Data sheet

Pressure flow controllers

AFD 2 / VFG 22(1) / VFG 2(1) / VFGS 2

Pressure reduction controllers

Description

The controller is a self-acting pressure reduction controller primarily for use in district heating systems. Direct operated, reliable and high precise controller closes on rising pressure.

The controller has a control valve, an actuator with one control diaphragm and spring for pressure setting.
Further on two valve versions are available:
- VFG 2 / VFG 22 with metallic sealing cone
- VFG 21 / VFG 221 with soft sealing cone

Remote network balancing optimization function.
Together with Danfoss intelligent electrical actuator AMEi 6 iNET, remote adjustment of the pressure is enabled.

Main data:
- DN 15-250
- k_{VS} 4.0-800 m^3/h
- PN 16, 25, 40
- Setting range:
  0.1-0.35 bar / 0.1-1 bar / 0.5-1.5 bar / 1-2.5 bar / 1.5-4 bar / 1-3 bar / 1.5-5 bar / 3-8,5 bar / 3-12 bar / 8-16 bar
- Temperature:
  - VFG - Circulation water / glycolic water up to 30 %: 2 ... 150 / 200 °C
  - VFGS - Steam / circulation water / glycolic water up to 30 %: 2 ... 200 / 300 / 350 °C
- Connections:
  - Flange

Features & benefits

- Reliable Autonomous Operation:
  - As a direct-operated, self-acting controller, it provides highly precise and reliable pressure reduction that automatically closes on rising pressure, ensuring system stability and protection without requiring an external power source for its basic function.
- Intelligent Remote Management:
  - Integration with the Danfoss AMEi 6 iNET actuator enables remote pressure adjustments and network balancing optimization, allowing for enhanced control and improved efficiency across the district heating system from a central location.
- Wide Application Versatility:
  - With a broad range of sizes (DN 15-250), pressure ratings (PN 16-40), extensive pressure setting options, and versions for both high-temperature water and steam, this controller offers the flexibility to meet diverse system requirements.

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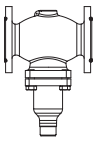
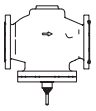
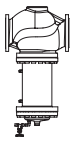
Ordering

Product code numbers

VFG 2 / VFG 22 Valve (metal sealing cone)

Picture	DN (mm)	k_{VS} (m^3/h)	Connections	$T_{max.}$ (°C)	Code No.		
					PN16	PN25	PN40
	15 [1]	4.0	Flanges acc. to EN 1092-1	150 °C (PN16)	**065B2388**	**065B2401**	**065B2411**
	20 [1]	6.3			**065B2389**	**065B2402**	**065B2412**
	25 [1]	8.0			**065B2390**	**065B2403**	**065B2413**
	32 [1]	16		200 °C [2] (PN25,40)	**065B2391**	**065B2404**	**065B2414**
	40 [1]	20			**065B2392**	**065B2405**	**065B2415**
	50 [1]	32			**065B2393**	**065B2406**	**065B2416**
	65	60		150 °C	**065B5500**	**065B5507**	**065B5514**
	80	80			**065B5501**	**065B5508**	**065B5515**
	100	160			**065B5502**	**065B5509**	**065B5516**
	125	250			**065B5503**	**065B5510**	**065B5517**
	150	380			**065B5504**	**065B5511**	**065B5518**
	200	650			**065B5505**	**065B5512**	**065B5519**
	250	800			**065B5506**	**065B5513**	**065B5520**
	150 [1]	280		200 °C [1]	**065B2424**	-	**On request**
	200 [1]	320			**065B2425**	-	**On request**
	250 [1]	400			**065B2426**	-	**On request**

[1] VFG 2 valves require ordering of 003G1780 adapter for a combination with AFD 2 pressure actuators

[2] At temperatures above 150°C only with seal pots (see Accessories)

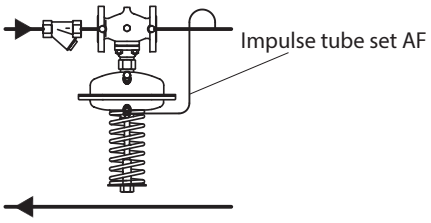
Example 1:
Pressure reduction controller, for water, DN 65, k_{VS} , PN 16, metallic sealing, setting range 1.5 - 5 bar, T_{max} 150 °C, flange;

– 1× VFG 22 DN 65 valve
Code no: **065B5500**

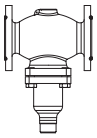
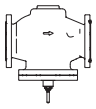
– 1× AFD 2 actuator
Code no: **003G5626**

– 1× Impulse tube set AF
Code no: **003G1391**

Products will be delivered separately.



VFG 21 / VFG 221 Valve (soft sealing cone)

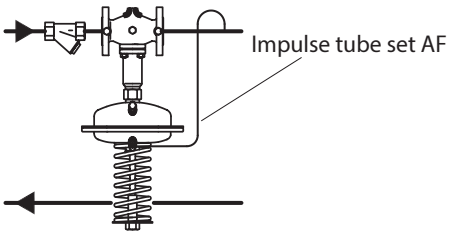
Picture	DN (mm)	k_{VS} (m^3/h)	Connections	$T_{max.}$ (°C)	Code No.		
					PN16	PN25	PN40
	15 [1]	4.0	Flanges acc. to EN 1092-1	150 °C	065B2502	-	-
	20 [1]	6.3			065B2503	-	-
	25 [1]	8.0			065B2504	-	-
	32 [1]	16			065B2505	-	-
	40 [1]	20			065B2506	-	-
	50 [1]	32			065B2507	-	-
	65	60			065B5521	065B5528	065B5535
	80	80			065B5522	065B5529	065B5536
	100	160			065B5523	065B5530	065B5537
	125	250			065B5524	065B5531	065B5538
	150	380			065B5525	065B5532	065B5539
	200	650			065B5526	065B5533	065B5540
	250	800			065B5527	065B5534	065B5541

[1] VFG 21 valves require ordering of 003G1780 adapter for a combination with AFD 2 pressure actuators

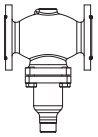
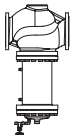
Example 2:
Pressure reduction controller; for water; DN 15; k_{VS} 4.0; PN 16; metallic sealing; setting range 0.5 - 1.5 bar; T_{max} 150 °C; flange;

– 1× VFG 2 DN 15 valve
Code no: **065B2388**
– 1× AFD actuator
Code no: **003G5630**
– 1× Impulse tube set AF
Code no: **003G1391**
– 1× Adapter VFG 2 - AFx 2
Code no: **003G1780**

Products will be delivered separately.



