

Gas-Actuated Thermometers, with Capillary Line

TFCh
TFChG

Bayonet ring case stainless steel

Standard Versions

Information on general and metrological features (e.g temperature resistance) and temperature ranges / error limits / smallest subdivision can be found in model overview 8000.

Measuring Unit

With nitrogen filling
(inert gas, physiological harmless)

Accuracy (EN 13 190)

Class 1

Case

With bayonet ring, 1.4301 (304 stainless steel)

Case Protection Type (EN 60 529 / IEC 529)

IP 65

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,
optional: centre back position (**rm**),
see page 2

Mounting device:

for bottom capillary line position:
back flange for surface mounting (**Rh**) or
mounting device for
gauge holder bracket (**Mgh**), see page 2

for centre back

capillary line position (**rm**): back flange for surface mounting (**Rh**) /
front flange (**Fr**)

Capillary Line (standard) 1m stainless steel Ø 2mm, with buckle
protection spirals at both ends
capillary line length L_{FL} selectable from
1m up to 15 m (> 15 m upon request),

Temperature Ranges (EN 13 190)

Temperature differences from 80 K to 600 K

Temperature Sensor (Stem)

1.4571 (316 stainless steel),

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 resp. L1: Lmin resp. L1min up to max. 2.50 m

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

Window

Instrument glass

Movement

Brass/German silver



Dial

Aluminum, black figures, white background

Pointer

Aluminum, black

Zero Adjustment ($\pm 6\%$)

Externally by a screw

Ordering Information, Standard Temperature Ranges, Options

See page 4

Special Versions and further Options among others

- Other stem models, e. g.
 - without bent tube, with compression fitting, adjustable at capillary line see data sheet 8299.2
 - with connection for food- / biotechnics / pharmaceutical industry, see data sheet 8299.3
 - contact stem for temperature measurement at the outsides of the cases and pipe barrels up to 300 °C, see data sheet 8299.4
- Other stem-Ø, connection thread and materials upon request
- Capillary line $F_{FL} > 15$ m upon request
- Other temperature ranges and/or special scales, e.g. double scale °C/°F, coloured fields or areas, dial inscriptions, etc.
- Min.- or max.- drag indicator upon request
- Case parts 1.4404 (316 stainless steel) upon request
- Model TFCh for ambient temperatures up to -60 °C upon request; Model TFChG for ambient temperatures up to -40 °C. For ambient temperatures below -20°C we recommend: thermometers with crimped-on ring case models TFChg resp. TFChgG
- Position of the connection 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

Accessories

mechanical: thermowells, see DS 8.8110 ff

electrical: limit switch contact assemblies,
see catalogue-heading 9.1



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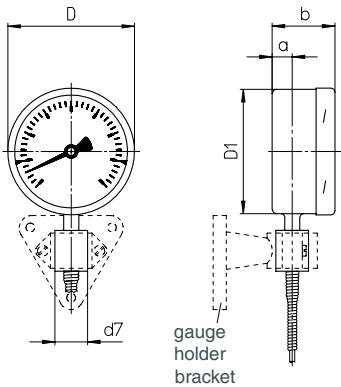
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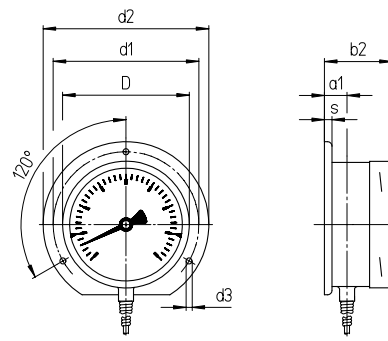
Capillary Line Position / Case Configurations, Code Letters, Dimensional Data and Weights

