

## Data sheet

# Pressure reduction controller AFD / VFG 2, VFG 21, VFGS 2

### Description



The controller is a self-acting pressure reducer primarily for use in district heating systems. The control closes on rising pressure.

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

#### Main data:

- DN 15-250
- PN 16, 25, 40
- Max. operating pressure 25 bar
- Max. temperature 350 °C
- Water and steam applications

### Ordering

Example:  
Pressure reducer AFD / VFG 2, DN 65,  
PN 25,  $t_{max}$  150 °C, pressure setpoint  
0.15 - 1.5 bar

- 1× VFG 2 DN 65 valve  
Code no: **065B2407**
- 1× AFD actuator  
Code no: **003G1005**
- 1× AF impulse tubes  
Code no: **003G1391**

Parts will be delivered separately.

### Valves VFG 2 (metallic sealing cone) - water

Picture	DN (mm)	$k_{vs}$ (m <sup>3</sup> /h)	$t_{max}$ (°C)		Code No.		
					PN 16	PN 25	PN 40
	15	4.0	150	200*	<b>065B2388</b>	<b>065B2401</b>	<b>065B2411</b>
	20	6.3			<b>065B2389</b>	<b>065B2402</b>	<b>065B2412</b>
	25	8.0			<b>065B2390</b>	<b>065B2403</b>	<b>065B2413</b>
	32	16			<b>065B2391</b>	<b>065B2404</b>	<b>065B2414</b>
	40	20			<b>065B2392</b>	<b>065B2405</b>	<b>065B2415</b>
	50	32			<b>065B2393</b>	<b>065B2406</b>	<b>065B2416</b>
	65	50			<b>065B2394</b>	<b>065B2407</b>	<b>065B2417</b>
	80	80			<b>065B2395</b>	<b>065B2408</b>	<b>065B2418</b>
	100	125			<b>065B2396</b>	<b>065B2409</b>	<b>065B2419</b>
	125	160	<b>065B2397</b>	<b>065B2410</b>	<b>065B2420</b>		
	150	280	140	-	<b>065B2398</b>	-	<b>065B2421</b>
	200	320			<b>065B2399</b>	-	<b>065B2422</b>
250	400	<b>065B2400</b>			-	<b>065B2423</b>	
	150	280	-	200*	on request		
	200	320					
	250	400					

\* for temperatures above 150 °C only with seal pot, mounted in the impulse tube (see accessories)

Ordering (continuous)

Valves **VFG 21** (soft sealing cone) - water

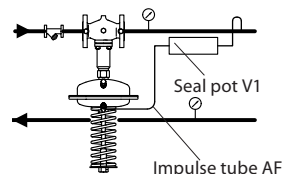
Picture	DN (mm)	k <sub>vs</sub> (m <sup>3</sup> /h)	t <sub>max.</sub> (°C)	Code No.	
				PN 16	PN 25
	15	4.0	150	065B2502	065B2515
	20	6.3	150	065B2503	065B2516
	25	8.0	150	065B2504	065B2517
	32	16	150	065B2505	065B2518
	40	20	150	065B2506	065B2519
	50	32	150	065B2507	065B2520
	65	50	150	065B2508	065B2521
	80	80	150	065B2509	065B2522
	100	125	150	065B2510	065B2523
	125	160	150	065B2511	065B2524
	150	280	140	065B2512	-
	200	320	140	065B2513	-
	250	400	140	065B2514	-

Example:  
Pressure reducer AFD / VFGS2,  
DN 65, PN 25, t<sub>max.</sub> 200 °C, for steam,  
pressure setpoint 0.15 - 1.5 bar

- 1x VFGS 2 valve  
Code no: **065B2449**
- 1x AFD actuator  
Code no: **003G1005**
- 1x V1 seal pot  
Code no: **003G1392**

- Option:
- 1x AF impulse tubes  
Code no: **003G1391**
  - 1x Flowdivider  
Code no: **065B2778**

Parts will be delivered separately.



