

Gas-actuated Thermometers, Rigid Mount

Bayonet ring case stainless steel

TSCh
TSChG

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 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 mount with neck tube

Stem position:

- vertical bottom position
- with angle (**w**, **wst**, **wl**, **wr**)
- centre back position (**rm**)

Mounting device:

- without
- for centre back connection:
back flange for surface mounting (**rmRh**)

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, A4.1, 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, see data sheet 8299.1
 - 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
- 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 TSCh for ambient temperatures to -60 °C upon request; Model TSChG for ambient temperatures to -40 °C
For ambient temperatures below -20 °C we recommend: thermometer with crimped-on ring case models TSChg or TSChgG
- 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 8.8110ff.

Electronic: limit switch contact assemblies, see catalogue heading 9.1

www.armano-messtechnik.com

ARMANO

ARMANO Messtechnik GmbH

Location Beierfeld

Am Gewerbepark 9 • 08344 Grünhain-Beierfeld
Tel.: +49 3774 58 - 0 • Fax: +49 3774 58 - 545
mail@armano-beierfeld.com

Location Wesel

Manometerstraße 5 • 46487 Wesel-Ginderich
Tel.: +49 2803 9130 - 0 • Fax: +49 2803 1035
mail@armano-wesel.com

8201

09/19

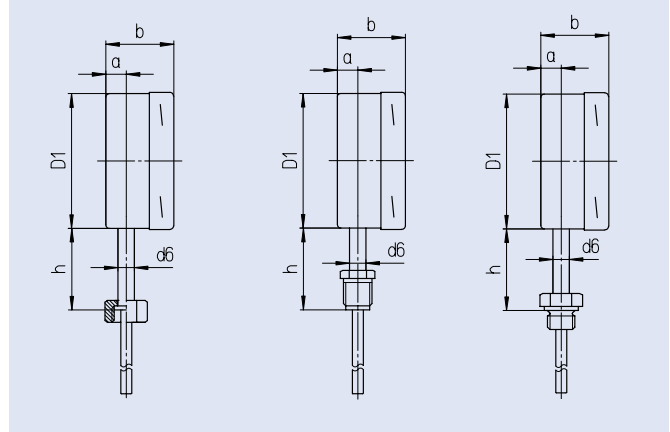
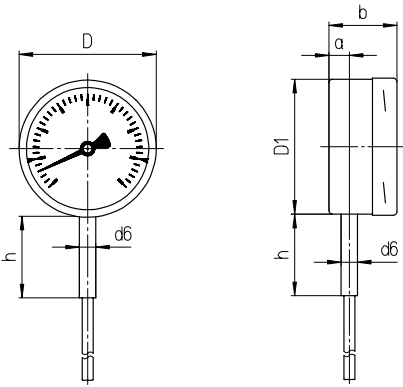
Stem Position, Code Letters, Dimensional Data and Weights

Vertical Bottom Stem Position

Stem model A1 (also A5)

Stem model A3 (also A6) Stem model A4 Stem model A4.1

without additional code letter



Angular Bottom Stem Position

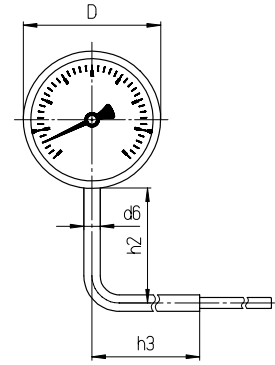
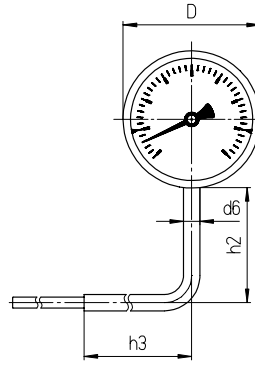
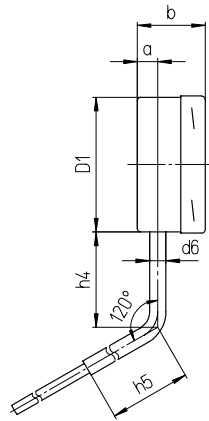
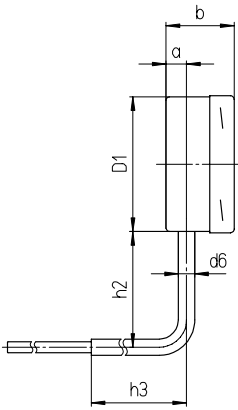
with angle:

