61
52 152-014	15/14	G3/4	114	100	2,52	0,66
52 152-020	20	G1	125	100	5,70	0,81
52 152-025	25	G1 1/4	142	105	8,70	1,1
52 152-032	32	G1 1/2	160	110	14,2	1,5
52 152-040	40	G2	170	120	19,2	2,1
52 152-050	50	G2 1/2	200	120	33,0	3,2

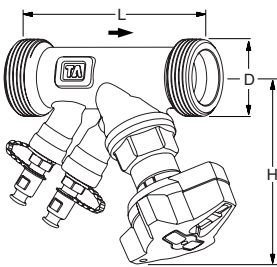
→ = Flow direction

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

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

### Male threads

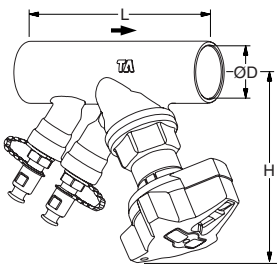
Thread length according to DIN 3546  
Excl. draining



TA No	DN	D	L	H	Kvs	Kg
52 156-014	15/14	G3/4	90	100	2,52	0,62
52 156-020	20	G1	100	100	5,70	0,72
52 156-025	25	G1 1/4	115	105	8,70	0,88
52 156-032	32	G1 1/2	134	110	14,2	1,2
52 156-040	40	G2	150	120	19,2	1,6
52 156-050	50	G2 1/2	168	120	33,0	2,3

### Soldering ends

Excl. draining



TA No	DN	D	L	H	Kvs	Kg
52 153-014	15/14	15	90	100	2,52	0,62
52 153-020	20	22	91	100	5,70	0,68
52 153-025	25	28	110	105	8,70	0,80
52 153-032	32	35	124	110	14,2	1,2
52 153-040	40	42	130	120	19,2	1,5
52 153-050	50	54	155	120	33,0	2,3

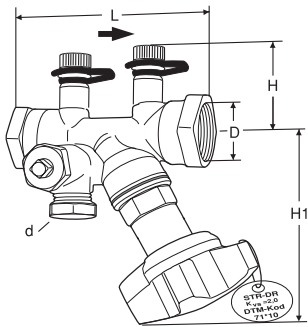
→ = Flow direction

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

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

**Female threads**

Thread length according to ISO7/1  
With draining



TA No	TA No	DN	D	L	H	H1	Kvs	Kg
<b>d = G1/2</b>		<b>d = G3/4</b>						
52 173-015*	52 173-615*	15	G1/2	94	50	92	2,0	0,70
52 173-020*	52 173-620*	20	G3/4	104	50	92	2,0	0,76
52 173-025	52 173-625	25	G1	104	53	94	4,01	0,86

→ = Flow direction

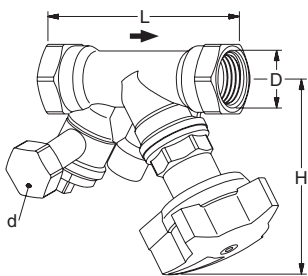
Kvs = m<sup>3</sup>/h at a pressure drop of 1 bar and fully open valve.

\*) Can be connected to smooth pipes by KOMBI compression coupling. See catalogue leaflet KOMBI under section Couplings.

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

**Female threads**

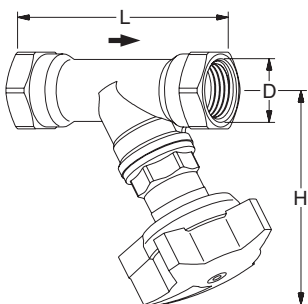
Thread length according to ISO7/1  
With draining



TA No	TA No	DN	D	L	H	Kvs	Kg
<b>d = G1/2</b>		<b>d = G3/4</b>					
52 150-214*	52 150-614*	15/14	G1/2	90	100	2,52	0,64
52 150-220*	52 150-620*	20	G3/4	97	100	5,70	0,71
52 150-225	52 150-625	25	G1	110	105	8,70	0,90
52 150-232	52 150-632	32	G1 1/4	124	110	14,2	1,2
52 150-240	52 150-640	40	G1 1/2	130	120	19,2	1,6
52 150-250	52 150-650	50	G2	155	120	33,0	2,2

**Female threads**

Thread length according to ISO7/1  
Excl. draining



TA No	DN	D	L	H	Kvs	Kg
52 150-314*	15/14	G1/2	90	100	2,52	0,45
52 150-320*	20	G3/4	97	100	5,70	0,52
52 150-325	25	G1	110	105	8,70	0,70
52 150-332	32	G1 1/4	124	110	14,2	1,0
52 150-340	40	G1 1/2	130	120	19,2	1,3
52 150-350	50	G2	155	120	33,0	2,0

→ = Flow direction

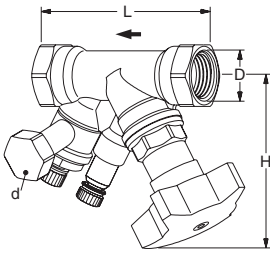
Kvs = m<sup>3</sup>/h at a pressure drop of 1 bar and fully open valve.