Vertical Bottom Capillary Line Position

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

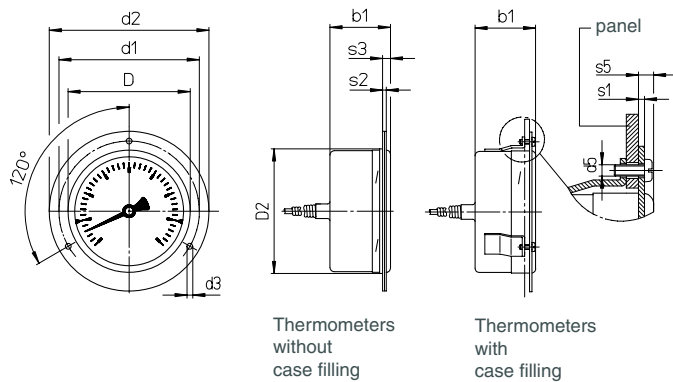


Back flange for surface mounting
code letters: **Rh**

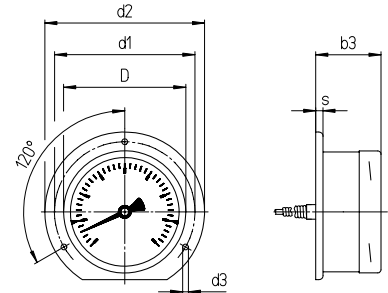


Centre Back Capillary Line Position

Front flange
code letters: **rmFr**



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



Dimensional Data (mm / inches) and Weights (kg / lb)

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
2½"	.47	.59	1.54	1.54	1.65	1.65	2.52	2.44	2.60	2.95	3.35	.14		1.02	.20	.04	.08	.22	.28	0.84	0.99
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
4"	.59	.73	1.97	1.97	2.10	2.10	3.98	3.90	4.06	4.57	5.2	.19		1.02	.24	.04	.08	.22	.28	1.32	1.87
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
6"	.59	.71	1.97	1.97	2.09	2.09	6.34	6.26	6.42	7.01	7.72	.23		1.02	.24	.06	.10	.24	.31	2.03	3.53
250	15	-	57	57	-	-	251	249	-	270	285	5.8	-	26	2	-	2	8.5	-	2.00	-
10"	.59	-	2.24	2.24	-	-	9.88	9.80	-	10.6	11.2	.23		1.02	.08	-	.08	.33	-	4.40	-

¹⁾ Details concerning gauge holder bracket can be found in the additional data sheets of catalogue-heading 8.

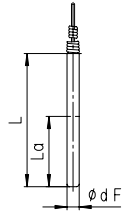
²⁾ The information is an example and relates on version with mounting device for gauge holder bracket and stem A1, Ø 10 mm (0.4"), length 200 mm (8") and 1 m capillary line.

Stem Models

Stem Models

Process connection: without screw fitting, plain stem

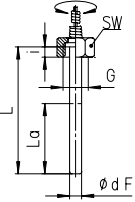
Stem model: **A1**
 Form according to DIN 13 190: Form 1
 Stem material: 1.4571
 Stem-Ø dF: 8, 10, 12
 Order length: L



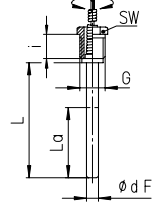
Data sheet (suitable thermowell models): 8.8140 (SK1), 8.8141 (SK2)

Process connection: Union nut Male thread, turnable

Stem model: **A3**
 Form according to DIN 13 190: Form 5
 Stem material: 1.4571
 Stem-Ø dF: 8, 10, 12
 Screw fitting material: 1.4571
 Order length: L



Stem model: **A4**
 Form according to DIN 13 190: Form 4
 Stem material: 1.4571
 Stem-Ø dF: 8, 10, 12
 Screw fitting material: 1.4571
 Order length: L



Data sheet (suitable thermowell models): 8.8111 (SF4.1), 8.8113 (SF4.1F), 8.8110 (SF4), 8.8112 (SF4F), 8.8130 (SF8), 8.8131 (SF9), 8.8120 (SF5), 8.8121(SF6+SF7)

Thread (dimensions in mm):

G	SW	i
G 1/2	27	10
G 3/4	32	12
M 20 x 1.5	27	10
M 24 x 1.5	32	12
M 27 x 2	32	12

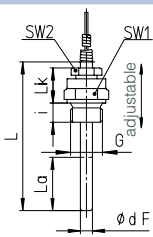
Thread (dimensions in mm):

G	SW	i
G 1/2 B	27	20
G 3/4 B	32	23
M 18 x 1,5	22	14
M 20 x 1,5	27	20

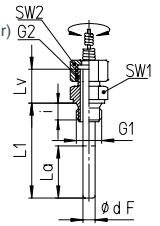
Thermowell required!

