

DA 516, DAF 516

Differential pressure controller with adjustable set-point



TA

Pressurisation & Water Quality › Balancing & Control › Thermostatic Control

ENGINEERING ADVANTAGE

These compact differential pressure controllers for heating and cooling systems are particularly effective in situations requiring high temperatures and/or pressure drop. They can be used both on the primary and secondary side in district heating and comfort cooling systems. Rust protection is assured thanks to the electrophoretically painted ductile iron body.

> **Inline design**

Inline flow allows high pressure drops without noise.

> **Adjustable set-point**

Delivers desired differential pressure ensuring accurate balancing.

> **Measuring point**

Simplifies the balancing procedure, increases its accuracy and enables troubleshooting.



> Technical description

Application:

Heating and cooling systems with variable flow.

Functions:

Differential pressure control over the load.

Dimensions:

DN 15-150

Pressure class:

PN 25

DN 100-150: PN 16 and PN 25

Max. differential pressure (Δp_V):

1600 kPa = 16 bar

Setting range:

Δp over the load is adjustable within:

DN 15-125: 5-30 kPa, 10-60 kPa, 10-100 kPa or 60-150 kPa.

DN 150: 5-30 kPa, 10-60 kPa, 10-100 kPa, 60-150 kPa or 100-400 kPa.

Delivery setting:

DN 15-50: Maximum value (30, 60, 100 resp. 150 kPa).

DN 65-125: Midway min./max. value (~18, ~35, ~55, resp. ~105 kPa).

DN 150: Minimum value (5, 10, 10, 60 resp. 100 kPa).

Temperature:

Max. working temperature: 120°C

Min. working temperature: -10°C

Media:

Water and neutral fluids, water-glycol mixtures.

Material:

Valve body: Ductile iron EN-GJS-400

Diaphragms and gaskets: EPDM

Adjustment ring: DN 15-50 Ryton PPS, DN 65-125 R St 37-2 steel. (DN 150 has no adjustment ring)

Surface treatment:

Electrophoretic painting.

Marking:

TA, DN, PN, Material, Kvs, Δp and flow direction arrow.

Flanges:

DN 15-50: According to EN-1092-2:1997, type 16.

DN 65-150: According to EN-1092-2:1997, type 21.

Operating function

DA 516 (DN 15-125)

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

The pressure downstream of the load acts via an internal capillary pipe in the valve body and attempts, together with the spring (3) 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 (5). Adjustment can be fixed by tightening the fixing screw (4).

DN 150

Valve DN 150 is a pilot controlled valve. It consists of a diaphragm and spring actuated inline main valve (3), an adjustable built-in two way differential pressure controlling pilot valve (7) and a built-in throttle (4). Various chambers in the main valve and pilot valve are interconnected with internal channels.

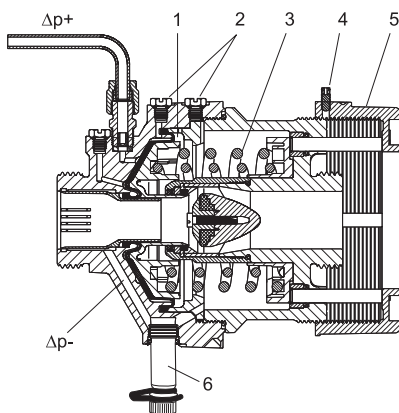
The main spring (2) opens the main valve, while differential pressure on the main diaphragm (1) closes it. The pilot spring (8) closes the pilot valve, while differential pressure on the pilot piston (9) opens it. The pilot valve reacts to sensed changes in controlled differential pressure (Δp). By turning the adjustment screw (6), force of the pilot spring is changed and the preset value of Δp is adjusted.

If Δp is equal to the preset value, both pilot and main valve are in equilibrium and stationary.

