ENGINEERING
TOMORROW

Data sheet

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

Description



AVPA (PN 16) AVPA (PN 25)

AVPA 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 m³/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:
  - External thread (weld-on, thread and flange tailpieces)
  - Flange

Ordering

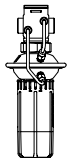
Example:
Differential pressure relief controller, DN 15, k_{VS} 4.0; PN 25; setting range 0.2-1.0 bar; T_{max} 150 °C; ext. thread

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

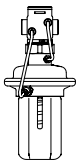
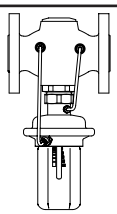
Option:
- *1× Weld-on tailpieces*
  Code no: ***003H6908***

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

AVPA PN 16 Controller

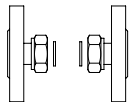
Picture	DN (mm)	k_{VS} (m³/h)	Connection		Δp setting range (bar)	Code No.	Δp setting range (bar)	Code No.
	15	4.0	Cylindr. ext. thread acc. to ISO 228/1	G ¾ A	0.05-0.5	**003H6593**	0.2-1.0	**003H6596**
	20	6.3		G 1 A		**003H6594**		**003H6597**
	25	8.0		G 1¼ A		**003H6595**		**003H6598**

AVPA PN 25 Controller

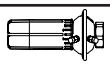
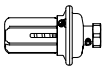
Picture	DN (mm)	k_{VS} (m³/h)	Connection		Δp setting range (bar)	Code No.	Δp setting range (bar)	Code No.
	15	4.0	Cylindr. ext. thread acc. to ISO 228/1	G ¾ A	0.2-1.0	**003H6602**	0.3-2.0	**003H6605**
	20	6.3		G 1 A		**003H6603**		**003H6606**
	25	8.0		G 1¼ A		**003H6604**		**003H6607**
	32	12.5		G 1¾ A		**003H6599**		-
	40	16		G 2 A		**003H6600**		-
	50	20		G 2½ A		**003H6601**		-
	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	-		**003H6908**
		20			**003H6909**
		25			**003H6910**
		32			**003H6911**
		40			**003H6912**
		50			**003H6913**
	External thread tailpieces	15	Conical ext. thread acc. to EN 10226-1	R ½″	**003H6902**
		20		R ¾″	**003H6903**
		25		R 1″	**003H6904**
		32		R 1¼″	**003H6905**
		40		R 1½	**065B2004**
		50		R 2	**065B2005**
	Flange tailpieces	15	Flanges PN 25, acc. to EN 1092-2		**003H6915**
		20			**003H6916**
		25			**003H6917**

Service kits

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

Technical data

Valve (for AVPA PN 16)

Nominal diameter		**DN**	**15**	**20**	**25**
k_{VS} value		m^3/h	4.0	6.3	8.0
Cavitation factor z			≥ 0.6		
Leakage acc. to standard IEC 534		% of k_{VS}	≤ 0.2		
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		˚C	2 … 150		
Connections	valve		External thread		
	tailpieces		Weld-on, external thread and flange		
Materials					
Valve body			Red bronze CuSn5ZnPb (Rg5)		
Valve seat			Stainless steel, mat. No. 1.4571		
Valve cone			Dezincing free brass CuZn36Pb2As		
Sealing			EPDM		
Pressure relieve system			Piston		

Actuator (for AVPA PN 16)

Type		**AVPA PN 16**	
Actuator size	cm^2	39	
Nominal pressure	PN	16	
Diff. pressure setting ranges and spring colours	bar	0.05-0.5	0.2-1.0
		grey	black
Materials			
Actuator housing		Zinc plated, DIN 1624, No. 1.0338	
Diaphragm		EPDM	
Impulse tube		Copper tube Ø6 × 1 mm	

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Technical data *(continuous)*

Valve (for AVPA PN 25)

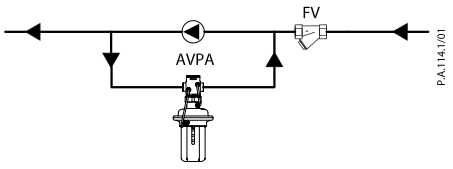
Nominal diameter		DN	15	20	25	32	40	50
k_{VS} value		m³/h	4.0	6.3	8.0	12.5	16/20 [1]	20/25 [1]
Cavitation factor z			≥ 0.6		≥ 0.55		≥ 0.5	
Leakage acc. to standard IEC 534		% of k_{VS}	≤ 0.02			≤ 0.05		
Nominal pressure		PN	25					
Max. differential pressure		bar	20			16		
Medium			Circulation water / glycolic water up to 30 %					
Medium pH			Min. 7, max. 10					
Medium temperature		°C	2 …150					
Connections	valve		Thread			Thread and flange		
	tailpieces		Weld-on and external thread					
			Flange			-		
Materials								
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					
Pressure relieve system			Piston					

[1] *Flange valve body*

Actuator (for AVPA PN 25)