Valves **VFGS 2** - steam

Picture	DN (mm)	k <sub>vs</sub> (m <sup>3</sup> /h)	k <sub>vs</sub> <sup>1)</sup> (m <sup>3</sup> /h)	t <sub>max.</sub> <sup>2)</sup> (°C)	Code No.			
					PN 16	PN 25	PN 40	
	15	4.0	2.5	350	065B2430	065B2443	065B2453	
	20	6.3	4.0	350	065B2431	065B2444	065B2454	
	25	8.0	6.3	350	065B2432	065B2445	065B2455	
	32	16	10	350	065B2433	065B2446	065B2456	
	40	20	16	350	065B2434	065B2447	065B2457	
	50	32	25	350	065B2435	065B2448	065B2458	
	65	50	40	350	065B2436	065B2449	065B2459	
	80	80	63	350	065B2437	065B2450	065B2460	
	100	125	100	350	065B2438	065B2451	065B2461	
	125	160	125	350	065B2439	065B2452	065B2462	
		150	280	-	300	065B2440	-	065B2463
		200	320	-	300	065B2441	-	065B2464
250		400	-	300	065B2442	-	065B2465	

<sup>1)</sup> Valves with flow divider for noise reduction (see accessories)

<sup>2)</sup> max. medium temperatures for valves VFGS 2 (see table on the right)

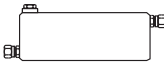



<sup>2)</sup> Max. medium temperatures for valves VFGS 2

	PN	DN 15-125	DN 150-250
Steam, max. 200 °C	16, 25, 40	with seal pot	-
Steam, max. 300 °C	16, 40	-	with seal pot
Steam, max. 300 °C	16	with seal pot and stem extension ZF4	-
Steam, max. 350 °C	25, 40	with seal pot and stem extension ZF4	-

AFD Actuators

Picture	Pressure setpoint (bar)	For DN	Code No.
	8-16	DN 15-125	003G1000
	3-12		003G1001
	1-6	DN 150-250	003G1413
	1-6	DN 15-125	003G1002
	0.5-3		003G1003
	0.1-0.7	DN 15-250	003G1004
	0.15-1.5		003G1005
	0.05-0.35 (630 cm <sup>2</sup> )		003G1006

**Ordering (continuous)**
**Accessories**

	Type	Description	Ordering no.	Code No.
	Seal pot V1 (capacity 1l)	With threaded fittings for tube Ø 10 and clamping ring	<b>1x</b>	<b>003G1392</b>
	Seal pot V2 (capacity 3l)	With threaded fittings for tube Ø 10 (for actuator size 630 cm <sup>2</sup> ) and clamping ring	<b>1x</b>	<b>003G1403</b>
	Impulse tube AF	- Copper tube Ø 10 x 1 x 1500 mm - 1 x threaded fitting G ¼ ISO 228 - 2x socket	<b>1x</b>	<b>003G1391</b>
	Valve stem extension ZF4	Only for DN 15 - 125 (for temperatures until 350 °C)	<b>1x</b>	<b>003G1394</b>
	Flowdivider for VFGS 2 (noise reduction for steam)	Flowdivider DN 15, 20	<b>1x</b>	<b>065B2775</b>
		Flowdivider DN 25, 32	<b>1x</b>	<b>065B2776</b>
		Flowdivider DN 40, 50	<b>1x</b>	<b>065B2777</b>
		Flowdivider DN 65, 80	<b>1x</b>	<b>065B2778</b>
		Flowdivider DN 100, 125	<b>1x</b>	<b>065B2779</b>

