

Gas-actuated Thermometers, with Capillary Line

TFCh
TFChG

Bayonet ring case stainless steel

Standard Versions

This data sheet contains detailed information on our standard versions and available options. In overview 8000 you will find additional information on 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 13 190)

Class 1

Case

With bayonet ring, stainless steel 1.4301 (304)

Degree of Protection (DIN EN 60 529/IEC 529)

IP65

Case Filling

For model TFChG: silicone oil

Nominal Case Sizes

TFCh: 63, 100, 160, 250 mm (2½, 4, 6, 10")

TFChG: 63, 100, 160 mm (2½, 4, 6")

Case Configuration

Connection temperature sensor (stem):

- capillary line

Capillary line position:

- vertical bottom position
- centre back position (rm)

Mounting device:

- for bottom capillary line position:
 - back flange for surface mounting (Rh)
 - mounting device for gauge holder bracket (Mgh)
- for centre back capillary line position:
 - back flange for surface mounting (rmRh)
 - front flange for panel mounting (rmFr)

Capillary Line

1 m stainless steel Ø 2 mm

with buckle protection spiral at both ends

capillary line length L_{FL} selectable from 1 m to 15 m

Temperature Ranges (DIN EN 13 190)

Temperature differences (spans) from 80 K up to 600 K

Temperature Sensor (Stem)

Made of stainless steel 1.4571 (316Ti)

Max. static operating pressure: 25 bar

Stem models: A1, A3, A4, A5 or A6

Stem Ø dF: 8, 10 or 12 mm

Stem length L or L1: from Lmin or L1min up to 2.50 m

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

Window

Instrument glass

Movement

Brass/German silver



Dial

Aluminum white, scale black

Pointer

Aluminum black

Indication Adjustment (±6 %)

Externally via screw

Ordering Information, Standard Ranges, Options

See page 4

Special Versions and Further Options

- Other stem models, 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, see data sheet 8299.4
- Other stem Ø, connection threads and materials upon request
- Capillary line $F_{FL} > 15$ m upon request
- Other temperature ranges and/or special scales, e.g. dual scale °C/°F, coloured fields or ranges, dial inscriptions
- Stationary pointer or drag indicator with window made of polycarbonate upon request (not for NCS 250)
- Case parts stainless steel 1.4404 (316L) upon request
- Model TFCh for ambient temperatures to -60 °C upon request; Model TFChG for ambient temperatures to -40 °C
For ambient temperatures below -20 °C we recommend: thermometer with crimped-on ring case models TFChg or TFChgG
- Position of connection radial at 3 o'clock, 9 o'clock, 12 o'clock, others upon request or other than vertical installation (90°)
- GOST version for Russia, Ukraine, Kazakhstan, Belarus

Accessories

Mechanical: thermowells, see data sheets 8.8110 ff.

Electronic: limit switch contact assemblies, see catalogue heading 9.1



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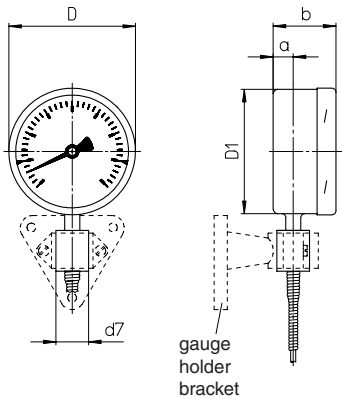
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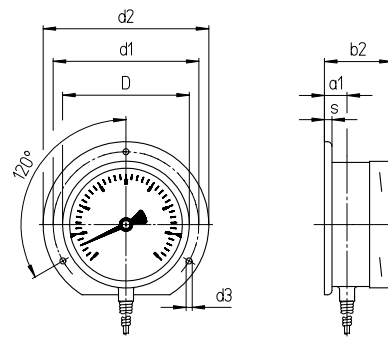
Capillary Line Position, Code Letters, Dimensional Data and Weights

