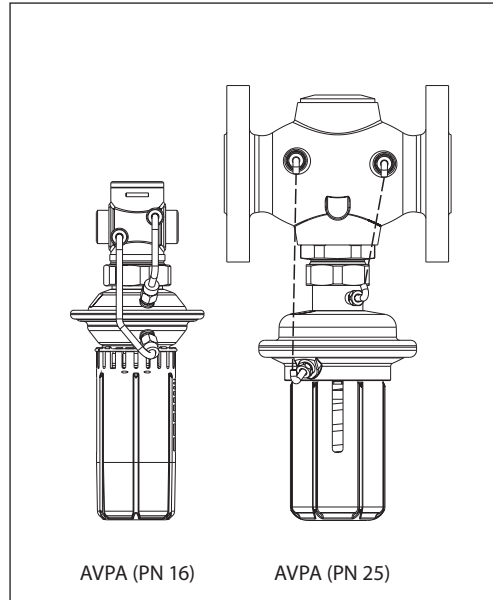


## Data sheet

# Differential pressure relief controller AVPA (PN 16 and PN 25)

### Description



The controller is a self-acting differential pressure relief controller primarily for use in district heating systems. The controller is normally closed and opens on rising differential pressure.

The controller has a control valve, an actuator with one control diaphragm and handle for differential pressure setting.

#### Main data:

- DN 15 - 50
- $k_{vs}$  4.0 - 25 m<sup>3</sup>/h
- PN 16, 25
- Setting range:  
0.05 - 0.5 bar / 0.2 - 1.0 bar / 0.3 - 2.0 bar
- Temperature:  
- Circulation water / glycolic water up to 30%:  
2 ... 150 °C
- Connections:  
- Ext. thread (weld-on, thread and flange tailpieces)  
- Flange

### Ordering

Example:  
Differential pressure relief controller,  
DN 15,  $k_{vs}$  4.0, PN 25, setting range  
0.2 - 1.0 bar,  $t_{max}$  150 °C, ext. thread

- 1x AVPA DN 15 controller  
Code no: **003H6602**

#### Option:

- 1x Weld-on tailpieces  
Code no: **003H6908**

The controller will be delivered completely assembled, inclusive impulse tubes between valve and actuator.

#### AVPA PN 16 Controller

Picture	DN (mm)	$k_{vs}$ (m <sup>3</sup> /h)	Connection		$\Delta p$ setting range (bar)	Code No.	$\Delta p$ setting range (bar)	Code No.
	15	4.0	Cylindr. ext. thread acc. to ISO 228/1	G ¾ A	0.05 - 0.5	003H6593	0.2 - 1.0	003H6596
	20	6.3		G 1 A				003H6597
	25	8.0		G 1¼ A				003H6598

#### AVPA PN 25 Controller

Picture	DN (mm)	$k_{vs}$ (m <sup>3</sup> /h)	Connection		$\Delta p$ setting range (bar)	Code No.	$\Delta p$ setting range (bar)	Code No.
	15	4.0	Cylindr. ext. thread acc. to ISO 228/1	G ¾ A	0.2 - 1.0	003H6602	0.3 - 2.0	003H6605
	20	6.3		G 1 A				003H6606
	25	8.0		G 1¼ A				003H6607
	32	12.5		G 1¾ A				-
	40	16		G 2 A				-
	50	20		G 2½ A				-
	32	12.5	Flanges PN 25, acc. to EN 1092-2			003H6608		003H6611
	40	20		003H6609				003H6612
	50	25		003H6610				003H6613

**Ordering (continuous)**
**Accessories**

Picture	Type designation	DN	Connection	Code No.
	Weld-on tailpieces	15	-	<b>003H6908</b>
		20		<b>003H6909</b>
		25		<b>003H6910</b>
		32		<b>003H6911</b>
		40		<b>003H6912</b>
		50		<b>003H6913</b>
	External thread tailpieces	15	Conical ext. thread acc. to EN 10226-1	R 1/2" <b>003H6902</b>
		20		R 3/4" <b>003H6903</b>
		25		R 1" <b>003H6904</b>
		32		R 1 1/4" <b>003H6905</b>
	Flange tailpieces	15	Flanges PN 25, acc. to EN 1092-2	<b>003H6915</b>
		20		<b>003H6916</b>
		25		<b>003H6917</b>