\*) Can be connected to smooth pipes by KOMBI compression coupling. See catalogue leaflet KOMBI under section Couplings.

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

### Female threads

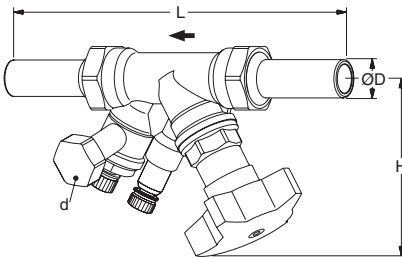
Thread length according to ISO7/1  
With draining



TA No	TA No	DN	D	L	H	Kvs	Kg
<b>d = G1/2</b>		<b>d = G3/4</b>					
52 149-315*	52 149-815*	15	G1/2	90	100	4,01	0,75
52 149-320*	52 149-820*	20	G3/4	97	100	5,95	0,82
52 149-325	52 149-825	25	G1	110	105	8,26	0,98
52 149-332	52 149-832	32	G1 1/4	124	110	14,6	1,3
52 149-340	52 149-840	40	G1 1/2	130	120	20,7	1,7
52 149-350	52 149-850	50	G2	155	120	32,9	2,3

### Smooth ends

With draining



TA No	TA No	DN	D	L	H	Kvs	Kg
<b>d = G1/2</b>		<b>d = G3/4</b>					
52 449-315	52 449-815	15	15	154	100	4,01	0,85
52 449-320	52 449-820	20	22	179	100	5,95	0,98
52 449-325	52 449-825	25	28	208	105	8,26	1,2
52 449-332	52 449-832	32	35	233	110	14,6	1,7
52 449-340	52 449-840	40	42	260	120	20,7	2,2
52 449-350	52 449-850	50	54	305	120	32,9	3,1

← = Flow direction

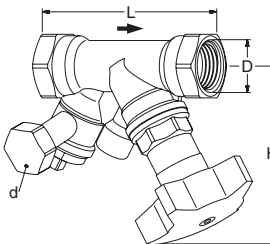
Kvs = m<sup>3</sup>/h at a pressure drop of 1 bar and fully open valve.

\*) Can be connected to smooth pipes by KOMBI compression coupling. See catalogue leaflet KOMBI under section Couplings.

## STS: Shut-off, draining

### Female threads

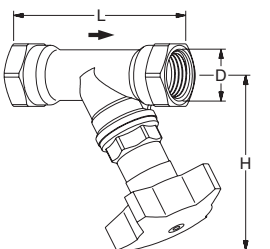
Thread length according to ISO7/1  
With draining



TA No	TA No	DN	D	L	H	Kvs	Kg
<b>d = G1/2</b>		<b>d = G3/4</b>					
52 149-215*	52 149-615*	15	G1/2	90	100	4,4	0,61
52 149-220*	52 149-620*	20	G3/4	97	100	6,8	0,69
52 149-225	52 149-625	25	G1	110	105	9,8	0,86
52 149-232	52 149-632	32	G1 1/4	124	110	18,3	1,2
52 149-240	52 149-640	40	G1 1/2	130	120	25,4	1,5
52 149-250	52 149-650	50	G2	155	120	42,4	2,2

### Female threads

Thread length according to ISO7/1  
Excl. draining



TA No	DN	D	L	H	Kvs	Kg
52 149-015*	15	G1/2	90	100	4,4	0,43
52 149-020*	20	G3/4	97	100	6,8	0,49
52 149-025	25	G1	110	105	9,8	0,67
52 149-032	32	G1 1/4	124	110	18,3	0,96
52 149-040	40	G1 1/2	130	120	25,4	1,3
52 149-050	50	G2	155	120	42,4	2,0

→ = Flow direction

Kvs = m<sup>3</sup>/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.