**Technical data**
**Valves VFG 2, VFG 21, VFGS 2**

Nominal diameter DN		15	20	25	32	40	50	65	80	100	125	150	200	250
$k_{VS}$ value	(m <sup>3</sup> /h)	4	6.3	8	16	20	32	50	80	125	160	280	320	400
$k_{VS}$ value <sup>1)</sup>	(m <sup>3</sup> /h)	2.5	4.0	6.3	10	16	25	40	63	100	125	-	-	-
z value acc. to VDMA 24 422		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
Dif. pressure $\Delta p_{max}$ PN 16 (bar)		16	16	16	16	16	16	16	16	15	15	12	10	10
Dif. pressure $\Delta p_{max}$ PN 40 (bar)		20	20	20	20	20	20	20	20	15	15	12	10	10
Nominal pressure		PN 16, 25 or 40, flanges to DIN 2501												
Max. temperature	VFG 2	Metalic sealing cone 150 °C (with seal pot up to 200 °C)										140 °C (200 °C <sup>2)</sup> )		
	VFG 21	Soft sealing cone 150 °C										140 °C		
	VFGS 2	Metalic sealing cone 200 °C, with seal pot										300 °C <sup>2)</sup>		
		Metalic sealing cone 350 °C <sup>3)</sup> , with seal pot and ZF4												
Flow medium		Circulation water / Glycolic water up to 30% / steam (only VFGS 2)												
Pressure relieving		Stainless steel bellows, mat. No.1.4571											Rolling diaphragm	
Valve body material	PN 16	Grey cast iron EN-GJL-250 (GG-25)												
	PN 25 (DN 15-125)	Ductile iron EN-GJS-400-18-LT (GGG-40.3)												
	PN 40 (DN 150-250)	Cast steel GP240GH (GS-C 25)												
Cone material		Stainless steel, mat. No. 1.4404 (VFG 2, VFG 21), mat. No. 1.4021 (VFGS 2)												
Conical seal		EPDM only version VFG 21												
Seat material		Stainless steel, mat. No. 1.4021											mat. No. 1.4313	

<sup>1)</sup>  $k_{VS}$  with flow divider

<sup>2)</sup> with body extension and seal pot

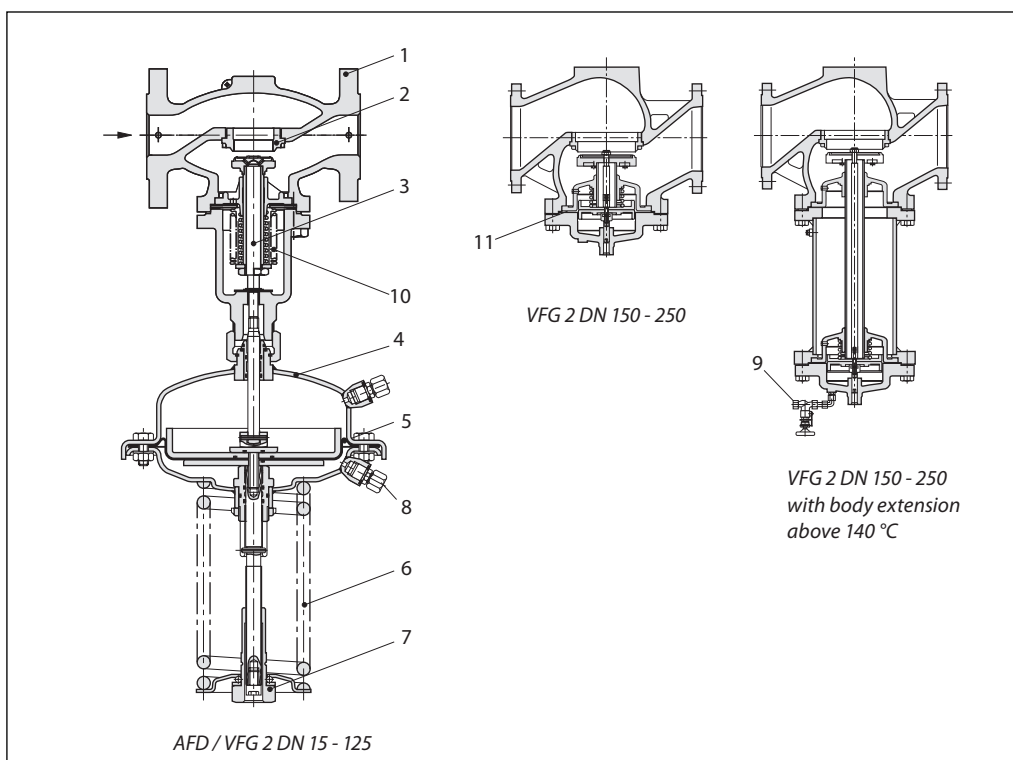
<sup>3)</sup> only PN 25 and PN 40, for PN 16  $t_{max} = 300$  °C