**Service kits**

Picture	Type designation	Ap setting range (bar)	Code No.
	Actuator with adjustable handle PN 16	0.05 - 0.5	<b>003H6823</b>
		0.2 - 1.0	<b>003H6824</b>
	Actuator with adjustable handle PN 25	0.2 - 1.0	<b>003H6834</b>
		0.3 - 2.0	<b>003H6835</b>

**Technical data**
**Valve (for AVPA PN 16)**

Nominal diameter	DN	15	20	25
$k_{vs}$ value	m <sup>3</sup> /h	4.0	6.3	8.0
Cavitation factor z *		≥ 0.6		
Nominal pressure	PN	25		
Max. differential pressure	bar	12		
Medium		Circulation water / glycolic water up to 30%		
Medium pH		Min. 7, max. 10		
Medium temperature		2 ... 150 °C		
Connections	valve	Thread		
	tailpieces	Weld-on, external thread and flange		
<b>Materials</b>				
Valve body		Red bronze CuSn5ZnPb (Rg5)		
Valve seat		Stainless steel, mat. No. 1.4571		
Valve cone		Dezincing free brass CuZn36Pb2As		
Sealing		EPDM		

\*  $k_v/k_{vs} \leq 0.5$  at DN 25 and higher

**Actuator (for AVPA PN 16)**

Actuator size	cm <sup>2</sup>	39	
Nominal pressure	PN	16	
Diff. pressure setting ranges and spring colours	bar	0.05 - 0.5	0.2 - 1.0
		grey	black
<b>Materials</b>			
Actuator housing		Zinc chromatic steel, DIN 1624, No. 1.0338	
Diaphragm		EPDM	
Impulse tube		Copper tube Ø6 × 1 mm	

Technical data (continuous)

Valve (for AVPA PN 25)

<b>Nominal diameter</b>	<b>DN</b>	<b>15</b>	<b>20</b>	<b>25</b>	<b>32</b>	<b>40</b>	<b>50</b>
$k_{vs}$ value	m <sup>3</sup> /h	4.0	6.3	8.0	12.5	16/20 <sup>1)</sup>	20/25 <sup>1)</sup>
Cavitation factor z *		≥ 0.6					
Nominal pressure	PN	25					
Max. differential pressure	bar	20			16		
Medium		Circulation water / glycolic water up to 30%					
Medium pH		Min. 7, max. 10					
Medium temperature		2 ...150 °C					
Connections	valve	Thread		Thread and flange			
	tailpieces	Weld-on and flange		Weld-on			
		External thread			-		
<b>Materials</b>							
Valve body	thread	Red bronze CuSn5ZnPb (Rg5)			Ductile iron EN-GJS-400-18-LT (GGG 40.3)		
	flange	-					
Valve seat		Stainless steel, mat. No. 1.4571					
Valve cone		Dezincing free brass CuZn36Pb2As					
Sealing		EPDM					

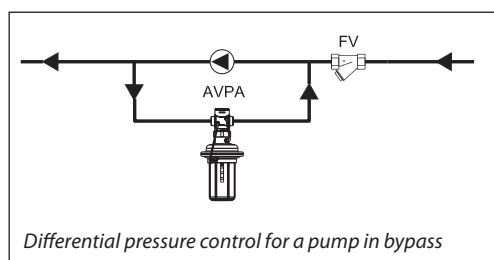
\*  $k_v/k_{vs} \leq 0.5$  at DN 25 and higher

<sup>1)</sup> Flange valve body

Actuator (for AVPA PN 25)

