

Data sheet

Safety pressure reduction controller SAVD (PN 25)

Description



The controller has a control valve, an actuator with two control diaphragms and a spring(s) for pressure setting.

Design-tested according to DIN EN 4747-1 and AGFW guidelines FW 504.

Main data:

- DN 15-50
- k_{VS} 4.0-25 m³/h
- PN 25
- Setting range:
1-5 / 2-8 / 3-12 bar
- Temperature:
- Circulation water/glycolic water up to 30 %:
2 ... 150 °C
- Connections:
- Ext. thread (weld-on, ext. thread and flange tailpieces)
- Flange

SAVD is a self-acting safety pressure reduction controller primarily for use in district heating systems. The controller is normally opened and closes on rising pressure. It is used for pressure reduction control and as a protection against excess pressure behind the valve.

Ordering

Example:
Safety pressure reduction controller,
DN 15, k_{VS} 4.0; PN 25, setting range
1-5 bar, T_{max} 150 °C, ext. thread

- SAVD DN 15 controller
Code No: **003H6693**

Option:
- Weld-on tailpieces
Code No: **003H6908**

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

SAVD Controller

Picture	DN (mm)	k_{VS} (m ³ /h)	Connection		Δp setting range (bar)	Code No.	Δp setting range (bar)	Code No.	Δp setting range (bar)	Code No.		
	15	1.0	Cylindr. ext. thread acc. to ISO 228/1	G 3/4 A	1-5	003H6813	2-8	003H6816	3-12	-		
		1.6				003H6814		003H6817				
		2.5				003H6815		003H6818				
		4.0				003H6693		003H6969			003H6699	
	20	6.3				G 1 A		003H6694			003H6970	003H6700
	25	8.0				G 1 1/4 A		003H6695			003H6971	003H6701
	32	12.5				G 1 3/4 A		003H6696			003H6972	003H6702
40	16	G 2 A	-	003H6973	-							
50	20	G 2 1/2 A	-	003H6974	-							
	32	12.5	Flanges PN 25, acc. to EN 1092-2		1-5	003H6705	2-8	003H6975	3-12	003H6708		
	40	20				003H6706		003H6976		003H6709		
	50	25				003H6707		003H6977		003H6710		

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 1/2 003H6902
		20		R 3/4 003H6903
		25		R 1 003H6904
		32		R 1 1/4 003H6905
		40		R 1 1/2 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	DN	k _{vs} (m ³ /h)	Code No.
	Valve insert	15	4.0	003H6873
		20	6.3	003H6874
		25	8.0	003H6875
		32/40/50	12.5/16/20/25	003H6876
	Actuator with setting spring	Δp setting range (bar)		Code No.
		1-5		003H6846
		3-12		003H6847

Technical data
Valve

Nominal diameter	DN	15	20	25	32	40	50
k _{vs} value	m ³ /h	4.0	6.3	8.0	12.5	16/20 ¹⁾	20/25 ¹⁾
Cavitation factor z ²⁾		≥ 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	°C	2 ... 150					
Connections	valve	Ext. thread			Ext. thread and flange		
	tailpieces	Weld-on and flange			Weld-on		
		External thread			-		
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					

¹⁾ Flange valve body

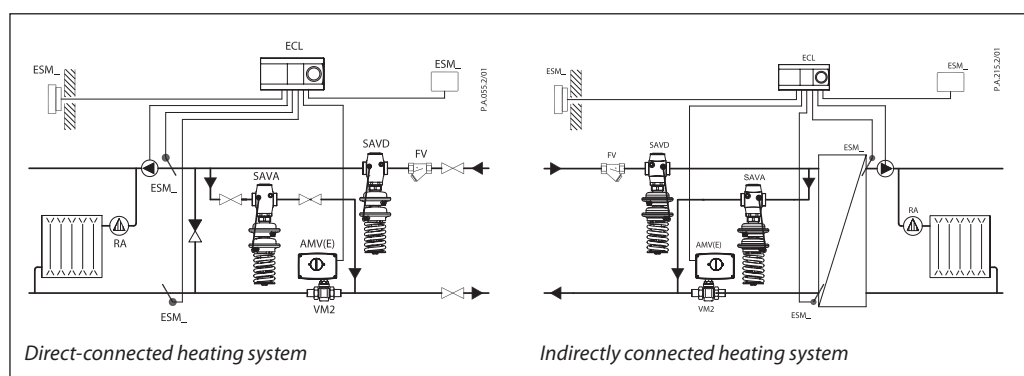
²⁾ k_v/k_{vs} ≤ 0.5 at DN 25 and higher

Technical data (continuous)

