



Actuators - Temperature

STW/VFG(S) 2, STW/AFT/VFG(S) 2

Description

The controllers STFW/VFG(S) 2 and STFW/AFT/VFG 2 are used for temperature control and temperature monitoring of drinking water and heating systems.

- Type-tested acc. to EN 14597-2015
- District heating systems acc. to DIN 4747
- Heating systems acc. to DIN 4751 and DIN 4752
- Water heating systems for drinking and industrial waters acc. to DIN 4753

Ordering

Product code numbers

Table: Type VFG 2, VFGS 2

Type	Valve size	Kvs values [m ³ /h]	Media temperature [°C] [Max]	Code number
VFG 2	DN 15	4.00	200	065B2388
VFG 2	DN 15	4.00	200	065B2401
VFG 2	DN 15	4.00	200	065B2411
VFG 2	DN 20	6.30	200	065B2402
VFG 2	DN 20	6.30	200	065B2389
VFG 2	DN 20	6.30	200	065B2412
VFG 2	DN 25	8.00	200	065B2390
VFG 2	DN 25	8.00	200	065B2403
VFG 2	DN 25	8.00	200	065B2413
VFG 2	DN 32	16.00	200	065B2404
VFG 2	DN 32	16.00	200	065B2414
VFG 2	DN 32	16.00	200	065B2391
VFG 2	DN 40	20.00	200	065B2415
VFG 2	DN 40	20.00	200	065B2405
VFG 2	DN 40	20.00	200	065B2392
VFG 2	DN 50	32.00	200	065B2416
VFG 2	DN 50	32.00	200	065B2406
VFG 2	DN 50	32.00	200	065B2393
VFG 2	DN 65	50.00	200	065B2417
VFG 2	DN 65	50.00	200	065B2394
VFG 2	DN 65	50.00	200	065B2407
VFG 2	DN 80	80.00	200	065B2408
VFG 2	DN 80	80.00	200	065B2395
VFG 2	DN 80	80.00	200	065B2418
VFG 2	DN 100	125.00	200	065B2419
VFG 2	DN 100	125.00	200	065B2396
VFG 2	DN 100	125.00	200	065B2409
VFG 2	DN 125	160.00	200	065B2420
VFG 2	DN 125	160.00	200	065B2397
VFG 2	DN 125	160.00	200	065B2410
VFG 2	DN 150	280.00	150	065B2398
VFG 2	DN 150	280.00	150	065B2421
VFG 2	DN 150	280.00	150	065B2424
VFG 2	DN 200	320.00	150	065B2422
VFG 2	DN 200	320.00	150	065B2399
VFG 2	DN 200	320.00	150	065B2425
VFG 2	DN 250	400.00	150	065B2423
VFG 2	DN 250	400.00	150	065B2426
VFG 2	DN 250	400.00	150	065B2400
VFGS 2	DN 15	4.00	350	065B2443
VFGS 2	DN 15	4.00	350	065B2453
VFGS 2	DN 15	4.00	300	065B2430
VFGS 2	DN 20	6.30	350	065B2444
VFGS 2	DN 20	6.30	350	065B2454
VFGS 2	DN 20	6.30	300	065B2431
VFGS 2	DN 25	8.00	300	065B2432
VFGS 2	DN 25	8.00	350	065B2445
VFGS 2	DN 25	8.00	350	065B2455
VFGS 2	DN 32	16.00	350	065B2456
VFGS 2	DN 32	16.00	350	065B2446
VFGS 2	DN 32	16.00	300	065B2433
VFGS 2	DN 40	20.00	350	065B2457

