

# Square Thermometer, for Switch Panels

**TFQS**

**Square case, front narrow rim black**  
**With limit switch contact assembly**

This data sheet contains information on the maximum possible number of contacts, on electrical connections, ordering information and options concerning the model TFQS with limit switch contact assemblies (with low-action, magnetic, electronic or inductive contacts), as well as dimensional drawings with the position of the electrical connections.

**Data sheet 8225** contains all details concerning the available versions of model TFQS without limit switches. These details as well as the required ordering information apply also to the version with limit switches, unless otherwise stated below.

**Model overview 9.1000** contains general and detailed definitions, applications and operating principles for the respective limit switch types. It also provides detailed information on the selection, switching functions and minimum spans, on operating conditions, explosion protection, options and others.



## Standard Versions

### Available Limit Switch Contact Assemblies

1. **Direct** (electromechanical)
  - 1.1 Low-action contact **S**
  - 1.2 Magnetic contact **M**
2. **Indirect** (contact-free)
  - 2.1 Electronic contact **E**
  - 2.2 Inductive contact **I**

### Maximum Possible Number of Contacts

	NCS 96 x 96	NCS 144 x 144
up to 2x S	O	O
3x S	O	-
up to 2x M	O	O
3x M	O	-
up to 2x E	O	O
3x E	O	-
up to 2x I	O	O
3x I	O	-

O = available

**Degree of Protection** (DIN EN 60529 / IEC 60529)  
 IP43

**Nominal Case Sizes**  
 96 x 96, 144 x 144 mm (3.78 x 3.78, 5.67 x 5.67")

**Window**  
 Instrument glass

**Adjusting Mechanism Limit Setting Pointer**  
 All instruments are equipped with an adjusting lock in the window. With the removable key, the limit setting pointer can be externally set to the value of the desired switching point.

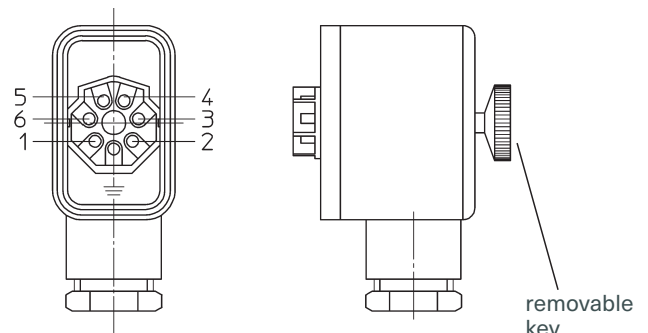
## Electrical Connection

- for limit switch (S / M)
  - for limit switch (E)
  - for limit switch (I)
- plug connector  
 terminal box black  
 terminal box blue,  
 for identification of an intrinsically  
 safe circuit, anything else as E

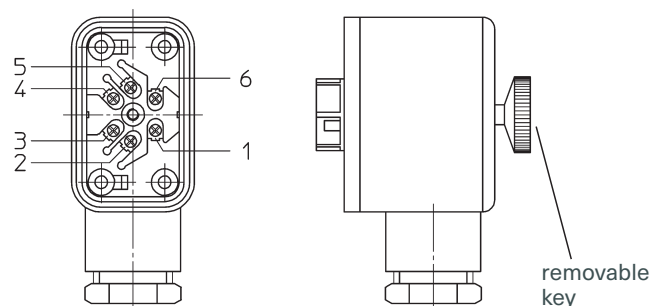
## Plug Connector and Terminal Box

IP65, 6-pin, with M20x1.5 screwed cable gland with strain relief, terminals numbered according to wiring diagram (on the device), protective contact available

## Plug Connector



## Terminal Box



For the position of the electrical connection, please refer to the dimensional drawings, see pages 2 and 4 (cable entry).

[www.armano-messtechnik.com](http://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

**8225.90**

02/24

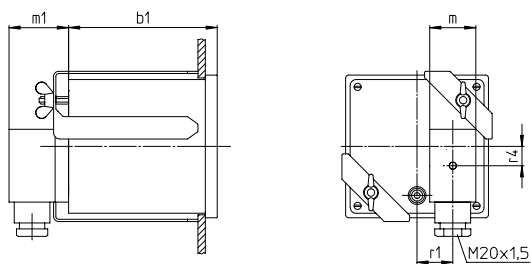
## Case Configurations, Code Letters, Dimensional Data and Weight

Compared to the basic model, there are deviations in the front-to-back sizes, see table.  
Please refer to data sheet 8225 for the other dimensional data.

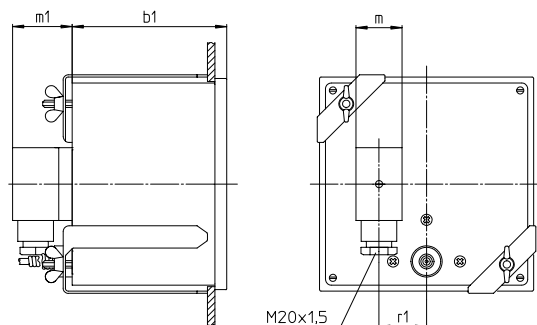
### Lower Back Capillary Line Position

#### NCS 96 x 96

without code letters



#### NCS 144 x 144



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

NCS / type	b1	m	m1	r1	r4	approx. weight <sup>1)</sup> TFQS
96 x 96 1, 2 and 3 contacts	100 <b>3.94</b>	31 <b>1.22</b>	42 <b>1.65</b>	24 <b>0.94</b>	13 <b>0.51</b>	1.00 <b>2.2</b>
144 x 144 1 and 2 contacts	104 <b>4.09</b>	31 <b>1.22</b>	42 <b>1.65</b>	32 <b>1.26</b>	-	1.55 <b>3.42</b>

<sup>1)</sup> The data are examples and relate to model TFQS, A3,  $dF = 12$ ,  $L = 200$  mm,  $L_{R1} = 1$  m,  $G\frac{1}{2}$ , M2.