Actuator

Actuator size	cm ²	54		
Nominal pressure	PN	25		
Diff. pressure setting ranges and spring colours	bar	1-5	2-8	3-11
		blue	black	black, green
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		

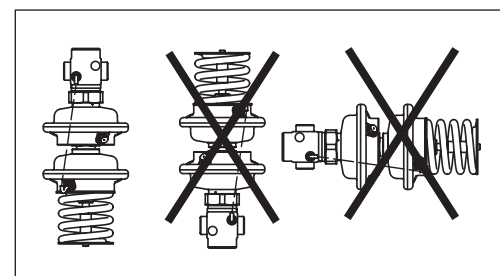
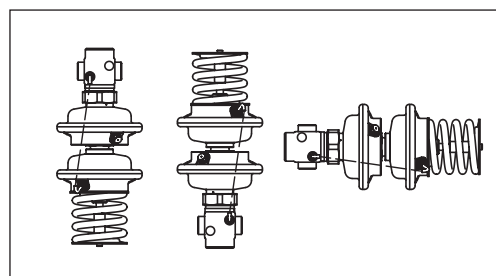
Application principles



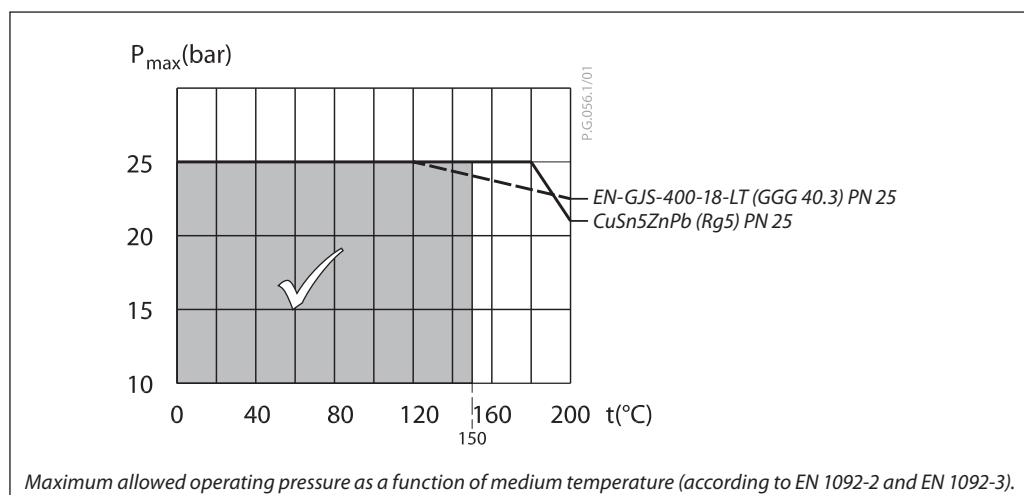
Installation positions

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

Safety pressure reduction controller has to control 5.0 bar behind the controller. Max. flow through the system is less than 2.2 m³/h, min. flow pressure is 6.2 bar.

Given data:

$$Q_{\max} = 2.2 \text{ m}^3/\text{h}$$

$$p_{1 \text{ min}} = 6.2 \text{ bar}$$

$$p_{\text{reduced}} = 5 \text{ bar}$$

Nominal pressure PN 25

The min. differential pressure across the controller is calculated from the formula:

$$\Delta p_{\text{SAVD}} = p_{1 \text{ min}} - p_{\text{reduced}} = 6.2 - 5.0$$

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

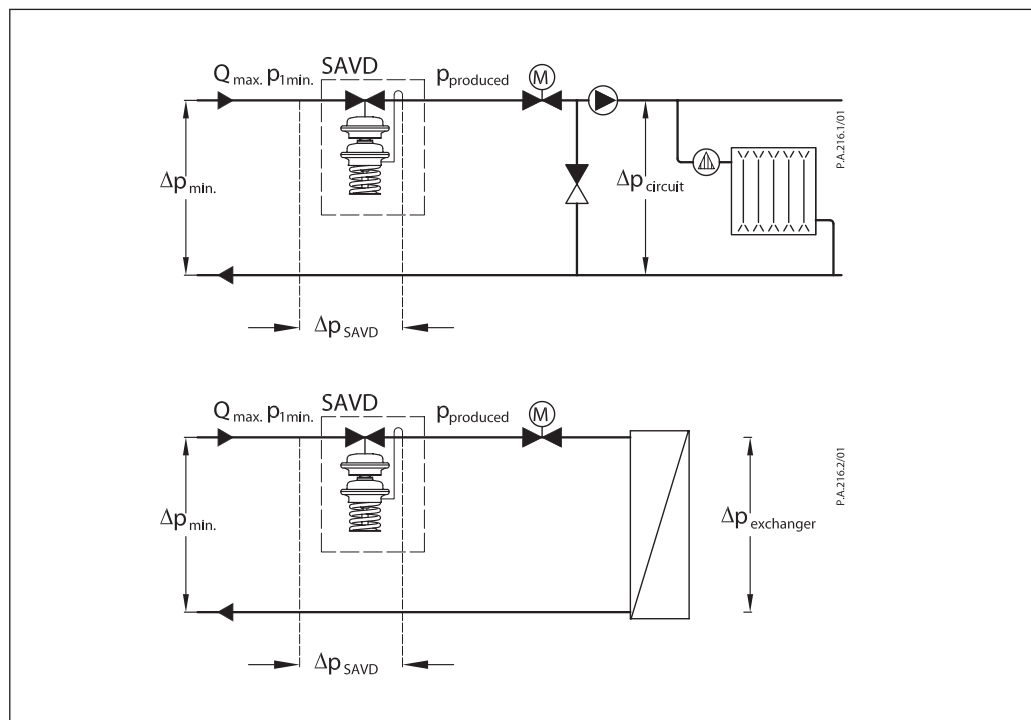
$$k_v = \frac{Q_{\max}}{\sqrt{\Delta p_{\text{SAVD}}}} = \frac{2.2}{\sqrt{1.2}}$$

k_v value is calculated according to formula:

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

Solution:

The example selects SAVD DN 15, k_{vS} value 4.0; with pressure setting range 1-5 bar.

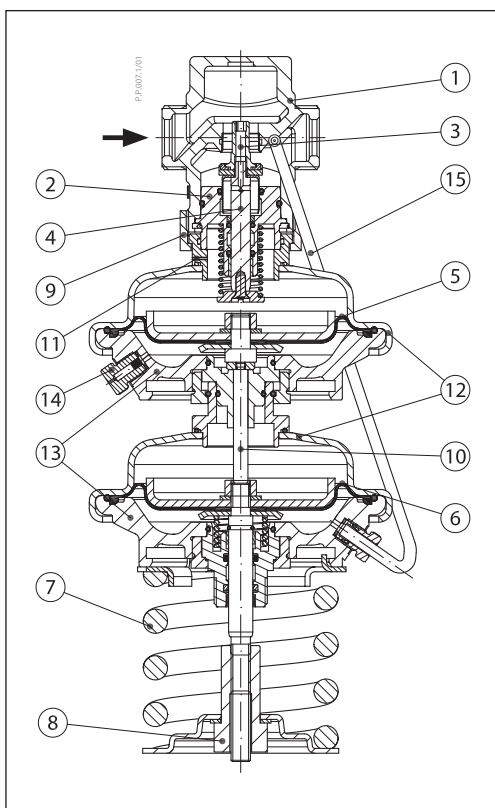


Sizing of Safety Valve SV or Safety Pressure Relief Valve SÜV

If pressure protection is performed by a safety pressure reduction controller (SAV) the downstream safety units (safety valve SV or safety pressure relief valve SÜV) must be designed for a flow rate of at least 1 % of the k_{vS} value of the safety pressure reduction controller (SAV). More details see in standard DIN 4747-1.

Design

1. Valve body
2. Valve insert
3. Pressure relieved valve cone
4. Valve stem
5. Safety diaphragm
6. Control diaphragm
7. Setting spring for pressure control
8. Adjuster for pressure setting, prepared for sealing
9. Union nut
10. Connection stem
11. Air space bore
12. Upper casing of diaphragm
13. Lower casing of diaphragm
14. Threaded joint with sintering filter
15. Impulse tube



Function

Mode of Operation

The safety pressure reduction controller controls the pressure and protects the system against excess pressure behind the valve. The valve cone is softsealed and pressure balanced.

Control function

The pressure behind the control valve is being transferred through the impulse tube into the lower (+) chamber of the control diaphragm. The pressure generates a force on the control diaphragm which counteracts the force of the setting spring. This difference in forces act through the connection stem and the valve stem upon the valve cone. The valve closes when the pressure behind the valve rises and opens when the pressure decreases.

