

Data sheet

Two- and three way valves VFG.. / VFGS 2 / VFU.. for self-acting thermostats and electrical actuators

Description

Valves for heating, district heating and cooling systems.

The valves can be used with following actuators:

- Thermostats AFT..
- Actuators AMV(E) 655, 658, 659 (from Q4 2014)

VFG 2
VFG 21
(see pages 2, 3, 4)

**Main data:**

- DN 15-250
- T_{max} 200 °C
- 2-way valve (Normally Open)
- Media: circulation water and glycolic water up to 30%
- Cone: VFG 2 metal/metal sealing
VFG 21 soft sealing
- Pressure relieved

VFGS 2
(see pages 5, 6)

**Main data:**

- DN 15-250
- T_{max} 350 °C
- 2-way valve (Normally Open)
- Media: steam
- Cone: metal/metal sealing
- Pressure relieved

VFG 33
(see pages 6, 7)

**Main data:**

- DN 25-125
- T_{max} 200 °C
- Media: circulation water and glycolic water up to 30%
- mixing pressure balanced valve
- Cone: metal/metal sealing

VFU 2
(see page 7, 8)

**Main data:**

- DN 15-125
- T_{max} 150 °C
- 2-way valve (Normally Close)
- Media: circulation water and glycolic water up to 30%
- Cone: metal/metal sealing
- Pressure relieved

Ordering (VFG 2)

Cone:
metal /metal sealing, pressure
relieved.

Picture	DN (mm)	k _{vs} (m ³ /h)	Connections	T _{max} (°C)	Code No.	T _{max} (°C)	Code No.	
					PN 16		PN 25	PN 40
	15	4.0	Flanges acc. to EN 1092-1	150 ¹⁾	065B2388	200 ¹⁾	065B2401	065B2411
	20	6.3			065B2389		065B2402	065B2412
	25	8.0			065B2390		065B2403	065B2413
	32	16			065B2391		065B2404	065B2414
	40	20			065B2392		065B2405	065B2415
	50	32			065B2393		065B2406	065B2416
	65	50			065B2394		065B2407	065B2417
	80	80			065B2395		065B2408	065B2418
	100	125			065B2396		065B2409	065B2419
	125	160			065B2397		065B2410	065B2420
	150	280		150 ¹⁾	065B2398	150 ¹⁾	-	065B2421
	200	320			065B2399		-	065B2422
	250	400			065B2400		-	065B2423
	150	280		150 ¹⁾	065B2424	200 ¹⁾	-	On request
	200	320			065B2425		-	On request
	250	400			065B2426		-	On request

¹⁾ For detailed temperature limits refer to pressure/temperature diagram pg 9

Technical data (VFG 2)

Nominal diameter	DN	15	20	25	32	40	50	65	80	100	125	150	200	250	
k _{vs} value	(m ³ /h)	4	6.3	8	16	20	32	50	80	125	160	280 320 ¹⁾	320 450 ¹⁾	400 630 ¹⁾	
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	
	Δp _{max.} ²⁾ (bar)	PN 16	16	16	16	16	16	16	16	16	15	15			
	AFT	PN 25, 40	20	20	20	20	20	20	20	20	15	15			
	Δp _{max.} ³⁾ (bar)	PN 16	16	16	16	16	16	16	16	16	15	15	12	10	10
	AMV(E) 655, 658, 659 (from Q4 2014) ⁴⁾	PN 25, 40	20	20	20	20	20	20	20	20	15	15	12	10	10
Nominal pressure ²⁾		PN 16, 25 flanges to EN 1092-2 or 40, flanges to EN 1092-1													
Flow media/Temperature	PN 16	Circulation water / Glycolic water up to 30 % / thermo oil / 2 ... 150 °C													
	PN 25, 40	Circulation water / Glycolic water up to 30 % / thermo oil / 2 ... 200 °C													
Pressure balance		Stainless steel bellow, mat. No.1.4571										Rolling diaphragm			
Valve body material	PN 16	Grey cast iron EN-GJL-250 (GG-25)													
	PN 25	Ductile iron EN-GJS-400-18-LT (GGG-40.3)													
	PN 40	Cast steel GP240GH (GS-C 25)													
Cone material		Stainless steel, mat. No. 1.4404										mat. No. 1.4021			
Seat material		Stainless steel, mat. No. 1.4021													

¹⁾ In combination with actuators AMV(E), k_{vs} values are higher if Y60 piece is removed from valve.