VFGS 2 Valves (metallic sealing cone) - for steam

Picture	DN (mm)	k_{VS} (m^3/h)	k_{VS} [1] (m^3/h)	Connections	$T_{max.}$ (°C)	Code No.		
						PN16	PN25	PN40
	15	4.0	2.5	Flanges acc. to EN 1092-1	150 °C [2] (PN16) 350 °C [2] (PN25,40)	065B2430	065B2443	065B2453
	20	6.3	4.0			065B2431	065B2444	065B2454
	25	8.0	6.3			065B2432	065B2445	065B2455
	32	16	10			065B2433	065B2446	065B2456
	40	20	16			065B2434	065B2447	065B2457
	50	32	25			065B2435	065B2448	065B2458
	65	60	40			065B2436	065B2449	065B2459
	80	80	63			065B2437	065B2450	065B2460
	100	160	100			065B2438	065B2451	065B2461
	125	250	125			065B2439	065B2452	065B2462
	150 [3]	380	200		150°C [2] (PN16) 300°C [2] (PN40)	065B2440	-	065B2463
	200 [3]	650	225			065B2441	-	065B2464
	250 [3]	800	280			065B2442	-	065B2465

[1] VFGS 2 valves require ordering of 003G1780 adapter for a combination with AFD 2 pressure actuators

[2] Max. media temperatures for valves VFGS 2 (in steam applications always accessories have to be used – see table below)

[3] Valve has valve body extension (VBE) and pre-installed flow divider

Max. media temperatures and use of accessories

Steam temp.	PN16		PN25		PN40	
	DN 15-125	DN 150-250	DN 15-125	DN 150-250	DN 15-125	DN 150-250
up to 150 °C	SP	SP + VBE	SP	X	SP	SP + VBE
up to 200 °C	X	X				
200 … 300 °C	X	X	SP + ZFx	X	SP + ZFx	SP + VBE
300 … 350 °C	X	X	SP + ZFx	X	SP + ZFx	X

Following accessories have to be used as stated in table above:

SP - Seal pot

ZF - Stem extension

VBE - Valve with valve body extension

X - Valve is not to be used

See Accessories

Example 3:

Pressure reduction controller; for water; DN 15; k_{VS} 4.0; PN 25; metallic sealing; setting range 0.5 - 1.5 bar; T_{max} 200 °C; flange;

– 1× VFG 2 DN 15 valve
Code no: **065B2401**

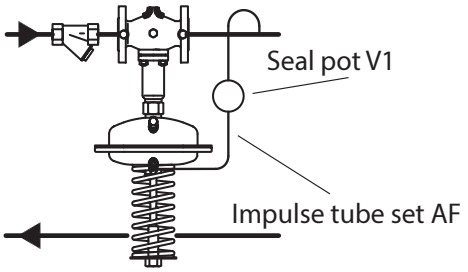
– 1× 1× AFD actuator
Code no: **003G5640**

– 1× Impulse tube set AF
Code no: **003G1391**

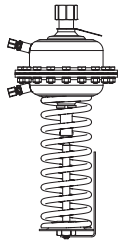
– 1× Seal pot V1
Code no: **003G1392**

– 1× Adapter VFG 2 - AFx 2
Code no: **003G1780**

Products will be delivered separately.



AFD 2 Actuator

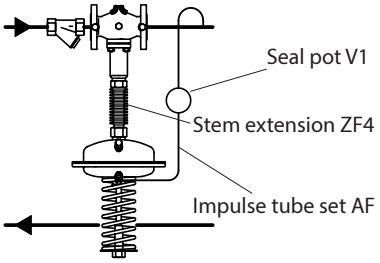
Picture	Setting range (bar)	Possible combinations with DN	Actuator size (cm^2)	Spring colour	Code No.	
					PN16	PN40
	8-16	15-125	32	black [1]	-	**003G5634**
	3-12	15-125	32	red	**003G5625**	**003G5635**
	3-8.5	15-125	80	black [1]	-	**003G5624**
	1.5-5	15-125	80	red	**003G5626**	**003G5636**
	1-3	15-125	80	yellow	**003G5627**	**003G5637**
	1.5-4	15-250	160	black [1]	**003G5628**	**003G5638**
	1-2.5	15-250	160	red	**003G5629**	**003G5639**
	0.5-1.5	15-125	160	yellow	**003G5630**	**003G5640**
	0.4-1.5	15-250	320	red	**003G5631**	**003G5641**
	0.1-1	15-250	320	orange	**003G5632**	**003G5642**
	0.1-0.35	15-250	640	yellow	**003G5633**	**003G5643**

[1] Combination with AMEi6 not possible

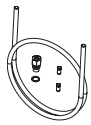
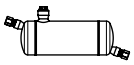
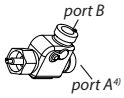
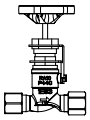
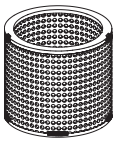
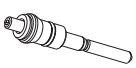
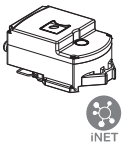
Example 4:
Pressure reduction controller; for steam; DN 15; k_{VS} 4.0; PN 25; metallic sealing; setting range 0.5 - 1.5 bar; T_{max} 350 °C; flange;

– 1× VFGS 2 DN 15 valve
Code no: **065B2443**
– 1× AFD actuator
Code no: **003G5640**
– 1× Impulse tube set AF
Code no: **003G1391**
– 1× Seal pot V1
Code no: **003G1392**
– 1× Stem extension ZF4
Code no: **003G1394**
– 1× Adapter VFG 2 - AFx 2
Code no: **003G1780**

Products will be delivered separately.



Accessories code numbers

Picture	Type designation	Description	Connections	Code No.
	Impulse tube set AF	– 1× Copper tube Ø10 × 1 × 1500 mm – 1× compression fitting for imp. tube connection to pipe (G ¼) – 2× socket	-	**003G1391**
	Seal pot V1 [1]	Capacity 1 liter; with compression fittings for imp. tube Ø10	-	**003G1392**
	Seal pot V2 [1]	Capacity 3 liter; with compression fittings for imp. tube Ø10 , for actuator size 640 cm^2	-	**003G1403**
	Compression fitting [2]	For impulse tube Ø10 connections to controller	G ¼	**003G1468**
	Combination piece KF3	For combination with pressure actuators. Electrical actuator connected on side (port B) only for ON/OFF function.	G 1¼ / 2x G 1¼	**003G1441**
	Combination piece KF2	For combination with thermostat - side connection to port B	-	**003G1440**
	Shut off valve	For impulse tube Ø10	-	**003G1401**
	Static throttle valve			**065B2909**
	Flow dividers for VFGS 2 [3]	Flowdivider DN 15, 20	-	**065B2775**
		Flowdivider DN 25, 32		**065B2776**
		Flowdivider DN 40, 50		**065B2777**
		Flowdivider DN 65, 80		**065B2778**
		Flowdivider DN 100, 125		**065B2779**
	Adapter	For combination of new Virtus pressure actuators AFx 2, with old generation of valves VFx 2	-	**003G1780**
	AMEi 6 **iNET** el. actuator 230 V	Intelligent Δp actuator with **iNET** function	-	**082G4302**
	AMEi 6 **iNET** el. actuator 24 V			**082G4303**

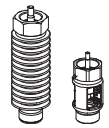
[1] Seal pot has to be used on impulse tubes when $T_{max} \geq 200$ °C and always in steam applications

[2] Consist of a nipple, compression ring and nut

[3] Flowdividers can be used in steam application for noise reduction; after installing into the valve, valve's k_{vs} is reduced – see VFGS 2 table

[4] Port A - for connection of any type of actuator

Stem extensions [1]

