

Gas-Actuated Thermometers, Rigid Stem

Bayonet ring case stainless steel

TSCh
TSChG

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 TSChG: silicone oil

Nominal Case Sizes

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

TSChG: 63, 100, 160 (mm) (2½", 4", 6")

Case Configuration

Connection temperature

sensor (stem): rigid connection with neck tube

Stem position:

vertical bottom position,

optional: with angle (**w**, **wst**, **wl**, **wr**) or
centre back position (**rm**),
see page 2

Mounting device:

without,

optional: for centre back connection (**rm**),
back flange for surface
mounting (**Rh**), see page 2

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, A4.1, 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 (± 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, see data sheet 8299.1
 - 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
- 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 TSCh for ambient temperatures up to -60 °C upon request; Model TSChG for ambient temperatures up to -40 °C. For ambient temperatures below -20 °C we recommend: thermometers with crimped-on ring case model TSChg resp. TSChgG
- Position of 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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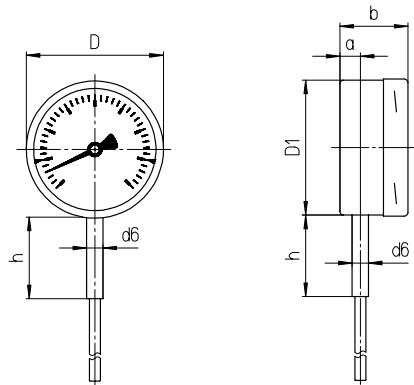
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Stem Position / Case Configurations, Code Letters, Dimensional Data and Weights

Vertical Bottom Stem Position

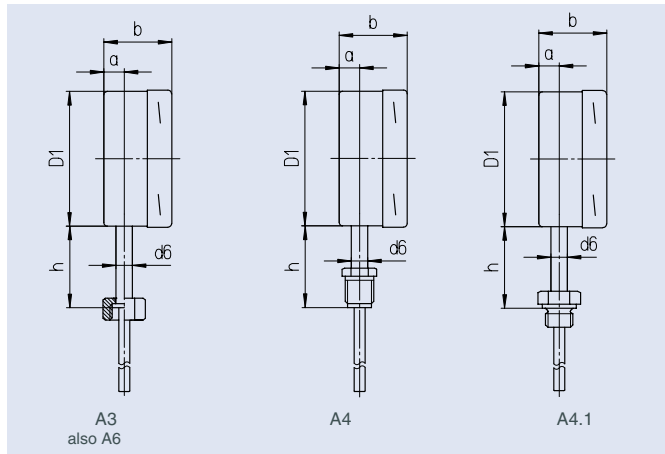
without additional code letters



A1
also A5

Further Stem Models

(demonstrated as example: vertical bottom stem position)



A3
also A6

A4

A4.1

Vertical Bottom Stem Position with angle

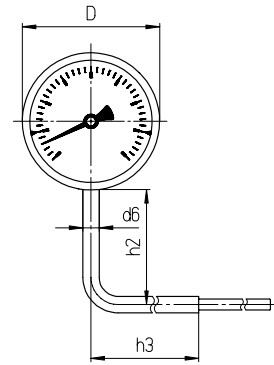
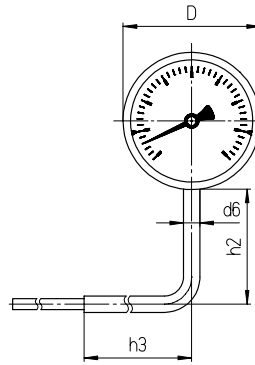
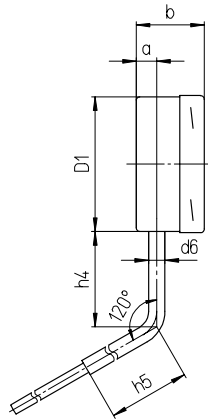
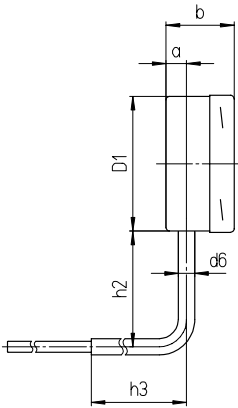
with angle:

90° angled to the back,
code letter **w**

obtuse-angled to the back,
code letter **wst**

right-angled to the left,
code letters **wl**

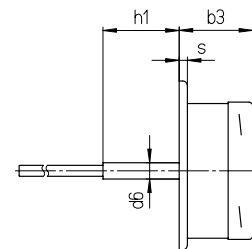
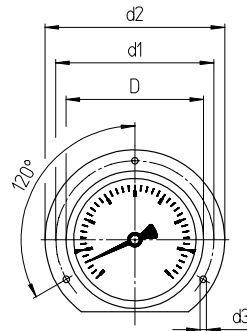
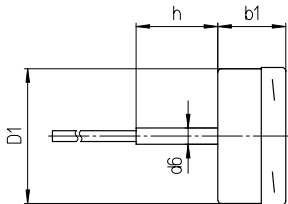
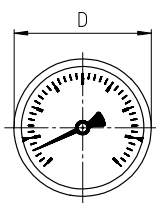
right-angled to the right,
code letters **wr**



Centre Back Stem Position

code letters **rm**

with back flange for surface mounting (back flange),
code letters **rmRh**



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

NCS	a	b	b1	b3	D	D1	d1	d2	d3	d6	h ¹⁾	h1 ¹⁾	h2	h3	h4	h5	s	approx. weight ²⁾	
																		TSch	TSchG
63	12	39	39	42	64	62	75	85	3.6	12	60	57	85	120	70	120	5	0.24	0.32
2½"	.47	1.54	1.54	1.65	2.52	2.44	2.95	3.35	.14	.47	2.36	2.24	3.35	4.72	2.76	4.72	.2	0.53	0.70
100	15	50	50	53.5	101	99	116	132	4.8	12	60	56.5	85	120	70	120	6	0.46	0.72
3"	.59	1.97	1.97	2.10	3.98	3.9	4.57	5.2	.19	.47	2.36	2.22	3.35	4.72	2.76	4.72	.24	1.01	1.59
160	15	50	50	53	161	159	178	196	5.8	12	60	57	85 ³⁾	120	70 ³⁾	120	6	0.78	1.50
6"	.59	1.97	1.97	2.09	6.34	6.26	7.01	7.72	.23	.47	2.36	2.24	3.35	4.72	2.76	4.72	.24	1.72	3.30
250	15	57	57	—	251	249	270	285	5.8	12	60	—	109	120	70	120	—	1.83	—
10"	.59	2.24	2.24	—	9.88	9.8	10.62	11.22	.23	.47	2.36	—	4.29	4.72	2.76	4.72	—	4.03	—

¹⁾ Temperature range > 500 °C and above: +20 mm (0.79")

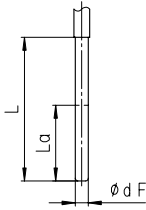
²⁾ The information is an example and relates on version with stem A1, Ø 10 mm (0.4"), length 200 mm (8").

³⁾ For TSChG: h2 = 109 mm (4.29"), h4 = 94 mm (3.7")

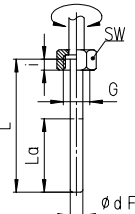
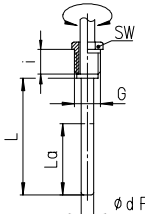
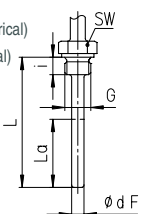
Stem Models

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)		



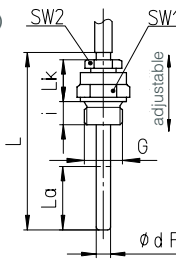
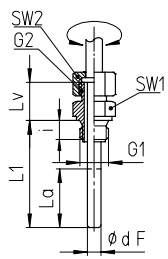
Process connection:	Union nut	Male thread, turnable	Male thread, rigid
Stem model:	A3	A4	A4.1
Form according to DIN 13 190:	Form 5	Form 4	Form 6 (thread cylindrical) Form 7 (thread conical)
Stem material:	1.4571	1.4571	1.4571
Stem-Ø dF:	8, 10, 12	8, 10, 12	8, 10, 12
Screw fitting material:	1.4571	1.4571	1.4571
Order length:	L	L	L
Data sheet (suitable thermowell models):	8.8111 (SF4.1), 8.8113 (SF4.1F) 8.8130 (SF8), 8.8131 (SF9)	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	SW	i	G	SW	i	G	SW	i
	G 1/2	27	10	G 1/2 B	27	20	G 1/2 B	27	14
	G 3/4	32	12	G 3/4 B	32	23	G 3/4 B	32	16
	M 20 x 1.5	27	10	M 18 x 1.5	22	14	1/2" NPT	27	19
	M 24 x 1.5	32	12	M 20 x 1.5	27	20	3/4" NPT	27	19
	M 27 x 2	32	12				M 18 x 1.5	24	14
							M 20 x 1.5	27	14

Thermowell required!