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

Stem model: **A5**
 (= basic stem A1 with compression fitting)
 Form according to DIN 13 190: Form 2 (thread cylindrical), Form 3 (thread conical)
 Stem material: 1.4571
 Stem-Ø dF: 8, 10, 12
 Screw fitting material: 1.4571
 Order length: L



Stem model: **A6**
 (= basic stem A3 with double male adapter)
 Stem material: 1.4571
 Stem-Ø dF: 8, 10, 12
 Screw fitting material: 1.4571
 Order length: L1



Data sheet (suitable thermowell models): 8.8110 (SF4), 8.8112 (SF4F), 8.8120 (SF5), 8.8121(SF6+SF7), 8.8110 (SF4), 8.8112 (SF4F), 8.8120 (SF5), 8.8121(SF6+SF7)

Thread (dimensions 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
M 20 x 1.5	27	22	14	42

Thread (dimensions 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
M 20 x 1.5	M 20 x 1.5	27	27	14	28
M 24 x 1.5	M 20 x 1.5	32	27	14	28
M 27 x 2	M 20 x 1.5	32	27	16	28

Minimum Stem Length, Active Length and maximum realisable Stem Length

The **minimum length Lmin / L1min** of the stem is the smallest possible stem length La (vessel) and the stem model.
 The **active length La** of the stem (vessel) has to immerse completely into the medium, to grant a measuring result, which corresponds to the accuracy class.
 The **maximum realisable stem length** is 2,50 m. Larger lengths are realisable with a capillary line, e.g. with special stems A2, A7 and A7.1 (data sheet 8299.2).

Stem model:	Length:	Thread:	Capillary line including stem up to 5 m						Capillary line including stem > 5 m to 15 m					
			up to max. 500 °C			500 °C and above			up to max 500 °C			500 °C and above		
			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	67	94	129	164	214	334
A6	L1min	G 1/2 B, M 20x1.5	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	108	135	170	205	255	375
others			upon request			upon request			upon request			upon request		

Ordering Information with Indication- and Temperature Ranges, Options

Basic Model: Gas-actuated thermometers, rigid connection to stem		TFCh
Case filling:	without	without code letters
	silicone oil	G
Nominal case size:	case-Ø 63, 100, 160, 250 (mm) (NCS 250 not with case filling)	63, 100, 160, 250
Capillary line position / case configuration:	vertical bottom position, mounting device for gauge holder bracket	Mgh
	vertical bottom position, back flange for surface mounting	Rh
	centre back position, front flange	rmFr
	centre back position, back flange for surface mounting	rmRh
Temperature ranges:	scale: ΔT (K):	
	0 — 80 °C 80	e. g. 0-100 °C
	0 — 100 °C 100	
	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	A1
	union nut	A3
	male thread, turnable	A4
	male thread / compression fitting	A5
	male thread, turnable / double-male adapter	A6
	Stem-Ø dF:	8, 10 or 12 mm
Stem length:	L resp. 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	<i>(order at the moment still as cleartext)</i>
	plastic clip red or green external at bayonet ring for NCS 100 and 160	
	stationary red pointer on the dial	
	adjustable when removable ring	
	window laminated safety glass	
	acrylic glass (PMMA)	
	polycarbonate (PC) (not NCS 250)	
	movement stainless steel	
	case ventilation no.22 for outdoor installation	
	case polished	
	bayonet ring polished	
	protective hose for capillary line flexible armour made of stainless steel	
	flexible armour made of stainless steel with PE-cover	
	shrinkdown plastic tubing polyolefine, max. 10 m	
Version: German Lloyd or Russian Sea Register TFCh 100, 160 TFChG 63, 100, 160 dial marking with symbol		
copy of the certificate upon request		
measuring point marking stainless steel-plate 12 mm x 55 mm (0.47" x 2.17"), wire mounting or sticker on case coverage		

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 clearly

Technical changes, replacement of materials and errors excepted.