

Gas-actuated Thermometers, with Capillary Line

TFK 4 1/2"
TFKG 4 1/2"

Standard Versions

This data sheet contains detailed information on our standard versions and available options. In overview 8000 you will find additional information on the selection, metrological features, permissible ambient and storage temperatures as well as error limits, etc. Information on the metrologically optimal design of thermometers can be found in our technical information sheet T08-000-031.

Measuring Unit

With nitrogen filling (inert gas, physiologically safe)

Accuracy (DIN EN 13190)

Class 1

Case

With screw ring, PBTP (thermoplastic) black, flame-retardant and impact resistant, fire classification UL 94 V-0, case with integrated back flange for surface mounting

Degree of Protection (DIN EN 60529 / IEC 60529)

IP65

Case Filling

Model TFKG silicone oil

Nominal Case Size

4 1/2"

Case Configuration

Connection temperature sensor (stem)

- capillary line

Capillary line position

- vertical bottom position

Mounting device

- integrated back flange for surface mounting

Capillary line

1 m (3.28') stainless steel Ø 2 mm (0.08")

capillary line length L_{FL} selectable from 1 m to 15 m (3.28 to 49.21')
with bend protection springs on both ends

Temperature Ranges (DIN EN 13190)

Temperature differences from 80 K up to 600 K

Temperature Sensor (Stem)

Made of stainless steel 316Ti (1.4571)

Max. static

operating pressure 25 bar

Stem types A1, A3, A4, A5, A6 or A10

Stem Ø dF 8, 10, 12 mm (0.31, 0.39, 0.47") or 3/8"

Stem length L or L1 from Lmin or L1min up to 2.50 m (8.2')

Please regard the minimum stem length depending on active length (L_a) and stem type, see page 3

Window

Laminated safety glass

Movement

Stainless steel

Dial

Aluminum white, scale black

Pointer

Adjustable pointer, aluminum black, with aluminum mechanism

Indication Adjustment (±6 %)

Externally via screw



Ordering Information, Standard Ranges, Options

See page 4

Further Options

Other stem types, e.g.

- without bent tube, with compression fitting, adjustable at the capillary line, see data sheet 8299.2

- with connection for food / bio / pharmaceutical industries, see data sheet 8299.3

- contact stem for temperature measurement at the outside of tanks and pipe barrels up to 300 °C (572 °F), see data sheet 8299.4

Special Versions Upon Request

- Other stem Ø, connection threads and materials
- Capillary line $L_{FL} > 15$ m
- Other temperature ranges and / or special scales, e.g. dual scale °C / °F, coloured fields or ranges, dial inscriptions

Accessories

Mechanical Thermowells see data sheets 8.8110 ff.

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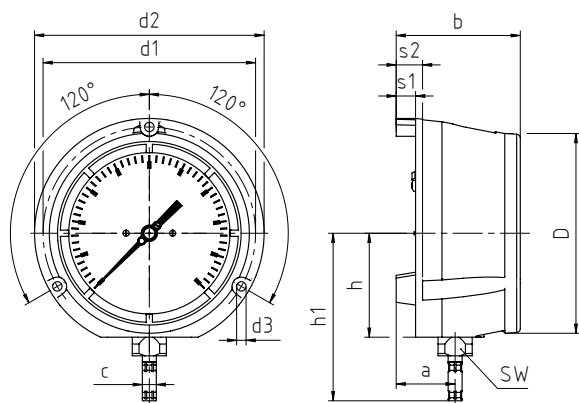
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Capillary Line Position, Code Letters, Dimensional Data and Weight

Vertical Bottom Capillary Line Position



Dimensional Data (mm / inch) and Weight (kg / lb)

NCS	a	b	c	D	d1	d2	d3	h	h1	s1	s2	SW	approx. weight ¹⁾	
													TFK	TFKG
4½"	38 1.5	80 3.15	9 0.35	129 5.08	137 5.39	148 5.83	6.1 0.24	67 2.64	108 4.25	12.5 0.49	17 0.67	22 0.87	1.1 2.43	1.5 3.31