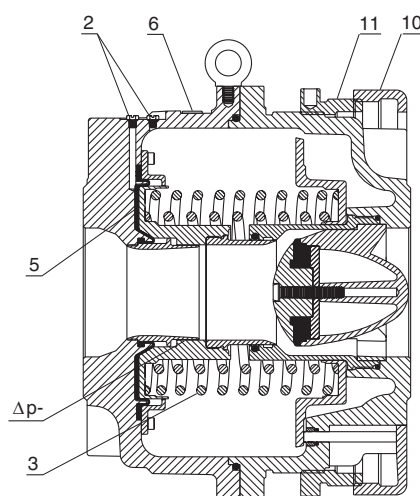
If Δp is higher than preset value, the pilot valve opens and increases the flow in bypass line (5). Increased bypass flow results in increased pressure drop on the throttle (4). This increased pressure drop on the throttle is led via internal channels onto the main diaphragm (1) and causes the main valve (3) to close. Flow in the main line decreases, and brings Δp back down to the preset value.

If Δp decreases, the pilot valve closes and decreases the flow in bypass line (5). Pressure drop on the throttle (4) decreases, so differential pressure on the main diaphragm (1) decreases and main valve (3) opens to bring Δp back up to the preset value.

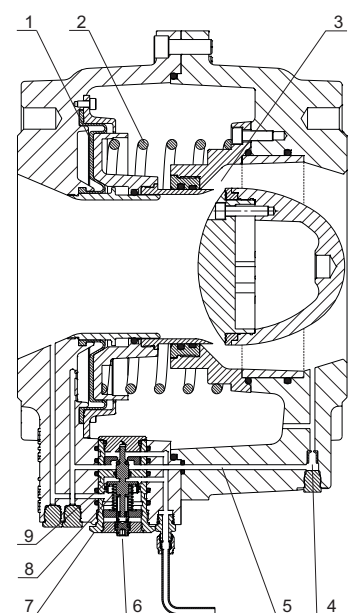
DN 15-50



DN 65-125



DN 150



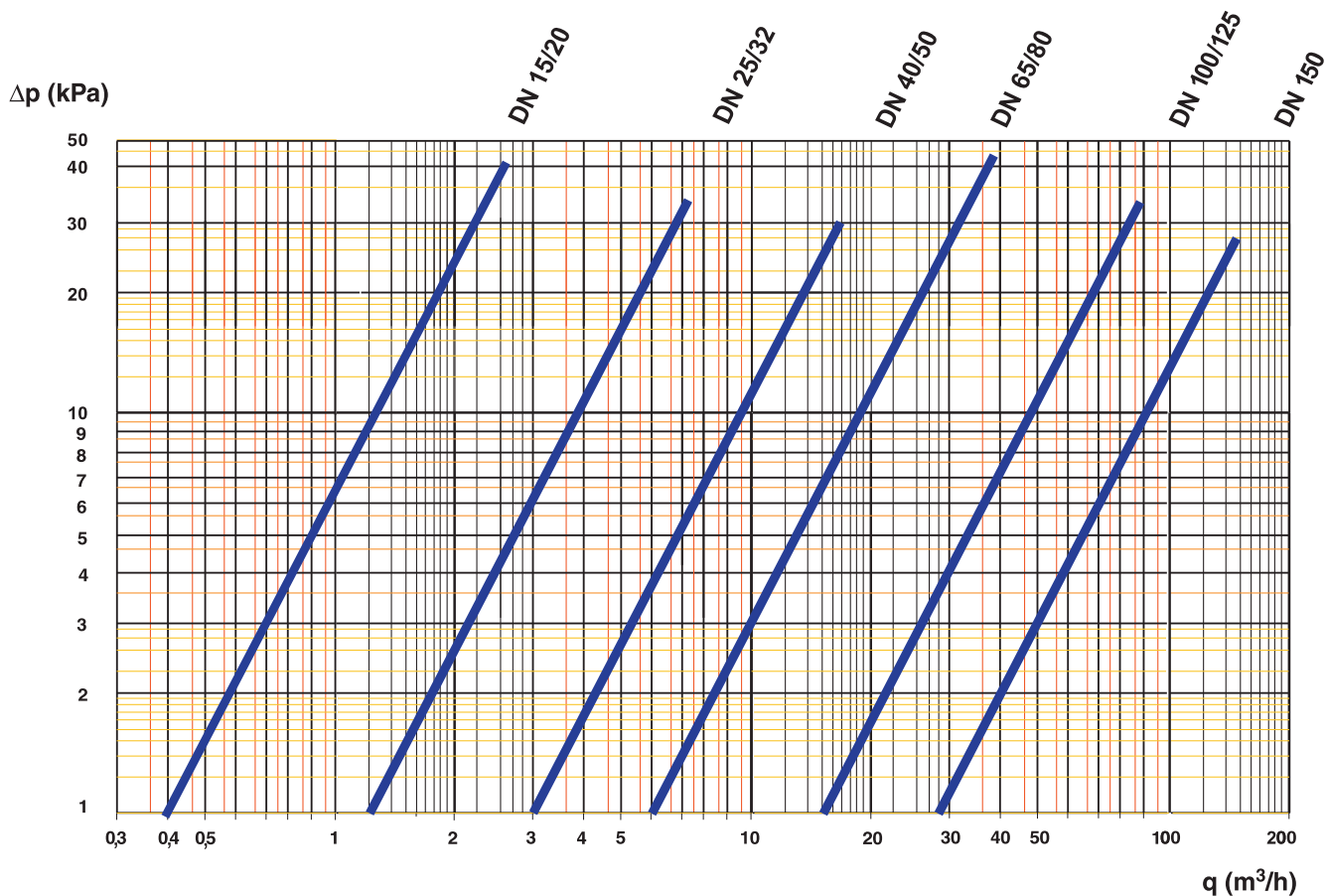
DAF 516

Installation in the inlet pipe. 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 diaphragm.

Sizing

1. Select the smallest size for the designed flow according to the diagram.
2. Check that the available Δp 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:

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



Installation

IMPORTANT: The valve body must not be disassembled.

