

# DAL 516



## **Differential pressure controllers**

With adjustable set-point and flow limitation

# DAL 516

These compact differential pressure controllers for heating and cooling systems are particularly effective in situations requiring high temperatures and/or pressure drop. These valves are also suitable for use on the secondary side in district heating and comfort cooling systems. Rust protection is assured thanks to the electrophoretically painted ductile iron body.

## Key features

- > **Inline design**  
Inline flow allows high pressure drops without noise.
- > **Adjustable set-point**  
Delivers desired differential pressure ensuring accurate balancing.
- > **Integrated throttle for flow limitation**  
No need for additional flow limitation valve.



## Technical description

### Application:

Central heating, cooling systems and in district heating substations.

### Functions:

Differential pressure control and flow limitation.  
Closes at increasing  $\Delta p$ .

### Dimensions:

DN 15-125

### Pressure class:

PN 25  
DN 100-125: PN 16 and PN 25

### Max. differential pressure ( $\Delta p_V$ ):

1600 kPa = 16 bar

### Setting range:

Differential pressure adjustable 5-30 kPa, 10-60 kPa, 10-100 kPa and 60-150 kPa.

### Temperature:

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

### Media:

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

### Material:

Valve body: Ductile iron EN-GJS-400-15  
Diaphragm and seals: EPDM

### Surface treatment:

Electrophoretic painting.

### Marking:

IMI TA, DN, PN and flow direction arrow.

### Threads:

DN 15-50: According to ISO 228.

### Flanges:

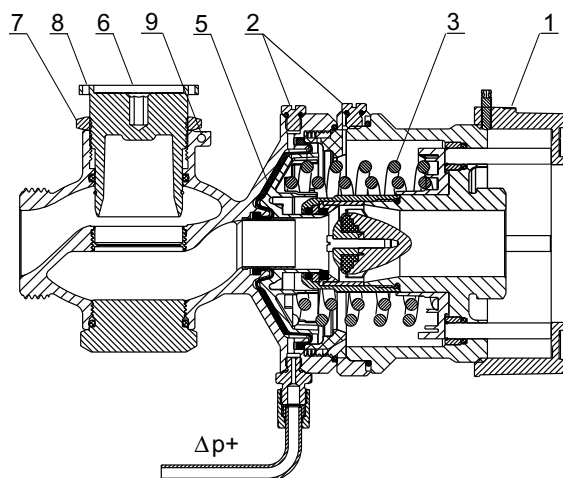
DN 15-50 (optional): According to EN-1092-2:1997, type 16.  
DN 65-125: According to EN-1092-2:1997, type 21.

## Operating function

Installation in the return pipe. The pressure upstream the consumer acts through an external copper capillary pipe ( $\Delta p+$ ) to the inlet side of the diaphragm (5) and closes the valve.

The pressure downstream the flow limitation throttle (upstream of the differential pressure control part) acts through an internal capillary pipe ( $\Delta p-$ ) to the outlet side of the diaphragm and together with the spring (3) attempts to open the valve.

The spring force can be adjusted by turning the setting wheel (1). Built in throttle (6) enables flow limitation. Flow limitation can be secured using by the fixing nut (7). It is also possible to secure the position of a throttle with the leaden seal - use holes on the body (9) and the throttle (8).



## Sizing

Select the size according to maximal speed. Recommended maximal speed in residential areas is 2 m/s and in industrial areas 3 m/s.

Total pressure loss is calculated by the equation:

$$\Delta p = \left( \frac{q}{100 \times Kvs} \right)^2 \quad [\text{kPa, l/h}]$$

## Installation

Install the controller in the return pipe, downstream the consumer. Flow direction is shown by arrow on the valve's body. The best position is horizontal with vent screws (2) on top. Installation of a strainer upstream of the controller is recommended.

Connect copper capillary pipe ( $\Delta p+$ ) to the pipeline upstream the consumer. In case of a horizontal pipeline connect the copper capillary pipe laterally to prevent air and dirt from entering. It is important to ensure that working temperature and pressure do not exceed allowed values.