right-angled to the back,
code letters **w**

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

lateral to the left,
code letters **wl**

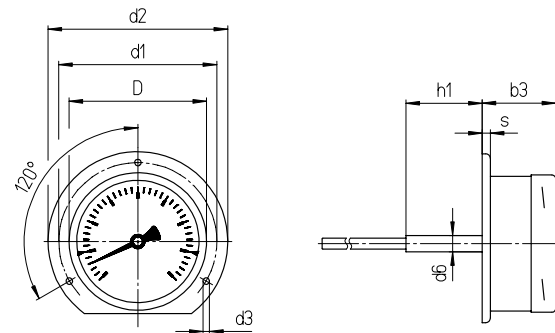
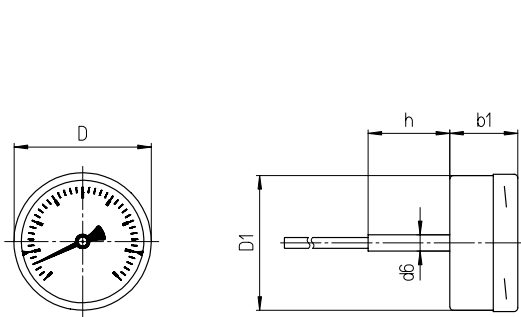
lateral to the right,
code letters **wr**



Centre Back Stem Position

code letters **rm**

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



Dimensional Data (mm) and Weights (kg)

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
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
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
250	15	57	57	—	251	249	270	285	5.8	12	60	—	109	120	70	120	—	1.83	—

¹⁾ Temperature ranges ≥ 400 °C: extended neck tube for smaller stem lengths, see T08-000-031
Temperature ranges > 500 °C: +20 mm – standard for all stem lengths

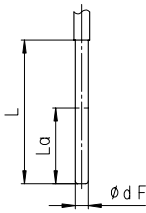
²⁾ The data are examples and relate to the version with stem A1, \varnothing 10 mm, length 200 mm.

³⁾ For TSChG: h2 = 109 mm, h4 = 94 mm

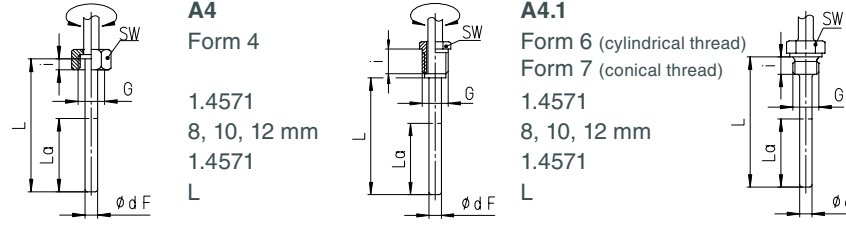
Stem Models

Stem Models

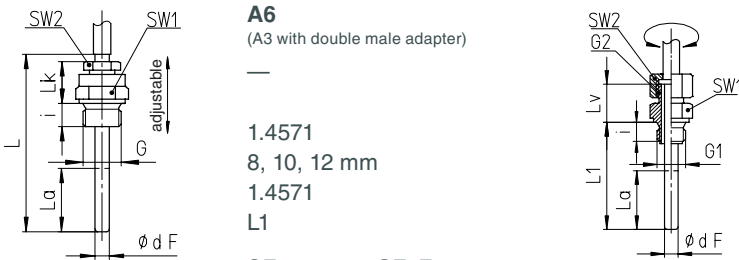
Process connection:	Without screw fitting, plain stem		
Stem model:	A1		
Form acc. to DIN EN 13 190:	Form 1		
Stem material:	1.4571		
Stem Ø dF:	8, 10, 12 mm		
Order length:	L		
Suitable thermowell models: (data sheet)	SK1 (8.8140), SK2 (8.8141)		



