

Climate  
Control

IMI TA

## DAF 516

– NPT threads/ANSI flanges



### **Differential pressure controllers**

With adjustable set-point – for installation in the supply pipe

## DAF 516 – NPT threads/ANSI flanges

This compact differential pressure controller for heating and cooling systems is particularly effective in situations requiring high temperatures and/or pressure drop. DAF 516 can be used both on the primary and secondary side in district heating and comfort cooling systems. Rust protection is assured thanks to the electrophoretic 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.

### Technical description

#### Application:

Heating and cooling systems.  
Installation in supply pipe.

#### Functions:

Differential pressure control  
Pre-setting  $\Delta p$  over the load ( $\Delta p_L$ )  
Measuring ( $\Delta p_L$ )

#### Dimensions:

1/2" - 5"

#### Pressure class:

1/2"-2": PN 25 (362 psi)  
2 1/2"-5": Class 150

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

230 psi

#### Setting range:

$\Delta p$  over the load is adjustable within:  
0.73-4.35 psi, 1.45-8.7 psi, 1.45-14.5 psi,  
8.7-22 psi.

#### Delivery setting:

Size 1/2"-2": Maximum value (4.35, 8.7,  
14.5, 22 psi).

Size 2 1/2"-5": Midway min./max. value  
(~2.61, ~1.02, ~1.45, ~15.2 psi).

#### Temperature:

Max. working temperature: 302°F  
Min. working temperature: 14°F

#### Media:

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

#### Material:

Valve body: Ductile iron EN-GJS-400-15  
Membranes and gaskets: EPDM  
Adjustment ring: Size 1/2"-2" Ryton PPS,  
size 2 1/2"-5" R St 37-2 steel.

#### Surface treatment:

Electrophoretic painting.

#### Marking:

IMI TA, Size, PN, Material, Cvs,  $\Delta p$  and  
flow direction arrow.

#### Connection:

Size 1/2" - 2": External threads according  
to ISO 228. (Separate connections with  
NPT threads available.)

Size 2 1/2" - 5": Flanges according to  
ASME/ANSI B16.42 Class 150.

## Operating function

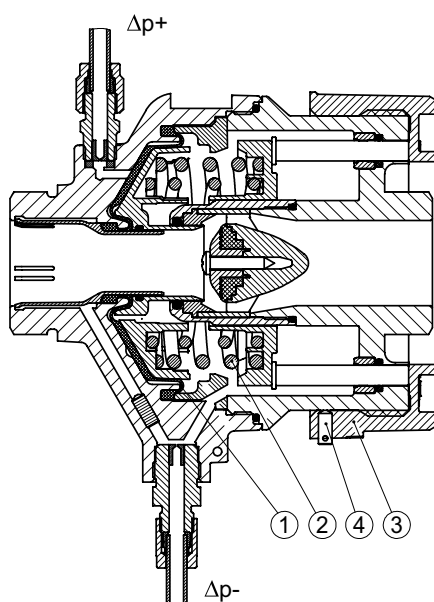
The pressure upstream of the load acts through an external capillary pipe ( $\Delta p+$ ) on the plus side of the membrane (1) and attempts to close the valve.

The pressure downstream of the load acts through an external capillary pipe ( $\Delta p-$ ) in the valve body and attempts, together with the spring (2) force, to open the valve. In this way, the differential pressure over the load is kept constant on the set value.

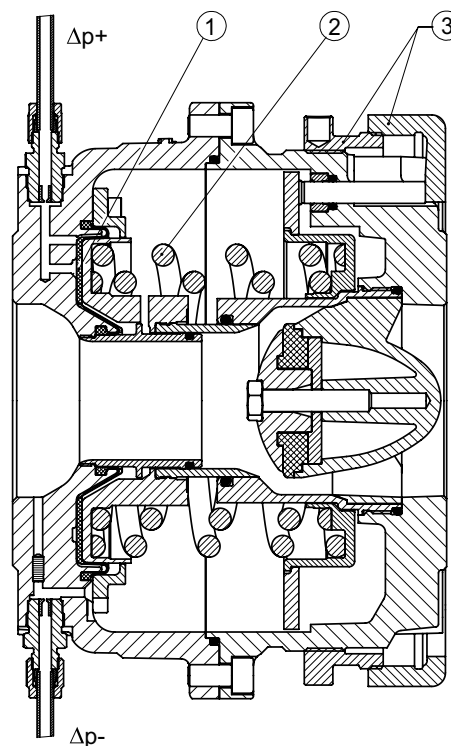
The spring force can be adjusted by turning the adjustment ring (3). Adjustment can be fixed ( $1/2''-2''$ ) by tightening the fixing screw (4).

