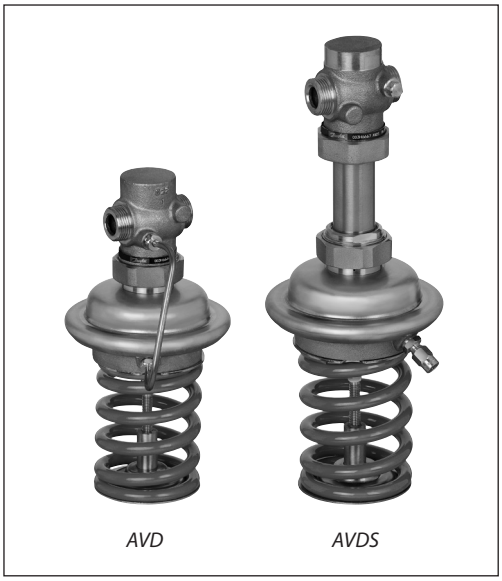
ENGINEERING
TOMORROW

Data sheet

Pressure reduction controllers (PN 25)
AVD - for water
AVDS - for steam

Description



AVD *AVDS*

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

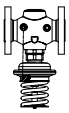
*Example 1 - **AVD** controller:*
Pressure reduction controller for water, DN 15, k_{VS} 4.0, PN 25, setting range 1-5 bar, T_{max} 150 °C, ext. thread

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

Option:
- 1× 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.*

Ordering *(continuous)*

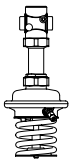
*Example 2 - **AVDS** controller: Pressure reduction controller for steam, DN 15, k_{VS} 3.2, PN 25, setting range 1-5 bar, T_{max} 200 °C, ext. thread*

- *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***

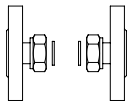
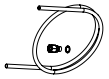
The controller will be delivered completely assembled. External impulse tube (AV) and seal pot must be ordered separately.

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 ¾ 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 1¼ A		**003H6669**		**003H6674**

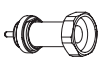
[1] *Seal pot has to be used on impulse tubes always in steam applications when $T_{max} \geq 150$ °C*

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 ½	**003H6902**
		20		R ¾	**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: - 1× copper tube Ø 6 × 1 × 1500 mm - 1× compression fitting) for imp. tube connection to pipe Ø 6 × 1 mm		R 1/8	**003H6852**
				R 3/8	**003H6853**
				R ½	**003H6854**
	[1] 10 compression fittings for impulse tube connection to pipe, Ø 6 × 1 mm R 1/8				**003H6857**
	[1] 10 compression fittings for impulse tube connection to pipe, Ø 6 × 1 mm R 3/8				**003H6858**
	[1] 10 compression fittings for impulse tube connection to pipe, Ø 6 × 1 mm R ½				**003H6859**
	[1] 10 compression fittings for impulse tube connection to actuator, Ø 6 × 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 × 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**
		32/40/50	12.5/20/25	**003H6876**
	Valve body extension with stuffing box [2]	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	m^3/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)

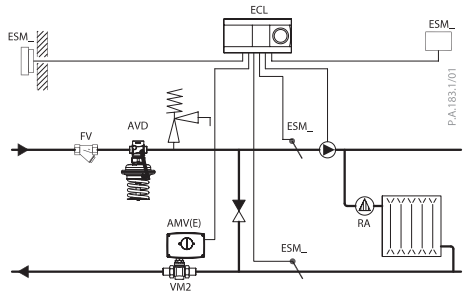
Nominal diameter	**DN**	**15**			**20**	**25**
k_{VS} value	m^3/h	1.0	1.6	3.2	4.5	6.3
Cavitation factor z		≥ 0.6				≥ 0.55
Leakage acc. to standard IEC 534	% of k_{VS}	≤ 0.02				
Nominal pressure	PN	25				
Max. differential pressure	bar	10				
Medium		Steam / Circulation water / glycolic water up to 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

