

Data sheet

Pressure reduction controllers (PN 25)

AVD - for water

AVDS - for steam

Description



AVD(S) is a self-acting pressure reduction controller primarily for use in district heating systems. The controller is normally opened and closes on rising pressure.

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

Main data AVD:

- DN 15-50
- k_{vs} 0.4-25 m³/h
- PN 25
- Setting range: 1-5 bar / 3-12 bar
- Temperature:
 - Circulation water/glycolic water up to 30 %: 2 ... 150 °C
- Connections:
 - Ext. thread (weld-on, thread and flange tailpieces)
 - Flange

Main data AVDS:

- DN 15-25
- k_{vs} 1.0-6.3 m³/h
- PN 25
- Setting range: 1-5 bar / 3-12 bar
- Temperature:
 - Steam/circulation water/glycolic water up to 30 %: 2 ... 200 °C
- Connections:
 - External thread (weld-on, thread and flange tailpieces)

Ordering

Example 1 - AVD controller:
Pressure reduction controller for water, DN 15, k_{vs} 4.0, PN 25, setting range 1-5 bar, T_{max} 150 °C, ext. thread

- 1x AVD DN 15 controller
Code No: **003H6644**

Option:
- 1x Weld-on tailpieces
Code No: **003H6908**

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

AVD Controller

Picture	DN (mm)	k _{vs} (m³/h)	Connection		Pressure setting range (bar)	Code No.	Pressure setting range (bar)	Code No.
	15	0.4	Cylindr. ext. thread acc. to ISO 228/1	G ¾ A	1-5	003H6957	3-12	003H6978
		1.0				003H6958		003H6979
		4.0				003H6644		003H6650
	20	6.3		G 1 A		003H6645		003H6651
	25	8.0		G 1¼ A		003H6646		003H6652
	32	12.5	Flanges PN 25, acc. to EN 1092-2			003H6659		003H6662
	40	20				003H6660		003H6663
	50	25				003H6661		003H6664

Note: other controllers available on special request.

Data sheet

Pressure reduction controllers AVD(S) (PN 25)

Ordering (continuous)

Example 2 - **AVDS** controller:
Pressure reduction controller for
steam, DN 15, k_{vs} 3.2, PN 25, setting
range 1-5 bar, T_{max} 200 °C,
ext. thread

- 1× AVDS DN 15 controller
Code No: **003H6667**
- 1× Impulse tube set AV 1/8
Code No: **003H6852**

Option:

- 1× Weld-on tailpieces
Code No: **003H6908**
- 1× Seal pot
Code No: **003H0277**

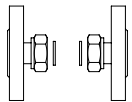
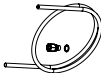
The controller will be delivered
completely assembled. External
impulse tube (AV) and seal pot must
be ordered separately.

AVDS Controller ¹⁾

Picture	DN (mm)	k_{vs} (m ³ /h)	Connection		Pressure setting range (bar)	Code No.	Pressure setting range (bar)	Code No.
	15	1.0	Cylindr. ext. thread acc. to ISO 228/1	G 3/4 A	1-5	003H6665	3-12	003H6670
		1.6				003H6666		003H6671
		3.2				003H6667		003H6672
	20	4.5		G 1 A		003H6668		003H6673
	25	6.3		G 1 1/4 A		003H6669		003H6674

¹⁾ Seal pot has to be used on impulse tubes always in steam applications when $T_{max} \geq 150$ °C

Accessories

Picture	Type designation	DN	Connection		Code No.
	Weld-on tailpieces	15	-		003H6908
		20			003H6909
		25			003H6910
	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
	Flange tailpieces	15	Flanges PN 25, acc. to EN 1092-2		003H6915
		20			003H6916
		25			003H6917
	Impulse tube set AV	Description: - 1x copper tube Ø 6 x 1 x 1500 mm - 1x compression fitting) for imp. tube connection to pipe Ø 6 x 1 mm		R 1/8	003H6852
				R 3/8	003H6853
				R 1/2	003H6854
	1) 10 compression fittings for impulse tube connection to pipe, Ø 6 x 1 mm R 1/8				003H6857
	1) 10 compression fittings for impulse tube connection to pipe, Ø 6 x 1 mm R 3/8				003H6858
	1) 10 compression fittings for impulse tube connection to pipe, Ø 6 x 1 mm R 1/2				003H6859
	1) 10 compression fittings for impulse tube connection to actuator, Ø 6 x 1 mm G 1/8				003H6931
	Shut off valve Ø 6 mm				003H0276
	2) Seal pot, 0.3 l, with two compression fittings Ø 6 x 1 mm				003H0277

¹⁾ Compression fitting consists of a nipple, compression ring and nut.