By incorrect handling, the controller may not work properly and safety problems may occur.

The **DA 516** must be installed in the return pipe. The **DAF 516** can also be installed in the flow pipe. Flow direction is shown by the arrow (11) on the valve's identification plate (10). The best position is horizontal with the venting screws (2) pointing upwards. Installation of a strainer upstream of the valve is recommended.

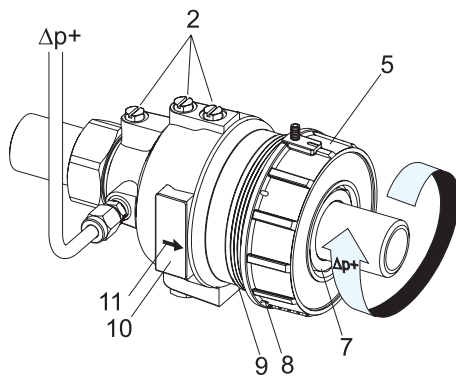
Connect capillary pipe ($\Delta p+$, copper $\text{Ø}6 \times 1$), to the pipeline upstream of the load. In case of DAF 516, connect another capillary pipe downstream the load.

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).

When welding the connections, the valve must be protected from too high a temperature.

In case of valves DN 15-50, turn the adjustment ring (5) clock-wise until stop to make the nut (7) on the outlet side accessible.

If measuring point is mounted on the DA 516, the differential pressure over the load can be measured by using TA's measuring or balancing instruments.



Capillary pipe

Before putting into operation, the capillary pipe must be installed. The other end of the capillary pipe is connected to the balancing valve STAD/STAF or other suitable point on the pipeline.