Picture	Type	For valves DN	Tmax (°C)	Media		Used for sealing	Used for isolation	Code No.
				water	steam			
 ZF4, 5 ZF6	ZF4	15-125	350	Yes	Yes [2]	Yes	Yes	**003G1394**
	ZF5		350		Yes			**003G1396**
	ZF6		200		Yes [2]		- [3]	**003G1393**

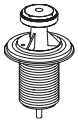
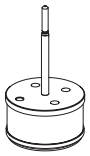
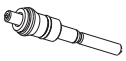
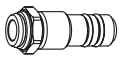
[1] Stem extension has to be used always when $T_{max} > 200$ °C

[2] Condensate

[3] ZF6 can be used for stroke position indication

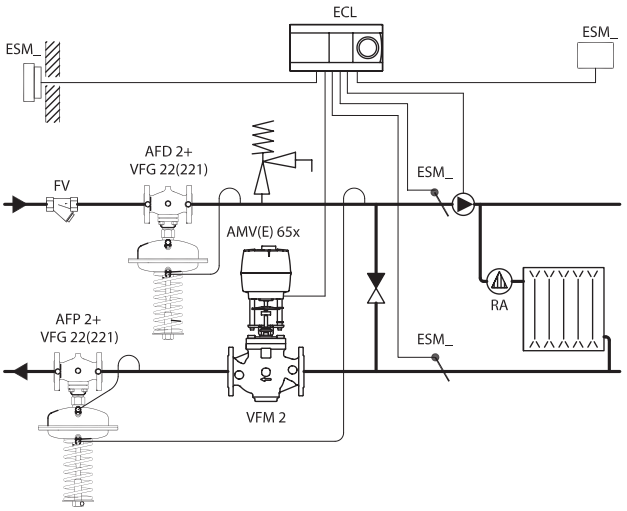
Spare parts code numbers

Service kits

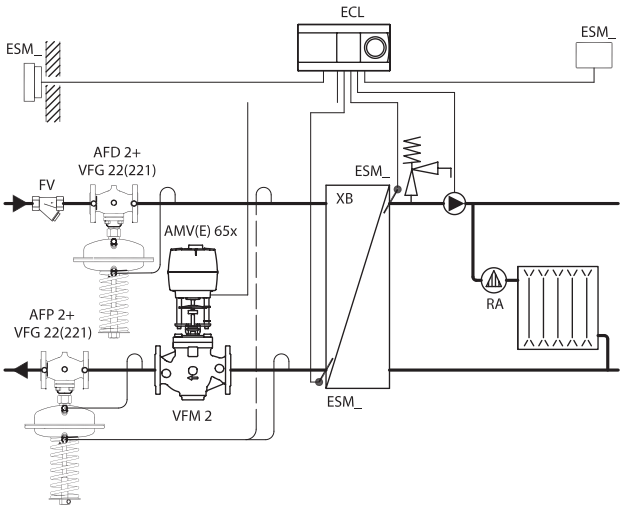
Picture	Type designation	DN (mm)	k_{vs} (m^3/h)	PN	for VFG 2 / VFG 22	for VFG 21 / VFG 221	for VFGS 2
	Valve insert	15	4.0	16/25/40	**065B2796**	**065B2790**	**065B2802**
		20	6.3		**065B2797**	**065B2791**	**065B2803**
		25	8.0		**065B2798**	**065B2792**	**065B2804**
		32	16				
		40	20		**065B2799**	**065B2793**	**065B2805**
		50	32				
	Pressure control insert VFG/Q 22	65	60		**003G1800**	**003G1807**	**065B2806**
		80	80		**003G1801**	**003G1808**	
		100	160		**003G1802**	**003G1809**	**065B2807**
		125	250		**003G1803**	**003G1810**	
		150	380		**On demand**	**On demand**	-
		200	650		**On demand**	**On demand**	-
		250	800		**On demand**	**On demand**	-
	Adapter (sealing cone) VFG(S) 2 - AFD 2	15-250	-		**003G1780**		
	Pressure stuffing box VFG/Q 22(1)	65-125	-		**003G1730**		-
		150-200	-		**003G1731**		-
		250	-		**003G1732**		-

Overview

Application examples



Direct-connected heating system



Indirectly connected heating system

Product details

General data

VFG 2 / VFG 22(1) Valve

Nominal diameter		DN	15	20	25	32	40	50	65	80	100	125	150	200	250
k_{VS} value		m^3/h	4.0	6.3	8.0	16	20	32	60	80	160	250	380	650	800
Cavitation factor z			0.6	0.6	0.6	0.55	0.55	0.5	0.42	0.35	0.3	0.27	0.23	0.2	0.18
Leakage acc. to standard IEC 534 (% of k_{vs})	VFG 2 / VFG 22		≤ 0.03										≤ 0.05		
	VFG 21 / VFG 221		≤ 0.01												
Nominal pressure		PN	16, 25, 40												
Max. differential pressure	PN 16	bar	16								15		12	10	
	PN 25, 40		20												
Pressure relieve system			Bellows (Stainless steel 1.4571)						Chamber relieved						
Media			Circulation water / glycolic water up to 30 %												
Media pH			Min. 7 , Max. 10												
Media temperature	VFG 2 / VFG 22	°C	2 ... 150 / 2 ... 200 [3]						2 … 150						
	VFG 21 / VFG 221		2 ... 150												
Connections			Flange												
Materials															
Valve body	PN 16		Grey cast iron EN-GJL-250 (GG-25)												
	PN 25		Ductile iron EN-GJS-400 (GGG-40.3)												
	PN 40		Cast steel GP240GH (GS-C 25)												
Valve seat			Stainless steel, mat. No. 14021												
Valve cone			Stainless steel, mat. No. 14404						Stainless steel, mat. No. 1.4021						
Sealing	VFG 2		Metal												
	VFG 22														
	VFG 21		EPDM												
	VFG 221														

VFGS 2

Nominal diameter		DN	15	20	25	32	40	50	65	80	100	125	150	200	250
k_{VS} value		m^3/h	4.0	6.3	8.0	16	20	32	50	80	125	160	280	320	400
k_{VS} value [2]			2.5	4.0	6.3	10	16	25	40	63	100	125	-	-	-
Cavitation factor z			0.6	0.6	0.6	0.55	0.55	0.5	0.5	0.45	0.4	0.35	0.3	0.2	0.2
Leakage acc. to standard IEC 534 (% of k_{vs})			≤ 0.03										≤ 0.05		
Nominal pressure		PN	16, 25, 40												
Max. differential pressure	PN 16	bar	16								15		12	10	
	PN 25, 40		20												
Pressure relieve system			Bellows (Stainless steel, mat. No. 1.4571)										Diaphragm (EPDM)		
Media			Steam / Circulation water / Glycolic water up to 30%												
Media pH			Min. 7 , Max. 10												
Media temperature		°C	2 ... 200 / 2 ... 300 / 2 … 350 [3]										2 … 300		
Connections			Flange												
Materials															
Valve body	PN 16		Grey cast iron EN-GJL-250 (GG-25)												
	PN 25		Ductile iron EN-GJS-400(GGG-40.3)												
	PN 40		Cast steel GP240GH (GS-C 25)												
Valve seat			Stainless steel, mat. No. 14021										Stainless steel, mat. No. 1.4313		
Valve cone			Stainless steel, mat. No. 14404										Stainless steel, mat. No. 1.4021		
Sealing			Metal												