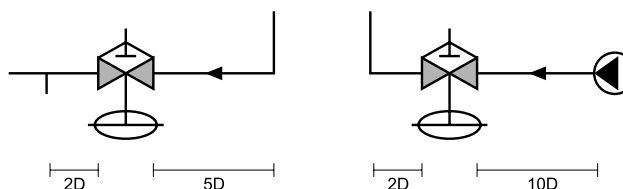
Before you mount the controller, check the fitting length of the controller and distance between connections on the pipeline. Fit the connections (welding and threaded ends) to the pipeline first, then clean the remains of welding operations if needed. Then install the controller.

If flanged connections are used, check pitch diameter and the diameter of the holes for the screws.

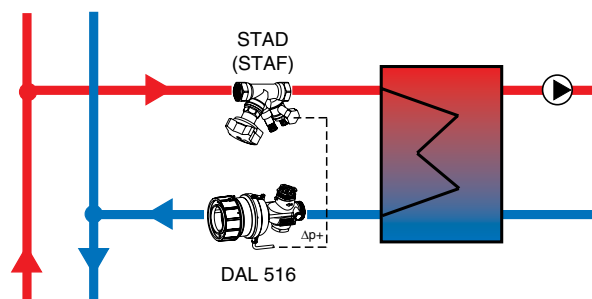
When the pipeline and the controller are full of water and the pressure is stabilized, vent the controller by the vent screws (2). Installation of a balancing valve STAD (STAF) is recommended to enable flow measurement, commissioning and troubleshooting with balancing instrument TA-SCOPE.

### Normal pipe fittings

Try to avoid mounting taps and pumps immediately before the valve.



### Application example

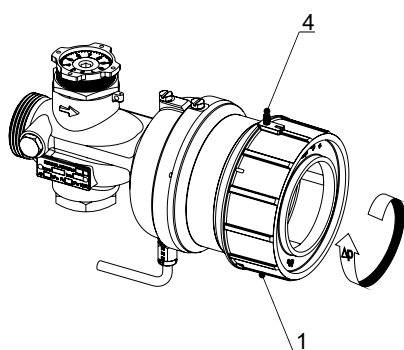


## Setting

### DN 15-50

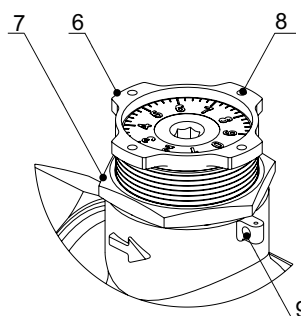
#### Differential pressure adjustment

1. Unscrew the fixing screw (4) - Allen key 2 mm - on setting wheel (1).
2. Turn the setting wheel clockwise to increase the differential pressure and vice versa.
3. On the setting wheel there is a mark which shows how the  $\Delta p$  changes at one turn of the setting wheel.
4. The pressures can be controlled through pressure gauges on the pipeline.
5. After required differential pressure  $\Delta p$  is reached, tighten the fixing screw on the setting wheel.
6. It is also possible to secure the setting with the leaden seal - use holes on the body and the setting wheel.



#### Flow adjustment

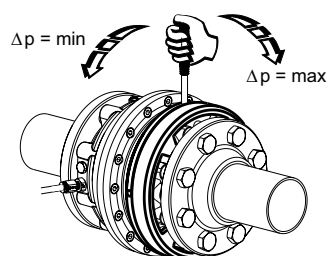
1. Unscrew the fixing nut (7).
2. Turn the throttle (6) clockwise down to decrease flow and vice versa.
3. When the flow is correctly set, you can fix the presetting by tightening the fixing nut.
4. You can secure the throttle position using the holes on the throttle (8) and valve body (9).



### DN 65-125

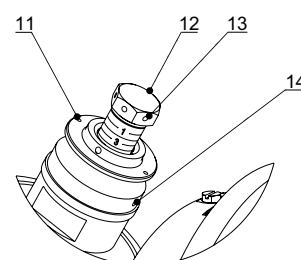
#### Differential pressure adjustment

1. Principle is the same as DN 15-50, except there is no mark which shows how the  $\Delta p$  changes at one turn of the setting wheel and also there is no fixing screw and no leaden seal to secure the setting.
2. The setting wheel moves indirectly by the middle nut, which is turned by the batons supplied with the controller.
3. The pressures can be controlled through pressure gauges on the pipeline.