## 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.

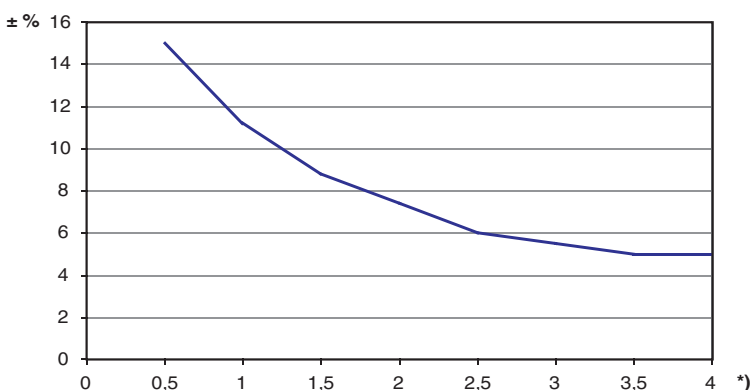
### Deviation of flow at different settings

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  $\pm 7\%$ .**

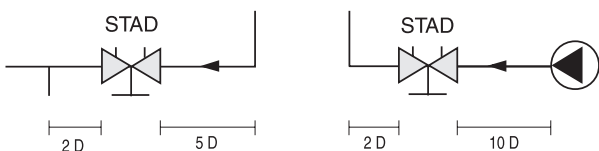
This applies for valves fitted to operate in their specified direction of flow, with normal pipe connections.

**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 ( $\leq 20$  cSt =  $3^\circ E=100S.U.$ ), 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  $\Delta p$  and the design flow are known, use the formula to calculate the Kv-value or use the diagram.

$$K_v = 0,01 \frac{q}{\sqrt{\Delta p}} \quad q \text{ l/h, } \Delta p \text{ kPa}$$

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

## 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

## Support material

### Software

**TA Select:** Makes it easy to choose the right balancing valves by taking into account the desired flow and pressure drop.

### Measuring instruments

Use the balancing instrument TA-CBI or measuring instrument TA-CMI. They are 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 and TA-CMI, see each catalogue leaflet.

### 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

## Example

### Wanted:

Presetting for DN 25 at a desired flow rate of 1,6 m<sup>3</sup>/h and a pressure drop of 10 kPa.

### Solution:

Draw a straight line joining 1,6 m<sup>3</sup>/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:

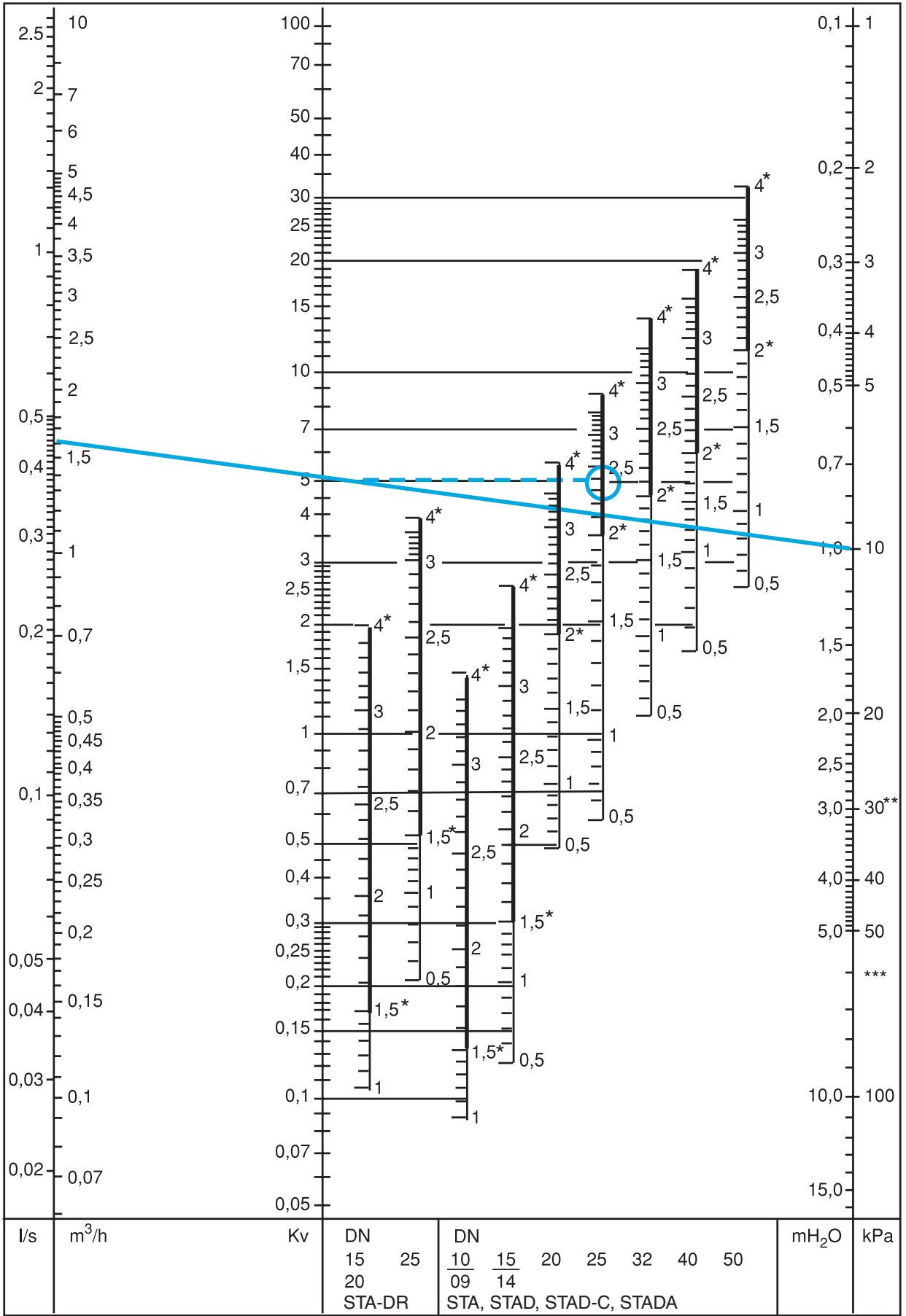
If the flow rate is out of the scale in the diagram, the reading can be made as follows:

Starting with the example above, we get 10 kPa, Kv=5 and flow-rate 1.6 m<sup>3</sup>/h.

At 10 kPa and Kv=0,5 we get the flow-rate 0,16 m<sup>3</sup>/h, and at Kv=50, we get 16 m<sup>3</sup>/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**



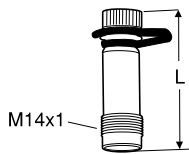
\*) Recommended area  
 \*\*) 25 db (A)  
 \*\*\*) 35 db (A)

## Accessories

### STAD, STADA, STAM

#### Measuring points

Max 120°C (intermittent 150°C)

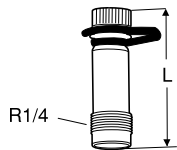


TA No	L
52 179-014	44
52 179-015	103

### STA-DR

#### Measuring points

max 120°C (Intermittent 150°C)



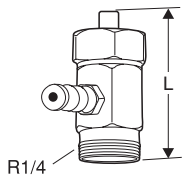
TA No	L
52 179-009	39
52 179-609	103

### STA-DR

#### Measuring points

max 180°C

+ older STAD and STAF

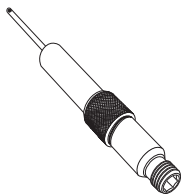


TA No	L
52 179-000	30
52 179-601	90

### STAD, STADA, STA-DR, STAM

#### Measuring points, extensions 60 mm (not for 52 179-000/-601)

Can be installed without draining of the system.

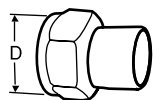


TA No
52 179-006

### STADA, STAD-C

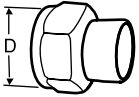
#### Welding connection

max 120°C



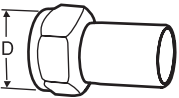
TA No	Valve DN	Thread D	Pipe DN
52 009-010	10	G1/2	10
52 009-015	15	G3/4	15
52 009-020	20	G1	20
52 009-025	25	G1 1/4	25
52 009-032	32	G1 1/2	32
52 009-040	40	G2	40
52 009-050	50	G2 1/2	50

**STADA, STAD-C**  
**Soldering connection**  
 max 120°C



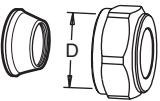
TA No	Valve DN	Thread D	Pipe Ø
52 009-510	10	G1/2	10
52 009-512	10	G1/2	12
52 009-515	15	G3/4	15
52 009-516	15	G3/4	16
52 009-518	20	G1	18
52 009-522	20	G1	22
52 009-528	25	G1 1/4	28
52 009-535	32	G1 1/2	35
52 009-542	40	G2	42
52 009-554	50	G2 1/2	54

**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

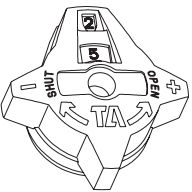
**STADA, STAD-C**  
**Compression connection**  
 max 100°C



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

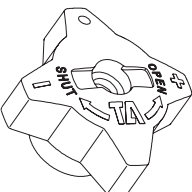
Support bushes shall be used, for more information see FPL, FPL-PX catalogue leaflet.

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



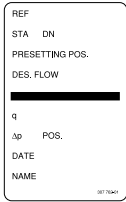
TA No
52 186-003

**STAM, STS**  
**Handwheel complete**



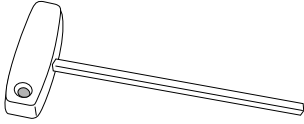
TA No
52 186-005

**Identification tag**  
Incl 1 pc per valve



TA no
52 161-990

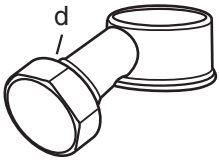
**Allen key**



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