[1] At temperatures above 150 °C only with seal pots (see Accessories)

[2] Valves with built in flow divider for noise reduction (see Accessories)

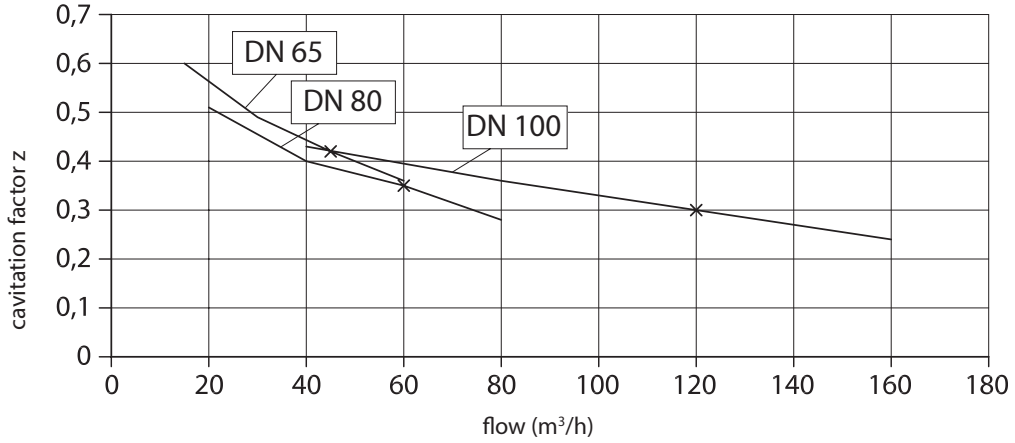
[3] In steam aplications always accessories have to be used – see table on page below

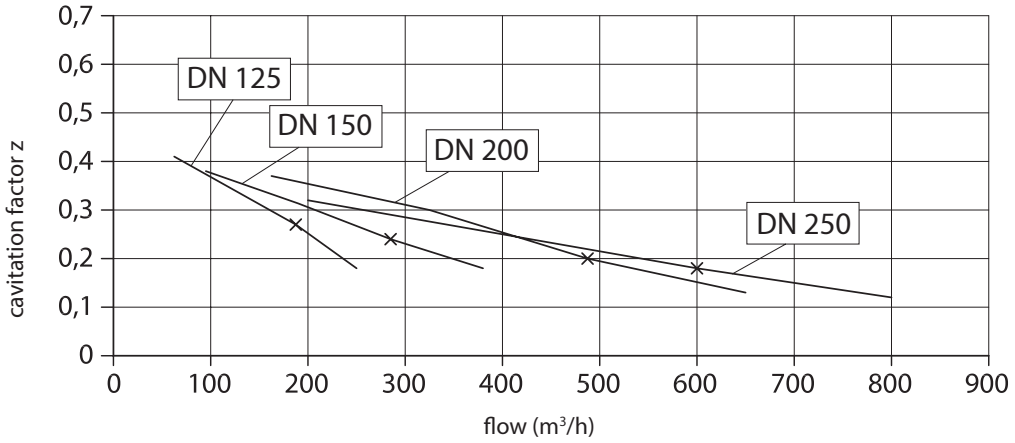
AFD 2 Actuator

Actuator size	**cm²**	**32**		**80**			**160**			**320**		**640**
Max. operating pressure	bar	16, 40										
Diff. Pressure setting ranges and spring colours	bar	black [1]	red	black [1]	red	yellow	black [1]	red	yellow	red	orange	yellow
		8-16	3-12	3-8.5	1.5-5	1-3	1.5-4	1-2.5	0.5-1.5	0.4-1.5	0.1-1	0.1-0.35
For valve DN		15-125					15-250		15-125	15-250		
Materials												
Actuator housing		Steel, mat. No. 10345 , zinc plated										
Control diaphragm		EPDM										

[1] Combination with AMEi 6 not possible

Actuator and impulse tubes minimum temperature is 2 °C to prevent media from freezing

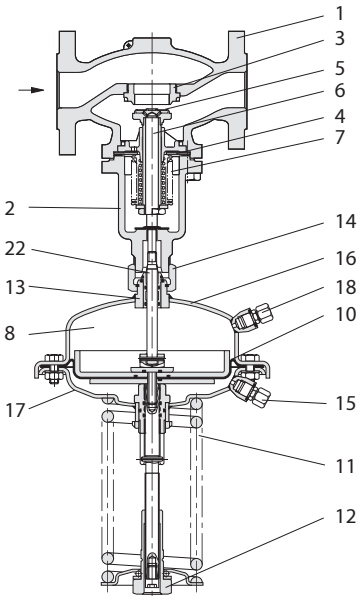




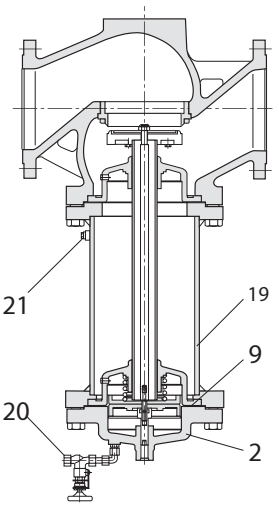
Design

VFG DN15-50, VFGS DN15-250

1. Valve body
2. Cover
3. Valve seat
4. Valve insert
5. Pressure relieved valve cone
6. Valve stem
7. Bellows for pressure relief of valve cone
8. Actuator
9. Diaphragm for pressure relief of valve cone
10. Control diaphragm for pressure control
11. Setting spring for pressure control
12. Adjuster for pressure setting, prepared for sealing
13. Stuffing cone
14. Union nut
15. Compression fitting for impulse tube
16. Upper casing of diaphragm
17. Lower casing of diaphragm
18. Air space bore
19. Valve body extension
20. Shut off valve for water filling
21. Closing plug
22. Adapter VFG(S) 2 - AFD 2



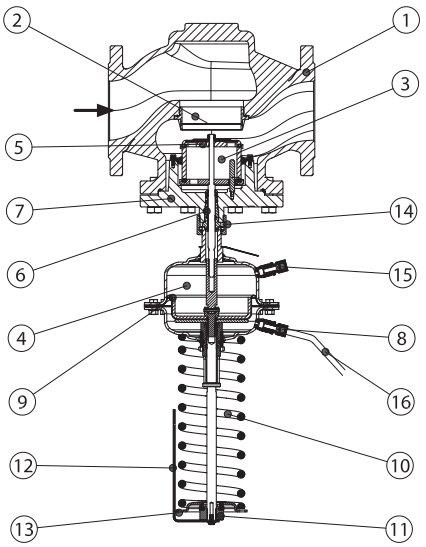
AFD 2 / VFG 2 DN15-50
AFD 2 / VFGS 2 DN15-125



VFG DN150-250, T_{max} 200 °C
VFGS DN150-250, T_{max} 300 °C

VFG DN65-250

1. Valve body
2. Valve seat
3. Pressure control insert
4. Pressure actuator
5. Pressure control cone
6. Stuffing box
7. Cover
8. Impulse tube connection
9. Diaphragm
10. Setting spring for pressure control
11. Adjuster for pressure setting
12. Setting scale
13. Setting indicator
14. Union nut
15. Air space bore
16. Impulse tube