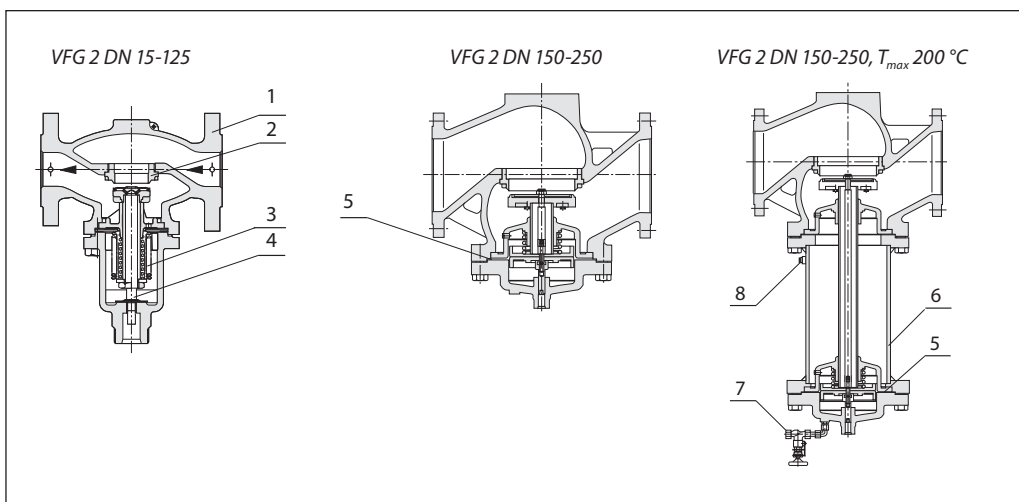
²⁾ Above operating pressure of 14 bar use of valve stem extension ZF4, ZF6 or combination piece KF2 is necessary.

³⁾ In order the actuator can close at max differential pressure flow velocity musn't exceed 2 m/s.

⁴⁾ With adapter: **065B3527**

Design (VFG 2)

1. Valve body
2. Valve seat
3. Bellows
4. Valve insert
5. Diaphragm
6. Valve body extension
7. Shut off valve for water filling
8. Closing plug





Ordering (VFG 21)

Cone:
soft sealing, pressure relieved.

Picture	DN (mm)	k _{vs} (m ³ /h)	Connections	T _{max} (°C)	Code No.
					PN 16
	15	4.0	Flanges acc. to EN 1092-1	150	065B2502
	20	6.3			065B2503
	25	8.0			065B2504
	32	16			065B2505
	40	20			065B2506
	50	32			065B2507
	65	50			065B2508
	80	80			065B2509
	100	125			065B2510
	125	160			065B2511
	150	280	Flanges acc. to EN 1092-1	150	065B2512
	200	320			065B2513
	250	400			065B2514

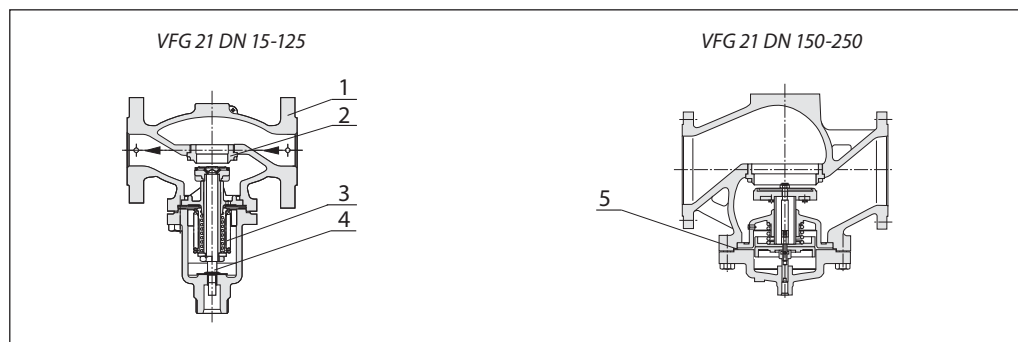
Technical data (VFG 21)

