

# Square Thermometers for Switch Panels

TFQS

Square case, front narrow rim black

## Standard Versions

Information on selection and metrological features (temperature-resistance, among others) and temperature ranges / smallest subdivision / error limits can be found in model overview 8000.

### Measuring Unit

With nitrogen filling  
(inert gas, physiologically safe)

### Accuracy (EN 13 190)

Class 1

### Case

Square case, narrow front flange black,  
bracket for switch panel mounting

### Case Protection Type (EN 60 529 / IEC 529)

IP 43

### Nominal Case Sizes

96 x 96, 144 x 144 mm ( 3.8" x 3.8", 5.7" x 5.7)

### Case Configuration

Connection temperature

sensor (stem): capillary line

Capillary line position: lower back position (**r**),  
see page 2

Mounting device : u-clamp

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

### Temperature Ranges

Spans from 80 K to 600 K

### Temperature Sensor (Stem)

made of stainless steel 1.4571 (316 L),

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:  $L_{min}$  resp.  $L1_{min}$  to max. 2.50 m

Please consider the minimum stem length depending on the active length ( $L_a$ ) and stem model, see page 3.

### Window

Instrument glass

### Movement

Brass / German silver

### Dial

Aluminium, white, scaling black

### Pointer

Aluminium, black

### Indication adjustment ( $\pm 6\%$ )

From the outside via screw



## Ordering Information, Standard Temperature Ranges, Options

See page 4

## Special Versions and further Options among others

- Other stem-Ø 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, etc.
- Stationary red pointer, min. or max. drag indicator upon request

## Accessories:

Mechanical: thermowells, see data sheet 8.8110 ff.

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



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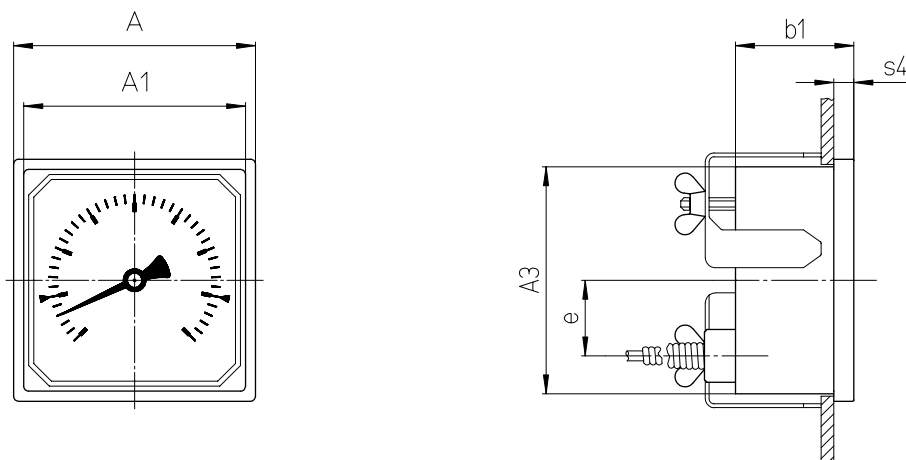
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# Capillary Line Position / Case Configurations, Code Letters, Dimensional Data and Weights

## Capillary Line Lower Back Position

TFQS

no additional code letter



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

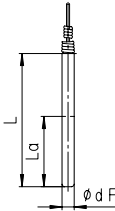
NCS	A	A1	A3	b1	e	s4	approx. weight <sup>1)</sup> TFQS
96	96	88	90	48	33	8	0.64
<b>3.8"</b>	<b>3.78</b>	<b>3.46</b>	<b>3.54</b>	<b>1.89</b>	<b>1.30</b>	<b>.31</b>	<b>1.41</b>
144	144	134	136	48	52	8	1.15
<b>5.7"</b>	<b>5.67</b>	<b>5.28</b>	<b>5.35</b>	<b>1.89</b>	<b>2.05</b>	<b>.31</b>	<b>2.53</b>

<sup>1)</sup> The indications serve as example and relate to versions with stem A1, Ø 10 mm (0.4"), length 200 mm (8") and 1 m capillary line.

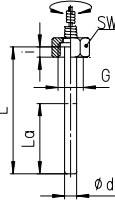
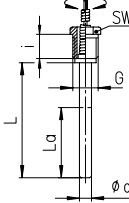
# Stem Models

## Stem Models

<b>Process connection:</b>	<b>without screw fitting, plain stem</b>		
<b>Stem model:</b>	<b>A1</b>		
<b>Form according to DIN 13 190:</b>	Form 1		
<b>Stem material:</b>	1.4571		
<b>Stem-Ø dF:</b>	8, 10, 12		
<b>Order length:</b>	L		
<b>Data sheet</b> (suitable thermowell model):	8.8140 (SK1), 8.8141 (SK2)		