Function

The pressure behind of the control valve is being transferred through the impulse tube to the actuator chamber and act on control diaphragm for pressure control. 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

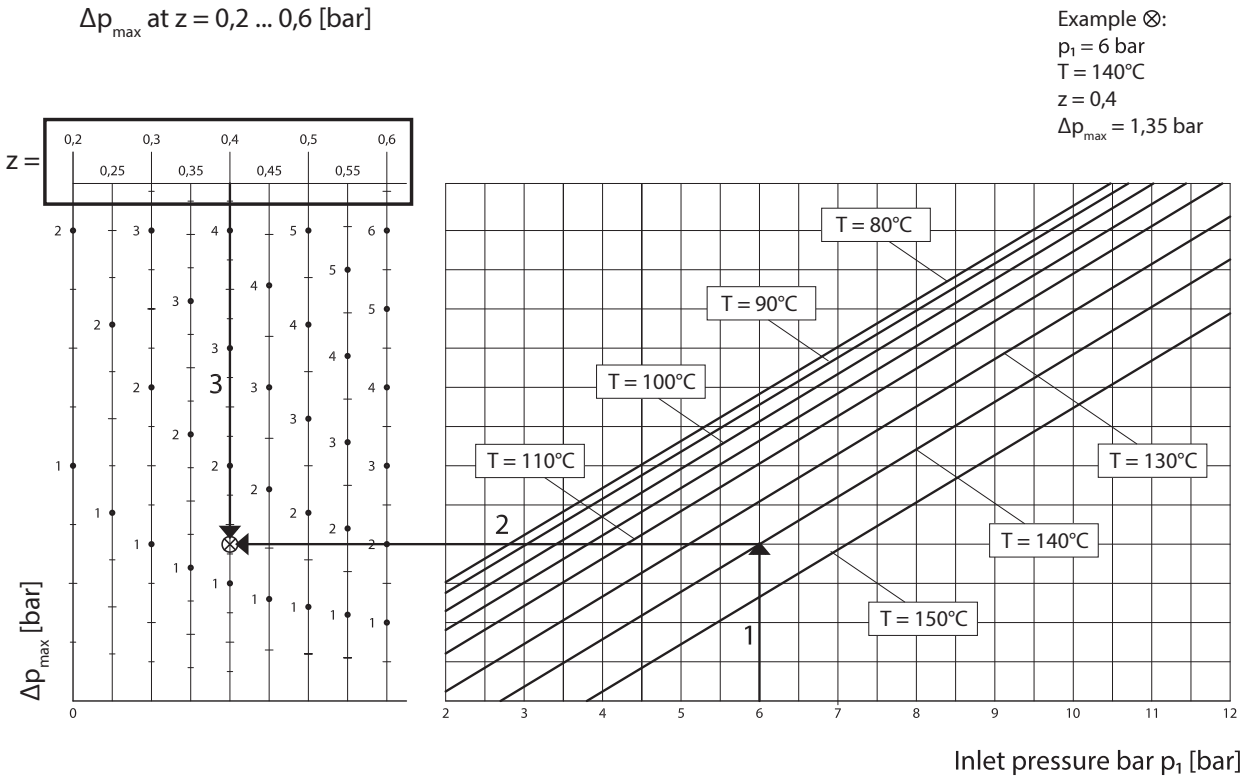
Pressure setting

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 pressure indicators.

Pressure and temperature data

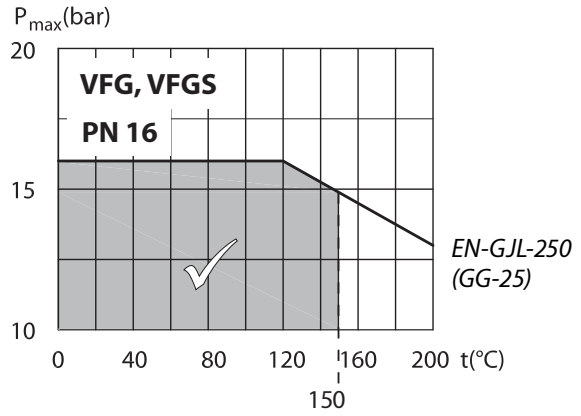
Operating area

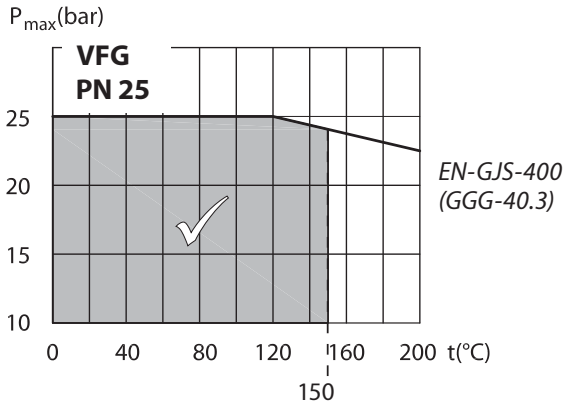
Maximum allowed differential pressure over the controller (Δp_{max}) at different cavitation factors (z)



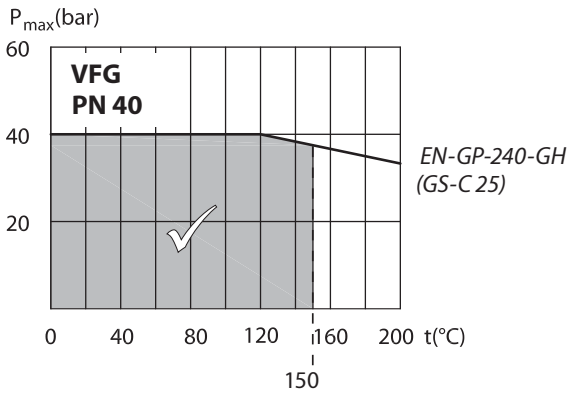
Pressure temperature diagram

Working area is below P-T line and it ends at T_{max} for each valve

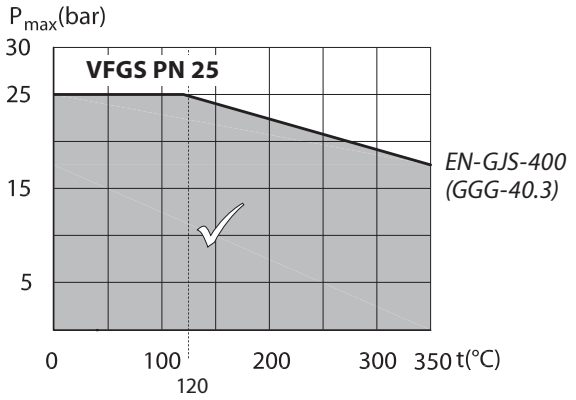


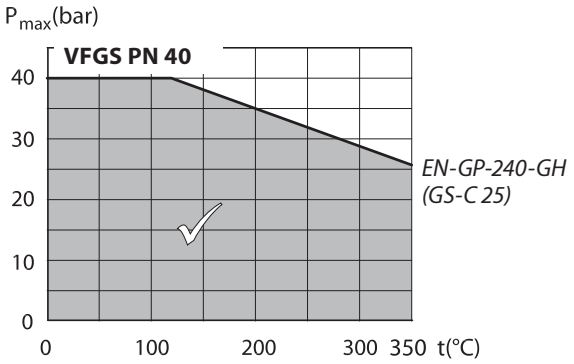


Maximum allowed operating pressure as a function of media temperature (according to EN 1092-2)



Maximum allowed operating pressure as a function of media temperature (according to EN 1092-1)





Sizing

Example:

Pressure reduction controller has to control 6.0 bar behind the controller. Max. flow through the system is less than 4.0 m^3/h, min. flow pressure is 7.5 bar.