Nominal diameter DN	DN	15	20	25	32	40	50	65	80	100	125	150	200	250	
k_{vs} value	(m ³ /h)	4	6.3	8	16	20	32	50	80	125	160	280 320 ¹⁾	320 450 ¹⁾	400 630 ¹⁾	
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	
 $\Delta p_{max.}^{2)}$ (bar)	PN 16	16	16	16	16	16	16	16	16	16	15	15	-		
 $\Delta p_{max.}^{3)}$ (bar)	PN 16	16	16	16	16	16	16	16	16	16	15	15	12	10	10
	AMV(E) 655, 658, 659 (from Q4 2014) ⁴⁾	PN 25	20	20	20	20	20	20	20	20	15	15	12	10	10
Nominal pressure ²⁾		PN 16 or 25, flanges to EN 1092-2													
Flow media/Temperature		Circulation water / Glycolic water up to 30% / 2 ... 150 °C													
Pressure balance		Stainless steel bellow, mat. No.1.4571										Rolling diaphragm			
Valve body material		PN 16	Grey cast iron EN-GJL-250 (GG-25)												
		PN 25	Ductile iron EN-GJS-400-18-LT (GGG-40.3)												
Cone material		Stainless steel, mat. No. 1.4404										mat. No. 1.4021			
Seat material		Stainless steel, mat. No. 1.4021										mat. No. 1.4313			
Conical seal		EPDM													

¹⁾ in combination with actuators AMV(E), k_{vs} values are higher if Y60 piece is removed from valve.
²⁾ above operating pressure of 14 bar use of valve stem extension ZF4, ZF6 or combination piece KF2 is necessary.
³⁾ In order the actuator can close at max differential pressure flow velocity musn't exceed 2 m/s.
⁴⁾ With adapter: **065B3527**

Design (VFG 21)

- 1 Valve body
- 2 Valve seat
- 3 Bellow
- 4 Valve insert
- 5 Diaphragm



Ordering (VFGS 2 – for steam) *Cone: metal/metal sealing, pressure relieved.*

Picture	DN (mm)	k _{vs} (m ³ /h)	k _{vs} ¹⁾ (m ³ /h)	Connections	T _{max} (°C)	Code No.	T _{max} (°C)	Code No.	
						PN 16		PN 25	PN 40
	15	4.0	2.5	Flanges acc. to EN 1092-1	150 ²⁾	065B2430	350 ²⁾	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	50	40			065B2436		065B2449	065B2459
	80	80	63			065B2437		065B2450	065B2460
	100	125	100			065B2438		065B2451	065B2461
	125	160	125			065B2439		065B2452	065B2462
	150 ³⁾	280	200		150 ²⁾	065B2440	300 ²⁾	-	065B2463
	200 ³⁾	320	225			065B2441		-	065B2464
	250 ³⁾	400	280			065B2442		-	065B2465

- ¹⁾ Valves with flow divider for noise reduction (see accessories)
²⁾ for detailed temperature limits refer to pressure/temperature diagram pg 9
³⁾ Valve has valve body extension (VBE) and pre-installed flow divider