Minimum Stem Length, Active Length and Maximum Feasible Capillary Line Length incl. Stem (mm / inch)

			capillary line incl. stem up to 5 m (16.4') ≤ 500 °C (≤ 932 °F)						capillary line incl. stem > 5 m to 15 m (> 16.4 to 49.21') ≤ 500 °C (≤ 932 °F)					
			stem Ø dF											
stem type	length	thread	12 (0.47")	10 (0.39")	8 (0.31")	12 (0.47")	10 (0.39")	8 (0.31")	12 (0.47")	10 (0.39")	8 (0.31")	12 (0.47")	10 (0.39")	8 (0.31")
all models	La	all standard threads	35	45	75	75	105	165	53	80	115	150	200	320
			1.38	1.77	2.95	2.95	4.13	6.5	2.09	3.15	4.53	5.91	7.87	12.6
A1 / A3 / A4	Lmin	all standard threads	55	65	95	95	125	185	73	100	135	170	220	340
			2.17	2.56	3.74	3.74	4.92	7.28	2.87	3.94	5.31	6.69	8.66	13.39
A5	Lmin	all standard threads	90	100	130	130	160	220	108	135	170	205	255	375
			3.54	3.94	5.12	5.12	6.3	8.66	4.25	5.31	6.69	8.07	10.04	14.76
A6	L1min	G½ B, M 20x1.5	49	59	89	89	119	179	69	96	131	166	216	336
			1.93	2.32	3.5	3.5	4.69	7.05	2.72	3.78	5.16	6.54	8.5	13.23
		G¾ B, M 24x1.5, M 27x2	51	61	91	91	121	181	72	99	134	169	219	339
			2	2.4	3.58	3.58	4.76	7.13	2.83	3.9	5.28	6.65	8.62	13.35
others		½" NPT, ¾" NPT	54	64	94	94	124	184	67	94	129	164	214	334
			2.13	2.52	3.7	3.7	4.88	7.24	2.64	3.7	5.08	6.46	8.43	13.15
others			upon request											

			capillary line incl. stem up to 5 m (16.4') ≤ 600 °C (≤ 1112 °F)		capillary line incl. stem > 5 m to 15 m (> 16.4 to 49.21') ≤ 600 °C (≤ 1112 °F)	
stem type	length	thread	stem Ø dF ¾"			
A1	Lmin	–	96 3.8"		123 4.8"	
A10	La	½" NPT, G ½ B, without	76 3"		103 4"	

The minimum length Lmin / L1min is the smallest feasible stem length.

Important: Please note the technical information sheet T08-000-031 on the metrologically optimal stem length.

The active length La is the temperature-sensitive part of the stem.

The maximum feasible stem length is 2.50 m (8.2'). With a capillary line, greater lengths are possible, e.g. with special stems A2, A7 and A7.1 (data sheet 8299.2).

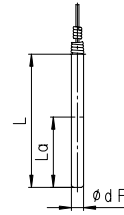
¹⁾ example, data for version with stem A1, Ø 10 mm (0.39"), length 200 mm (7.87") and 1 m (3.28') capillary line

Stem Types

Stem Types

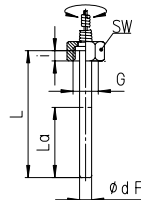
Process connection without screw fitting, plain stem

Stem type	A1
Form acc. to DIN EN 13190	form 1
Stem material	1.4571
Stem Ø dF	8, 10, 12 mm or 3/8"
Order length	L
Suitable thermowell models (data sheet)	SK1 (8.8140), SK2 (8.8141)



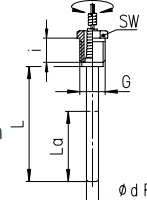
Process connection union nut

Stem type	A3
Form acc. to DIN EN 13190	form 5
Stem material	1.4571
Stem Ø dF	8, 10, 12 mm
Order length	L
Suitable thermowell models (data sheet)	SF4.1 (8.8111), SF4.1F (8.8113) SF8 (8.8130), SF9 (8.8131)