Given data:

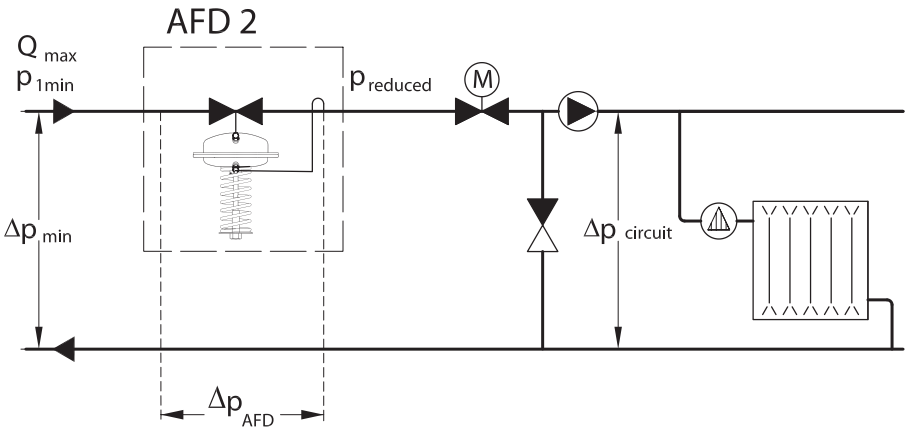
Q_{max} = 25 m^3/h
$\Delta p_{1\ min}$ = 7.5 bar
$\Delta p_{reduced}$ = 6.0 bar

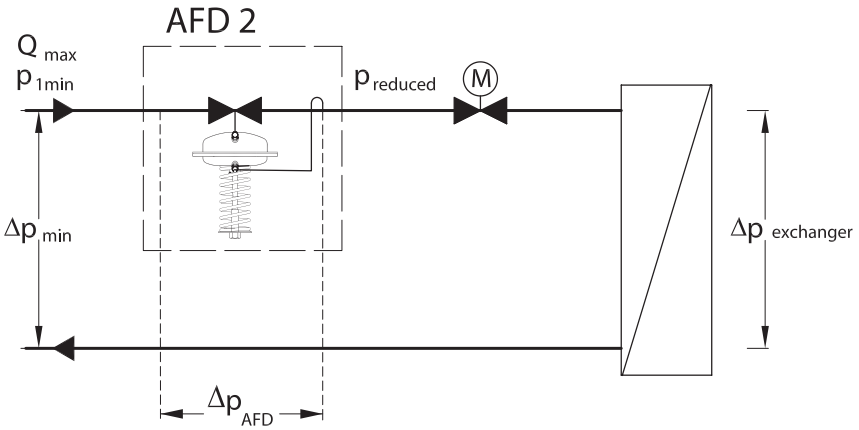
Nominal pressure PN 25
The min. differential pressure across the controller is calculated from the formula:
$\Delta p_{AFD} = p_{1\ min} - p_{reduced} = 7.5 - 6.0$
Δp_{AFD} = 1.5 bar

k_v value is calculated according to formula:

$$k_v = \frac{Q_{max}}{\sqrt{\Delta p_{AFD}}} = \frac{35}{\sqrt{1.5}} = 28.6 m^3/h$$

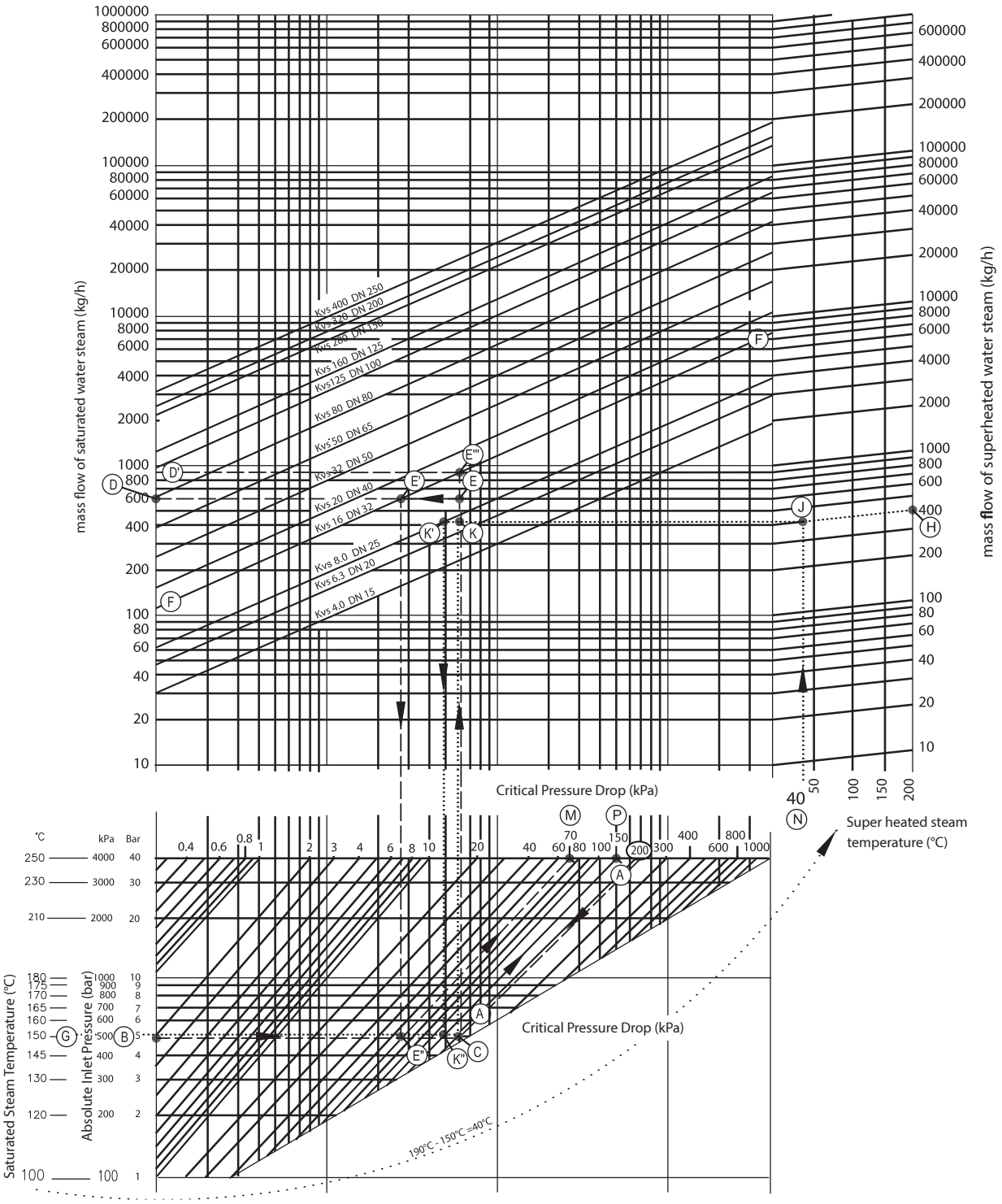
Solution:
AFD 2 3-8.5
VFG 22(1) DN65 k_{VS} 60





Sizing - steam

Max. Δp in low pressure steam application variance from 0.5 bar to 6 bar



Steam valve sizing is based on 40 % of the absolute steam pressure (immediately upstream of the valve) being dropped across the valve when fully open. At this condition the steam is travelling at or close to its critical velocity (approx. 300 m/s) and throttling will occur over the full valve stroke. If the steam is travelling slower than this then the first part of the valve stroke will merely increase the velocity of the steam without reducing the volumetric flow.

