



#### Technical description

**Application:**

District heating and cooling systems with variable flow.

**Functions:**

Differential pressure control over the load and flow limitation.

**Pressure class:**

DN 32-125: PN 16  
DN 150-200: PN 25

**Max. differential pressure:**

1600 kPa = 16 bar

**Temperature:**

Max. working temperature: 150°C  
Min. working temperature: -10°C

**Setting range:**

$\Delta p$  over the presetting throttle is kept on 15 kPa ( $F_c=15$ ).  
 $\Delta p_L$  is adjustable within 10-60 kPa. (50-150 kPa and 120-250 kPa on request)  
Delivery setting: 10 kPa. (50 kPa respectively 120 kPa)

**Media:**

Water and neutral fluids, water-glycol mixtures.

**Material:**

Valve body:  
PN 16: Cast iron EN-GJL-250  
PN 25: Ductile iron EN-GJS-400-18LT  
Diaphragms and gaskets: EPDM  
Valve plug: Stainless steel with EPDM insert.  
Valve seat: Stainless steel.

**Surface treatment:**

Duasolid painting.

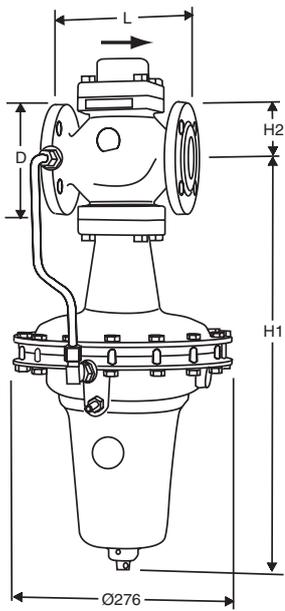
**Marking:**

TA, DN, PN, Fc and flow direction arrow.

**Flanges:**

DN 32-50: According to EN-1092-2:1997, type 16.  
DN 65-200: According to EN-1092-2:1997, type 21.

## DK 50



### 10-60 kPa, PN 16

TA No	DN	D	L	H1	H2	Kvs	$q_{min}$ m <sup>3</sup> /h	$q_{max}$ m <sup>3</sup> /h	Kg
52 750-032	32	140	180	540	120	21	0,8	8,5	38
52 750-040	40	150	200	540	120	25	0,8	9,5	39
52 750-050	50	165	230	570	135	32	1,0	13	46
52 750-065	65	185	290	580	150	55	1,5	21	55
52 750-080	80	200	310	670	170	70	2,5	24	66
52 750-090	100	235	350	690	225	120	4,0	45	88
52 750-091	125	270	400	700	235	145	5,0	60	105

### 10-60 kPa, PN 25

TA No	DN	D	L	H1	H2	Kvs	$q_{min}$ m <sup>3</sup> /h	$q_{max}$ m <sup>3</sup> /h	Kg
52 750-092	150	300	480	770	270	230	15	200	235
52 750-093	200	360	600	800	310	240	20	230	297
52 750-094	200	360	600	800	310	360	20	280	297

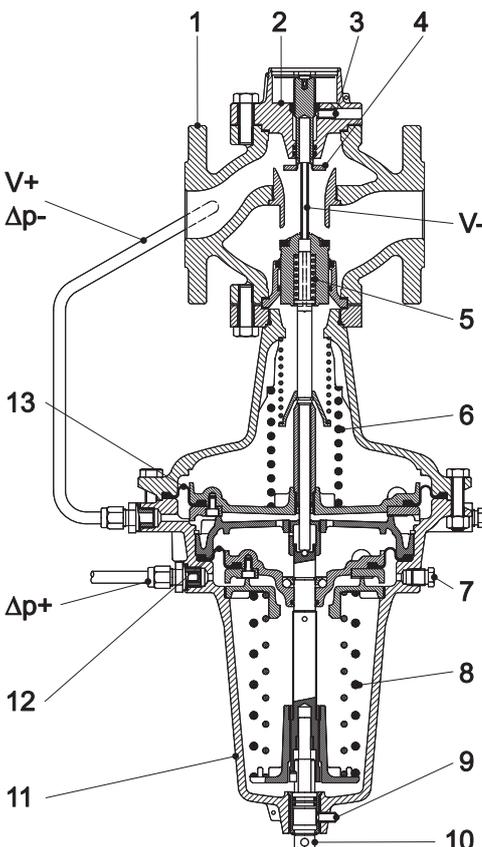
PN 16 and other setting ranges (see front page) on request.

