Gas-actuated Thermometers, with Capillary Line

Crimped-on ring case stainless steel

TFChg
TFChgG

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 polished crimped-on ring, stainless steel 304 (1.4301)

Degree of Protection (DIN EN 60 529/IEC 529)
IP65

Case Filling
Model TFChg**G**: silicone oil

Nominal Case Sizes
63, 80, 100, 160 mm (2½, 3, 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**)
  - u-clamp for panel mounting (**rmBFr**)

Capillary line
1 m (3.28') stainless steel Ø 2 mm (0.08")
with buckle protection spiral at both ends
capillary line length L_{FL} selectable from 1 m to 15 m (3.28 to 49.21')

Temperature Ranges (DIN EN 13 190)
Temperature differences (spans) from 80 K up to 600 K

Temperature Sensor (Stem)
Made of stainless steel 316Ti (1.4571)

Max. static operating pressure:	25 bar
Stem models:	A1, A3, A4, A5 or A6
Stem Ø dF:	8, 10 or 12 mm (0.31, 0.39 or 0.47")
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 (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

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 (572 °F), see data sheet 8299.4
- Model TFChg for ambient temperatures down to –60 °C (–76 °F) each NCS;
  Model TFChgG for ambient temperatures down to –40 °C (–40 °F) each NCS, down to –60°C (–76 °F) NCS 100 and 160
- Position of connection radial at 3 o'clock, 9 o'clock, 12 o'clock or other than vertical installation (90°)
- GOST version for Russia and Kazakhstan

Special Versions Upon Request

- Other stem Ø, connection threads and materials
- Capillary line F_{FL} > 15 m
- Other temperature ranges and/or special scales, e.g. dual scale °C/°F, coloured fields or ranges, dial inscriptions
- Case parts stainless steel 316L (1.4404)
- Other position of connection

Thermowells

See data sheets 8.8110ff.

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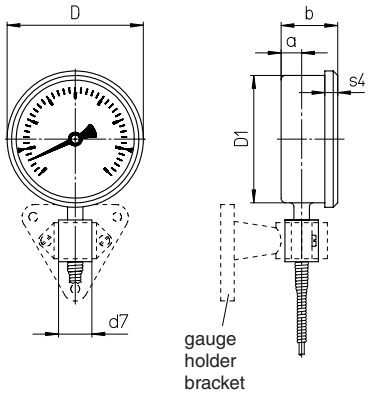
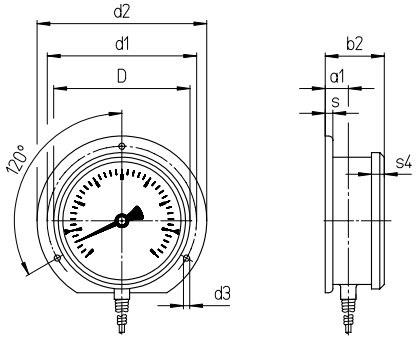
Capillary Line Position, Code Letters, Dimensional Data and Weight

Vertical Bottom Capillary Line Position

mounting device for gauge holder bracket[1)]
code letters **Mgh**

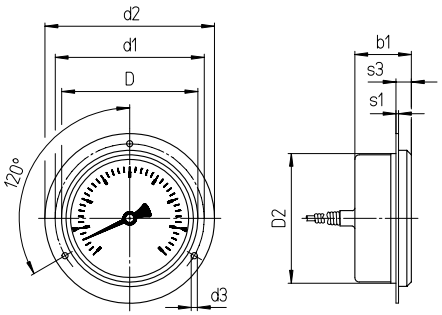


back flange for surface mounting
code letters **Rh**



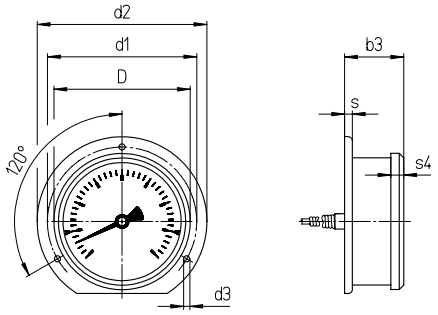
Centre Back Capillary Line Position

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



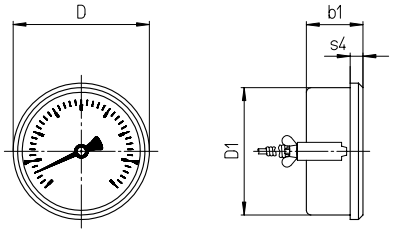
recommended panel cut out for
NCS 63 (2½") Ø 67 ±0.3 mm (2.64 ±0.01")
NCS 80 (3") Ø 84 ±0.3 mm (3.31 ±0.01")
NCS 100 (4") Ø 104 ±0.5 mm (4.09 ±0.02")