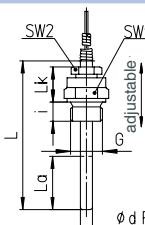
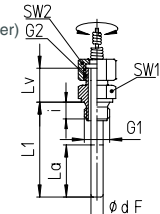
<b>Process connection:</b>	<b>Union nut</b>	<b>Male thread, turnable</b>
<b>Stem model:</b>	<b>A3</b>	<b>A4</b>
<b>Form according to DIN 13 190:</b>	Form 5	Form 4
<b>Stem material:</b>	1.4571	1.4571
<b>Stem-Ø dF:</b>	8, 10, 12	8, 10, 12
<b>Screw fitting material:</b>	1.4571	1.4571
<b>Order length:</b>	L	L
<b>Data sheet</b> (suitable thermowell model):	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)

Thread (dimensions in mm):			Thread (dimensions in mm):		
G	SW	i	G	SW	i
G 1/2	27	10	G 1/2 B	22	20
G 3/4	32	12	G 3/4 B	27	23
M 20 x 1.5	27	10	M 18 x 1.5	22	14
M 24 x 1.5	32	12	M 20 x 1.5	22	20
M 27 x 2	32	12			

Thermowell required!

<b>Process connection:</b>	<b>Male thread / compression fitting</b>	<b>Male thread, turnable / double male adapter</b>
<b>Stem model:</b>	<b>A5</b> (= basic stem A1 with compression fitting)	<b>A6</b> (= basic stem A3 with double male adapter)
<b>Form according to DIN 13 190:</b>	Form 2 (thread cylindrical) Form 3 (thread conical)	—
<b>Stem material:</b>	1.4571	1.4571
<b>Stem-Ø dF:</b>	8, 10, 12	8, 10, 12
<b>Screw fitting material:</b>	1.4571	1.4571
<b>Order length:</b>	L	L1
<b>Data sheet</b> (suitable thermowell model):	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 (dimension in mm):			Thread (dimension in mm):							
G	SW1	SW2	i	Lk	G1	G2	SW1	SW2	i	Lv
G 1/2 B	27	22	14	38	G 1/2 B	G 1/2 B	27	27	14	28
G 3/4 B	32	22	16	38	G 3/4 B	G 1/2 B	32	27	16	28
1/2" NPT	27	22	19	38	1/2" NPT	G 1/2 B	27	27	19	28
3/4" NPT	27	22	19	38	3/4" NPT	G 1/2 B	27	27	19	28
M 20 x 1.5	27	22	14	38	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 Length, Active Length and maximum realisable Capillary Line Length including Stem

The **minimum length Lmin / L1min** of the stem is the smallest possible stem length depending on the active length La (temperature-sensitive part) and the stem model.

The **active length La** of the stem (temperature-sensitive part) has to immerse completely into the medium, in order to obtain a measuring result that corresponds to the accuracy class.

The **maximum realisable stem length** is 2,50 m. Greater lengths can be obtained with a capillary line, e.g. with special stems A2, A7 and A7.1 (data sheet 8299.1).

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	8	10	12
<b>all models</b>	La	all standard threads	35	45	75	75	105	165	53	80	115	150	200	320
<b>A1 A3 A4</b>	Lmin	all standard threads	55	65	95	95	125	185	73	100	135	170	220	340
<b>A5</b>	Lmin	all standard threads	90	100	130	130	160	220	67	94	129	164	214	334
<b>A6</b>	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: Square Thermometers for Switch Panels		TFQS
Case filling:	without	no code letters
Nominal case size:	case 96, 144 (mm) (3.8", 5.7")	<b>96, 144</b>
Temperature ranges:	scale: $\Delta T$ (K):	
	0 – 80 °C 80	
	0 – 100 °C 100	e.g. <b>0 – 100 °C</b>
	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	e.g. <b>-30/+50 °C</b>
	-40 / + 40 °C 80	
	-40 / + 60 °C 100	
	-30 / + 50 °C 80	
	-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	<b>A1</b>
	union nut	<b>A3</b>
	male thread, turnable	<b>A4</b>
	male thread / compression fitting	<b>A5</b>
	male thread, turnable / double male adapter	<b>A6</b>
Stem- $\varnothing$ dF:	8, 10 or 12 mm	<b>dF 8, 10, 12</b>
Stem-length:	L resp. L1 in mm	e.g. <b>L = 100 mm</b>
Capillary line length:	$L_{FL} > 1$ to 15 m	<b><math>L_{FL} = 5</math> m</b>
Process connection:	see page 3	e.g. <b>G <math>\frac{1}{2}</math> B</b>
Options:	red mark on the dial	
	window acrylic glas (PMMA)	
	movement stainless steel	
	wide front rim, TFQB	
	protective hose for capillary line flexible armour made of stainless steel	<i>(order at present still in cleartext)</i>
	flexible armour made of stainless steel with PE-cover	
	shrinkdown plastic tubing polyolefin, max. 10 m	
	measuring point stainless steel plate 12mm x 55mm (0.47" x 2.17") with	
	marking wire mounting or sticker on case coverage	

### Example:

**TFQS 96, 0 – 100 °C, A3, dF 12, L = 100 mm,  $L_{FL} = 5$  m G  $\frac{1}{2}$**

### Special Versions: Please describe your requirements in cleartext