**Capillary pipe (Ø10) included: 2 500 mm**

→ = Flow direction

## Operating function

The controller consists of the valve (1) and the actuator (11). The valve body has the built-in throttle (4) with a flow adjustment scale (2). Inside the actuator there are two diaphragms, (13) for flow and (12) for differential pressure control. The differential pressure on the diaphragms acts against the forces of their springs. The spring attempts to open, and the differential pressure attempts to close the valve. Both diaphragms act parallel, totally independent one from another. The pressure before the throttle acts as plus pressure (V+) to the bottom side of the flow diaphragm and simultaneously as minus pressure ( $\Delta p$ -) to the top side of the differential pressure diaphragm. The pressure downstream of the throttle acts as minus pressure (V-) to the top side of the flow diaphragm. The pressure upstream of the load acts as plus pressure ( $\Delta p$ +) to the bottom side of the differential pressure diaphragm. Increased flow or more closed throttle will increase the pressure drop on the throttle. This also causes the increase of the differential pressure and the closing force on the flow diaphragm. The diaphragm moves the valve plug until it is stopped by the spring force. There is only one value of the flow for one throttle position when the forces, that act on the diaphragm, are in balance. Constant flow, maintained by the controller, depends only on the throttle position and not on the pressure upstream and downstream of the valve.



1. Valve
2. Adjustment scale
3. Fixing screw (flow adjustment)
4. Throttle
5. Safty spring
6. Flow control spring
7. Venting screws
8. Differential pressure control spring
9. Fixing screw (differential pressure adjustment)
10. Adjustment screw
11. Actuator
12. Differential pressure control diaphragm
13. Flow control diaphragm

## Installation

The controller must be installed in the return pipe. It is recommended to install the controller in horizontal pipeline with actuator body below.

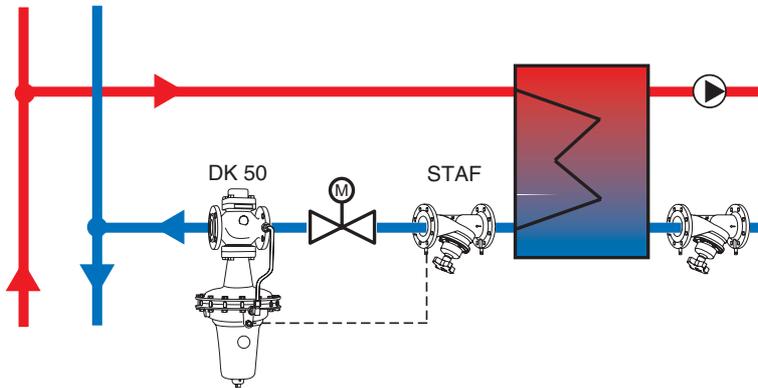
Installation of a strainer upstream of the valve is recommended. When filling, vent the actuator body by using the venting screws. The direction of the flow is shown by the arrow on the valve body. Connect capillary pipes (copper  $\text{Ø}10 \times 1$ ) always laterally to the pipe.

### Keeping the differential pressure over a control valve constant

#### Heat exchanger

The controller should be mounted downstream the control valve and STAF upstream the control valve, but downstream the heat exchanger.

STAF can be mounted in the supply pipe, but with a decreased valve authority as a consequence.



## Setting

#### Flow adjustment

Release the fixing screw (3). Turn the throttle clockwise down to the start position of 0,00 turns. Then adjust the corresponding number of scale turns according to flow chart and the pointer on the valve's body. At the end, tighten the fixing screw. The water flow is being measured on each individual controller in all positions of the adjustment scale.

Flow chart with identity number of the controller is included in the scope of supply. The original flow chart is kept in supplier's archive.

If balancing valve STAF is used the flow can be measured by using the balancing instrument TA-CBI or measuring instrument TA-CMI.