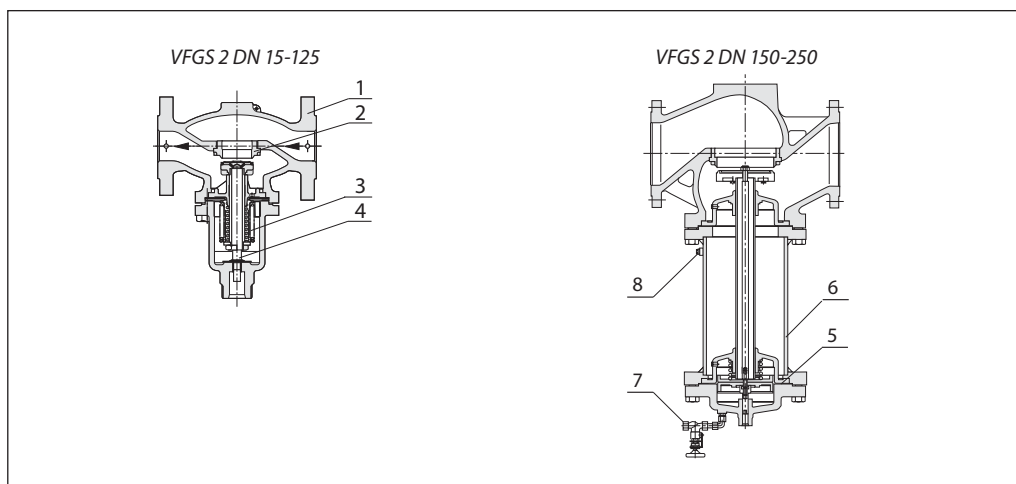
Technical data (VFGS 2)

Nominal diameter	DN	15	20	25	32	40	50	65	80	100	125	150	200	250	
k _{vs} value	(m ³ /h)	4	6.3	8	16	20	32	50	80	125	160	280 320 ²⁾	320 450 ²⁾	400 630 ²⁾	
k _{vs} value ¹⁾	(m ³ /h)	2.5	4.0	6.3	10	16	25	40	63	100	125	200	225	280	
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	
	Δp _{max.} ³⁾ (bar)	PN 16	16	16	16	16	16	16	16	16	15	15	-		
	AFT	PN 25, 40	20	20	20	20	20	20	20	20	20	15			
	Δp _{max.} ⁴⁾ (bar)	PN 16	16	16	16	16	16	16	16	16	15	15	12	10	10
	AMV(E) 655, 658, 659 (from Q4 2014) ⁵⁾	PN 25, 40	20	20	20	20	20	20	20	20	20	15	15	12	10
Nominal pressure ³⁾		PN 16, 25 flanges to EN 1092-2 or 40, flanges to EN 1092-1													
Flow media/Temperature	PN 16	Steam / max. 150 °C										Steam / max. 300 °C			
	PN 25, 40	Steam / max. 350 °C													
Pressure balance		Stainless steel bellow, mat. No.1.4571										Rolling diaphragm			
Valve body material	PN 16	Grey cast iron EN-GJL-250 (GG-25)													
	PN 25	Ductile iron EN-GJS-400-18-LT (GGG-40.3)													
	PN 40	Cast steel GP240GH (GS-C 25)													
Cone material		Stainless steel, mat. No. 1.4021										mat. No. 1.4313			
Seat material		Stainless steel, mat. No. 1.4021													

- ¹⁾ Valves with flow divider for noise reduction (see accessories)
²⁾ In combination with actuators AMV(E), k_{vs} values are higher if Y60 piece is removed from valve.
³⁾ Above operating pressure of 14 bar use of valve stem extension ZF4, ZF6 or combination piece KF2 is necessary.
⁴⁾ In order the actuator can close at max differential pressure flow velocity musn't exceed 2 m/s.
⁵⁾ With adapter: **065B3527**

Design (VFGS 2)

1. Valve body
2. Valve seat
3. Bellow
4. Valve insert
5. Diaphragm
6. Valve body extension
7. Shut off valve for water filling
8. Closing plug



Ordering (VFG 33)

VFG 33 (mixing valve – pressure balanced)

Picture	DN (mm)	k _{vs} (m ³ /h)	Connections	T _{max} (°C)	Code No.	T _{max} (°C)	Code No.
					PN 16		PN 25
	25	8.0	Flanges acc. to EN 1092-1	150 ¹⁾	065B2598	200 ¹⁾	065B2606
	32	12.5			065B2599		065B2607
	40	20			065B2600		065B2608
	50	32			065B2601		065B2609
	65	50			065B2602		065B2610
	80	80			065B2603		065B2611
	100	125			065B2604		065B2612
	125	160			065B2605		065B2613