Vertical Bottom Capillary Line Position

mounting device for gauge holder bracket¹⁾
code letters: **Mgh**

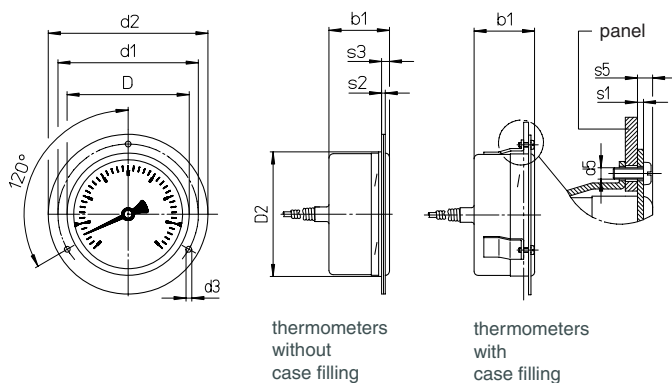


back flange for surface mounting
code letters: **Rh**

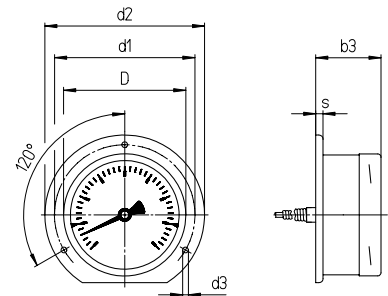


Centre Back Capillary Line Position

front flange for panel mounting
code letters: **rmFr**



back flange for surface mounting
code letters: **rmRh**



Dimensional Data (mm) and Weights (kg)

NCS	a	a1	b	b1	b2	b3	D	D1	D2	d1	d2	d3	d5	d7	s	s1	s2	s3	s5	approx. weight ²⁾	
																				TFCh	TFChG
63	12	15	39	39	42	42	64	62	66	75	85	3.6	M3	26	5	1	2	5.5	7	0.38	0.45
100	15	18.5	50	50	53.5	53.5	101	99	103	116	132	4.8	M4	26	6	1	2	5.5	7	0.6	0.85
160	15	18	50	50	53	53	161	159	163	178	196	5.8	M5	26	6	1.5	2.5	6	8	0.92	1.6
250	15	-	57	57	-	-	251	249	-	270	285	5.8	-	26	2	-	2	8.5	-	2.00	-

¹⁾ Available versions can be found on our website in section Product Range, heading Accessories.

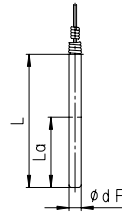
²⁾ The data are examples and relate to the version with mounting device for gauge holder bracket Mgh and stem A1, Ø 10 mm, length 200 mm and 1 m capillary line.

Stem Models

Stem Models

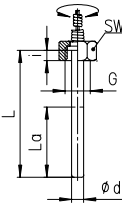
Process connection: Without screw fitting, plain stem

Stem model: A1
Form acc. to DIN EN 13 190: Form 1
Stem material: 1.4571
Stem Ø dF: 8, 10, 12 mm
Order length: L
Suitable thermowell models: SK1 (8.8140), SK2 (8.8141)
(data sheet)

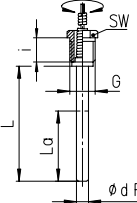


Process connection: Union nut **Male thread, turnable**

Stem model: A3
Form acc. to DIN EN 13 190: Form 5
Stem material: 1.4571
Stem Ø dF: 8, 10, 12 mm
Screw fitting material: 1.4571
Order length: L



Stem model: A4
Form acc. to DIN EN 13 190: Form 4
Stem material: 1.4571
Stem Ø dF: 8, 10, 12 mm
Screw fitting material: 1.4571
Order length: L



Suitable thermowell models: SF4.1 (8.8111), SF4.1F (8.8113), SF8 (8.8130), SF9 (8.8131)
(data sheet)

Suitable thermowell models: SF4 (8.8110), SF4F (8.8112), SF5 (8.8120), SF6, SF7 (8.8121)

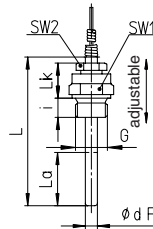
Thread (dimensional data in mm):	G	SW	i
	G 1/2	27	10
	G 3/4	32	12
	M20x1.5	27	10
	M24x1.5	32	12
	M27x2	32	12

Thread (dimensional data in mm):	G	SW	i
	G 1/2 B	22	20
	G 3/4 B	27	23
	M18x1.5	22	14
	M20x1.5	22	20

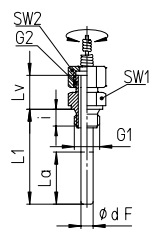
Thermowell required!