Type			**AVPA PN 25**	
Actuator size		cm^2	54	
Nominal pressure		PN	25	
Diff. pressure setting ranges and spring colours		bar	0.2-1.0	0.3-2.0
			yellow	red
Materials				
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 × 1 mm	

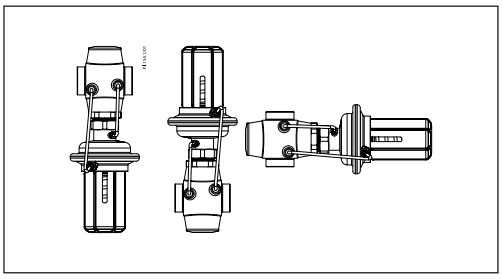
Application principle



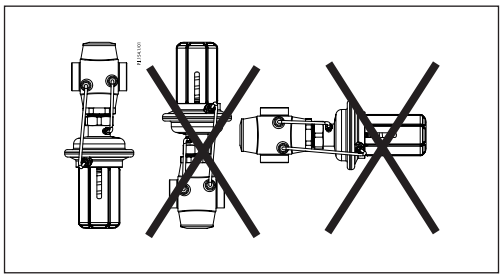
Differential pressure control for a pump in bypass

Installation positions

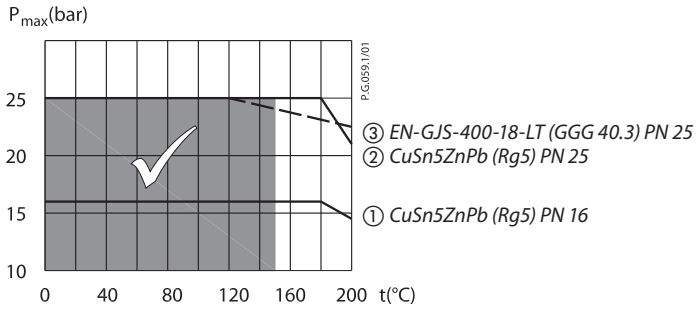
Up to medium temperature of 100 °C the controllers can be installed in any position.



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



Pressure temperature diagram



Maximum allowed operating pressure as a function of medium temperature (according to EN 1092-2 and EN 1092-3).

Sizing

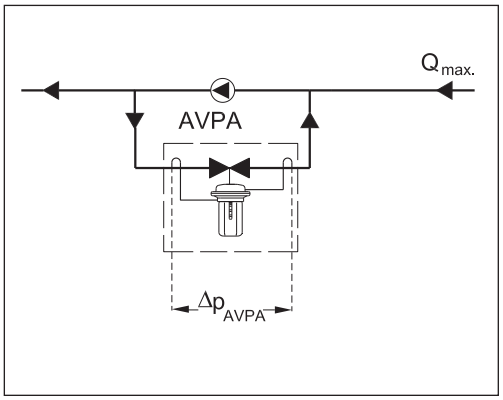
Given data:
Q_{max} = 4.5 m³/h
Δp_{AVPA} = 1.4 bar
Nominal pressure PN 25

k_v value is calculated according to formula:

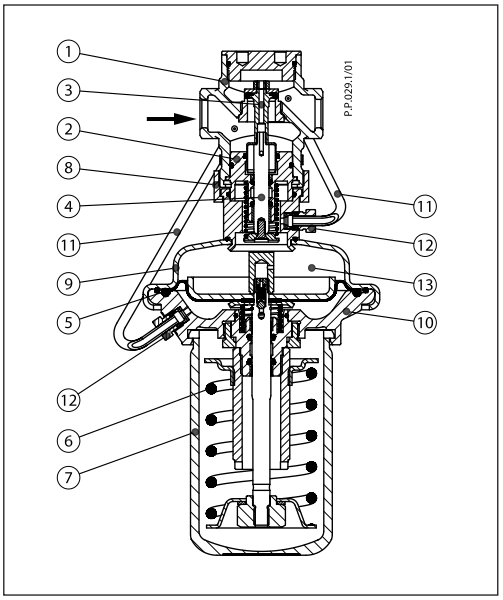
$$k_v = \frac{Q_{max}}{\sqrt{\Delta p_{AVPA}}} = \frac{4.5}{\sqrt{1.4}}$$

k_v = 3.8 m³/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 for diff. pressure control
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
11. Impulse tube
12. Compression fitting for impulse tube
13. Actuator

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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.