**Pressure actuators AFD / Seal pot**

Actuator size		cm <sup>2</sup>	32	80	160	250	630
Setpoint ranges with spring colour	red	bar	3-12	1-6	-	0.15-1.5	-
	yellow		-	0.5-3	-	0.1-0.7	0.05-0.35
	black		8-16	-	-	-	-
	blue		-	-	1-6	-	-
Max. operating pressure		bar	25				16
Actuator housing		Steel, mat. No. 1.0338, zinc plated and yellow chromate					
Rolling diaphragm		EPDM reinforced with fibre					
Connection for impulse tubes		For tube Ø10 × 1 mm (0.8), threaded fitting G ¼, ISO 228					
Seal pot		Steel, lacquered, capacity 1l (V1), 3l (V2) mounted in impulse tubes above 150 °C					

**Design and function**

- 1. Valve body
- 2. Valve seat
- 3. Valve insert
- 4. Actuator housing
- 5. Rolling diaphragm
- 6. Setpoint spring
- 7. Setpoint adjustment
- 8. Impulse tube connection
- 9. Filling valve
- 10. Bellow for pressure relieving
- 11. Diaphragm for pressure relieving

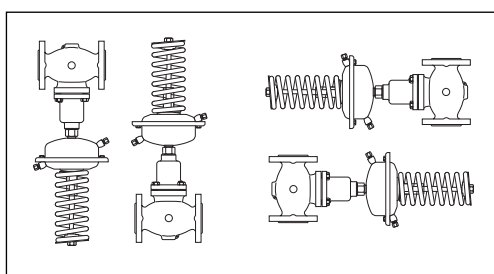


When the system idle the valve is fully open. The pressure of the system after the control valve is transferred to the lower (+) side of the actuator diaphragm through the impulse tube. On the other side of the diaphragm atmospheric pressure is acting.

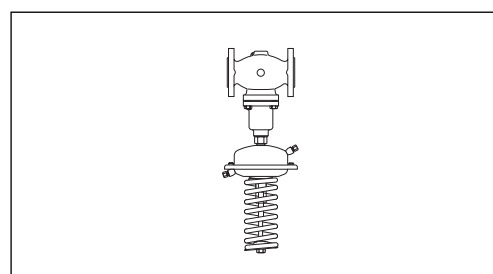
When the controlled pressure increase over the set value, the valve closes until a balance, between forces of the diaphragm and the spring is realized. The pressure can be adjusted via the setpoint adjustment.

**Installation position**

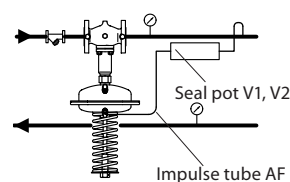
Controls DN 15 - 80 with flow medium temperature up to 120 °C can be installed in any position.



Controllers DN 100 - 250 and if temperature exceeds 120 °C (all nominal diameter) have to be installed in horizontal pipes only, with a pressure actuator oriented downwards.



Seal pot must be fitted in the impulse tube between the pipe line and the control actuator. Seal pot must be used in all steam applications and when temperature is higher than 150 °C. AF impulse tubes listed under Accessories can be used.



**Setting**

The pressure setpoint is set by adjusting the setting spring.