Process connection: Male thread/compression fitting **Male thread, turnable/double male adapter**

Stem model: A5
(A1 with compression fitting)
Form acc. to DIN EN 13 190: Form 2 (cylindrical thread), Form 3 (conical thread)
Stem material: 1.4571
Stem Ø dF: 8, 10, 12 mm
Screw fitting material: 1.4571
Order length: L



Stem model: A6
(A3 with double male adapter)
Form acc. to DIN EN 13 190: —
Stem material: 1.4571
Stem Ø dF: 8, 10, 12 mm
Screw fitting material: 1.4571
Order length: L1



Suitable thermowell models: SF4 (8.8110), SF4F (8.8112), SF5 (8.8120), SF6, SF7 (8.8121)
(data sheet)

Suitable thermowell models: SF4 (8.8110), SF4F (8.8112), SF5 (8.8120), SF6, SF7 (8.8121)

Thread (dimensional data in mm):	G	SW1	SW2	i	Lk
	G 1/2 B	27	22	14	42
	G 3/4 B	32	22	16	42
	1/2" NPT	27	22	19	42
	3/4" NPT	27	22	19	42
	M20x1.5	27	22	14	42

Thread (dimensional data in mm):	G1	G2	SW1	SW2	i	Lv
	G 1/2 B	G 1/2 B	27	27	14	28
	G 3/4 B	G 1/2 B	32	27	16	28
	1/2" NPT	G 1/2 B	27	27	19	28
	3/4" NPT	G 1/2 B	27	27	19	28
	M20x1.5	M20x1.5	27	27	14	28
	M24x1.5	M20x1.5	32	27	14	28
	M27x2	M20x1.5	32	27	16	28

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

Stem model:	Length:	Thread:	Capillary line incl. stem up to 5 m up to max. 500 °C						Capillary line incl. stem > 5 m to 15 m up to max. 500 °C					
			Stem Ø dF:			Stem Ø dF:			Stem Ø dF:			Stem Ø dF:		
			12	10	8	12	10	8	12	10	8	12	10	8
all models	La	all standard threads	35	45	75	75	105	165	53	80	115	150	200	320
A1 / A3 / A4	Lmin	all standard threads	55	65	95	95	125	185	73	100	135	170	220	340
A5	Lmin	all standard threads	90	100	130	130	160	220	108	135	170	205	255	375
A6	L1min	G 1/2 B, M20x1.5	49	59	89	89	119	179	69	96	131	166	216	336
		G 3/4 B, M24x1.5, M27x2	51	61	91	91	121	181	72	99	134	169	219	339
		1/2" NPT, 3/4" NPT	54	64	94	94	124	184	67	94	129	164	214	334
others			upon request			upon request			upon request			upon request		

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. With a capillary line, greater lengths are possible, e.g. with special stems A2, A7 and A7.1 (data sheet 8299.2).

Ordering Information

Basic Model: Gas-actuated Thermometer with Capillary Line		TFCh
Case filling:	without silicone oil	without code letters G
Nominal case size:	case Ø 63, 100, 160, 250 mm (2 ½, 4, 6, 10") (NCS 250 not with case filling)	63, 100, 160, 250
Capillary line position/ case configuration:	vertical bottom position, mounting device for gauge holder bracket vertical bottom position, back flange for surface mounting centre back position, front flange for panel mounting centre back position, with back flange for surface mounting	Mgh Rh rmFr rmRh
Temperature ranges:	scale: ΔT (K): 0 – 80 °C 80 0 – 100 °C 100 e.g. 0–100 °C 0 – 120 °C 120 0 – 160 °C 160 0 – 200 °C 200 0 – 250 °C 250 0 – 300 °C 300 0 – 400 °C 400 0 – 500 °C 500 0 – 600 °C 600 –100 / +100 °C 200 –50 / +50 °C 100 –40 / +40 °C 80 –40 / +60 °C 100 –30 / +50 °C 80 e.g. –30/+50 °C –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 union nut male thread, turnable male thread/compression fitting male thread, turnable/double male adapter	A1 A3 A4 A5 A6
Stem Ø dF:	8, 10 or 12 mm	dF 8, 10, 12
Stem length:	L or L1 in mm e.g.	L = 100 mm
Capillary line length:	$L_{FL} \geq 1$ to 15 m	$L_{FL} = 3$ m
Process connection:	see page 3 e.g.	G ½ B
Options:	red mark on the dial plastic clip red or green, external at the bayonet ring for NCS 100 and 160 stationary red on the dial pointer adjustable with removable ring window laminated safety glass acrylic glass (PMMA) polycarbonate (PC) (not for NCS 250) movement stainless steel case ventilation no. 22 for outdoor installation case polished bayonet ring polished protection hose for capillary line spiral protection hose made of stainless steel spiral protection hose made of stainless steel with PE cover shrinking hose polyolefin, max 10 m versions: DNV GL and Russian Sea Register dial marking with symbol copy of the certificate upon request TFCh 100, 160 TFChG 63, 100, 160 instrument tag stainless steel plate 12 x 55 mm (0.47 x 2.17") with wire mounting or sticker upon the case	

Example:

TFCh 100, 0–100 °C, A5, dF 8, L = 100 mm, $L_{FL} = 3$ m G ½ B

Special Versions: Please describe your requirements in cleartext!