VFGS 2	DN 40	20.00	350	065B2447
VFGS 2	DN 40	20.00	300	065B2434
VFGS 2	DN 50	32.00	350	065B2458
VFGS 2	DN 50	32.00	350	065B2448
VFGS 2	DN 50	32.00	300	065B2435
VFGS 2	DN 65	50.00	350	065B2449
VFGS 2	DN 65	50.00	300	065B2436
VFGS 2	DN 65	50.00	350	065B2459
VFGS 2	DN 80	80.00	350	065B2460
VFGS 2	DN 80	80.00	350	065B2450
VFGS 2	DN 80	80.00	300	065B2437
VFGS 2	DN 100	125.00	350	065B2461
VFGS 2	DN 100	125.00	300	065B2438
VFGS 2	DN 100	125.00	350	065B2451
VFGS 2	DN 125	160.00	350	065B2462
VFGS 2	DN 125	160.00	300	065B2439
VFGS 2	DN 125	160.00	350	065B2452
VFGS 2	DN 150	280.00	300	065B2463
VFGS 2	DN 150	280.00	300	065B2440
VFGS 2	DN 200	320.00	300	065B2464
VFGS 2	DN 200	320.00	300	065B2441
VFGS 2	DN 250	400.00	300	065B2465
VFGS 2	DN 250	400.00	300	065B2442

Table: Type AFT 06, AFT 17, STFW

Type	Temperature setting range [°C] [Min]	Temperature setting range [°C] [Max]	Temperature sensor material	Time constant [sec]	Code number
AFT 06	20	90	Copper mat. No 2.0090	120	065-4391
AFT 06	40	110	Copper mat. No 2.0090	120	065-4392
AFT 06	110	180	Copper mat. No 2.0090	120	065-4394
AFT 06	60	130	Copper mat. No 2.0090	120	065-4393
AFT 06	-20	50	Copper mat. No 2.0090	120	065-4390
AFT 17	60	130	Copper mat. No 2.0090	20	065-4403
AFT 17	-20	50	Copper mat. No 2.0090	20	065-4400
AFT 17	40	110	Copper mat. No 2.0090	20	065-4402
AFT 17	20	90	Copper mat. No 2.0090	20	065-4401
STFW	10	75	Copper mat. No 2.0090	120	065-4408
STFW	30	95	Copper mat. No 2.0090	120	065-4409
STFW	40	110	Copper mat. No 2.0090	120	065-4410

Note:

1. For thermostat **AFT**, the following applies:

Temperature setting range - Thermostats are proportional controllers, thus certain deviation from set point can be expected and varies up to +/- 10 %, depend on valve DN.

Time constant - acc. to EN 14597

Example 1:

Safety temperature monitor STFW/VFG 2; DN 25; PN 25; limit range 10 ... 75 °C:

- 1× STFW thermostat
Code no: **065-4408**
- 1× VFG 2 DN 25 valve
Code no: **065B2403**

Example 2:

Temperature controller with safety temperature monitor STFW/AFT/VFG 2; DN 25; PN 25; limit range 10 ... 75 °C.

- 1× STFW thermostat
Code no: **065-4408**
- 1× AFT 06 thermostat
Code no: **065-4135**
- 1× VFG 2 DN 25 valve
Code no: **065B2403**
- 1× KF2 comb. piece
Code no: **003G1398**

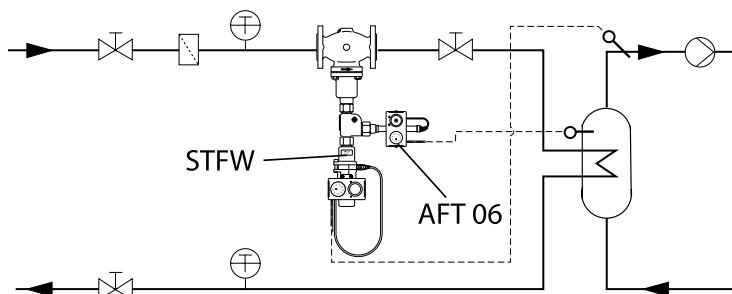
Parts will be delivered separately.