²⁾ Seal pot has to be used on impulse tubes always in steam applications when $T_{max} \geq 150$ °C

Service kits

Picture	Type designation	DN	k_{vs} (m ³ /h)	Code No.
	Valve insert ¹⁾	15	0.4	003H6869
			1.0	003H6870
			4.0	003H6873
		20	6.3	003H6874
		25	8.0	003H6875
	Valve body extension with stuffing box ²⁾	32/40/50	12.5/20/25	003H6876
		15	3.2	003H6877
		20	4.5	
		25	6.3	
	Actuator with setting spring		Pressure setting range (bar)	Code No.
			1-5	003H6844
			3-12	003H6845

¹⁾ for AVD controller only

²⁾ for AVDS controller only

Technical data

Valve (AVD)

Nominal diameter		DN	15			20	25	32	40	50
k _{VS} value		m³/h	0.4	1.0	4.0	6.3	8.0	12.5	20	25
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		External thread					Flange		
	tailpieces		Weld-on, external thread and flange					-		
Materials										
Valve body	thread		Red bronze CuSn5ZnPb (Rg5)					-		
	flange		-					Ductile iron EN-GJS-400-18-LT (GGG 40.3)		
Valve seat			Stainless steel, mat. No. 1.4571							
Valve cone			Dezincing free brass CuZn36Pb2As							
Sealing			EPDM							
Pressure relieve system			Piston							

Valve (AVDS)

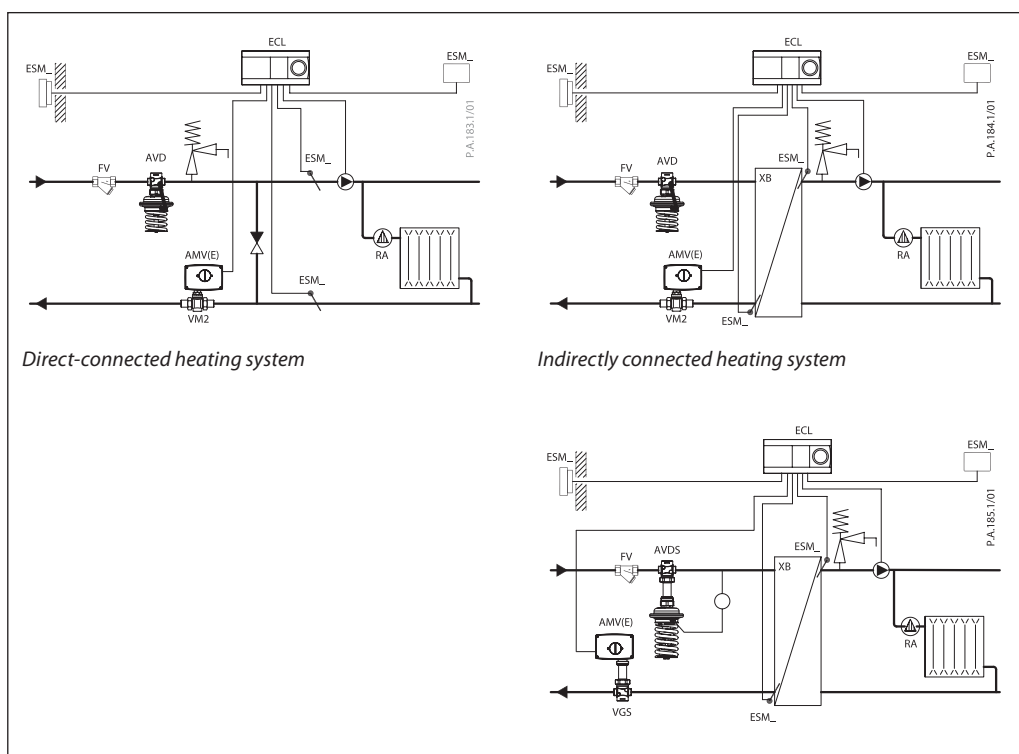
Nominal diameter		DN	15			20	25
k _{vs} value		m³/h	1.0	1.6	3.2	4.5	6.3
Cavitation factor z			≥ 0.6				≥ 0.55
Leakage acc. to standard IEC 534		% of k _{vs}	≤ 0.02				
Nominal pressure		PN	25				
Max. differential pressure		bar	10				
Medium			Steam / Circulation water / glycolic water up to 30 %				
Medium pH			Min. 7, max. 10				
Medium temperature		°C	2 ... 200 ¹⁾				
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			Stainless steel, mat. No. 1.4122				
Pressure relieve system			Bellows				