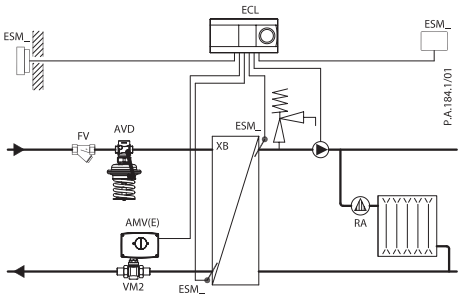
Actuator

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 × 1 mm	

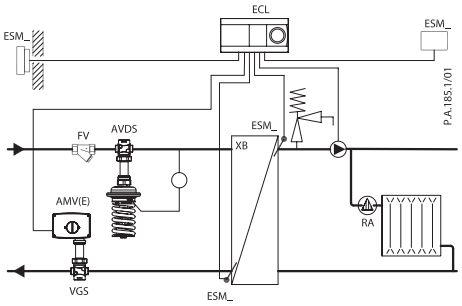
Application principles



Direct-connected heating system

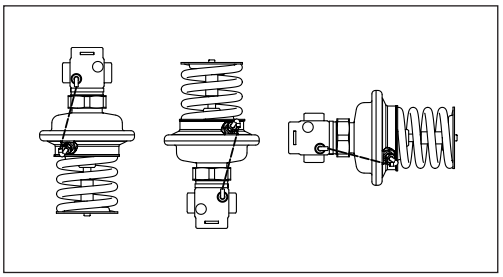


Indirectly connected heating system

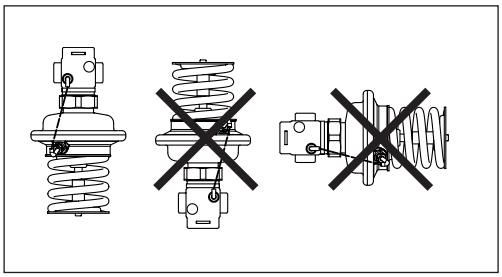


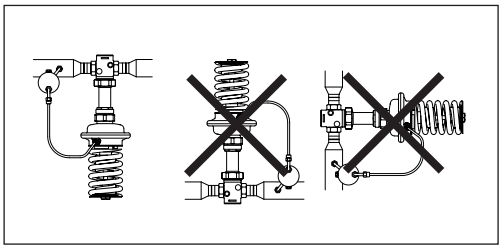
Installation positions

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

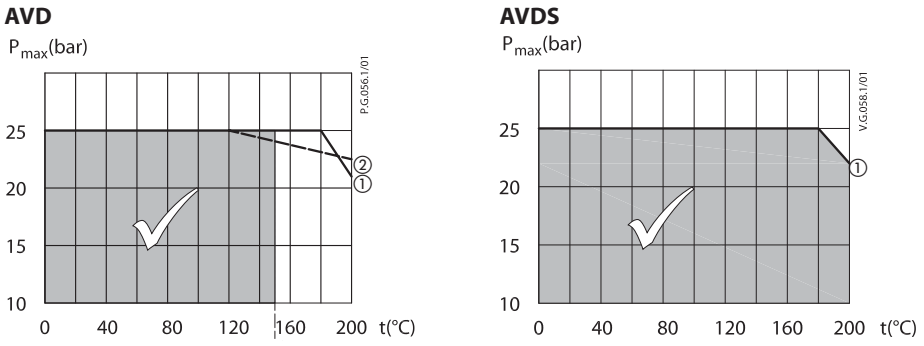


For higher temperatures (valid for AVD controller) and **always** in steam applications (AVDS controller) the controllers have to be installed in horizontal pipes only, with a pressure actuator oriented downwards.





Pressure temperature diagram



① *CuSn5ZnPb (Rg5) PN 25*
② *EN-GJS-400-18-LT (GGG 40.3) PN 25*

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

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 m³/h
$p_{1\,min}$ = 7.5 bar
$p_{reduced}$ = 6.0 bar