Actuator size	cm <sup>2</sup>	54	
Nominal pressure	PN	25	
Diff. pressure setting ranges and spring colours	bar	0.2 - 1.0	0.3 - 2.0
		yellow	red
<b>Materials</b>			
Actuator housing	Upper casing of diaphragm	Stainless steel, mat. No.1.4301	
	Lower casing of diaphragm	Dezincing free brass CuZn36Pb2As	
Diaphragm		EPDM	
Impulse tube		Copper tube Ø6 x 1 mm	

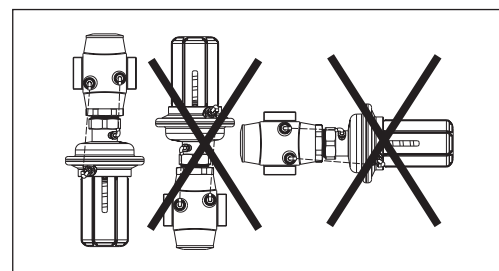
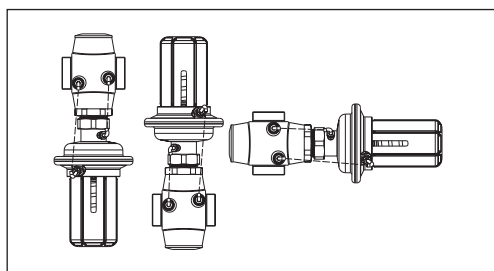
Application principle



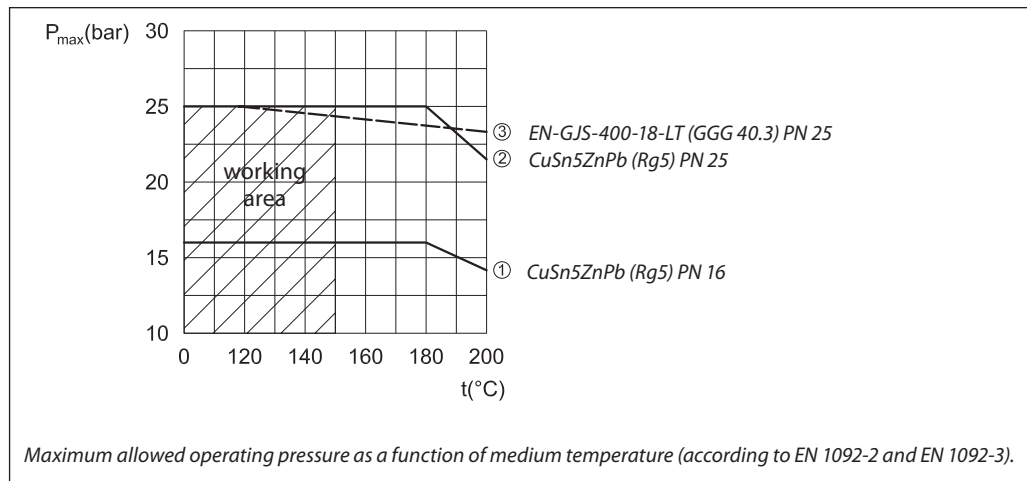
Installation positions

Up to medium temperature of 100 °C the controllers can be installed in any position.

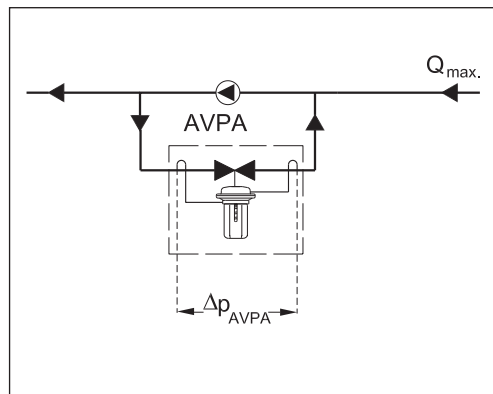
For higher temperatures the controllers have to be installed in horizontal pipes only, with a pressure actuator oriented downwards.