## Ordering Information, Limit Setting Pointer

Basic Model	Square Thermometer for Switch Panels, with Limit Switch Contact Assembly		TFQS
	When installing limit switches, the order text of the basic device is supplemented by		
	code letters	S low-action contact	
		M magnetic contact	e.g. <b>M</b>
		E electronic contact	
		I inductive contact	
	code number	1 making contact	
	for the switching function (clock-wise direction of action at rising temperature)	2 breaking contact	e.g. <b>2</b>
		3 single change-over contact as low-action or magnetic contact	
		11 1 <sup>st</sup> and 2 <sup>nd</sup> making contact	
		12 1 <sup>st</sup> making contact / 2 <sup>nd</sup> breaking contact	
		21 1 <sup>st</sup> breaking contact / 2 <sup>nd</sup> making contact	
		22 1 <sup>st</sup> and 2 <sup>nd</sup> breaking contact	
Please note	To ensure optimum functioning of the devices with limit switch, please specify in your order text: - switching temperatures - switching ranges, which are beyond the adjustment ranges defined by us - if you require a counterclockwise switching direction		
Options	for all limit switch types	adjusting lock with non-removable key switching distance fixing (from 2 contacts onwards) upon request	
	S / M contacts	separated circuits wire break control (parallel resistor for each contact) contact pins made of special materials upon request	
	E contacts	PNP switching output as 2-wire connection	
	I contacts	safety version SN or S1N reactionless interval switching for NCS 144 with 2 contacts, interval relay required	
	options for electrical connection see page 4		
	other position of the electrical connection upon request		
<b>Example</b>	<b>TFQS 96, 0 – 300 °C, A5, dF = 12, L = 200 mm, L<sub>FL</sub> = 3 m, G½, M2</b>		

### Information on Limit Switches with 3 Contacts

In contrast to thermometers with 2 contacts, thermometers with 3 contacts do not always allow the limit setting pointers to be adjusted one above the other.

#### Behaviour of the limit setting pointers to each other

Type limit switch	3 limit setting pointers	
	NCS 96 x 96	NCS 144 x 144
S, M	adjustable one above the other	
E, I	only 2 pointers adjustable one above the other	

#### Switching functions

Those limit setting pointers, which are not adjustable one above the other, are separated by a point when indicating the switching function.

Example: E 1.22                      3-fold; only the two rear pointers adjustable one above the other

#### Minimum distance of the limit setting pointers, which are not adjustable one above the other (in degree)

Type limit switch	NCS 96 x 96	NCS 144 x 144
E, I	35	

# Options

## Electrical Connection

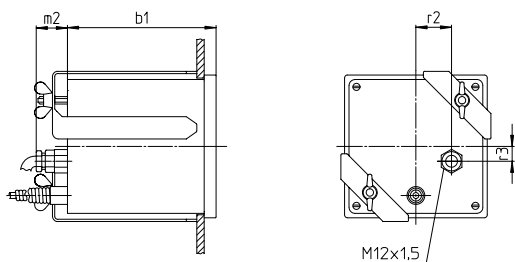
### Cable entry

- IP65
- Cable entry M 12x1.5 with strain relief and 1 m connection cable (connection cable longer than 1 m upon request)
- Available for types S / M

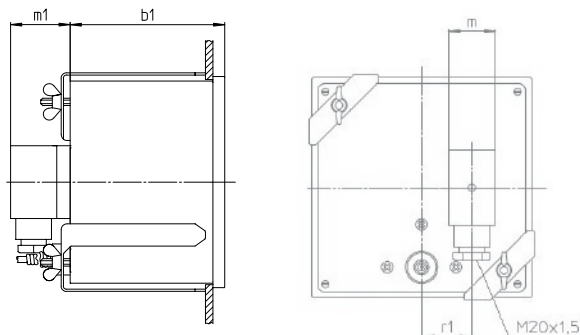
## Lower Back Capillary Line Position

### NCS 96 x 96

without code letters



### NCS 144 x 144



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

NCS / type	b1	m2	r2	r3	approx. weight <sup>1)</sup> TFQS
96 x 96    1, 2 and 3 contacts	100 <b>3.94</b>	21 <b>0.83</b>	24 <b>0.94</b>	10 <b>0.39</b>	1.00 <b>2.2</b>
144 x 144    1 and 2 contacts	104 <b>4.09</b>	21 <b>0.83</b>	45 <b>1.77</b>	35 <b>1.38</b>	1.55 <b>3.42</b>

## Plug connector DIN EN 175301-803

- IP65, 3-pin and protective contact
- Available for max. 2x S / M or 1x E / I or 2x E for option PNP switching output as 2-wire connection

The plug connectors DIN EN 175301-803 have the same position of connection as the plug connectors and terminal boxes, see page 2.

### Construction type A



### Construction type C



## Circular plug connector

- IP67, 4-pin without protective contact
- Available for max. 2x E / I
- With 2 m die cast cable upon request

The circular plug connectors have roughly the same position of connection as the cable entries, see above.

### Angular cable box



### Straight cable box upon request



<sup>1)</sup> The data are examples and relate to model TFQS, A3, dF = 12, L = 200 mm, L<sub>FL</sub> = 1 m, G½, M2.