#### Differential pressure adjustment

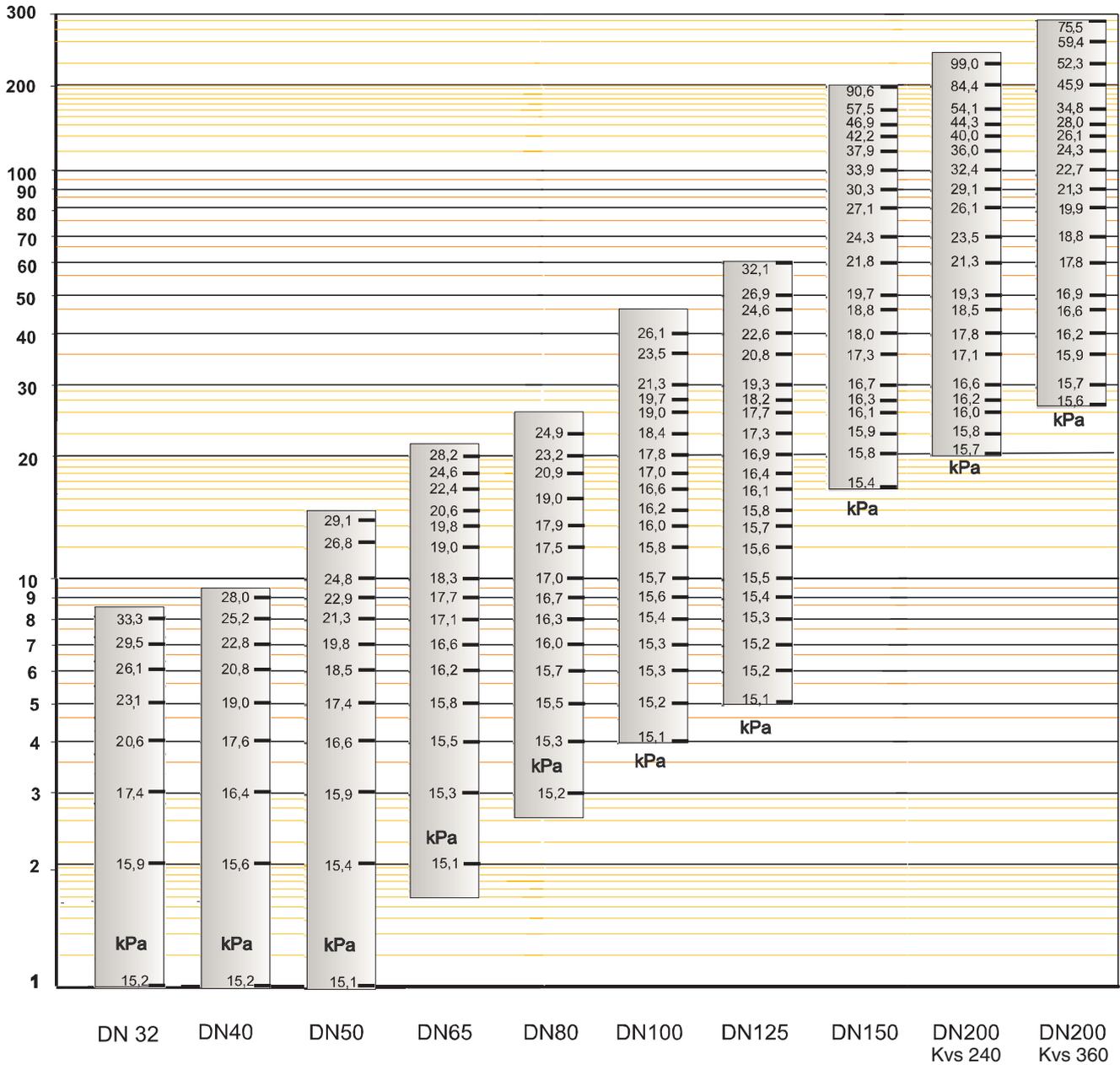
Release fixing screw (9). Adjust differential pressure by turning the adjustment screw. To increase the differential pressure, turn the screw clockwise (bottom view of screw). At the end, tighten the fixing screw.

## Sizing

1. Select the smallest size for the flow you need in the diagram.
2. Check that the available  $\Delta p$  is bigger than the sum of the pressure drops calculated with the formula or use the diagram:

$$\Delta p = \left( \frac{q}{100 \times Kvs} \right)^2 + FC$$

$q$  (m<sup>3</sup>/h)



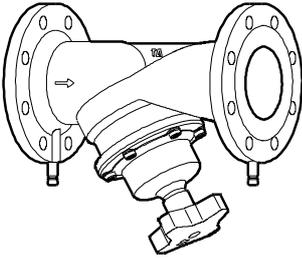
## Accessories

### Balancing valve STAF, STAF-SG

For flow measuring

Max 120°C

See catalogue leaflet STAF, STAF-SG,... for complete details.

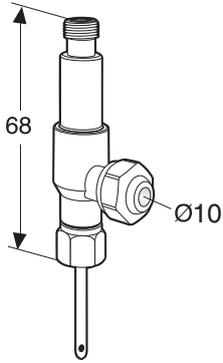


TA No	TA No	DN
<b>PN 16</b>	<b>PN 25</b>	
-	52 182-032**	32
-	52 182-040**	40
-	52 182-050**	50
52 181-065	52 182-065	65
52 181-080	52 182-080	80
52 181-090	52 182-090	100
52 181-091	52 182-091	125
52 181-092	52 182-092	150
52 181-093	52 182-093	200

\*\* ) Fit PN 16 flanges.

### Measuring point, two-way

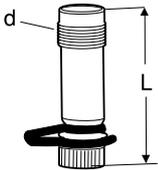
For connection of 10 mm copper pipe (STAF) while permitting simultaneous use of TA-CBI/TA-CMI.



TA No
52 179-210

### Measuring point

Max 120°C (Intermittent 150°C)



TA No	d	L
52 179-009	R1/4	39
52 179-609	R1/4	103
52 179-008	R3/8	39
52 179-608	R3/8	103

Products for higher temperatures - contact TA.

Other products, see TA Product catalogue section "Balancing valves".