Pressure temperature diagram



Sizing



Given data:

$$Q_{\max} = 2.0 \text{ m}^3/\text{h}$$

$$\Delta p_{\text{AVPA}} = 1.2 \text{ bar}$$

Nominal pressure PN 25

$$k_v = \frac{Q_{\max}}{\sqrt{\Delta p_{\text{AVPA}}}} = \frac{2.0}{\sqrt{1.2}}$$

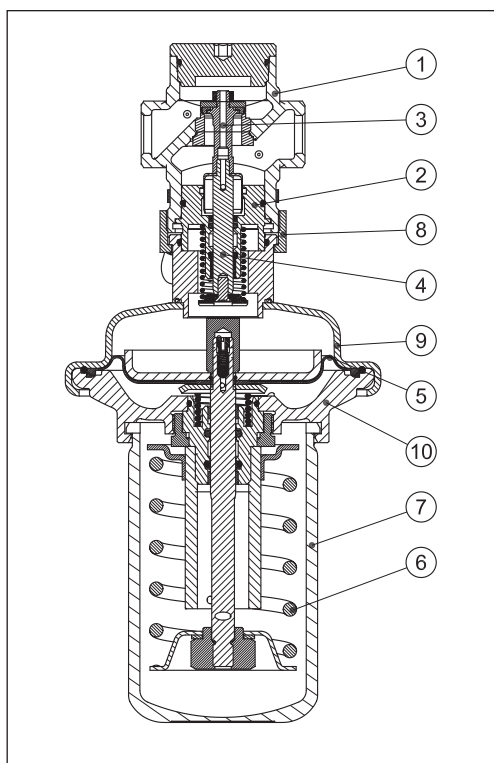
$$k_v = 1.8 \text{ m}^3/\text{h}$$

Solution:

The example selects AVPA PN 25 DN 15,  $k_{vS}$  value 4.0, with differential pressure setting range 0.3 - 2.0 bar.

**Design**

- 1. Valve body
- 2. Valve insert
- 3. Pressure relieved valve cone
- 4. Valve stem
- 5. Control diaphragm
- 6. Setting spring for diff. pressure control
- 7. Handle for diff. pressure setting, prepared for sealing
- 8. Union nut
- 9. Upper casing of diaphragm
- 10. Lower casing of diaphragm



**Function**

The pressures in front and behind of the control valve are being transferred through the impulse tubes to the actuator chambers and act on control diaphragm. Control valve is normally closed. It opens on rising differential pressure and closes on falling differential pressure to maintain constant differential pressure.

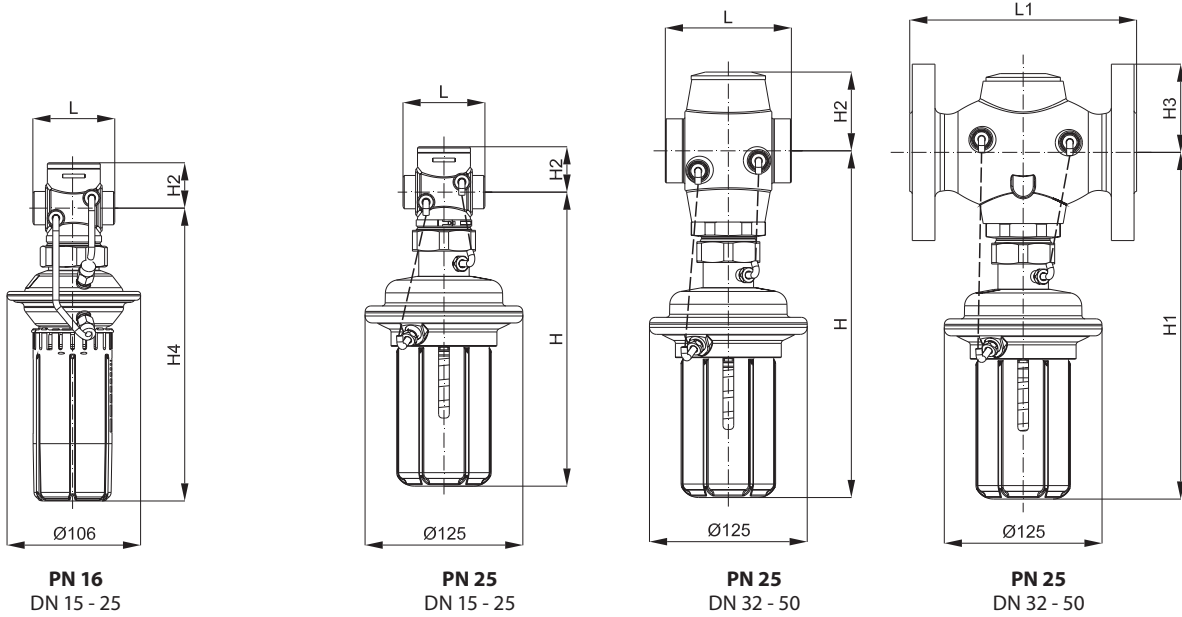
Controller is equipped with excess pressure safety valve, which protects actuator from too high differential pressure.