back flange for surface mounting (except NCS 80)
code letters **rmRh**



Centre Back Capillary Line Position

u-clamp for panel mounting
code letters **rmBFr**



recommended panel cut out for
NCS 63 (2½") Ø 64 ±0.3 mm (2.52 ±0.01")
NCS 80 (3") Ø 81 ±0.3 mm (3.19 ±0.01")
NCS 100 (4") Ø 102 ±0.5 mm (4.02 ±0.02")
NCS 160 (4") Ø 162 ±0.5 mm (6.38 ±0.02")

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

NCS	a	a1	b	b1	b2	b3	D	D1	D2	d1	d2	d3	d7	s	s1	s3	s4	approx. weight[2)] TFChg	approx. weight[2)] TFChgG
63 **2½"**	12 **0.47**	15 **0.59**	39 **1.54**	39 **1.54**	42 **1.65**	42 **1.65**	67 **2.64**	62 **2.44**	64 **2.52**	75 **2.95**	85 **3.35**	3.6 **0.14**	26 **1.02**	5 **0.2**	1 **0.04**	9 **0.35**	8 **0.31**	0.36 **0.79**	0.44 **0.97**
80 **3"**	15 **0.59**	18 **0.71**	42 **1.65**	42 **1.65**	45 **1.77**	–	86 **3.39**	79 **3.11**	81 **3.19**	95 **3.74**	110 **4.33**	4.8 **0.19**	26 **1.02**	5 **0.2**	1 **0.04**	9 **0.35**	8 **0.31**	0.45 **0.99**	0.59 **1.3**
100 **4"**	15 **0.59**	18.5 **0.73**	43 **1.69**	43 **1.69**	46.5 **1.83**	46.5 **1.83**	106 **4.17**	99 **3.9**	101 **3.98**	116 **4.57**	132 **5.2**	4.8 **0.19**	26 **1.02**	6 **0.24**	1 **0.04**	11.5 **0.45**	10 **0.39**	0.57 **1.26**	0.76 **1.68**
160 **6"**	15 **0.59**	18 **0.71**	51 **2**	51 **2**	54 **2.13**	54 **2.13**	167 **6.57**	159 **6.26**	–	178 **7.01**	196 **7.72**	5.8 **0.23**	26 **1.02**	6 **0.24**	–	–	11 **0.43**	0.88 **1.94**	1.59 **3.51**

[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 (0.39"), length 200 mm (7.87") and 1 m (3.28') capillary line.

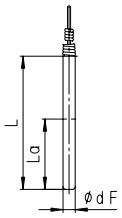
Stem Models

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

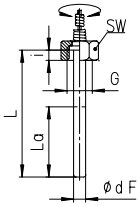
Suitable thermowell models: (data sheet) SK1 (8.8140), SK2 (8.8141)



Process connection: Union nut

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

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



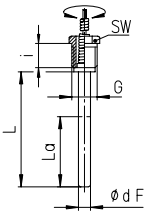
Thread (dimensional data in mm/inch):

G	SW	i
G½	27/**1.06**	10/**0.39**
G¾	32/**1.26**	12/**0.47**
M20x1.5	27/**1.06**	10/**0.39**
M24x1.5	32/**1.26**	12/**0.47**
M27x2	32/**1.26**	12/**0.47**

Process connection: Male thread, turnable

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



Thread (dimensional data in mm/inch):

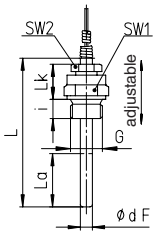
G	SW	i
G½B	22/**0.87**	20/**0.79**
G¾B	27/**1.06**	23/**0.91**
M18x1.5	22/**0.87**	14/**0.55**
M20x1.5	22/**0.87**	20/**0.79**

Thermowell required!