Process connection male thread, turnable

Stem type	A4
Form acc. to DIN EN 13190	form 4
Stem material	1.4571
Stem Ø dF	8, 10, 12 mm
Order length	L
Suitable thermowell models (data sheet)	SF4 (8.8110), SF4F (8.8112) SF5 (8.8120), SF6, SF7 (8.8121)



Thread (dimensional data in mm / inch)

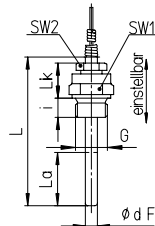
G	SW	i
G 1/2	27 / 1.06	10 / 0.39
G 3/4	32 / 1.26	12 / 0.47
M20x1.5	32 / 1.26	10 / 0.39
M24x1.5	27 / 1.06	12 / 0.47
M27x2	32 / 1.26	12 / 0.47

G	SW	i
G 1/2	22 / 0.87	20 / 0.79
G 3/4	27 / 1.06	23 / 0.91
M18x1.5	22 / 0.87	14 / 0.55
M20x1.5	22 / 0.87	20 / 0.79

Thermowell required!

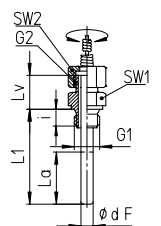
Process connection male thread / compression fitting

Stem type	A5 (A1 with compression fitting)
Form acc. to DIN EN 13190	form 2 (cylindrical thread) form 3 (conical thread)
Stem material	1.4571
Stem Ø dF	8, 10, 12 mm
Order length	L
Suitable thermowell models (data sheet)	SF4 (8.8110), SF4F (8.8112) SF5 (8.8120), SF6, SF7 (8.8121)



Process connection male thread, turnable / double male adapter

Stem type	A6 (A3 with double male adapter)
Form acc. to DIN EN 13190	—
Stem material	1.4571
Stem Ø dF	8, 10, 12 mm
Order length	L1
Suitable thermowell models (data sheet)	SF4 (8.8110), SF4F (8.8112) SF5 (8.8120), SF6, SF7 (8.8121)



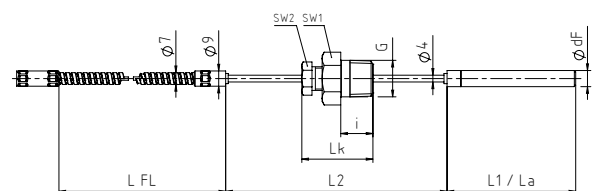
Thread (dimensional data in mm / inch)

G	SW1	SW2	i	Lk
G 1/2 B	27 / 1.06	22 / 0.87	14 / 0.55	42 / 1.65
G 3/4 B	32 / 1.26	22 / 0.87	16 / 0.63	42 / 1.65
1/2" NPT	27 / 1.06	22 / 0.87	19 / 0.75	42 / 1.65
3/4" NPT	27 / 1.06	22 / 0.87	19 / 0.75	42 / 1.65
M20x1.5	27 / 1.06	22 / 0.87	14 / 0.55	42 / 1.65

G1	G2	SW1	SW2	i	Lv
G 1/2 B	G 1/2 B	27 / 1.06	27 / 1.06	14 / 0.55	28 / 1.1
G 3/4 B	G 1/2 B	32 / 1.26	27 / 1.06	16 / 0.63	28 / 1.1
1/2" NPT	G 1/2 B	27 / 1.06	27 / 1.06	19 / 0.75	28 / 1.1
3/4" NPT	G 1/2 B	27 / 1.06	27 / 1.06	19 / 0.75	28 / 1.1
M20x1.5	M20x1.5	27 / 1.06	27 / 1.06	14 / 0.55	28 / 1.1
M24x1.5	M20x1.5	32 / 1.26	27 / 1.06	14 / 0.55	28 / 1.1
M27x2	M20x1.5	32 / 1.26	27 / 1.06	16 / 0.63	28 / 1.1