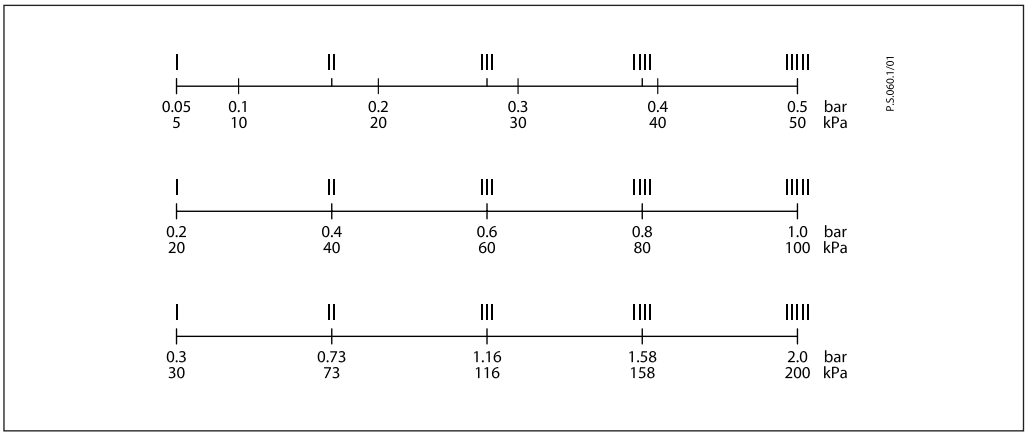
Controller is equipped with excess pressure safety valve, which protects control diaphragm for diff. pressure control from too high differential pressure.

Settings

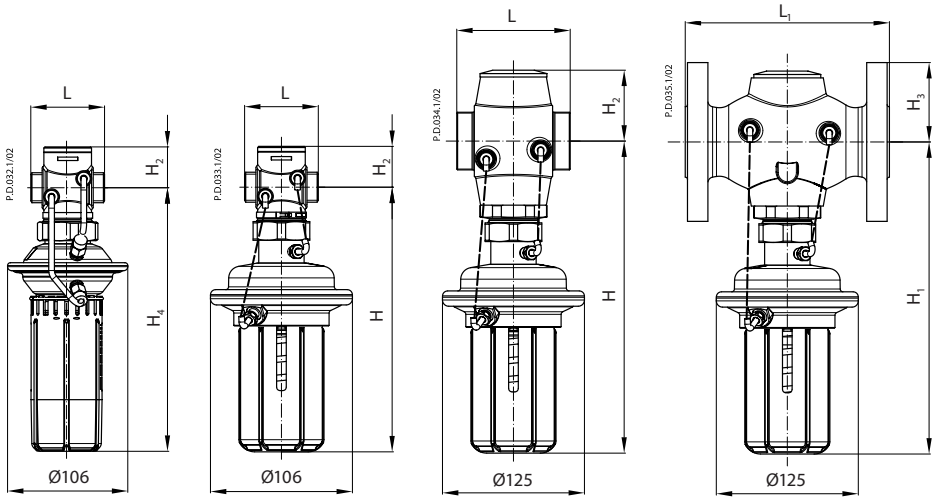
Differential pressure setting
Differential pressure setting is being done by the adjustment of the setting spring for differential pressure control. The adjustment can be done by means of spring for differential pressure setting and/or pressure indicators

Adjustment

Relation between scale figures and differential pressure. Values given are approximate.



Dimensions



PN 16 *DN 15 - 25*

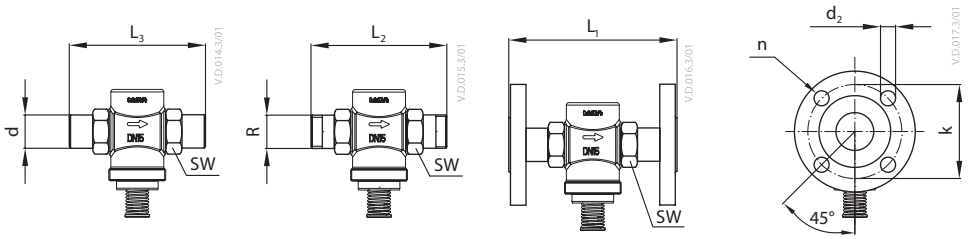
PN 25 *DN 15 - 25*

PN 25 *DN 32 - 50*

PN 25 *DN 32 - 50*

DN	L	L_1	H	H_1	H_2	H_3	H_4	Weight (kg)		
	mm							PN 16	PN 25	
									thread	flange
15	65	-	233	-	34	-	232	1.8	3.5	-
20	70	-	233	-	34	-	232	1.8	5.5	-
25	72	-	233	-	37	-	232	2.0	3.7	-
32	100	180	275	275	62	70	-	-	5.8	10.4
40	110	200	275	275	62	75	-	-	5.9	11.9
50	130	230	275	275	62	82	-	-	6.6	13.9

Note: *other flange dimensions - see table for tailpieces*



DN	R [1]	SW	d	L_1 [2]	L_2	L_3	k	d_2	n
		mm							
15	½	32 (G ¾A)	21	130	120	139	65	14	4
20	¾	41 (G 1A)	26	150	131	154	75	14	4
25	1	50 (G 1¼A)	33	160	145	159	85	14	4
32	1¼	63 (G 1¾A)	42	-	177	184	100	18	4
40	1 ½	70 (G 2A)	47	-	200	204	110	18	4
50	2	82 (G 2½A)	60	-	244	234	125	18	4

[1] *Conical ext. thread acc. to EN 10226-1*
[2] *Flanges PN 25, acc. to EN 1092-2*

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