

Data sheet

# Safety pressure relief controller SAVA (PN 25)

Description



SAVA is a self-acting safety pressure relief controller primarily for use in district heating systems.

The controller is normally closed and opens on rising pressure. It is used for pressure relief control and as a protection against excess pressure in front of the valve.

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

Design-tested according to DIN 4747-1 and AGFW - FW 506.

**Main data:**

- DN 15-50
- $k_{vs}$  4.0-25 m<sup>3</sup>/h
- PN 25
- Setting range: 1.0-4.5/2.0-7.5/3-11 bar
- Temperature:
  - Circulation water / glycolic water up to 30 %: 2 ... 150 °C
- Connections:
  - Ext. thread (weld-on, ext. thread and flange tailpieces)
  - Flange

Ordering

Example:  
Safety pressure relief controller,  
DN 15;  $k_{vs}$  4.0; PN 25; setting range  
1.0-4.5 bar;  $T_{max}$  150 °C; ext. thread

- SAVA DN 15 controller  
Code No: **003H6675**

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

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

SAVA Controller

Picture	DN (mm)	$k_{vs}$ (m <sup>3</sup> /h)	Connection		$\Delta p$ setting range (bar)	Code No.
	15	4.0	Cylindr. ext. thread acc. to ISO 228/1	G 3/4 A	1.0-4.5	<b>003H6675</b>
	20	6.3		G 1 A		<b>003H6676</b>
	25	8.0		G 1 1/4 A		<b>003H6677</b>
	32	12.5		G 1 3/4 A		<b>003H6678</b>
	40	16		G 2 A		<b>003H6679</b>
	50	20		G 2 1/2 A		<b>003H6680</b>
	15	4.0		G 3/4 A	2-7.5	<b>003H6960</b>
	20	6.3		G 1 A		<b>003H6961</b>
	25	8.0		G 1 1/4 A		<b>003H6962</b>
	32	12.5		G 1 3/4 A		<b>003H6963</b>
	40	16		G 2 A		<b>003H6964</b>
	50	20		G 2 1/2 A		<b>003H6965</b>
	15	4.0		G 3/4 A	3-11	<b>003H6681</b>
	20	6.3		G 1 A		<b>003H6682</b>
	25	8.0		G 1 1/4 A		<b>003H6683</b>
32	12.5	G 1 3/4 A	<b>003H6684</b>			
40	16	G 2 A	<b>003H6685</b>			
50	20	G 2 1/2 A	<b>003H6686</b>			
	32	12.5	Flanges PN 25, acc. to EN 1092-2	1.0-4.5	<b>003H6687</b>	
	40	20			<b>003H6688</b>	
	50	25			<b>003H6689</b>	
	32	12.5		2-7.5	<b>003H6966</b>	
	40	20			<b>003H6967</b>	
	50	25			<b>003H6968</b>	
	32	12.5		3-11	<b>003H6690</b>	
	40	20			<b>003H6691</b>	
	50	25			<b>003H6692</b>	

**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>
		40		R 1 1/2 <b>065B2004</b>
		50		R 2 <b>065B2005</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	$\Delta p$ setting range (bar)	Code No.
	Actuator with setting spring	1.0-4.5	<b>003H6846</b>
		3-11	<b>003H6847</b>

**Technical data**
**Valve**

Nominal diameter	DN	15	20	25	32	40	50
$k_{vs}$ 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 $z^2$		≥ 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				-	
<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					