¹⁾ for detailed temperature limits refer to pressure/temperature ratings diagram pg 9

Technical data (VFG 33)

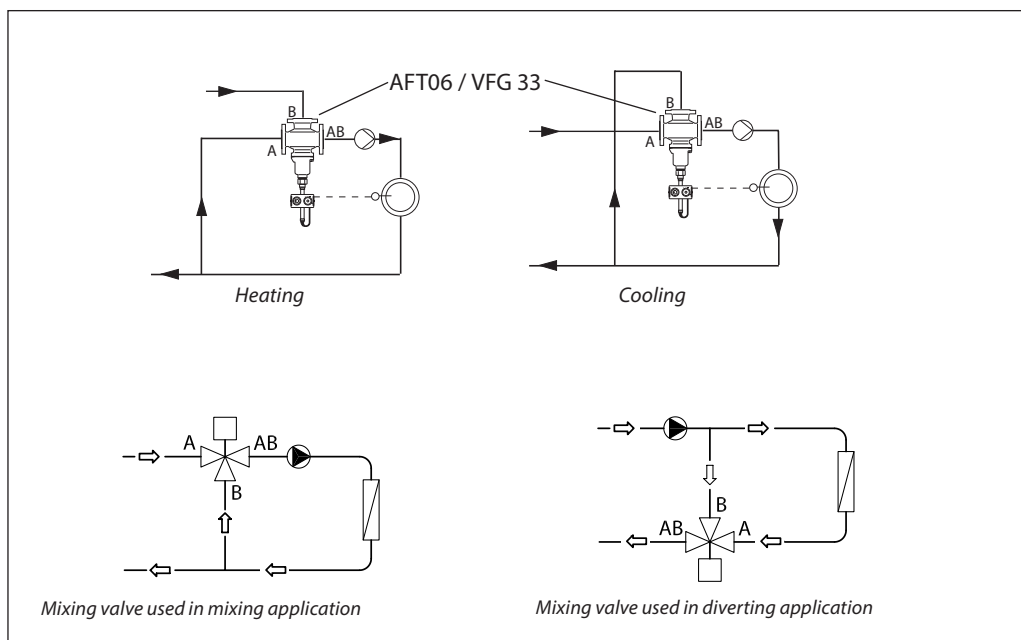
Nominal diameter		DN	25	32	40	50	65	80	100	125
k _{vs} value		(m ³ /h)	8	12.5	20	32	50	80	125	160
	Δp _{max.} ¹⁾ (bar)	PN 16	16	16	16	14	12	10	10	10
	AFT	PN 25	18	18	16	14	12	10	10	10
	Δp _{max.} ²⁾ (bar)	PN 16	16	16	16	16	16	16	15	15
	AMV(E) 655, 658, 659 (from Q4 2014) ³⁾	PN 25, 40	20	20	20	20	20	20	15	15
Nominal pressure ¹⁾		PN 16 or 25, flanges to EN 1092-2								
Flow media/Temperature		PN 16	Circ.water / Glycolic water up to 30 % / 2 ... 150 °C							
		PN 25	Circ.water / Glycolic water up to 30 % / 2 ... 200 °C							
Pressure balance		Stainless steel bellow, mat. No.1.4571								
Valve body material		PN 16, 25	Ductile iron EN-GJS-400-18-LT (GGG-40.3)							
Cone material		Stainless steel, mat. No. 1.4404								
Seat material		Stainless steel, mat. No. 1.4021								

¹⁾ Above operating pressure of 14 bar use of valve stem extension ZF4, ZF6 or combination piece KF2 is necessary.

²⁾ In order the actuator can close at max differential pressure flow velocity musn't exceed 2 m/s.