DAF 516 should be mounted in the supply pipe upstream of the heat exchanger and STAD (STAF) on the return pipe, but downstream of the control valve. Function is the same as for DA 516, except that the pressure downstream the load acts through the another external copper impulse pipe ( $\Delta p-$ ) to the minus side of the membrane. DAF 516 acts in this way as pressure controller (reducing valve) as well.

**1/2''-2''**



**2 1/2''-5''**

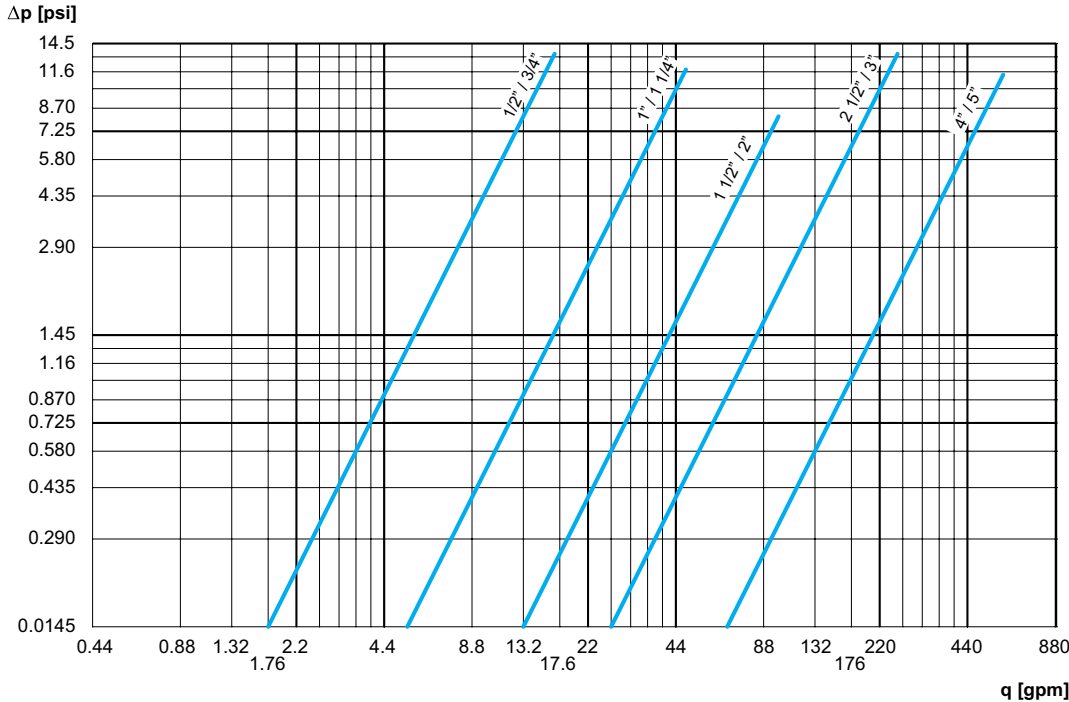


## Sizing

1. Select the smallest size for the designed flow according to the diagram.
2. Check that the available  $\Delta p$  is bigger than the pressure drop of the valve at the designed flow.

The pressure drop can be found in the diagram or calculated by the formula:

$$\Delta p = \left( \frac{q}{100 \times Cvs} \right)^2 \quad [\text{psi, gpm}]$$



## Installation

The DAF 516 must be installed in the supply pipe. Flow direction is shown by the arrow (11) on the valve's identification label (10). The best position is horizontal with the venting screws (2) pointing upwards.

Installation of a strainer upstream of the valve is recommended.