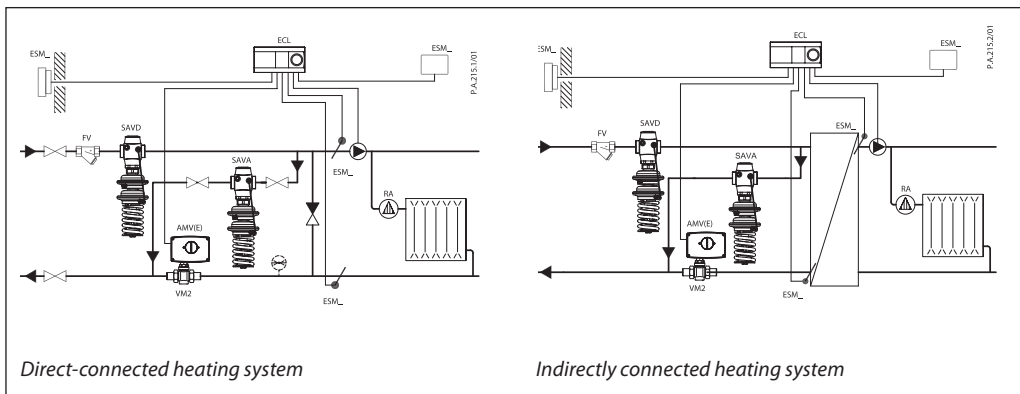
<sup>1)</sup> Flange valve body

<sup>2)</sup>  $k_v/k_{vs} \leq 0.5$  at DN 25 and higher

**Actuator**

Actuator size	cm <sup>2</sup>	54		
Nominal pressure	PN	25		
Diff. pressure setting ranges and spring colours	bar	1.0-4.5	2-7.5	3-11
		blue	black	black, green
<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 × 1 mm		

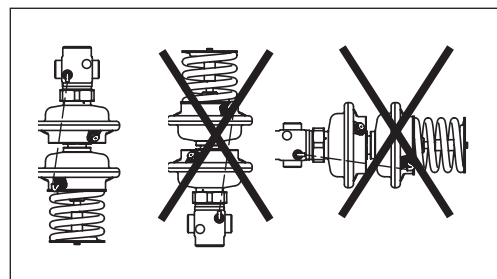
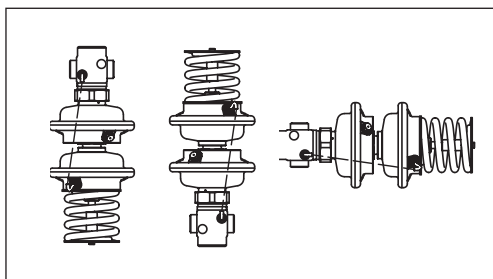
Application principles



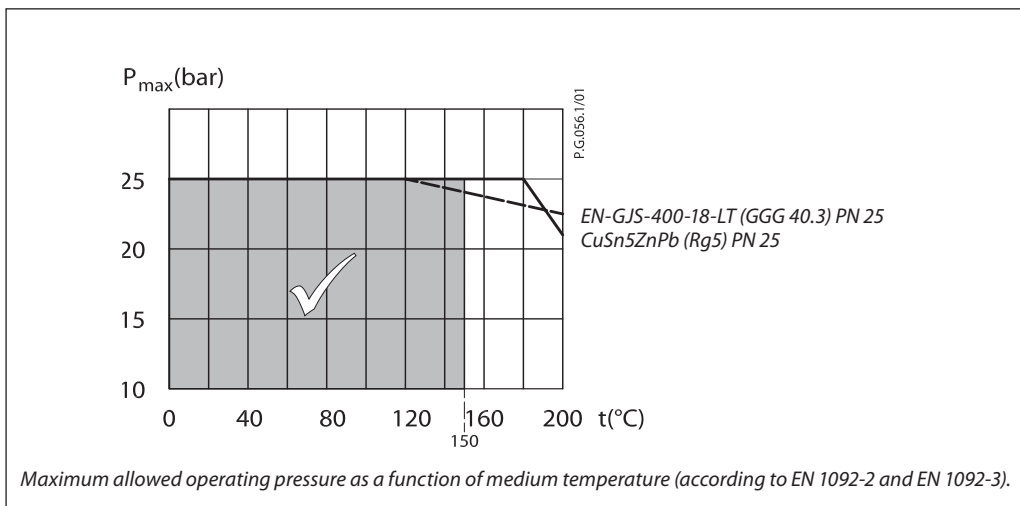
Installation positions

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

Given data:

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

$$\Delta p_{\min} = 1.4 \text{ bar}$$

Nominal pressure PN 25

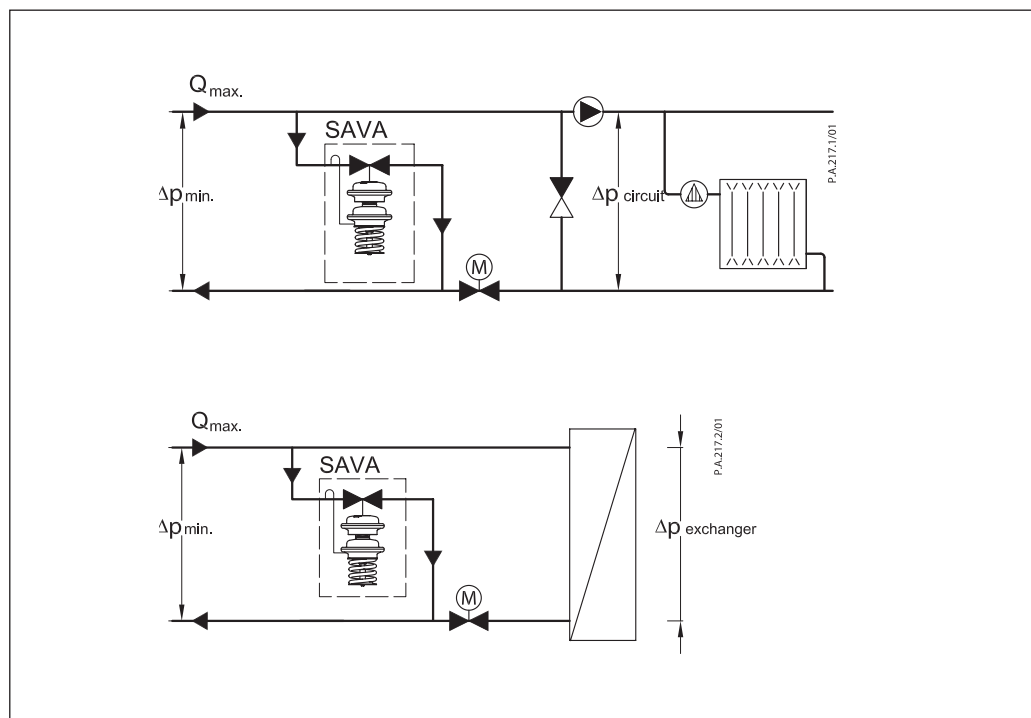
$k_v$  value is calculated according to formula:

$$k_v = \frac{Q_{\max}}{\sqrt{\Delta p_{\min}}} = \frac{2,2}{\sqrt{1,4}}$$

$$k_v = 1.9 \text{ m}^3/\text{h}$$

Solution:

The example selects SAVA DN 15,  $k_{vS}$  value 4.0; with pressure setting range 1.0-4.5 bar.

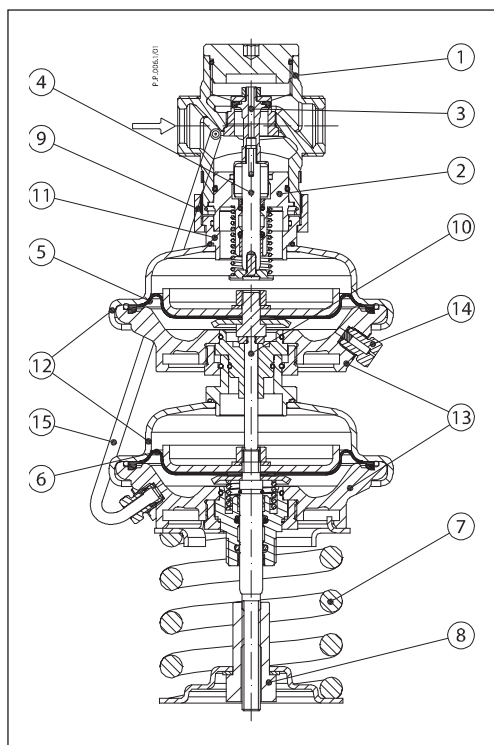


Sizing of Safety Valve SV or Safety Pressure Relief Valve SÜV

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 relief controller controls the pressure and protects the system against excess pressure in front of the valve. The valve cone is softsealed and pressure balanced.

*Control function*

The pressure in front of 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 acts through the connection stem and the valve stem upon the valve cone. The valve opens when the pressure in front of the valve rises and closes when the pressure decreases.