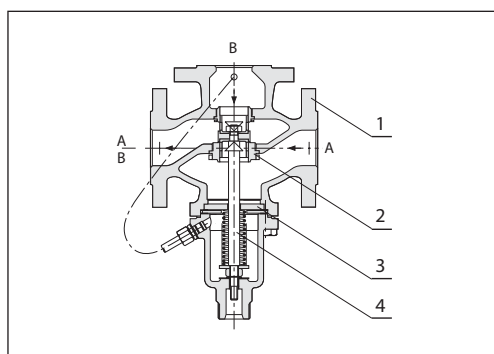
³⁾ With adapter: **065B3527**

Applications (VFG 33)



Design (VFG 33)

- 1 Valve body
- 2 Valve seat
- 3 Bellow
- 4 Valve insert



Ordering (VFU 2)

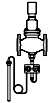

Opening valve, pressure relieved.

VFU 2 (metallic sealing cone)

Picture	DN (mm)	k_{vs} (m ³ /h)	Connections	T _{max} (°C)	Code No.
					PN 16
	15	4.0	Flanges acc. to EN 1092-1	150 ¹⁾	065B2738
	20	6.3			065B2739
	25	8.0			065B2740
	32	16			065B2741
	40	20			065B2742
	50	32			065B2743
	65	50			065B2744
	80	80			065B2745
	100	125			065B2746
	125	160			065B2747

¹⁾ For detailed temperature limits refer to pressure/temperature diagram pg 9

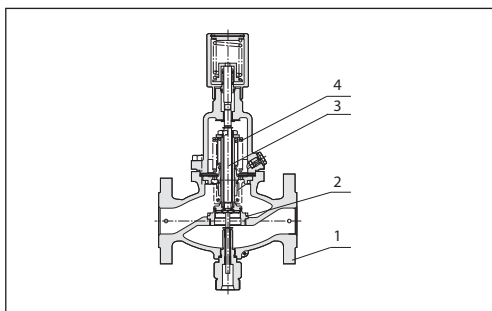
Technical data (VFU 2)

Nominal diameter		DN	15	20	25	32	40	50	65	80	100	125
k _{VS} value		(m ³ /h)	4	6.3	8	16	20	32	50	80	125	160
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
	Δp _{max.} (bar) AFT..	PN 16	10							8		
	Δp _{max.} (bar) AMV(E) 655, 658, 659 (from Q4 2014) ¹⁾	PN 16	12							10	8	
Nominal pressure		PN 16, flanges to EN 1092-2										
Flow media/Temperature		Circulation water / Glycolic water up to 30 % / 2 ... 150 °C										
Pressure balance		Stainless steel bellow, mat. No.1.4571										
Valve body material		Grey cast iron EN-GJL-250 (GG-25)										
Cone material/Conical seal		Stainless steel, mat. No. 1.4404										
Seat material		Stainless steel, mat. No. 1.4021										



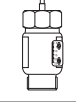

¹⁾ With adapter: **065B3527**

Design (VFU 2)

- 1 Valve body
- 2 Valve seat
- 3 Valve insert
- 4 Bellow



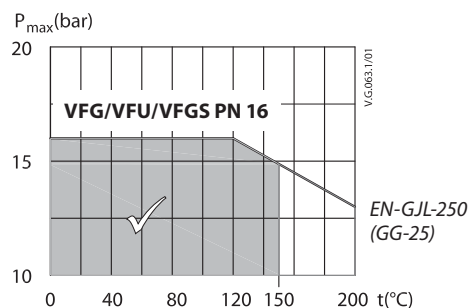
Accessories

Picture	Type	Note	Code No.
	Comb. piece KF2	For combinations with thermostats	003G1440
	Comb. piece KF3	For combinations with thermostats, pressure controllers and motorised actuators	003G1441
	Valve stem extension ZF4	Valves DN 15-125 For water above 200 °C	003G1394
	Valve stem extension ZF5	Valves DN 15-125 For oil above 200°C	003G1395
	Valve stem extension ZF6	Valves DN 15-125 For water, steam or oil above 200 °C	003G1396
	Valve stem extension ZF6	For water, steam temperatures until 200 °C	003G1393
	Flow divider for VFGS 2 (for noise reduction)	DN	Code No.
		15	065B2775
		20	065B2776
		25	
		32	
		40	065B2777
		50	
		65	065B2778
		80	
100	065B2779		
125			