Process connection:	Union nut	Male thread, turnable	Male thread, rigid																																																						
Stem model:	A3	A4	A4.1																																																						
Form acc. to DIN EN 13 190:	Form 5	Form 4	Form 6 (cylindrical thread) Form 7 (conical thread)																																																						
Stem material:	1.4571	1.4571	1.4571																																																						
Stem Ø dF:	8, 10, 12 mm	8, 10, 12 mm	8, 10, 12 mm																																																						
Screw fitting material:	1.4571	1.4571	1.4571																																																						
Order length:	L	L	L																																																						
Suitable thermowell models: (data sheet)	SF4.1 (8.8111), SF4.1F (8.8113) SF8 (8.8130), SF9 (8.8131)	SF4 (8.8110), SF4F (8.8112) SF5 (8.8120), SF6, SF7 (8.8121)	SF4 (8.8110), SF4F (8.8112) SF5 (8.8120), SF6, SF7 (8.8121)																																																						
Thread (dimensional data in mm):	<table border="1"> <thead> <tr> <th>G</th> <th>SW</th> <th>i</th> </tr> </thead> <tbody> <tr><td>G 1/2</td><td>27</td><td>10</td></tr> <tr><td>G 3/4</td><td>32</td><td>12</td></tr> <tr><td>M20x1.5</td><td>27</td><td>10</td></tr> <tr><td>M24x1.5</td><td>32</td><td>12</td></tr> <tr><td>M27x2</td><td>32</td><td>12</td></tr> </tbody> </table>	G	SW	i	G 1/2	27	10	G 3/4	32	12	M20x1.5	27	10	M24x1.5	32	12	M27x2	32	12	<table border="1"> <thead> <tr> <th>G</th> <th>SW</th> <th>i</th> </tr> </thead> <tbody> <tr><td>G 1/2 B</td><td>22</td><td>20</td></tr> <tr><td>G 3/4 B</td><td>27</td><td>23</td></tr> <tr><td>M18x1.5</td><td>22</td><td>14</td></tr> <tr><td>M20x1.5</td><td>22</td><td>20</td></tr> </tbody> </table>	G	SW	i	G 1/2 B	22	20	G 3/4 B	27	23	M18x1.5	22	14	M20x1.5	22	20	<table border="1"> <thead> <tr> <th>G</th> <th>SW</th> <th>i</th> </tr> </thead> <tbody> <tr><td>G 1/2 B</td><td>27</td><td>14</td></tr> <tr><td>G 3/4 B</td><td>32</td><td>16</td></tr> <tr><td>1/2" NPT</td><td>27</td><td>19</td></tr> <tr><td>3/4" NPT</td><td>27</td><td>19</td></tr> <tr><td>M18x1.5</td><td>24</td><td>14</td></tr> <tr><td>M20x1.5</td><td>27</td><td>14</td></tr> </tbody> </table>	G	SW	i	G 1/2 B	27	14	G 3/4 B	32	16	1/2" NPT	27	19	3/4" NPT	27	19	M18x1.5	24	14	M20x1.5	27	14
G	SW	i																																																							
G 1/2	27	10																																																							
G 3/4	32	12																																																							
M20x1.5	27	10																																																							
M24x1.5	32	12																																																							
M27x2	32	12																																																							
G	SW	i																																																							
G 1/2 B	22	20																																																							
G 3/4 B	27	23																																																							
M18x1.5	22	14																																																							
M20x1.5	22	20																																																							
G	SW	i																																																							
G 1/2 B	27	14																																																							
G 3/4 B	32	16																																																							
1/2" NPT	27	19																																																							
3/4" NPT	27	19																																																							
M18x1.5	24	14																																																							
M20x1.5	27	14																																																							
		Thermowell required!																																																							