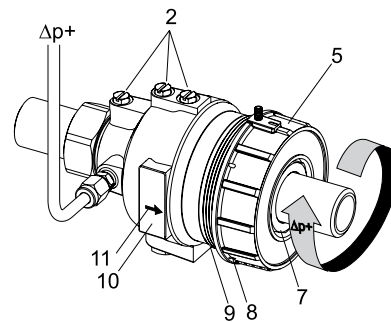
Connect capillary pipe ( $\Delta p+$ , copper  $\varnothing 6 \times 1$ ) to the pipeline upstream of the load. Connect the other capillary pipe ( $\Delta p-$ , copper  $\varnothing 6 \times 1$ ) downstream the load.

In case of a horizontal pipeline connect the capillary pipe laterally to prevent air and dirt from entering.

When filling, vent the body by using the venting screws (2).

In case of valves size 1/2" - 2", turn the adjustment ring (5) clockwise until stop to make the nut (7) on the outlet side accessible.

**Note:** When welding the connections (size 1/2" - 2") the valve must be protected from too high temperature.



### Capillary pipe

Before putting into operation, the capillary pipe must be installed.

- Capillary pipe ( $\Delta p-$ ) is connected to the balancing valve STAD/STAF or other suitable point to the pipeline, **downstream** of the load.

- Capillary pipe ( $\Delta p+$ ) is connected to the other suitable point to the pipeline, **upstream** of the load.

## Setting

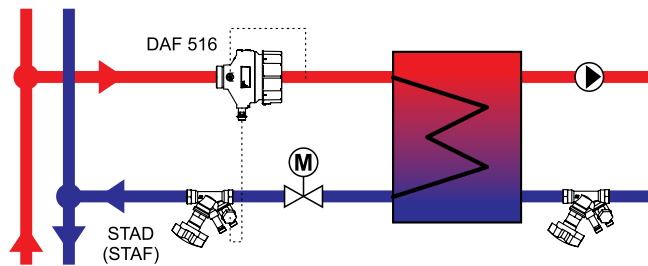
The differential pressure can be adjusted by turning the adjustment ring (5). The preset value can be sealed through the holes (see (8) and (9) under Installation).

| Size        | Number of turns | $\Delta p$ [psi] change per turn of setting nut/spanner |                         |                         |                            |
|-------------|-----------------|---------------------------------------------------------|-------------------------|-------------------------|----------------------------|
|             |                 | 0.73-4.35<br>(5-30 kPa)                                 | 1.45-8.7<br>(10-60 kPa) | 1.45-15<br>(10-100 kPa) | 8.7-22 psi<br>(60-150 kPa) |
| 1/2" / 3/4" | 10              | 2.6                                                     | 5.1                     | 9.3                     | 9.3                        |
| 1" / 1 1/4" | 14              | 1.8                                                     | 3.6                     | 6.6                     | 6.6                        |
| 1 1/2" / 2" | 15              | 1.7                                                     | 3.3                     | 6.0                     | 6.0                        |
| 2 1/2"      | 6,5             | 0.55                                                    | 1.1                     | 2.0                     | 2.0                        |
| 3"          | 6,5             | 0.55                                                    | 1.1                     | 2.0                     | 2.0                        |
| 4"          | 6,5             | 0.55                                                    | 1.1                     | 2.0                     | 2.0                        |
| 5"          | 6,5             | 0.55                                                    | 1.1                     | 2.0                     | 2.0                        |

Measure flow and adjust  $\Delta p$  accordingly.

## Application example

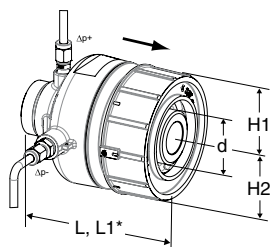
Keeping the differential pressure over a control valve constant



### Heat exchanger

DAF 516 should be mounted in the supply pipe upstream of the heat exchanger and STAD (STAF) on the return pipe, but downstream of the control valve. DAF 516 acts in this way as pressure controller (reducing valve) as well.

## Articles



### Size 1/2"-2"

**External thread** – Separate connections with NPT threads – see Connections for size 1/2"-2".

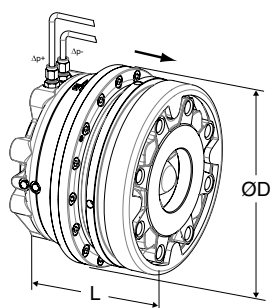
External threads according to ISO 228.