**Settings**

*Differential pressure setting*

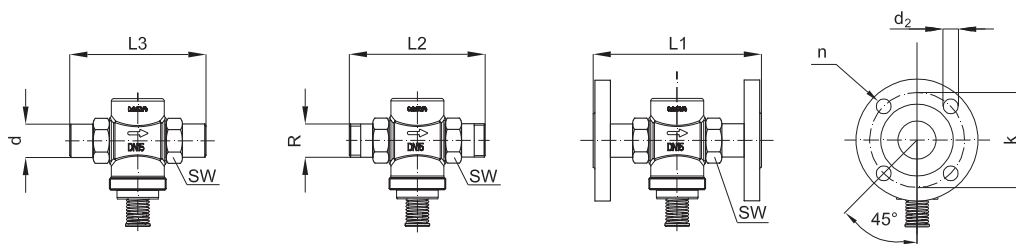
Differential pressure setting is being done by the adjustment of the setting spring for diff. pressure control. The adjustment can be performed on the basis of diff. pressure adjustment diagram (see relevant instructions) and/or pressure indicators.

Dimensions



DN	15		20		25		32		40		50	
	thread	thread	thread	thread	thread	flange	thread	flange	thread	flange	thread	flange
L	mm											
L1	-	-	-	-	100	110	130	-	-	-	-	-
H	65	70	75	100	110	130	-	-	-	-	-	-
H1	233	233	233	275	275	275	-	-	-	-	-	-
H2	-	-	-	275	275	275	-	-	-	-	-	-
H3	34	34	37	62	62	62	-	-	-	-	-	-
H4	-	-	-	70	75	82	-	-	-	-	-	-
H4	232	232	232	-	-	-	-	-	-	-	-	-
Weight	PN 16	kg	1.8	1.8	2.0	-	-	-	-	-	-	-
	PN 25		3.5	5.5	3.7	5.8	10.4	5.9	11.9	6.6	13.9	

Note: other flange dimensions - see table for tailpieces



DN	15		20		25		32		40		50	
SW	mm											
d	32 (G 3/4A)	41 (G 1A)	50 (G 1 1/4A)	63 (G 1 3/4A)	70 (G 2A)	82 (G 2 1/2A)	-	-	-	-	-	-
R <sup>1)</sup>	21	26	33	42	47	60	-	-	-	-	-	-
L1 <sup>2)</sup>	1/2	3/4	1	1 1/4	-	-	-	-	-	-	-	-
L2	130	150	160	-	-	-	-	-	-	-	-	-
L3	131	144	160	177	-	-	-	-	-	-	-	-
k	139	154	159	184	204	234	-	-	-	-	-	-
d <sub>2</sub>	65	75	85	100	110	125	-	-	-	-	-	-
n	14	14	14	18	18	18	-	-	-	-	-	-
n	4	4	4	4	4	4	-	-	-	-	-	-