Process connection:	Male thread/compression fitting	Male thread, turnable/double male adapter																																																																														
Stem model:	A5	A6																																																																														
	(A1 with compression fitting)	(A3 with double male adapter)																																																																														
Form acc. to DIN EN 13 190:	Form 2 (cylindrical thread) Form 3 (conical thread)	—																																																																														
Stem material:	1.4571	1.4571																																																																														
Stem Ø dF:	8, 10, 12 mm	8, 10, 12 mm																																																																														
Screw fitting material:	1.4571	1.4571																																																																														
Order length:	L	L1																																																																														
Suitable thermowell models: (data sheet)	SF4 (8.8110), SF4F (8.8112) SF5 (8.8120), SF6, SF7 (8.8121)	SF4 (8.8110), SF4F (8.8112) SF5 (8.8120), SF6, SF7 (8.8121)																																																																														
Thread (dimensional data in mm):	<table border="1"> <thead> <tr> <th>G</th> <th>SW1</th> <th>SW2</th> <th>i</th> <th>Lk</th> </tr> </thead> <tbody> <tr><td>G 1/2 B</td><td>27</td><td>22</td><td>14</td><td>42</td></tr> <tr><td>G 3/4 B</td><td>32</td><td>22</td><td>16</td><td>42</td></tr> <tr><td>1/2" NPT</td><td>27</td><td>22</td><td>19</td><td>42</td></tr> <tr><td>3/4" NPT</td><td>27</td><td>22</td><td>19</td><td>42</td></tr> <tr><td>M20x1.5</td><td>27</td><td>22</td><td>14</td><td>42</td></tr> </tbody> </table>	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	<table border="1"> <thead> <tr> <th>G1</th> <th>G2</th> <th>SW1</th> <th>SW2</th> <th>i</th> <th>Lv</th> </tr> </thead> <tbody> <tr><td>G 1/2 B</td><td>G 1/2 B</td><td>27</td><td>27</td><td>14</td><td>28</td></tr> <tr><td>G 3/4 B</td><td>G 1/2 B</td><td>32</td><td>27</td><td>16</td><td>28</td></tr> <tr><td>1/2" NPT</td><td>G 1/2 B</td><td>27</td><td>27</td><td>19</td><td>28</td></tr> <tr><td>3/4" NPT</td><td>G 1/2 B</td><td>27</td><td>27</td><td>19</td><td>28</td></tr> <tr><td>M20x1.5</td><td>M20x1.5</td><td>27</td><td>27</td><td>14</td><td>28</td></tr> <tr><td>M24x1.5</td><td>M20x1.5</td><td>32</td><td>27</td><td>14</td><td>28</td></tr> <tr><td>M27x2</td><td>M20x1.5</td><td>32</td><td>27</td><td>16</td><td>28</td></tr> </tbody> </table>	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
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																																																																												
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 Stem Length (mm)

Stem model:	Length:	Thread:	up to max. 500 °C			500 °C and above		
			Stem Ø dF:			Stem Ø dF:		
			12	10	8	12	10	8
all models	La	all standard threads	35	45	75	75	105	165
A1/A3/A4	Lmin	all standard threads	55	65	95	95	125	185
A4.1	Lmin	G 1/2 B, M18x1.5, M20x1.5	49	59	89	89	119	179
		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, M20x1.5	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		

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 A3.2, A4.2 and A4.3 (data sheet 8299.1) or basic models TFCh with capillary line to stem, data sheet 8221.

Ordering Information

Basic Model: Gas-actuated Thermometer Rigid Mount to the Stem		TSch
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
Stem position/ case configuration:	vertical bottom position right-angled to the back obtuse-angled to the back lateral angled to the left lateral angled to the right centre back position centre back position, with back flange for surface mounting	without code letters w wst wl wr rm 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 °C/+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, rigid male thread/compression fitting male thread, turnable/double male adapter	A1 A3 A4 A4.1 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
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, 160 stationary red pointer on the dial 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 versions: DNV GL dial marking with symbol and Russian Sea Register copy of the certificate upon request TSch 100, 160 TSchG 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:

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

Special Versions: Please describe your requirements in cleartext!