Process connection:	Male thread / compression	Male thread, turnable / double male adapter
Stem model:	A5 (= basic stem A1 with compression fitting)	A6 (= basic stem A3 with double male adapter)
Form according to DIN 13 190:	Form 2 (thread cylindrical) Form 3 (thread conical)	—
Stem material:	1.4571	1.4571
Stem-Ø dF:	8, 10, 12	8, 10, 12
Screw fitting material:	1.4571	1.4571
Order length:	L	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	G1	G2	SW1	SW2	i	Lv
	G 1/2 B	27	22	14	42	G 1/2 B	G 1/2 B	27	27	14	28
	G 3/4 B	32	22	16	42	G 3/4 B	G 1/2 B	32	27	16	28
	1/2" NPT	27	22	19	42	1/2" NPT	G 1/2 B	27	27	19	28
	3/4" NPT	27	22	19	42	3/4" NPT	G 1/2 B	27	27	19	28
	M 20 x 1.5	27	22	14	42	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

Stem model:	Length:	Thread:	up to max. 500 °C			500 °C and above			The minimum length Lmin / L1min of the stem is the smallest possible stem length against the active length La (vessel) and the stem model.
			Stem-Ø dF:			Stem-Ø dF:			
			12	10	8	12	10	8	
all models	La	all standard threads	35	45	75	75	105	165	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.
A1 A3 A4	Lmin	all standard threads	55	65	95	95	125	185	
A4.1	Lmin	G 1/2 B, M 18x1.5, M 20x1.5	49	59	89	89	119	179	The maximum realisable stem length is 2.50 m. Larger lengths are realisable with a capillary line, e. g. with special stems A3.2, A4.2 and A4.3 (data sheet 8299.1) or basic models TFCh with capillary line to stem, data sheet 8221.
		G 3/4 B	51	61	91	91	121	181	
		1/2" NPT, 3/4" NPT	54	64	94	94	124	184	
A5	Lmin	all standard threads	90	100	130	130	160	220	
A6	L1min	G 1/2 B, M 20x1.5	49	59	89	89	119	179	
		G 3/4 B, M24x1.5, M27x2	51	61	91	91	121	181	
		1/2" NPT, 3/4" NPT	54	64	94	94	124	184	
others			upon request			upon request			

Ordering Information with Indication- and Temperature Ranges, Options

Basic Model: Gas-actuated thermometers, rigid connection to stem		TSch	
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	
Stem position / case configuration:	vertical bottom position	without code letters	
	90° angled to the back	w	
	obtuse-angled to the back	wst	
	right-angled to the left	wl	
	right-angled to the right	wr	
	centre back position	rm	
	centre back position, with back flange for surface mounting	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	A1	
	union nut	A3	
	male thread, turnable	A4	
	male thread, rigid	A4.1	
	male thread / compression fitting	A5	
	male thread, turnable / double-male adapter	A6	
Stem-Ø dF:	8, 10 or 12 mm	dF 8, 10, 12	
Stem length:	L resp. L1 in mm	e. g. L = 100 mm	
Process connection:	see page 3	e. g. G ½ B	
Options:	red mark	on the dial	(order at the moment still as cleartext)
	plastic clip	red or green external at crimped-on 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	
	Version:	dial marking:symbol	
	German Lloyd or Russian Sea Register		
	TSch 100, 160	copy of the certificate upon request	
TSchG 63, 100, 160			
measuring point marking	stainless steel-plate 12 mm x 55 mm (0.47" x 2.17"), wire mounting or sticker on case coverage		

Example:

TSch 100 w, 0-100 °C, A3, dF 8, L = 100 mm, G ½

Special Versions: Please describe your requirements clearly

Technical changes, replacement of materials and errors excepted.