Process connection: Male thread/compression fitting

Stem 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

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



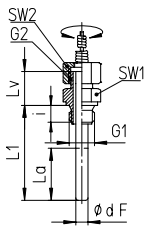
Thread (dimensional data in mm/inch):

G	SW1	SW2	i	Lk
G½B	27/**1.06**	22/**0.87**	14/**0.55**	42/**1.65**
G¾B	32/**1.26**	22/**0.87**	16/**0.63**	42/**1.65**
½" NPT	27/**1.06**	22/**0.87**	19/**0.75**	42/**1.65**
¾" 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**

Male thread, turnable/double male adapter

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



Thread (dimensional data in mm/inch):

G1	G2	SW1	SW2	i	Lv
G½B	G½B	27/**1.06**	27/**1.06**	14/**0.55**	28/**1.1**
G¾B	G½B	32/**1.26**	27/**1.06**	16/**0.63**	28/**1.1**
½" NPT	G½B	27/**1.06**	27/**1.06**	19/**0.75**	28/**1.1**
¾" NPT	G½B	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**

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')						Capillary line incl. stem >5 m to 15 m (>16.4 to 49.21')					
			up to max. 500 °C (932 °F)			500 °C (932 °F) and above			up to max. 500 °C (932 °F)			500 °C (932 °F) and above		
			Stem Ø dF:			Stem Ø dF:			Stem Ø dF:			Stem Ø dF:		
Stem model:	**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 **1.38**	45 **1.77**	75 **2.95**	75 **2.95**	105 **4.13**	165 **6.5**	53 **2.09**	80 **3.15**	115 **4.53**	150 **5.91**	200 **7.87**	320 **12.6**
A1 / A3 / A4	Lmin	all standard threads	55 **2.17**	65 **2.56**	95 **3.74**	95 **3.74**	125 **4.92**	185 **7.28**	73 **2.87**	100 **3.94**	135 **5.31**	170 **6.69**	220 **8.66**	340 **13.39**
A5	Lmin	all standard threads	90 **3.54**	100 **3.94**	130 **5.12**	130 **5.12**	160 **6.3**	220 **8.66**	108 **4.25**	135 **5.31**	170 **6.69**	205 **8.07**	255 **10.04**	375 **14.76**
A6	L1min	G½B, M20x1.5	49 **1.93**	59 **2.32**	89 **3.5**	89 **3.5**	119 **4.69**	179 **7.05**	69 **2.72**	96 **3.78**	131 **5.16**	166 **6.54**	216 **8.5**	336 **13.23**
		G¾B, M24x1.5, M27x2	51 **2**	61 **2.4**	91 **3.58**	91 **3.58**	121 **4.76**	181 **7.13**	72 **2.83**	99 **3.9**	134 **5.28**	169 **6.65**	219 **8.62**	339 **13.35**
		½" NPT, ¾" NPT	54 **2.13**	64 **2.52**	94 **3.7**	94 **3.7**	124 **4.88**	184 **7.24**	67 **2.64**	94 **3.7**	129 **5.08**	164 **6.46**	214 **8.43**	334 **13.15**
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 (8.2'). 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	TFChg
Case filling:	without	without code letters
	silicone oil	**G**
Nominal case size:	case Ø 63, 80, 100, 160 mm (2½, 3, 4, 6")	**63, 80, 100, 160**
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 for panel mounting	**rmFr**
	centre back position, with back flange for surface mounting	**rmRh**
	centre back position, u-clamp for panel mounting	**rmBFr**

Temperature ranges:

scale °C:	ΔT (K):	scale °F:	ΔT (°F):		
0 – 80 °C	80	0 – 150 °F	150		
0 – 100 °C	100	0 – 200 °F	200	e.g.	**0–100 °C**
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	80	100 – 1000 °F	900		
–40 / +60 °C	100	150 – 700 °F	550		
–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 (0.31, 0.39 or 0.47")		**dF 8, 10, 12**
Stem length:	L or L1 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.	**G½B**

Options:	red mark	on the dial	
	plastic clip	red or green, external at crimped-on ring for NCS 80, 100, 160	
	window	tempered safety glass for NCS 80, 100 and 160	
		acrylic glass (PMMA) for NCS 80 and 100	
		polycarbonate (PC) NCS 63, 80 and 100	
	movement stainless steel		
	case ventilation no. 22 for outdoor installation		
	case 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 (32.8')	
	versions: DNV GL and Russian Sea Register **TFChg 100 TFChgG 63, 80, 100**	dial marking with symbol	
		copy of the certificate upon request	
	instrument tag	stainless steel plate 12 x 55 mm (0.47 x 2.17"), wire mounting	
		sticker upon the case	

Example: **TFChg 80 rmBFr, 0–100 °C, A3, dF 10, L = 100 mm, L_{FL} = 3 m G½**

Special Versions: Please describe your requirements in cleartext!