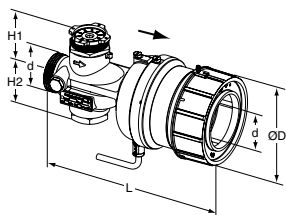


#### Flow adjustment

1. Unscrew the fixing screw (14) with an Allen key 2 mm.
2. Screw the flow adjustment screw (12) clockwise to decrease flow and vice versa.
3. At the end tighten the fixing screw and secure the position of a throttle with the leaden seal - using holes on the body (11) and the fixing screw (13).



## Articles

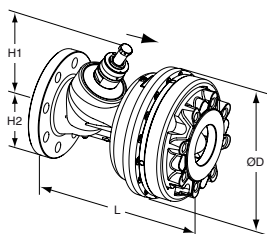


### DN 15-50

1200 mm capillary pipe (Ø6) included.

#### PN 25

DN	d	D	L	H1	H2	Kvs	Kg	EAN	Article No
<b>5-30 kPa</b>									
15/20	G1	97	136	45	52	2,5	1,4		52 763-720
25/32	G1 1/4	112	186	55	57	6	2,4		52 763-725
40/50	G2	146	238	75	71	13	4,4		52 763-740
<b>10-60 kPa</b>									
15/20	G1	97	136	45	52	2,5	1,4		52 761-220
25/32	G1 1/4	112	186	55	57	6	2,4		52 761-225
40/50	G2	146	238	75	71	13	4,4		52 761-240
<b>10-100 kPa</b>									
15/20	G1	97	136	45	52	2,5	1,4		52 760-220
25/32	G1 1/4	112	186	55	57	6	2,4		52 760-225
40/50	G2	146	238	75	71	13	4,4		52 760-240
<b>60-150 kPa</b>									
15/20	G1	97	136	45	52	2,5	1,4		52 762-220
25/32	G1 1/4	112	186	55	57	6	2,4		52 762-225
40/50	G2	146	238	75	71	13	4,4		52 762-240



### DN 65-125

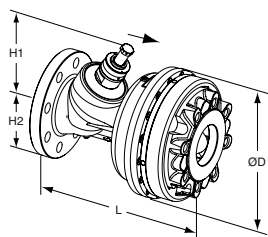
1500 mm capillary pipe (Ø6) included.

#### PN 25 (DN 65 and 80 also fit PN 16 flanges)

DN	D	L	H1	H2	Kvs	Kg	EAN	Article No
<b>5-30 kPa</b>								
65	220	290	180	93	45	24		52 763-765
80	220	310	183	100	50	26		52 763-780
100	320	350	174	118	75	58		52 763-790
125	320	400	175	135	105	62		52 763-791
<b>10-60 kPa</b>								
65	220	290	180	93	45	24		52 761-265
80	220	310	183	100	50	26		52 761-280
100	320	350	174	118	75	58		52 761-290
125	320	400	175	135	105	62		52 761-291
<b>10-100 kPa</b>								
65	220	290	180	93	45	24		52 760-265
80	220	310	183	100	50	26		52 760-280
100	320	350	174	118	75	58		52 760-290
125	320	400	175	135	105	62		52 760-291
<b>60-150 kPa</b>								
65	220	290	180	93	45	24		52 762-265
80	220	310	183	100	50	26		52 762-280
100	320	350	174	118	75	58		52 762-290
125	320	400	175	135	105	62		52 762-291