*Safety function in case of diaphragm break*

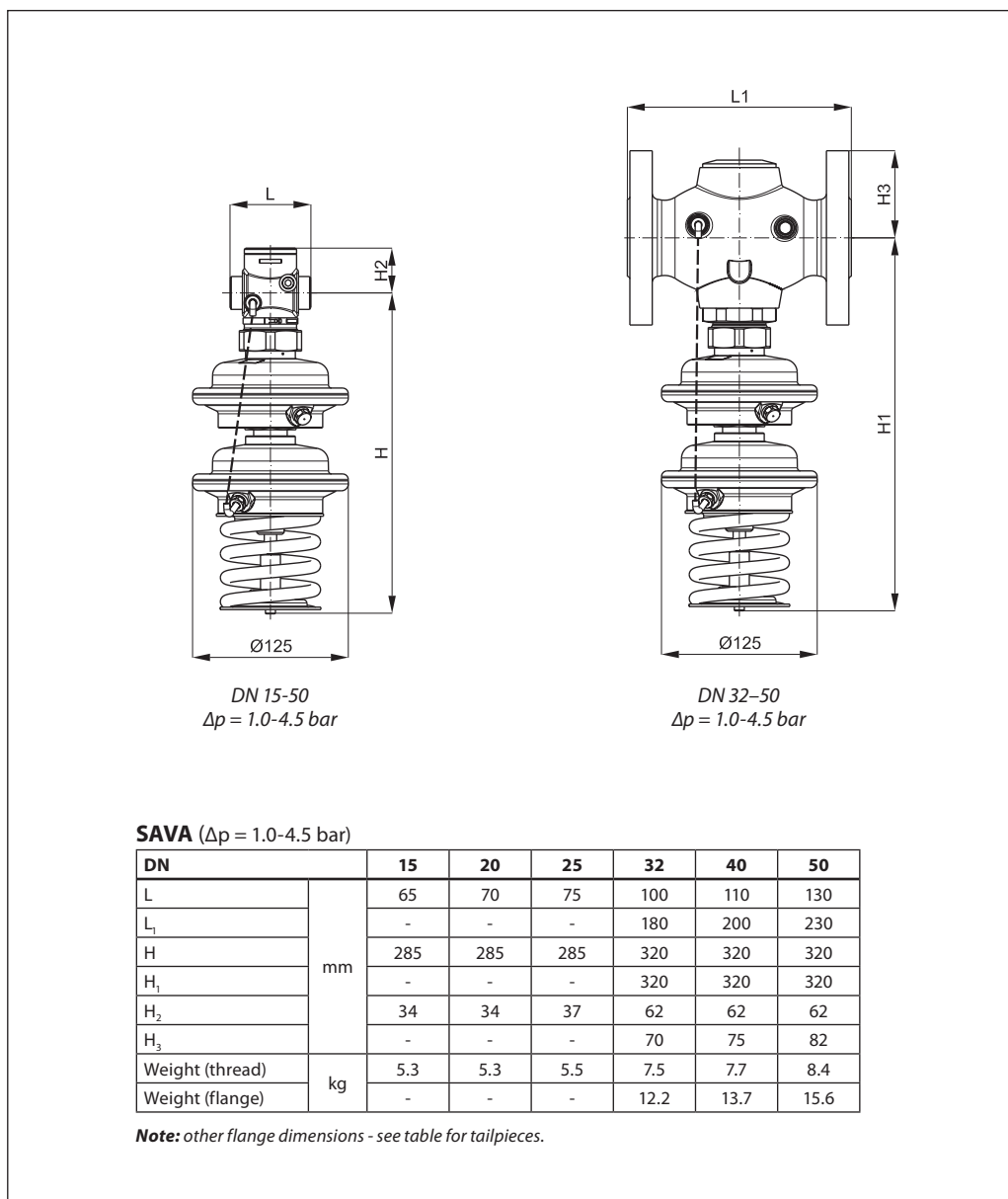
If the control diaphragm breaks, pressure gets in the two intermediate chambers. This pressure acts upon the safety diaphragm and causes the valve to open. The control function does not operate. A slight water leakage at the threaded joint on the safety diaphragm indicates a break of the control diaphragm.