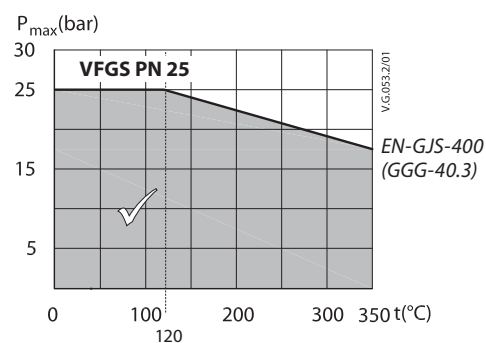
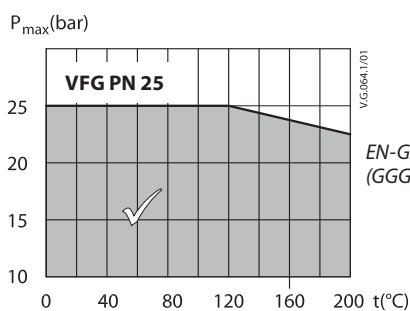
Remark:
Temperature controller with thermostat AFT.:
This controller can be used until operating pressure of 14 bar. If the operating pressure is higher than 14 bar the valve stem extension ZF4, ZF6 or the combination piece KF2 must be used.

Pressure temperature diagram

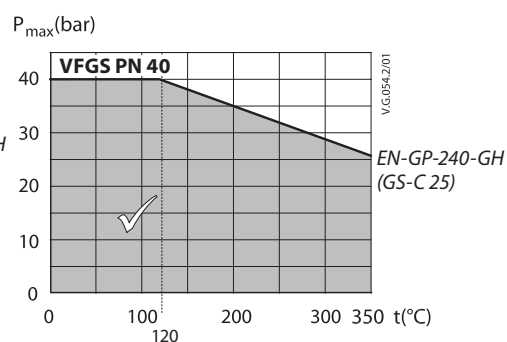
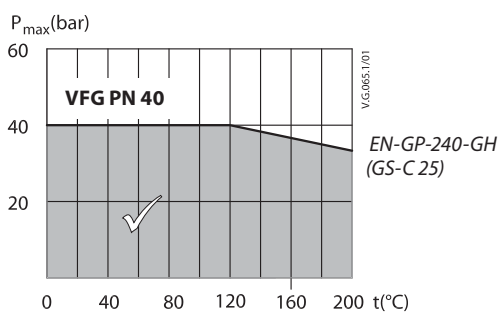
Working area is below P-T line and it ends at T_{max} for each valve