Control valve sizing diagram for steam

1: For saturated steam

Design data:
Flow rate: 600 kg/h
Absolute inlet pressure: 5 bar (500 kPa)

– follow dashed line –

The absolute inlet pressure is 500 kPa. 40 % of this is 200 kPa.

Locate the diagonal line corresponding to the pressure drop of 200 kPa (line A-A).
Read the absolute inlet pressure on the lower left hand scale (point B), and draw a horizontal line across until it meets the pressure drop diagonal (A-A) at point C.

From this point extend a vertical line upwards until it meets the horizontal line representing the steam flow of 600 kg/h from point D. The intersection of this is point E.

The nearest diagonal k_{vs} line above this is line F-F with a k_{vs} 16 (point E'). If the ideal valve size is not available the next largest size should be selected to ensure design flow.

The pressure drop through valve at the flow rate is found by the intersection of the 600 kg/h line with F-F (point E') and dropping a vertical; this actually hits the horizontal line for 500 kPa (point E") inlet pressure at a pressure drop diagonal of 70 kPa (point M). This is only 14 % of the inlet pressure and the control quality will not be good until the valve has partially closed. As with all steam valves this compromise is necessary since the next smaller valve would not pass the required flow (maximum flow would have been about 480 kg/h).

The maximum flow for same inlet pressure is found by extending the vertical line (C-E) through point E until it crosses the k_{vs} 16 line F-F (point E"') and reading off the flow 900 kg/h (point D').

Solution:
The example selects AFD DN 32, k_{vs} value 16, with pressure setting range 0.1 - 1.0 bar

2: For superheated steam

Design data:
Flow rate: 400 kg/h
Absolute inlet pressure: 5 bar (500 kPa)
Steam temperature: 190 °C

The procedure for superheated steam is much the same as for saturated steam, but uses a different flow scale which slightly elevates the readings according to the degree of superheat.

– follow dotted line –

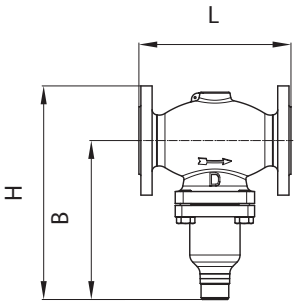
As before, the diagonal pressure drop line A-A is located as before for 40 % of 500 (200 kg/h). The horizontal inlet pressure line through point B is now extended to the left to read off the corresponding saturated steam temperature at point G (150 °C). The difference between the saturated steam temperature and the superheated steam temperature is 190 °C – 150 °C = 40 °C (point N).

The superheated steam flow is found on the upper right hand scale, point H, and the diagonal line is followed down from here until it meets a vertical line from the steam temperature elevation (40 °C) at point J.

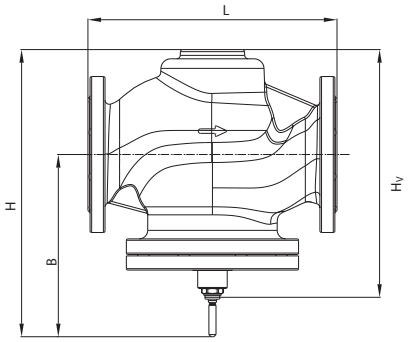
As before, the horizontal line through point B is drawn to cut line A-A at point C and the point where the vertical line from this point meets the horizontal line from point J is the operating point (point K). This horizontal line, J-K, is the corrected flow line. The nearest diagonal line above this is for k_{vs} 8 (point K'). A vertical line dropped from the intersection of J-K with the k_{vs} 8 line intersects the 500 kPa inlet pressure line (point K") at a pressure drop diagonal of about 150 kPa (point P). This is about 30% of the inlet pressure which will give reasonable control quality (compared to recommended ratio of 40%).

Solution:
The example selects AFD DN 25, k_{vs} value 8, with pressure setting range 0.1 - 1.0 bar

Dimensions



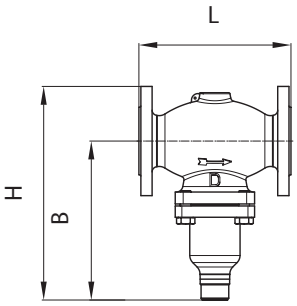
VFG 2 DN15-50



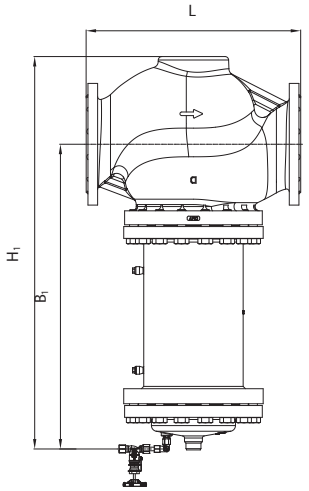
VFG 22(1) DN65-250

VFG 2(1), VFG 22(1) Valves

DN	L	B	H	H_V	B_1	H_1	Weight		
							PN 16	PN 25	PN 40
15	130	213	267	-			7.5	7.5	7.5
20	150	213	267	-			8.5	8.5	8.5
25	160	239	304	-			10	10	10
32	180	239	304	-			12	12	12
40	200	241	323	-			15	15	15
50	230	241	323	-			18	18	18
65	290	245	370	285	-		24	24	27
80	310	240	365	290	-		29	29	32
100	350	275	425	350	-		47	48	53
125	400	270	435	370	-		60	60	68
150	480	330	520	460	-		105	106	121
200	600	365	610	550	-		204	206	235
250	730	420	680	620	-		343	350	404
150 extension	480	-	-	-	620	799	154	-	179
200 extension	600	-	-	-	852	1089	301	-	336
250 extension	730	-	-	-	1199	1459	469	-	505



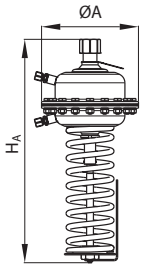
VFG(S) DN15-125



VFG(S) DN150-250
with valve body extension up to 200 (300) °C

VFGS 2 Valves

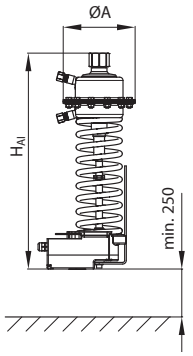
DN			15	20	25	32	40	50	65	80	100	125	150	200	250
L		mm	130	150	160	180	200	230	290	310	350	400	480	600	730
B		mm	213	213	239	239	241	241	276	276	381	381	326	354	401
H		mm	267	267	304	304	323	323	370	370	505	505	505	591	661
Weight	PN 16 / 25	kg	7.5	8.5	10	12	15	18	27.5	30	58	68	115	185	323
	PN 40	kg							30	32.5	60.5	69	141	253	333
B_1		mm											620	852	1199
H_1		mm											700	994	1359
Weight (valve with body extension)	PN 16 / 25	kg											154	301	469
	PN 40	kg											179	336	505