Nominal pressure PN 25

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

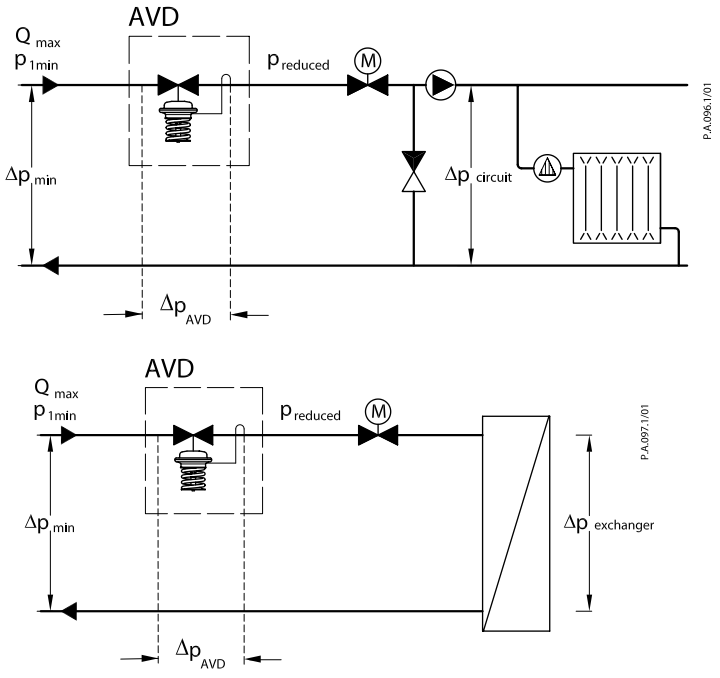
$\Delta p_{AVD} = p_{1\,min} - p_{reduced} = 7.5 - 6.0$

Δp_{AVD} = 1.5 bar
k_v value is calculated according to formula:

$$k_v = \frac{Q_{max}}{\sqrt{\Delta p_{AVD}}} = \frac{2{,}0}{\sqrt{1{,}5}}$$

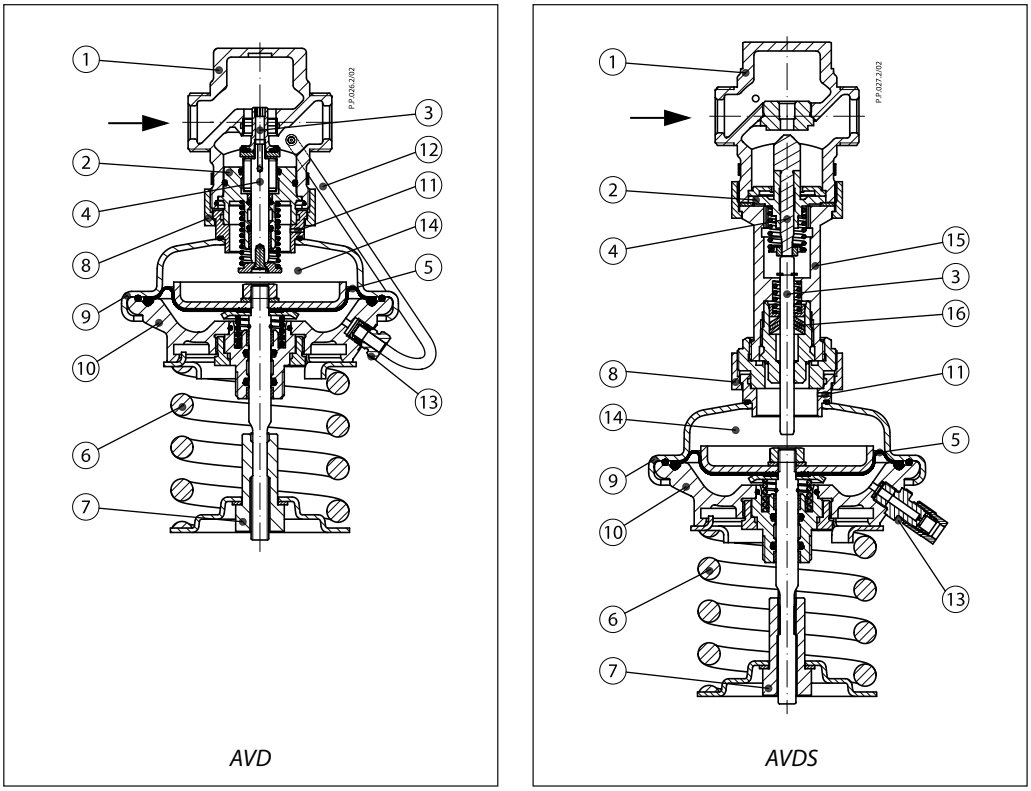
k_v = 1.6 m³/h

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



AVD *AVDS*

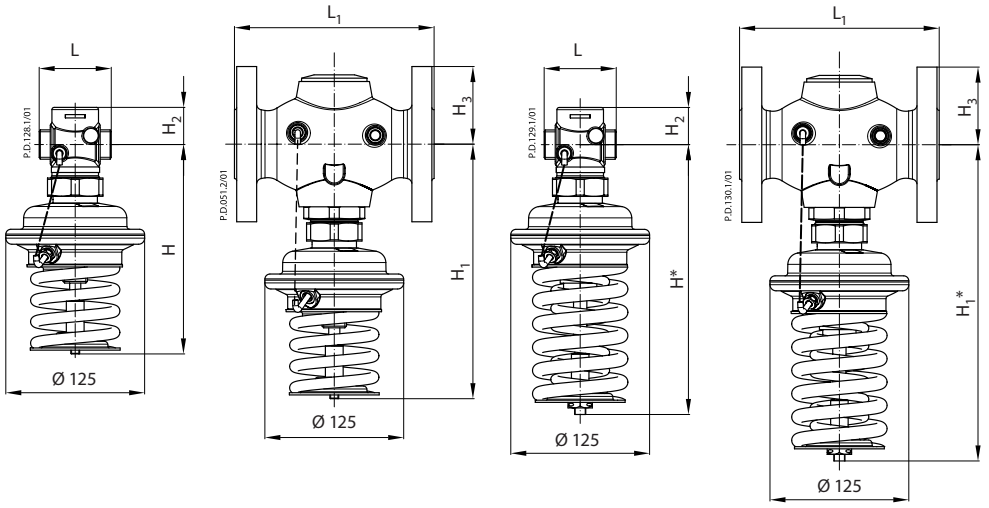
Function

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.

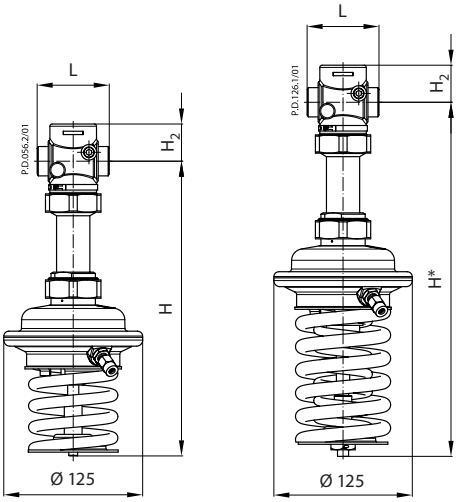
Dimensions



AVD DN 15-25 Δp = 1-5 bar | *AVD DN 32-50 Δp = 1-5 bar* | *AVD DN 15-25 Δp = 3-12 bar* | *AVD DN 32-50 Δp = 3-12 bar*

DN	L	L_1	H	H*	H_1	H_1*	H_2	H_3	**Weight** (kg)	
	mm								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

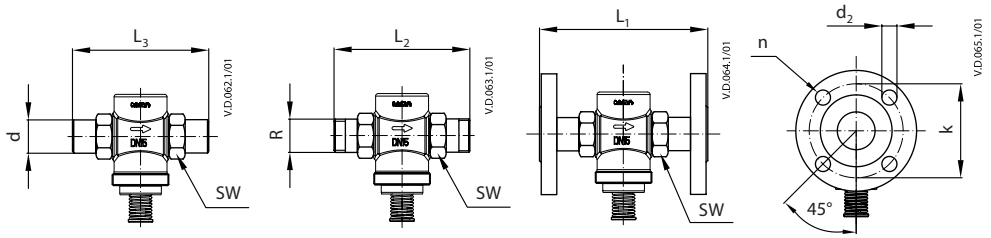
Note: *Other flange dimensions - see table for tailpieces.*



AVDS DN 15-25 Δp = 1-5 bar | *AVDS DN 15-25 Δp = 3-12 bar*

DN	L	H	H*	H_2	**Weight** (kg)	
	mm				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

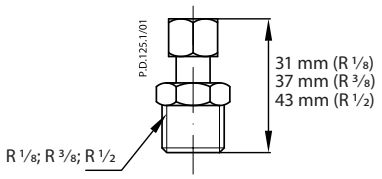
Dimensions *(continuous)*



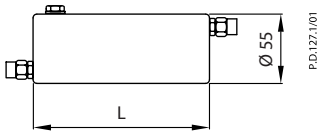
DN	R [1]	SW	d	L_1 [2]	L_2	L_3	k	d_2	n
		mm							
15	½	32 (G ¾A)	21	130	131	139	65	14	4
20	¾	41 (G 1A)	26	150	144	154	75	14	4
25	1	50 (G 1¼A)	33	160	160	159	85	14	4
32							100	18	4
40							110	18	4
50							125	18	4

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

Compression fittings



Seal pot



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