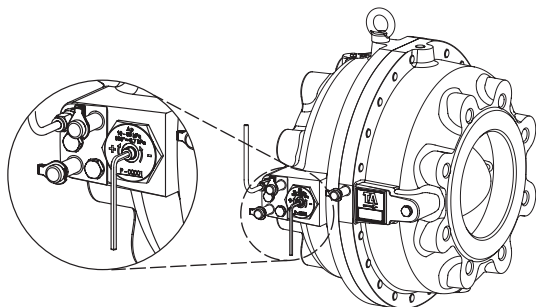
Setting

DN 15-125

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).

DN 150

The differential pressure can be adjusted by turning the adjustment screw in the pilot valve, using 4 mm Allen key. Turn the adjustment screw clockwise to increase Δp and vice versa.

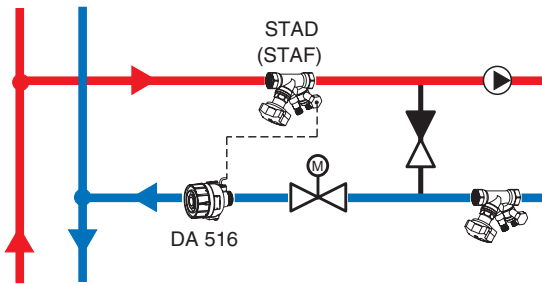


Application example

Keeping the differential pressure over a control valve constant

Shunt group

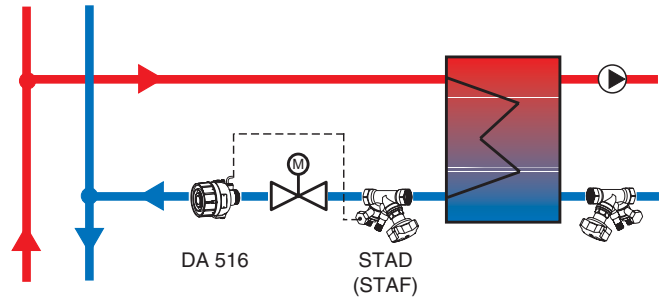
DA 516 should be mounted downstream of the control valve and STAD (STAF) may preferably be mounted in the supply pipe.



Heat exchanger

DA 516 should be mounted downstream of the control valve and STAD (STAF) upstream of the control valve, but downstream of the heat exchanger.

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



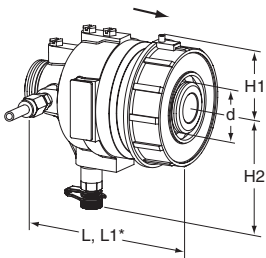
Articles – DA 516

DA 516 – DN 15-50

With measuring point

Capillary pipe (Ø6) included: 1 200 mm

PN 25



DN	d	L	L1*	H1	H2	Kvs	Kg	EAN	Article No
5-30 kPa									
15/20	G1	106	116	41	79	4	1,5		52 795-020
25/32	G1 1/4	125	150	51	84	12	2,6		52 795-025
40/50	G2	162	190	70	102	30	5,8		52 795-040
10-60 kPa									
15/20	G1	106	116	41	79	4	1,5		52 795-120
25/32	G1 1/4	125	150	51	84	12	2,6		52 795-125
40/50	G2	162	190	70	102	30	5,8		52 795-140
10-100 kPa									
15/20	G1	106	116	41	79	4	1,5		52 795-220
25/32	G1 1/4	125	150	51	84	12	2,6	3831112507135	52 795-225
40/50	G2	162	190	70	102	30	5,8	3831112507173	52 795-240
60-150 kPa									
15/20	G1	106	116	41	79	4	1,5		52 795-320
25/32	G1 1/4	125	150	51	84	12	2,6	3831112507166	52 795-325
40/50	G2	162	190	70	102	30	5,8	3831112507203	52 795-340

*) Length incl adjustment ring.

→ = Flow direction

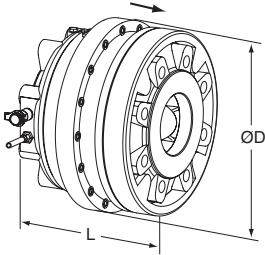
DA 516 – DN 65-125

DN 65-125 are flanged and do not need any separate connections.