**Combinations**

1. Valve VFG 2
2. Combination piece KF2
3. Thermostat AFT06, 26, 17, 27 \*
4. Impulse tube AF
5. Actuator AFD

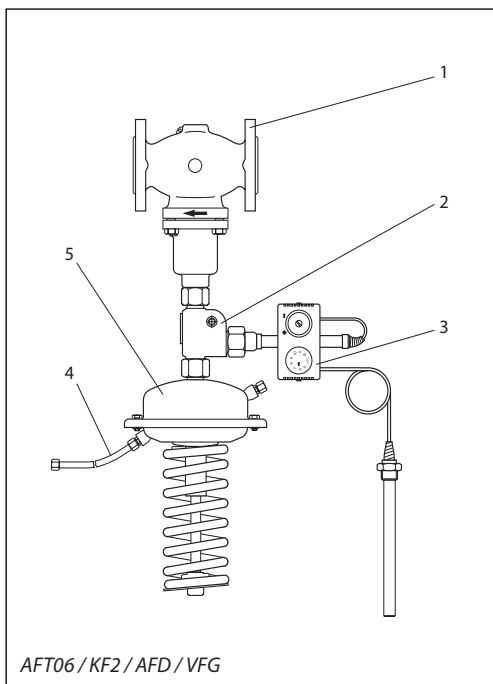
\* see Data sheet AFT06,....

*Example:*

*Pressure reducer and temperature controller AFD / AFT06 / VFG 2, DN 65, PN 25, t<sub>max</sub>. 150 °C, pressure setpoint 0.15 - 1.5 bar, temperature range 20 ... 90 °C*

- 1x VFG 2 DN 65 valve  
Code no: **065B2407**
- 1x AFD actuator  
Code no: **003G1005**
- 1x AFT06 thermostat  
Code no: **065-4391**
- 1x KF2 combination piece  
Code no: **003G1398**
- 1x AF impulse tube  
Code no: **003G1391**

Parts will be delivered separatly.



AFT06 / KF2 / AFD / VFG

*Combination piece*

Picture	Type	Code No.
	Combination piece KF2	<b>003G1398</b>
	Combination piece KF3	<b>003G1397</b>

**Note:**

*KF2 use always in combination with thermostats  
KF3 for combination with pressure actuators and electrical actuators*

Dimensions

VFG(S) DN 15 - 125

VFG DN 150 - 250

VFG(S) DN 150 - 250  
with body extension up to 200 °C

**VFG 2 valve**

DN		15	20	25	32	40	50	65	80	100	125	150	200	250
L		130	150	160	180	200	230	290	310	350	400	480	600	730
B		212	212	238	238	240	240	275	275	380	380	326	354	404
Weight (valve)	PN16	6.2	6.8	8.9	11.5	14.5	17.2	28.6	31.9	60.4	67.0	117.5	193	337
	PN25	6.2	7.0	9.4	11.5	14.2	17.3	29.3	31.8	59.5	65.5	-	-	-
	PN40	6.6	7.6	10.3	12.4	16.1	18.2	32.1	34.5	69.6	79.5	146	263	346.6
B1		-										630	855	1205
Weight (valve with body ext.)	PN16	-										152.5	273	515.5
	PN40	-										150.5	328.5	475.5

**VFG 21 valve**

DN		15	20	25	32	40	50	65	80	100	125	150	200	250
Weight (valve)	PN16	5.8	6.7	9.4	11.3	14.5	17.4	30.0	32.2	61.6	64.5	116.5	201.5	315.5
	PN25	6.5	7.6	9.3	11.7	13.7	17.6	29.3	32.6	62.6	72.5	-	-	-

**VFGS 2 valve**

DN		15	20	25	32	40	50	65	80	100	125	150	200	250
Weight (valve)	PN16	6.2	6.8	9.3	11.6	14.8	17.1	29.7	32.0	62.1	65.5	-		
	PN25	6.0	7.1	9.3	11.1	14.5	17.2	30.0	32.6	60.0	65.3			
	PN40	6.6	7.8	9.3	12.4	15.6	18.1	32.8	35.1	70.1	76.0			
Weight (valve with body ext.)	PN16	-										174.7	305.5	512.1
	PN40	-										193.5	314.3	539.5

Dimensions

Actuator AFD

Actuator size (cm <sup>2</sup> )	32	80	160	250	630
Ø A (mm)	172	172	230	263	380
H (mm)	435	430	600	470	520
Weight (kg)	7.5	7.5	19.5	13	28

Seal pot V1

Seal pot V2

Comb. piece KF2, KF3

Valve stem extension ZF4