Capillary pipes (Ø6 mm) included: 2 x 4 ft

Connection set (G1/2+G3/4) for capillary pipe to e.g. STAD and 2 capillary pipe connections R1/4 included.

| Size            | d      | L   | L1* | H1  | H2  | Cvs  | lb.  | Article No |
|-----------------|--------|-----|-----|-----|-----|------|------|------------|
| <b>1-4 psi</b>  |        |     |     |     |     |      |      |            |
| 1/2" / 3/4"     | G1     | 4,2 | 4,6 | 1,6 | 3,1 | 4,6  | 3,3  | 52 763-120 |
| 1" / 1 1/4"     | G1 1/4 | 4,9 | 5,9 | 2,0 | 3,3 | 13,9 | 5,7  | 52 763-125 |
| 1 1/2" / 2"     | G2     | 6,4 | 7,5 | 2,8 | 4,0 | 34,7 | 12,8 | 52 763-140 |
| <b>4-9 psi</b>  |        |     |     |     |     |      |      |            |
| 1/2" / 3/4"     | G1     | 4,2 | 4,6 | 1,6 | 3,1 | 4,6  | 3,3  | 52 761-120 |
| 1" / 1 1/4"     | G1 1/4 | 4,9 | 5,9 | 2,0 | 3,3 | 13,9 | 5,7  | 52 761-125 |
| 1 1/2" / 2"     | G2     | 6,4 | 7,5 | 2,8 | 4,0 | 34,7 | 12,8 | 52 761-140 |
| <b>4-15 psi</b> |        |     |     |     |     |      |      |            |
| 1/2" / 3/4"     | G1     | 4,2 | 4,6 | 1,6 | 3,1 | 4,6  | 3,3  | 52 760-120 |
| 1" / 1 1/4"     | G1 1/4 | 4,9 | 5,9 | 2,0 | 3,3 | 13,9 | 5,7  | 52 760-125 |
| 1 1/2" / 2"     | G2     | 6,4 | 7,5 | 2,8 | 4,0 | 34,7 | 12,8 | 52 760-140 |
| <b>9-21 psi</b> |        |     |     |     |     |      |      |            |
| 1/2" / 3/4"     | G1     | 4,2 | 4,6 | 1,6 | 3,1 | 4,6  | 3,3  | 52 762-120 |
| 1" / 1 1/4"     | G1 1/4 | 4,9 | 5,9 | 2,0 | 3,3 | 13,9 | 5,7  | 52 762-125 |
| 1 1/2" / 2"     | G2     | 6,4 | 7,5 | 2,8 | 4,0 | 34,7 | 12,8 | 52 762-140 |

\*) Length incl adjustment ring.



### 2 1/2" - 5"

**Flanges** – Do not need any separate connections. Flanges according to ASME/ANSI B16.42 Class 150.

Capillary pipes (Ø6 mm) included: 2 x 5 ft

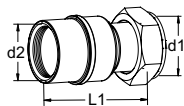
Included: Capillary pipe (Ø6 mm) 2 x 5 ft. and 2 capillary pipe connections R1/4 (M14x1 mounted on valve).

| Size            | ØD   | L   | Cvs   | lb.   | Article No |
|-----------------|------|-----|-------|-------|------------|
| <b>1-4 psi</b>  |      |     |       |       |            |
| 2 1/2"          | 8,3  | 6,3 | 69,4  | 39,7  | 52 768-665 |
| 3"              | 8,3  | 6,3 | 69,4  | 39,7  | 52 768-680 |
| 4"              | 12,6 | 10  | 173,4 | 127,9 | 52 768-690 |
| 5"              | 12,6 | 10  | 173,4 | 127,9 | 52 768-691 |
| <b>4-9 psi</b>  |      |     |       |       |            |
| 2 1/2"          | 8,3  | 6,3 | 69,4  | 39,7  | 52 768-765 |
| 3"              | 8,3  | 6,3 | 69,4  | 39,7  | 52 768-780 |
| 4"              | 12,6 | 10  | 173,4 | 127,9 | 52 768-790 |
| 5"              | 12,6 | 10  | 173,4 | 127,9 | 52 768-791 |
| <b>4-15 psi</b> |      |     |       |       |            |
| 2 1/2"          | 8,3  | 6,3 | 69,4  | 39,7  | 52 768-865 |
| 3"              | 8,3  | 6,3 | 69,4  | 39,7  | 52 768-880 |
| 4"              | 12,6 | 10  | 173,4 | 127,9 | 52 768-890 |
| 5"              | 12,6 | 10  | 173,4 | 127,9 | 52 768-891 |
| <b>9-21 psi</b> |      |     |       |       |            |
| 2 1/2"          | 8,3  | 6,3 | 69,4  | 39,7  | 52 768-965 |
| 3"              | 8,3  | 6,3 | 69,4  | 39,7  | 52 768-980 |
| 4"              | 12,6 | 10  | 173,4 | 127,9 | 52 768-990 |
| 5"              | 12,6 | 10  | 173,4 | 127,9 | 52 768-991 |