With measuring point

Capillary pipe (Ø6) included: 1 500 mm

PN 25 (DN 65-80 also fit PN 16 flanges)



DN	D	L	Kvs	Kg	EAN	Article No
5-30 kPa						
65	210	160	60	18		52 795-065
80	210	160	60	18		52 795-080
100	320	254	150	58		52 795-090
125	320	254	150	58		52 795-091
10-60 kPa						
65	210	160	60	18		52 795-165
80	210	160	60	18		52 795-180
100	320	254	150	58		52 795-190
125	320	254	150	58		52 795-191
10-100 kPa						
65	210	160	60	18	3831112507265	52 795-265
80	210	160	60	18	3831112507302	52 795-280
100	320	254	150	58	3831112507388	52 795-290
125	320	254	150	58	3831112507463	52 795-291
60-150 kPa						
65	210	160	60	18	3831112507296	52 795-365
80	210	160	60	18	3831112507333	52 795-380
100	320	254	150	58	3831112507418	52 795-390
125	320	254	150	58	3831112507494	52 795-391

PN 16

DN	D	L	Kvs	Kg	EAN	Article No
5-30 kPa						
100	320	254	150	58		52 795-490
125	320	254	150	58		52 795-491
10-60 kPa						
100	320	254	150	58		52 795-590
125	320	254	150	58		52 795-591
10-100 kPa						
100	320	254	150	58		52 795-690
125	320	254	150	58		52 795-691
60-150 kPa						
100	320	254	150	58		52 795-790
125	320	254	150	58		52 795-791

→ = Flow direction

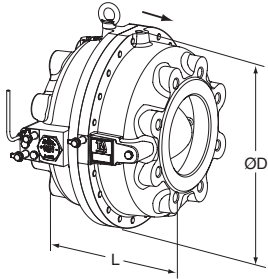
DA 516 – DN 150

DN 150 is flanged and do not need any separate connections.

With measuring points

Capillary pipe (Ø6) included: 1 500 mm

PN 25



DN	D	L	Kvs	Kg	EAN	Article No
5-30 kPa						
150	382	267	280	85		52 771-592
10-60 kPa						
150	382	267	280	85		52 771-692
10-100 kPa						
150	382	267	280	85		52 771-792
60-150 kPa						
150	382	267	280	85		52 771-892
100-400 kPa						
150	382	267	280	85		52 771-992

PN 16

DN	D	L	Kvs	Kg	EAN	Article No
5-30 kPa						
150	382	267	280	85		52 770-592
10-60 kPa						
150	382	267	280	85		52 770-692
10-100 kPa						
150	382	267	280	85		52 770-792
60-150 kPa						
150	382	267	280	85		52 770-892
100-400 kPa						
150	382	267	280	85		52 770-992

→ = Flow direction

Articles – DAF 516

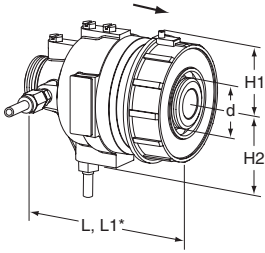
For installation in the inlet pipe.

DAF 516 – DN 15-50

Without measuring point

Capillary pipes (Ø6) included: 2 x 1 200 mm

PN 25



DN	d	L	L1*	H1	H2	Kvs	Kg	Article No
5-30 kPa								
15/20	G1	106	116	41	52	4	1,5	52 763-120
25/32	G1 1/4	125	150	51	57	12	2,6	52 763-125
40/50	G2	162	190	70	75	30	5,8	52 763-140
10-60 kPa								
15/20	G1	106	116	41	52	4	1,5	52 761-120
25/32	G1 1/4	125	150	51	57	12	2,6	52 761-125
40/50	G2	162	190	70	75	30	5,8	52 761-140
10-100 kPa								
15/20	G1	106	116	41	52	4	1,5	52 760-120
25/32	G1 1/4	125	150	51	57	12	2,6	52 760-125
40/50	G2	162	190	70	75	30	5,8	52 760-140
60-150 kPa								
15/20	G1	106	116	41	52	4	1,5	52 762-120
25/32	G1 1/4	125	150	51	57	12	2,6	52 762-125
40/50	G2	162	190	70	75	30	5,8	52 762-140

*) Length incl adjustment ring.