Accessories code numbers

Type	Description	Code number
Stem extensions	Stem extension ZF 6, AF range	003G1393
Stem extensions	Stem extension ZF 4, AF range	003G1394
Immersion pockets	Immersion pocket, AFT, R1Z, Bronze, PN40	003G1399
Immersion pockets	Immersion pocket, AFT, R1Z, SS, PN40	003G1412
Stuffing box kits	Stuffing cone fi12 incl. EPDM O-rings,AF	003G1464
Flow dividers	Flow divider for VFGS2 valves DN15, 20	065B2775
Flow dividers	Flow divider for VFGS2 valves DN25, 32	065B2776
Flow dividers	Flow divider for VFGS2 valves DN40, 50	065B2777
Flow dividers	Flow divider for VFGS2 valves DN65, 80	065B2778
Flow dividers	Flow divider for VFGS2 valves DN100, 125	065B2779
Valve Inserts	Valve insert VFG/Q/U 2 PN40 DN15	065B2796
Valve Inserts	Valve insert VFG/Q/U 2 PN40 DN20	065B2797
Valve Inserts	Valve insert VFG/Q/U 2 PN40 DN25/32	065B2798
Valve Inserts	Valve insert VFG/Q/U 2 PN40 DN40/50	065B2799
Valve Inserts	Valve insert VFG/Q/U 2 PN40 DN65/80	065B2800
Valve Inserts	Valve insert VFG/Q/U 2 PN40 DN100/125	065B2801
Valve Inserts	Valve insert VFGS2 PN40 DN15	065B2802
Valve Inserts	Valve insert VFGS2 PN40 DN20	065B2803
Valve Inserts	Valve insert VFGS2 PN40 DN25/32	065B2804
Valve Inserts	Valve insert VFGS2 PN40 DN40/50	065B2805
Valve Inserts	Valve insert VFGS2 PN40 DN65/80	065B2806
Valve Inserts	Valve insert VFGS2 PN40 DN100/125	065B2807
Valve Inserts	Valve insert VFG 2 PN40 DN150	065B2964
Valve Inserts	Valve insert VFG 2 PN40 DN250	065B2965
Adapters	Adapter 3 VFG(S), AFQM6, AFQM PN25	065B3527

Overview

Application examples



System with temperature controller and safety temperature monitor.

Functions

Operation

Mode of Operation

The controllers are proportional controllers and the valves are pressure-balanced.

Safety Temperature Monitor (STW)

Function STW

When reaching the set limit temperature at the temperature sensor (9), the safety temperature monitor interrupts energy supply by closing the valve (1). As soon as the temperature at the temperature sensor drops, the valve is opening automatically. The limit temperature is adjusted at the setpoint adjuster (7) with temperature scale. The setpoint adjuster can be sealed.

Extended Safety STW

If there is a leakage in the area of the temperature sensor, the connection pipe, or the thermostat, the valve is closed by a pressure spring in the safety thermostat.

Physical Function Principle STW

The safety thermostat operates in accordance with the liquid expansion principle. The temperature sensor, the connection pipe, and the working element are filled with liquid. As the temperature at the temperature sensor rises, the liquid expands, the working stem of the thermostat is pressed out and the valve VFG(S) 2 is closed.

Temperature Controller (TR)

Function TR

The temperature of a medium is controlled by the temperature controller (TR) in accordance with the adjusted setpoint. The setpoint is adjusted by turning the setpoint adjuster. The setpoint adjuster may be sealed.

Physical Function Principle

The thermostat operates in accordance with the liquid expansion principle. Temperature sensor, impulse tubes and thermostats are filled with liquid. As soon as the temperature at the temperature sensor rises the liquid expands. The stem of the thermostat is extended and the valve VFG(S) 2 is closed.

Product details

General data

Technical data

Valves **VFG 2, VFGS 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
k_{VS} value ¹⁾	m ³ /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
$\Delta p_{max.}^{2)}$, PN 16	bar	16	16	16	16	16	16	16	16	15	15
$\Delta p_{max.}^{2)}$, PN 25, 40	bar	20	20	20	20	20	20	20	20	15	15
Nominal pressure		PN 16, 25 or 40, flanges to EN1092-2									
Flow medium, VFG 2		Water for heating, district heating and cooling systems									
Flow medium, VFGS 2		Steam									

¹⁾ Valves with flow divider for noise reduction (see accessories)