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

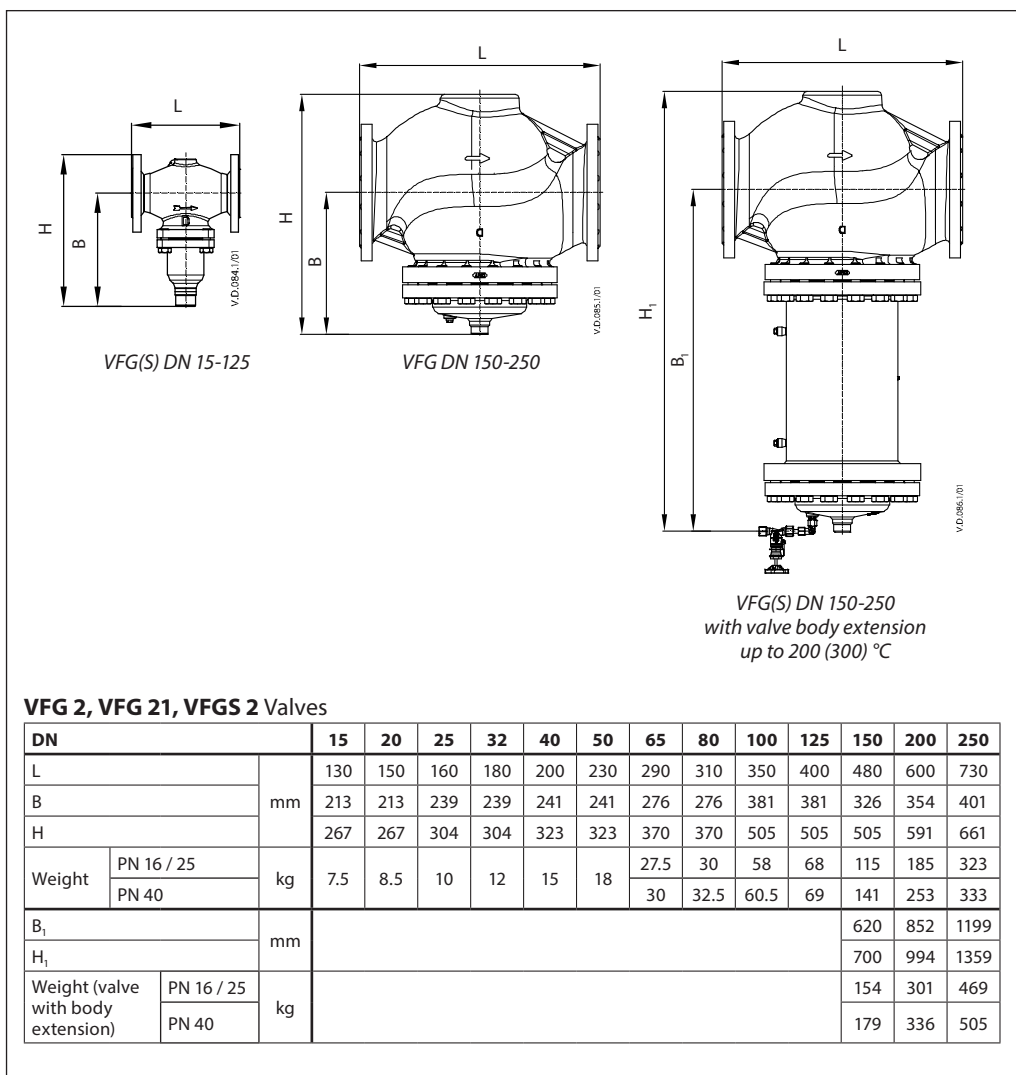


Maximum allowed operating pressure as a function of media temperature (according to EN 1092-2)

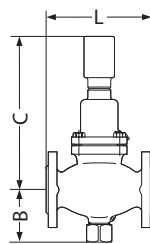


Maximum allowed operating pressure as a function of media temperature (according to EN 1092-1)

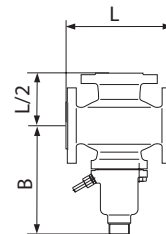
Dimensions



Dimensions (continuous)



VFU 2
DN 15-125



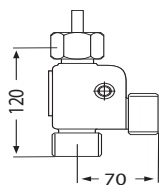
VFG 33
DN 25-125

VFG 33 valves

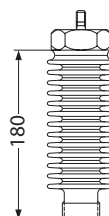
DN		25	32	40	50	65	80	100	125
L	mm	160	180	200	230	290	310	350	400
B	mm	238	238	240	240	275	275	380	380
Weight	kg	10.5	12	17	21	35	41	75	93

VFU 2 valve

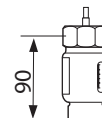
DN		15	20	25	32	40	50	65	80	100	125
L	mm	130	150	160	180	200	230	290	310	350	400
B	mm	95	95	106	106	123	123	135	135	165	165
C	mm	306	306	332	332	334	334	369	369	474	474
Weight	kg	7.0	9.0	10	13	17	22	33	41	70	79



Comb. piece KF2, KF3



Valve stem extension
ZF4, ZF5



Valve stem extension
ZF6



Danfoss A/S

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