→ = Flow direction

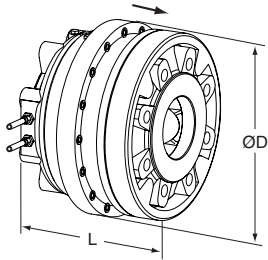
DAF 516 – DN 65-125

DN 65-125 are flanged and do not need any separate connections.

Without measuring point

Capillary pipes (Ø6) included: 2 x 1 500 mm

PN 25 (DN 65-80 also fit PN 16 flanges)



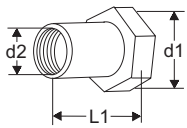
DN	D	L	Kvs	Kg	Article No
5-30 kPa					
65	210	160	60	18	52 763-165
80	210	160	60	18	52 763-180
100	320	254	150	58	52 763-190
125	320	254	150	58	52 763-191
10-60 kPa					
65	210	160	60	18	52 761-165
80	210	160	60	18	52 761-180
100	320	254	150	58	52 761-190
125	320	254	150	58	52 761-191
10-100 kPa					
65	210	160	60	18	52 760-165
80	210	160	60	18	52 760-180
100	320	254	150	58	52 760-190
125	320	254	150	58	52 760-191
60-150 kPa					
65	210	160	60	18	52 762-165
80	210	160	60	18	52 762-180
100	320	254	150	58	52 762-190
125	320	254	150	58	52 762-191

PN 16

DN	D	L	Kvs	Kg	Article No
5-30 kPa					
100	320	254	150	58	52 763-590
125	320	254	150	58	52 763-591
10-60 kPa					
100	320	254	150	58	52 761-590
125	320	254	150	58	52 761-591
10-100 kPa					
100	320	254	150	58	52 760-590
125	320	254	150	58	52 760-591
60-150 kPa					
100	320	254	150	58	52 762-590
125	320	254	150	58	52 762-591

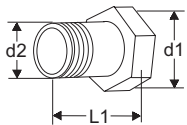
→ = Flow direction

Connections for DN 15-50



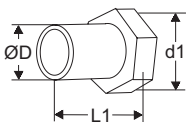
With female thread
Threads according to ISO 228

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



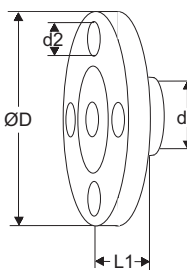
With male thread
Threads according to ISO 7

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



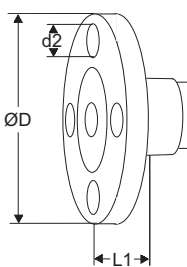
For welding

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

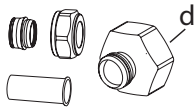


With flange
Attention! Must be used on the outlet side.

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).

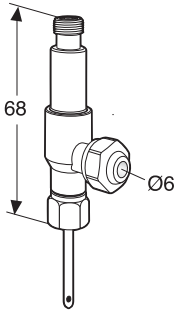
Accessories



Connection set STAD

Must be used on STAD when connection of 6 mm capillary pipe.

d	EAN	Article No
G1/2	7318793850003	52 762-006
G3/4	7318793850102	52 762-106



Measuring point, two-way

For connection of 6 mm copper pipe while permitting simultaneous use of TAs measuring or balancing instruments.

EAN	Article No
7318793848703	52 179-206

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6-10-5 DA 516 01.2012