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

Thermostat **STFW**

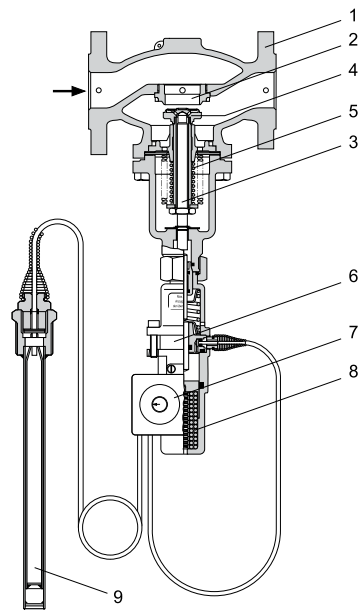
Limit range X_s	°C	10 ... 75, 30 ... 95, 40 ... 110
Time constant T acc. to EN 14597	s	max. 120
Gain KR	mm/°C	0.6
Max. adm. temp. at sensor	°C	100 °C above maximum setpoint
Nominal pressure sensor	PN	40
Capillary tube length	m	5
Temperature sensor		Ø24 × 386
Immersion pocket		Ø25 × 401 mm
Approx. weight	kg	3.5

Thermostats **AFT**

Type		AFT 06	AFT 17
Setting range X_s	°C	-20 ... 50, 20 ... 90, 40 ... 110, 60 ... 130, 110 ... 180	-20 ... 50, 20 ... 90, 40 ... 110, 60 ... 130
Time constant T	s	120 (with immersion pocket)	20 (without immersion pocket)
Gain K_s	mm / °C	0.8	0.8
Max. temperature at sensor		100 °C above the adjusted set-point	100 °C above the adjusted set-point
Max. amb. temperature	°C	0 ... 70	0 ... 70
Nominal pressure sensor	PN	40	40
Nominal pressure immersion pocket	PN	40	40
Capillary tube length	m	5	5
Temperature sensor		Smooth sensor Ø24 × 386	Spiral sensor Ø30 × 500
Immersion pocket		Ø25 × 401 mm	No immersion pocket
Weight	kg	3.0	3.5

Design

- 1 Valve VFG(S) 2
- 2 Valve seat
- 3 Trim
- 4 Cone
- 5 Bellow
- 6 Thermostat
- 7 Setpoint adjuster
- 8 Safety spring
- 9 Temperature sensor



Materials

Valves **VFG 2, VFGS 2**

Nominal diameter	DN 15, 20, 25, 32, 40, 50, 65, 80, 100, 125
Pressure balance	Stainless steel bellows, mat. No.1.4571
Valve body, PN 16	Grey cast iron EN-GJL-250 (GG-25)
Valve body, PN 25	Ductile iron EN-GJS-400 (GGG-40.3)
Valve body, PN 25/40	Cast steel GP240GH (GS-C 25)
Cone, VFG 2	Stainless steel, mat. No. 1.4404
Cone, VFGS 2	Stainless steel, mat. No. 1.4021
Seat	Stainless steel, mat. No. 1.4021

Thermostat **STFW**

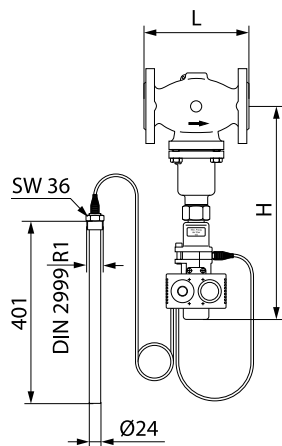
Temperature sensor	Copper / brass
Immersion pocket	Bronze, nickel-plated
Immersion pocket	Stainless steel mat. No. 1.4571

Thermostats **AFT**

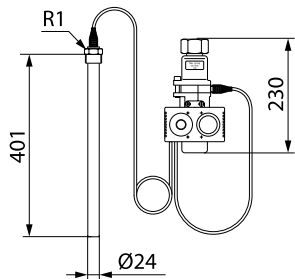
Type	AFT 06	AFT 17
Sensor medium	Silicon oil	Silicon oil
Sensor	Brass, bronze	Cu spiral, nickel-plated
Immersion pocket	Bronze, nickel-plated	No immersion pocket
Immersion pocket	Stainless steel Mat. No. 1.4571	No immersion pocket