Process connection male thread / compression fitting on bendable reinforcement

Stem type	A10
Stem material	1.4571
Stem Ø dF	3/8"
Order length	L1 in mm L2 (preferred dimensions 305 / 558 / 610 mm [12" / 18" / 24"])
Suitable thermowell models (data sheet)	SF4 (8.8110), SF4F (8.8112) SF5 (8.8120), SF6, SF7 (8.8121)



Thread (dimensional data in mm / inch)

G	SW1	SW2	i	Lk
1/2" NPT	27 / 1.06	17 / 0.67	19 / 0.75	42 / 1.65
G 1/2 B	27 / 1.06	17 / 0.67	14 / 0.55	42 / 1.65
without	—	—	—	—

Ordering Information, Options

Basic Model		Gas-actuated Thermometer with Capillary Line				TFK		
Case filling	without					without code letters		
	silicone oil					G		
Nominal case size	case Ø 4 1/2"					4 1/2"		
Capillary line position / case configuration	vertical bottom position					without code letters		
Temperature ranges	scale	ΔT (K)		scale	ΔT (°F)			
	0 – 80 °C	80		0 – 150 °F	150			
	0 – 100 °C	100		0 – 200 °F	200			
	0 – 120 °C	120		0 – 250 °F	250			
	0 – 160 °C	160		0 – 300 °F	300			
	0 – 200 °C	200		–50 / +130 °F	180			
	0 – 250 °C	250		–40 / +160 °F	200			
	0 – 300 °C	300		–30 / +120 °F	150			
	0 – 400 °C	400		20 – 240 °F	220			
	0 – 500 °C	500		40 – 400 °F	360			
	0 – 600 °C	600		50 – 300 °F	250			
	–100 / +100 °C	200		50 – 500 °F	450			
	–50 / +50 °C	100		100 – 800 °F	700			
	–40 / +40 °C ¹⁾	80		100 – 1000 °F	900			
	–40 / +60 °C	100		150 – 700 °F	550			
	–30 / +50 °C	80			e.g. –30 / +50 °C			
	–30 / +70 °C	100						
	–20 / +60 °C	80						
	–20 / +80 °C	100						
	50 – 300 °C	250						
	50 – 400 °C	350						
	100 – 500 °C	400						
	Stem	without screw fitting, plain stem					A1	
		union nut					A3	
		male thread, turnable					A4	
		male thread / compression fitting					A5	
		male thread, turnable / double male adapter					A6	
male thread / compression fitting on bendable reinforcement					A10			
Stem Ø dF	8, 10, 12 mm (0.31, 0.39, 0.47") or 3/8"					e.g.	dF 8	
Stem length	L, L1 or L2 in mm					e.g.	L = 100 mm	
Capillary line length	L _{FL} ≥ 1 to 15 m (≥ 3.28 to 49.21')						L _{FL} = 3 m	
Process connection	see page 3					e.g.	G 1/2 B	
These options are to be ordered in written form. Please contact us to ensure compatibility when combining options.								
Red mark	on the dial							
Window	acrylic glass (PMMA) polycarbonate (PC)							
Capillary line with bend protection made of stainless steel								
Protective sleeve for capillary line	spiral protective sleeve made of stainless steel (standard for stem type A10)							
	spiral protective sleeve made of stainless steel with PE cover							
	shrinking hose polyolefin, max. 10 m (32.8')							
Instrument tag	stainless steel plate 12 x 55 mm (0.47 x 2.17"), wire mounting							
	sticker on the case							
Example	TFK 4 1/2", 0 – 100 °C, A5, dF 8, L = 100 mm, L _{FL} = 3 m, G 1/2 B							
Special Versions: Please describe your requirements in cleartext!								

¹⁾ max. permissible storage temperature +50 °C (+122 °F)