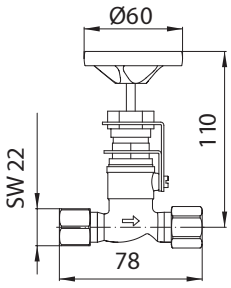
AFD 2 Actuator

Size	ØA	H_A	H_{AI}	Weight (kg)			
cm^2	mm			AFD 2 PN 16	AFD 2 PN 16 + AMEi 6	AFD 2 PN 40	AFD 2 PN 40 + AMEi 6
32	175	495	595	10	12.5	17	19.5
80				9	11.5	16	18.5
160	230	510	610	11.5	14	23.5	26
320	300	510	610	15	17.5	35.5	38
640	300	630	730	38	40.5	58	60.5

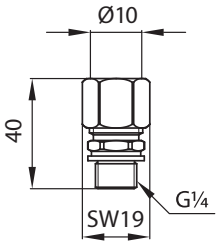
Total installation height of the controller (VFG 22(1) valve + AFD 2 pressure actuator) is sum of H_V and H_A (H_{AI})



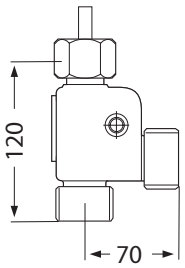
AMEi 6 intelligent actuator with iNET functionality should be ordered separately



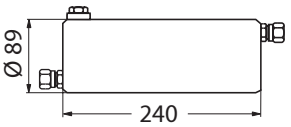
Shut off valve



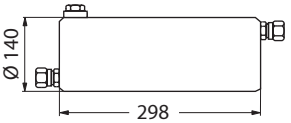
Compression fitting



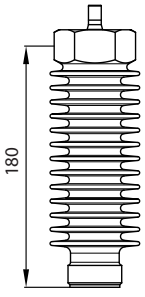
Comb. piece KF2, KF3



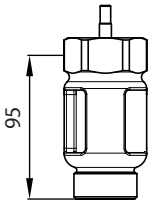
Seal pot V1



Seal pot V2



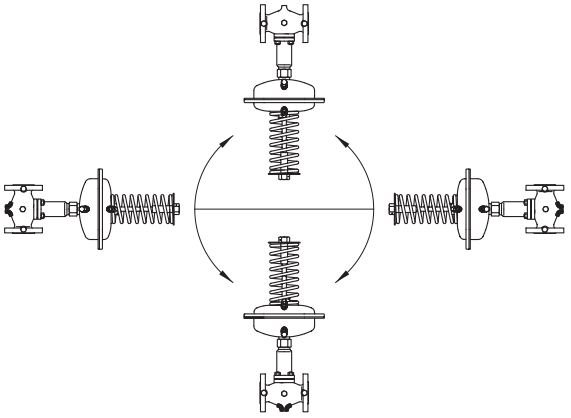
Valve steam extension ZF4, ZF5



Valve steam extension ZF6

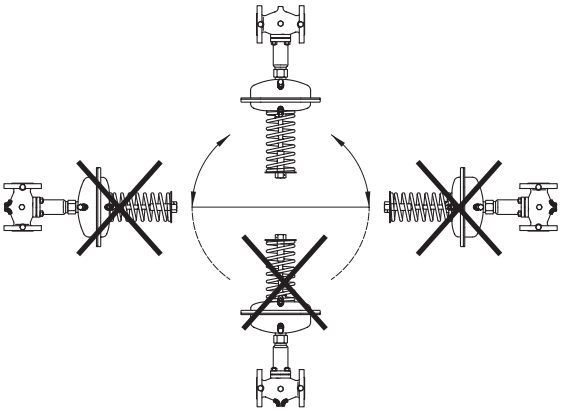
Installation

VFG 2 DN15-50	$T_{max} \leq 120°C$
VFGS 2 DN15-80	



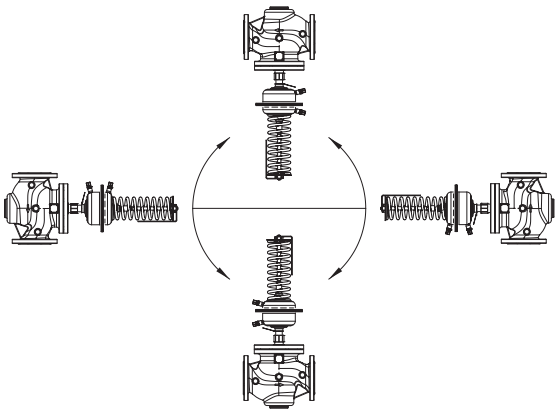
The controllers can be installed in any position.

VFG 2 DN15-50	$T_{max} > 120°C$
VFGS 2 DN15-80	
VFGS 2 DN100-250	2 ... 350 °C



The controllers can be installed in horizontal pipes only, with a pressure actuator oriented downwards.

VFG 22 DN65-250	2 ... 150 °C



The controllers can be installed in any position.

Certificates, declarations and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Certification body	Approval topic
EAC Declaration	EAC KZ 7100841.13.12.02339	EAC - Eurasian Customs Union	MD
EU Declaration	Danfoss EU 230612EN0854103.05	Danfoss	PED, Pressure
Export Control Declaration	Actuators pressure flow and temperature	Danfoss	
EU Declaration	Danfoss EU 230530EN0858104.06	Danfoss	PED, Pressure
UA Declaration	Danfoss UA 10.01.23 Heat Control Valves	Danfoss	
Pressure Safety Certificate	CE-0062-PED-H-DAF 002-24-DNK-rev-A	BV - Bureau Veritas	PED, Pressure

Contact details

Online support

Danfoss offers a wide range of support along with our products, including digital information, software, mobile apps and expert guidance. See the possibilities below.

The Danfoss Design center

Discover the Design Center, our advanced digital platform that streamlines product selection. With integrated tools and enhanced type pages, it's simpler than ever to access product information and documentation, and to select the right products. Check the availability of Danfoss products at partner locations and enjoy seamless transitions from selection to purchase with our basket-to-basket functionality. Whether you're buying from our distributors or directly from the Product Store, the Design Center simplifies your experience. Learn more at: designcenter.danfoss.com.

The Danfoss product store

The Danfoss Product Store is a one-stop shop available 24/7 for our customers, no matter where you are in the world or what area of industry you work in. Browse our catalog, check product details and documentation, view your prices and product availability, and quickly finalize your purchase. Start browsing at: store.danfoss.com.

Danfoss Partner Portal/Product Data tool

Designed to support you with easy access to product data extracts, essential resources, tools, and information. The Partner Portal provides a centralized hub for product documentation, training materials, marketing assets, and technical support, ensuring you have everything you need to succeed and grow your business with Danfoss. The Partner Portal is available 24/7 at: partner.danfoss.com and is ready to support your business.

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