Cvs = gpm at a pressure drop of 1 psi and fully open valve.

→ = Flow direction

## Connections for size 1/2" - 2"



### With internal thread NPT

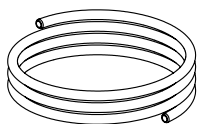
Threads according to ANSI/ASME B1.20.1-1983.

Swivelling nut

| d1     | d2        | L1* [in] | Article No |
|--------|-----------|----------|------------|
| G1 1/4 | 1 NPT     | 2.87     | 52 751-307 |
| G1 1/4 | 1 1/4 NPT | 3.15     | 52 751-308 |
| G2     | 1 1/2 NPT | 3.23     | 52 751-309 |
| G2     | 2 NPT     | 3.66     | 52 751-310 |

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

## Accessories

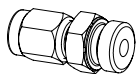


### Capillary pipe

Ø6 mm

2 pcs included in DAF 516.

| L [ft] | Ø    | Valve size  | Article No |
|--------|------|-------------|------------|
| 4      | 6 mm | 1/2" - 2"   | 52 759-215 |
| 5      | 6 mm | 2 1/2" - 5" | 52 759-265 |



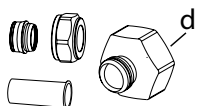
### Capillary pipe connection

For capillary pipe Ø6 mm with R1/4, R1/8 and M14 connection.

1/2" - 2": 2 pcs 6xR1/4 included in DAF 516 (2 pcs 6xR1/8 mounted on valve).

2 1/2" - 5": 2 pcs 6xR1/4 included in DAF 516 (2 pcs 6xM14x1 mounted on valve).

|              | Valve size    | Article No |
|--------------|---------------|------------|
| 6 mm x R1/4  | 2 1/2" - 5"   | 52 759-201 |
| 6 mm x R1/8  | 1/2" - 1 1/4" | 52 759-213 |
| 6 mm x R1/8  | 1 1/2" - 2"   | 52 759-218 |
| 6 mm x M14x1 | 2 1/2" - 5"   | 52 759-214 |



### Connection set STAD

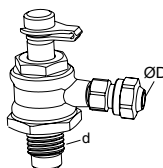
Must be used on STAD when connection of Ø6 mm capillary pipe.

2 transition nipples (G1/2 and G3/4),

1 thrust nut (Ø6), 1 cone (Ø6) and

1 support bush are included in DAF 516, DN 15-50 (sizes 1/2" - 2").

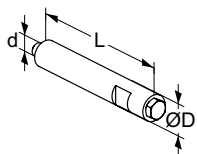
| d    | Article No |
|------|------------|
| G1/2 | 52 762-006 |
| G3/4 | 52 762-106 |



### Capillary pipe connection with shut-off

For connection of Ø6 mm capillary pipe to STAF/STAF-SG.

| d    | D    | Valve size   | Article No |
|------|------|--------------|------------|
| G1/4 | 6 mm | 3/4" - 2"    | 52 265-209 |
| G3/8 | 6 mm | 2 1/2" - 16" | 52 265-208 |



### Venting extension

Suitable when insulation is used.

Stainless steel/EPDM/Brass.

| d  | D [in] | L [in] | Article No |
|----|--------|--------|------------|
| M6 | 0.47   | 2.76   | 52 759-220 |



### Venting screw

Brass/EPDM

| d  | Article No |
|----|------------|
| M6 | 52 759-211 |



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