**Settings**

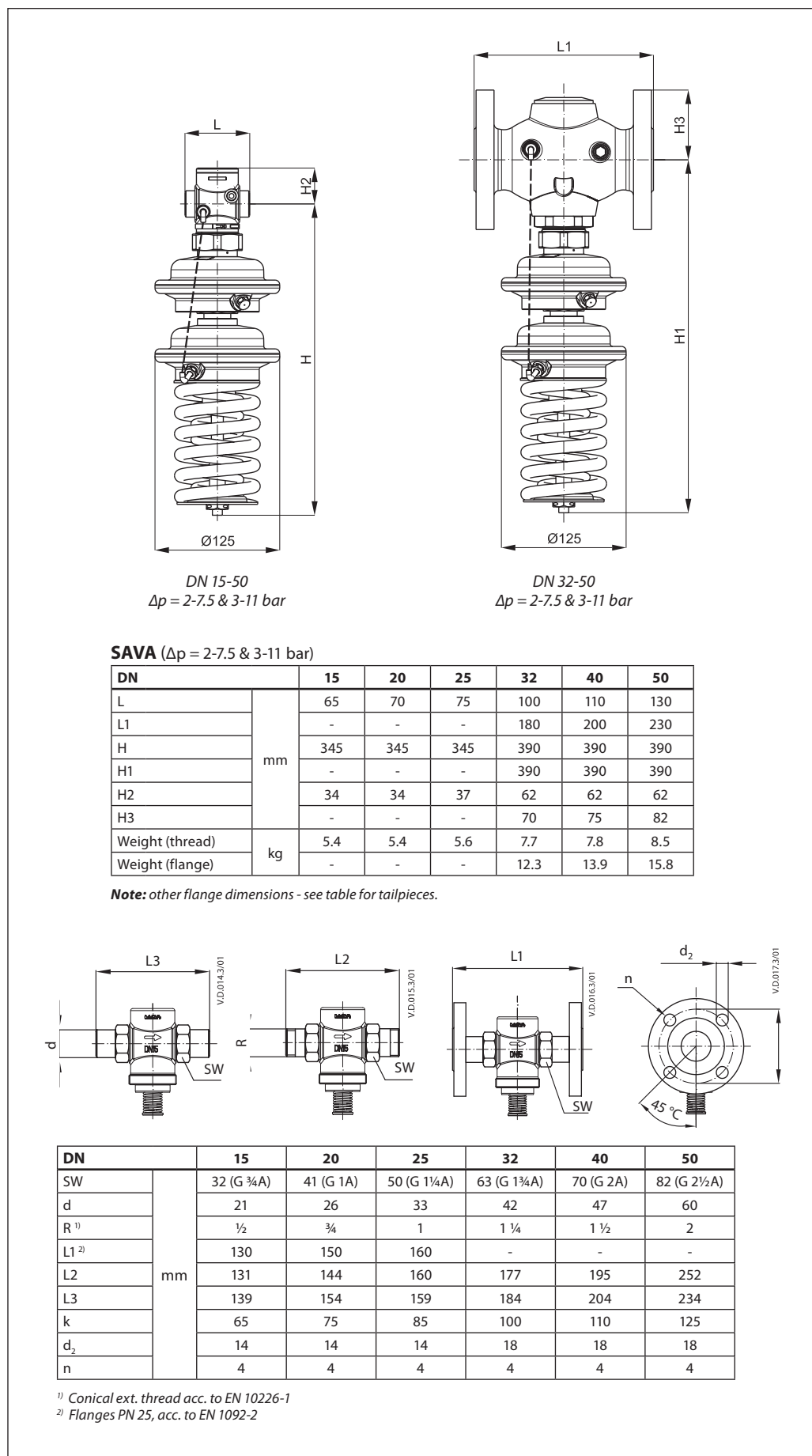
*Pressure setting*

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)





**Danfoss A/S**

Heating Segment • danfoss.com • +45 7488 2222 • E-Mail: heating@danfoss.com

---

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and all Danfoss logotypes are trademarks of Danfoss A/S. All rights reserved.

---