¹⁾ Seal pot has to be used on impulse tubes always in steam applications when $T_{max} \geq 150$ °C

Actuator

Type		AVD, AVDS	
Actuator size	cm ²	54	
Nominal pressure	PN	25	
Pressure setting ranges and spring colours	bar	1-5	3-12
		blue	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 Ø 6 x 1 mm	

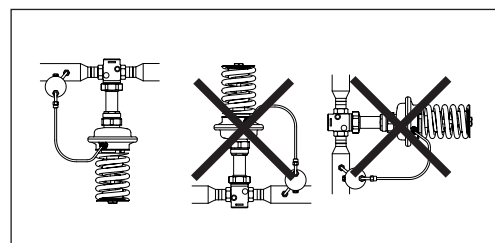
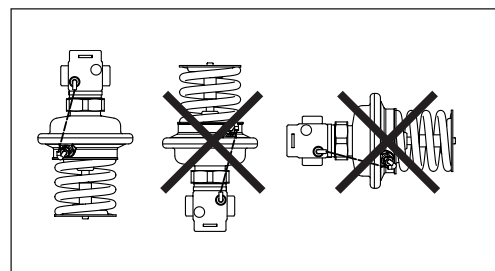
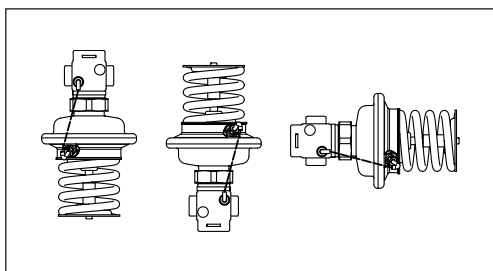
Application principles



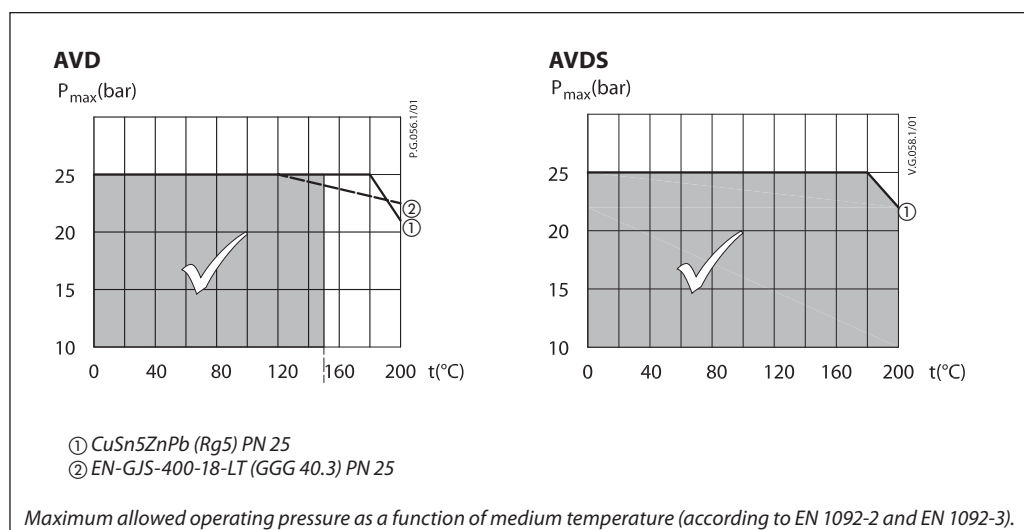
Installation positions

Up to medium temperature of 100 °C the controllers can be installed in any position (valid for AVD controller only).

For higher temperatures (valid for AVD controller) and **always** in steam applications (AVDS controller) the controllers have to be installed in horizontal pipes only, with a pressure actuator oriented downwards.



Pressure temperature diagram



Sizing

Pressure reduction controller has to control 6.0 bar behind the controller. Max. flow through the system is less than 2.0 m³/h, min. flow pressure is 7.5 bar.