Dimensions

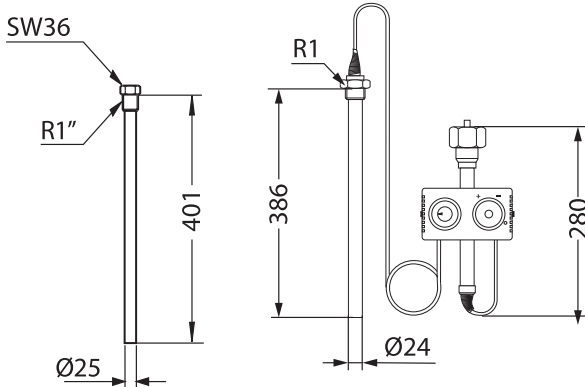


STFW / VFG(S) 2

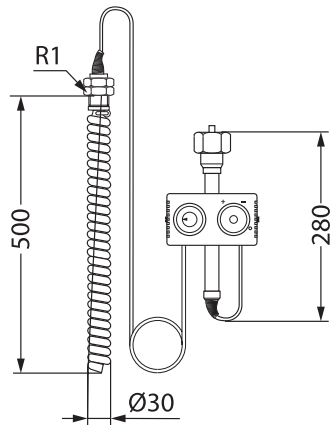


STFW

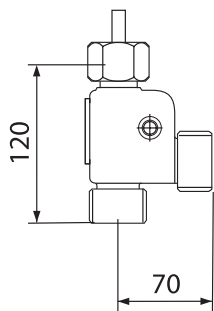
DN		15	20	25	32	40	50	65	80	100	125
L	mm	130	150	160	180	200	230	290	310	350	400
H	mm	442	442	468	468	470	470	505	505	610	610



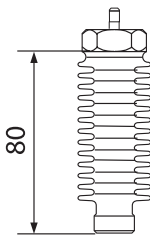
AFT 06



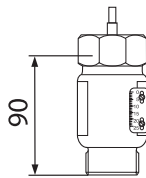
AFT 17



Combination piece KF2



Valve stem extension ZF4



Valve stem extension ZF6

Installation

Mounting

A strainer must be installed in front of the controller:

Nom. diameter	DN 15-25	DN 32-65	DN 80-125
Mesh size strainer	0.5 mm	0.8 mm	1.25 mm

The controller may be installed in any position.

The sensor must be immersed into the medium by its full length. Select the location of installation in such a way that the highest temperature of the medium is measured directly and without any delay.

The setpoint adjusters of the thermostats STFW, AFT may be sealed. For temperatures higher than 120 °C, the safety temperature monitor must be secured with a seal.

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	Issuer	Approval topic
EAC Declaration	EAC KZ 7100841.13.12.02339	EAC - Eurasian Customs Union	MD
UA Declaration	Danfoss UA 10.01.23 Heat Control Valves	Danfoss	
Electrical Safety Certificate	STW1077	DIN CERTCO	
Electrical Safety Certificate	DIN CERTCO TR(TW)761	DIN CERTCO	
Export Control Declaration	Actuators pressure flow and temperature	Danfoss	
Pressure Safety Certificate	Certificate B (UA.TR.131.B.2655-26) Control valves	Academtest LLC	Pressure
Pressure Safety Certificate	Certificate D (UA.TR.131.B.2655-26) Control valves	Academtest LLC	Pressure
Pressure Safety Certificate	Declaration Control valves	Danfoss	Pressure
EU Declaration	PL08-28_230612EN0854103_EU declaration of conformity_rev6_Control Valves.docx.pdf	Danfoss	Pressure, PED
EU Declaration	Packaging EU Declaration of Conformity 260707EN0801	Danfoss	Packaging, PPWR

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