→ = Flow direction

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

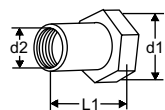

**PN 16**

DN	D	L	H1	H2	Kvs	Kg	EAN	Article No
<b>5-30 kPa</b>								
100	320	350	174	118	75	58		52 763-690
125	320	400	175	135	105	62		52 763-691
<b>10-60 kPa</b>								
100	320	350	174	118	75	58		52 761-690
125	320	400	175	135	105	62		52 761-691
<b>10-100 kPa</b>								
100	320	350	174	118	75	58		52 760-690
125	320	400	175	135	105	62		52 760-691
<b>60-150 kPa</b>								
100	320	350	174	118	75	58		52 762-690
125	320	400	175	135	105	62		52 762-691

→ = Flow direction

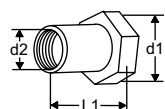
Kvs = m<sup>3</sup>/h at a pressure drop of 1 bar and fully open valve.

## Connections for DN 15-50


**With female thread**

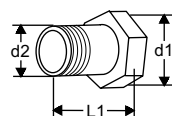
Threads according to ISO 228.  
Swivelling nut

d1	d2	L1*	EAN	Article No
G1	G1/2	26	3831112501027	52 759-015
G1	G3/4	32	3831112501034	52 759-020
G1 1/4	G1	47	3831112501041	52 759-025
G1 1/4	G1 1/4	52	3831112501058	52 759-032
G2	G1 1/2	52	3831112503489	52 759-040
G2	G2	64,5	3831112503205	52 759-050


**With female thread Rc**

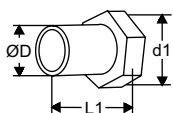
Threads according to ISO 7-1  
Swivelling nut

d1	d2	L1*	EAN	Article No
G1	Rc1/2	26	3831112527454	52 751-301
G1	Rc3/4	32	3831112527461	52 751-302
G1 1/4	Rc1	47	3831112527478	52 751-303
G1 1/4	Rc1 1/4	52	3831112527485	52 751-304
G2	Rc1 1/2	52	3831112527492	52 751-305
G2	Rc2	64,5	3831112527508	52 751-306


**With male thread**

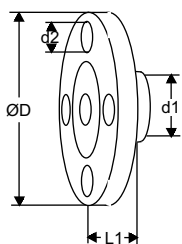
Threads according to ISO 7  
Swivelling nut

d1	d2	L1*	EAN	Article No
G1	R1/2	34	3831112500983	52 759-115
G1	R3/4	40	3831112500990	52 759-120
G1 1/4	R1	40	3831112501003	52 759-125
G1 1/4	R1 1/4	45	3831112501010	52 759-132
G2	R1 1/2	45	3831112503342	52 759-140
G2	R2	50	3831112503472	52 759-150



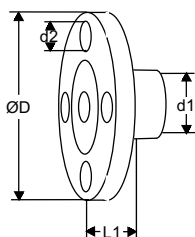
**For welding**  
Swivelling nut

d1	D	L1*	EAN	Article No
G1	20,8	37	3831112500945	52 759-315
G1	26,3	42	3831112500952	52 759-320
G1 1/4	33,2	47	3831112500969	52 759-325
G1 1/4	40,9	47	3831112500976	52 759-332
G2	48,0	47	3831112501140	52 759-340
G2	60,0	52	3831112501294	52 759-350



**With flange**  
**Attention!** Can be used on the **inlet** side only.

d1	d2	D	L1*	EAN	Article No
G1	M12	95	10	3831112501065	52 759-515
G1	M12	105	20	3831112501072	52 759-520
G1 1/4	M12	115	5	3831112504318	52 759-525
G1 1/4	M16	140	15	3831112501096	52 759-532
G2	M16	150	5	3831112504325	52 759-540
G2	M16	165	20	3831112501317	52 759-550



**With flange (extended)**  
**Attention!** Must be used on the **outlet** side.

d1	d2	D	L1*	EAN	Article No
G1	M12	95	47	3831112501157	52 759-615
G1	M12	105	47	3831112500136	52 759-620
G1 1/4	M12	115	62	3831112503533	52 759-625
G1 1/4	M16	140	62	3831112526129	52 759-632
G2	M16	150	72	3831112505025	52 759-640
G2	M16	165	72	3831112503892	52 759-650

\*) Fitting length (from the gasket surface to the end of the connection).