Given data:

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

$$p_{1\min} = 7.5 \text{ bar}$$

$$p_{\text{reduced}} = 6.0 \text{ bar}$$

Nominal pressure PN 25

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

$$\Delta p_{\text{AVD}} = p_{1\min} - p_{\text{reduced}} = 7.5 - 6.0$$

$$\Delta p_{\text{AVD}} = 1.5 \text{ bar}$$

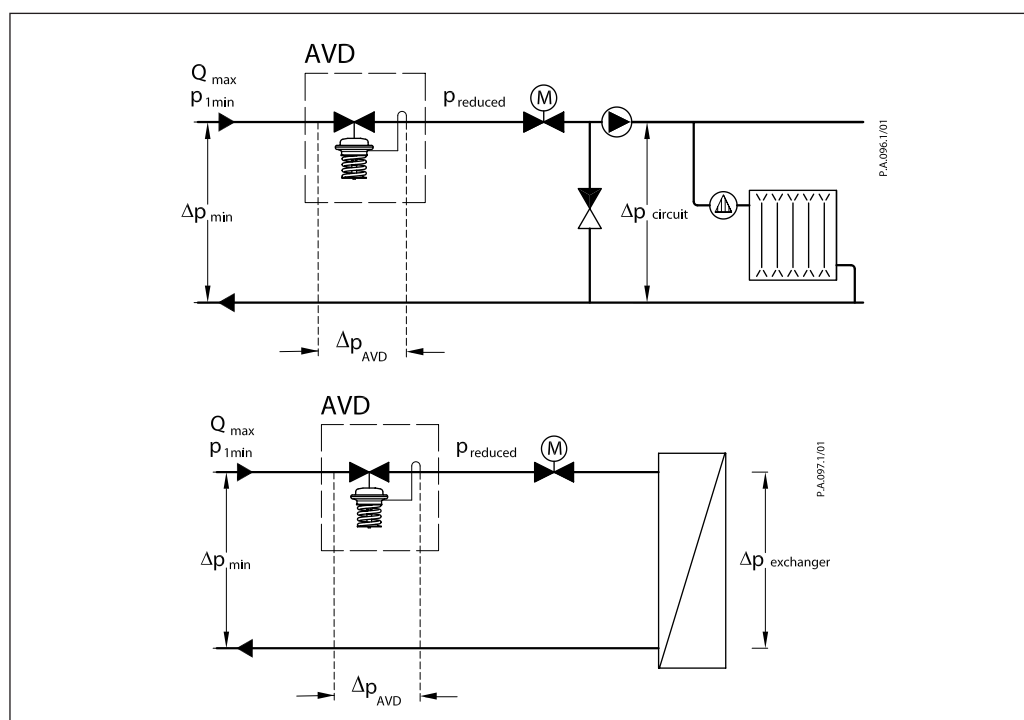
k_v value is calculated according to formula:

$$k_v = \frac{Q_{\max}}{\sqrt{\Delta p_{\text{AVD}}}} = \frac{2.0}{\sqrt{1.5}}$$

$$k_v = 1.6 \text{ m}^3/\text{h}$$

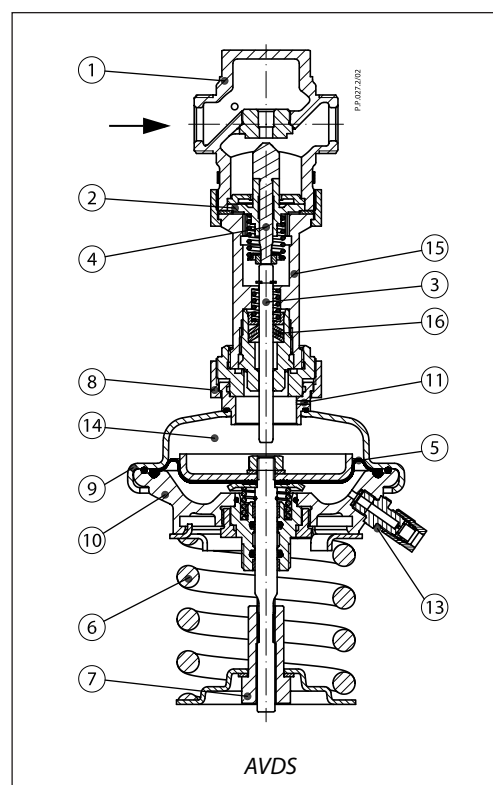
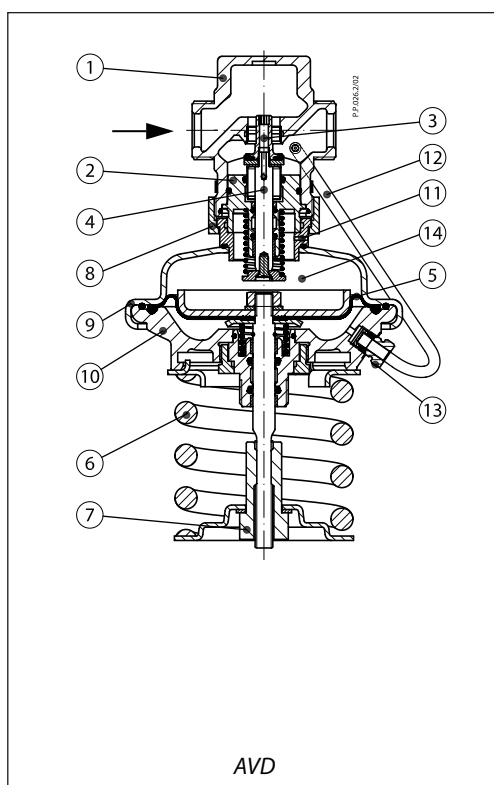
Solution:

The example selects AVD DN 15, k_{vS} value 4.0, with pressure setting range 3-12 bar



Design

1. Valve body
2. Valve insert
3. Pressure relieved valve cone
4. Valve stem
5. Control diaphragm
6. Setting spring for pressure control
7. Adjuster for pressure setting, prepared for sealing
8. Union nut
9. Upper casing of diaphragm
10. Lower casing of diaphragm
11. Air space bore
12. Impulse tube
13. Compression fitting for impulse tube
14. Actuator
15. Valve body extension
16. Stuffing box



Function

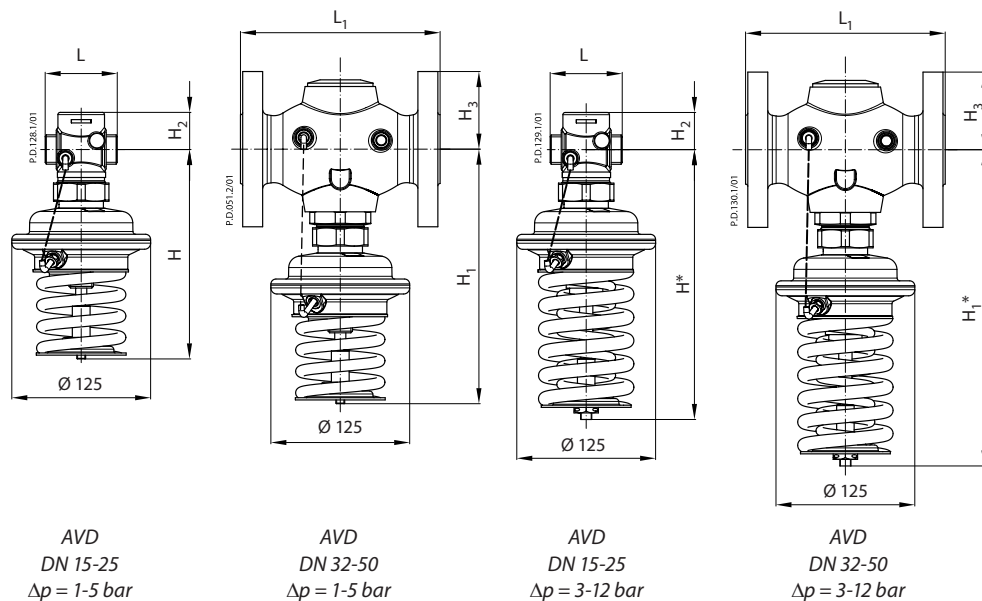
The pressure behind of the control valve is being transferred through the impulse tube to the actuator chamber and act on control diaphragm. On the other side of the diaphragm atmospheric pressure is acting (through air space bore). Control valve is normally opened. It closes on rising pressure and opens on falling pressure to maintain constant pressure.

Settings

Pressure setting

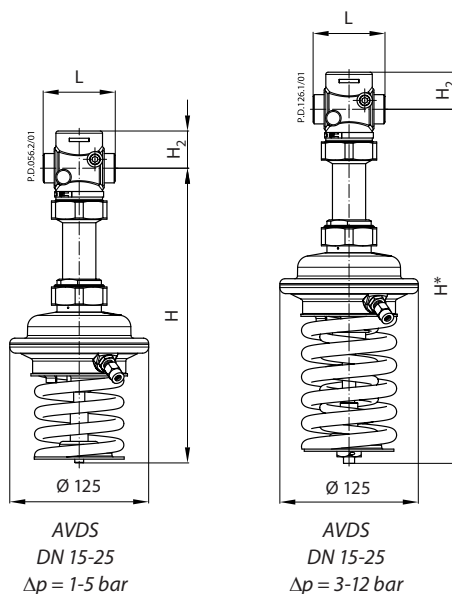
Pressure setting is being done by the adjustment of the setting spring for pressure control. The adjustment can be done by means of spring for pressure setting and/or pressure indicators.