Safety function in case of diaphragm break

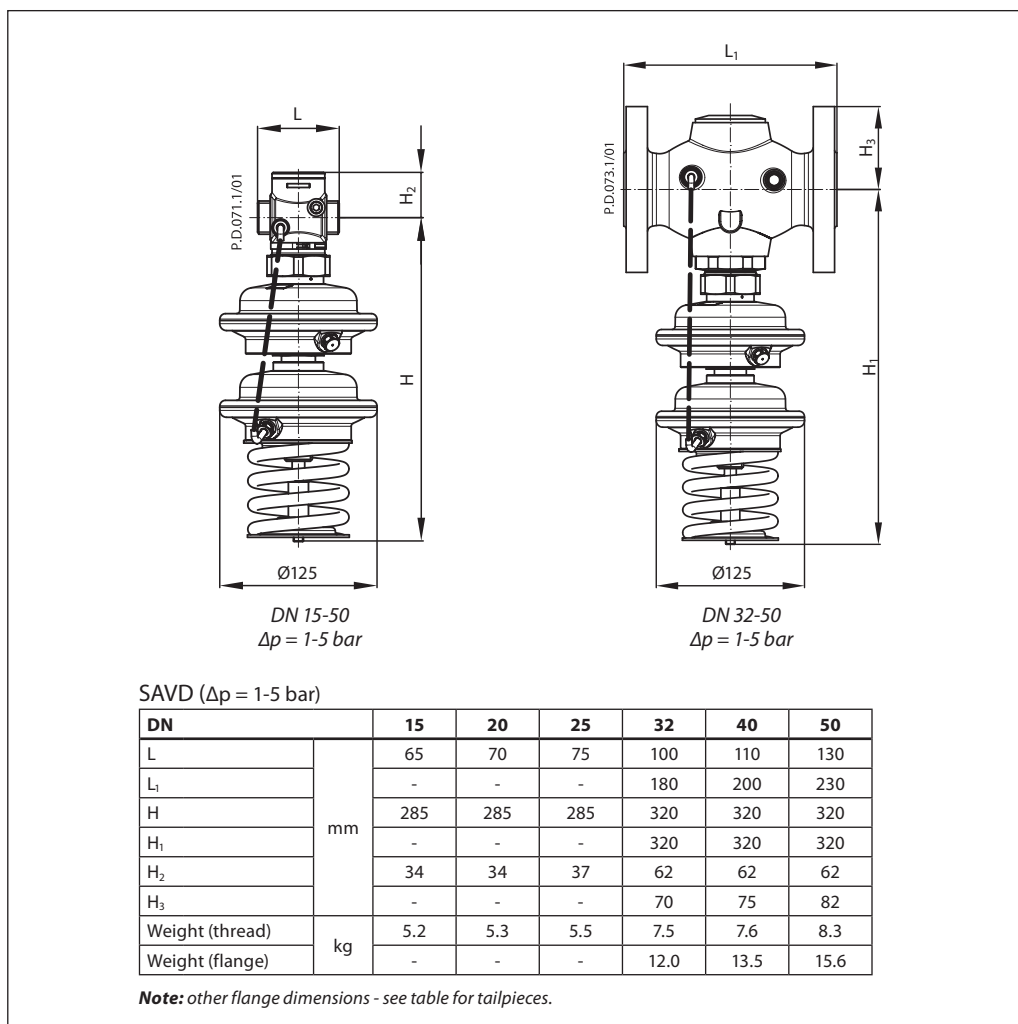
If the control diaphragm breaks, pressure gets in the two intermediate chambers. This pressure acts upon the safety diaphragm and causes the valve to close. The control function does not operate. A slight water leakage at the threaded joint on the safety diaphragm indicates a break of the control diaphragm.

Settings

Pressure setting

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

Dimensions



Dimensions (continuous)

SAVD ($\Delta p = 2-8$ & $3-12$ bar)

DN	15	20	25	32	40	50
L	65	70	75	100	110	130
L ₁	-	-	-	180	200	230
H	345	345	345	390	390	390
H ₁	-	-	-	390	390	390
H ₂	34	34	37	62	62	62
H ₃	-	-	-	70	75	82
Weight (thread)	5.4	5.4	5.6	7.7	7.8	8.5
Weight (flange)	-	-	-	12.1	13.7	15.8

Note: other flange dimensions - see table for tailpieces.

DN	15	20	25	32	40	50
SW	32 (G ¾A)	41 (G 1A)	50 (G 1¼A)	63 (G 1¾A)	70 (G 2A)	82 (G 2½A)
d	21	26	33	42	47	60
R ¹⁾	½	¾	1	1 ¼	1 ½	2
L ₁ ²⁾	130	150	160	-	-	-
L ₂	131	144	160	177	195	252
L ₃	139	154	159	184	204	234
k	65	75	85	100	110	125
d ₂	14	14	14	18	18	18
n	4	4	4	4	4	4

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



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