Dimensions



DN	L	L ₁	H	H*	H ₁	H ₁ *	H ₂	H ₃	Weight (kg)	
									1-5 bar	3-12 bar
15	65	-	215	275	-	-	34	-	3.5	3.7
20	70	-	215	275	-	-	34	-	3.5	3.7
25	75	-	215	275	-	-	37	-	3.7	3.8
32	-	180	-	-	250	320	-	70	10.2	10.4
40	-	200	-	-	250	320	-	75	11.8	11.9
50	-	230	-	-	250	320	-	82	13.9	14.0

Note: Other flange dimensions - see table for tailpieces.

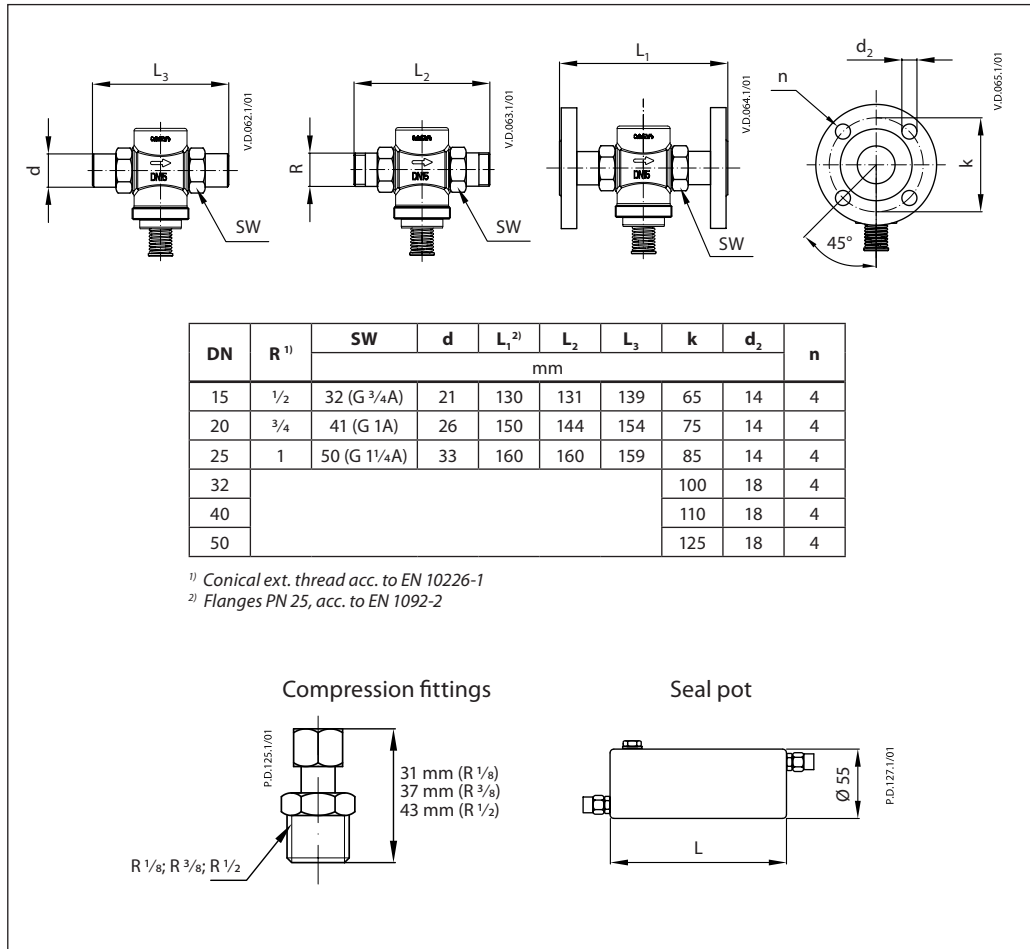


DN	L	H	H*	H ₂	Weight (kg)	
					1-5 bar	3-12 bar
15	65	290	345	34	3.5	3.7
20	70	290	345	34	3.5	3.7
25	75	290	345	37	3.7	3.9

Data sheet

Pressure reduction controllers AVD(S) (PN 25)

Dimensions (continuous)



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

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