

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 2 x S	O	O
3 x S	O	-
up to 2 x M	O	O
3 x M	O	-
up to 2 x E	O	O
3 x E	O	-
up to 2 x I	O	O
3 x I	O	-

O = available

Degree of Protection (DIN EN 60 529/IEC 529)
 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 switch point.

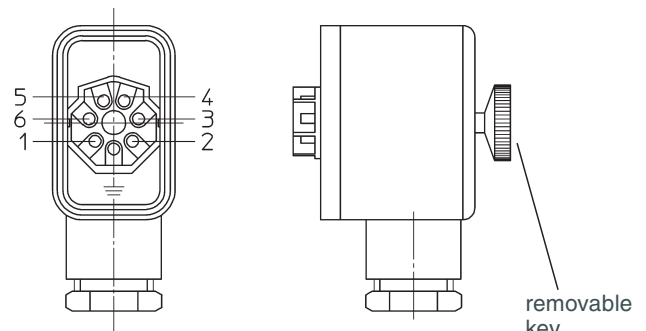
Electrical Connection

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

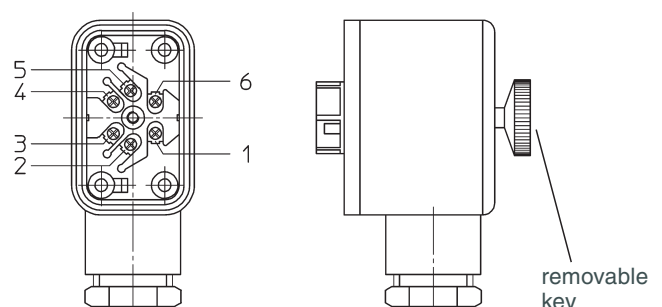
Plug Connector and Terminal Box

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).

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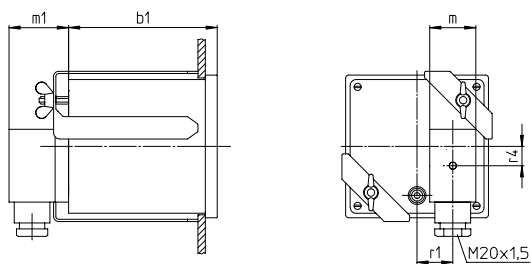
Case Configurations, Code Letters, Dimensional Data and Weights

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.

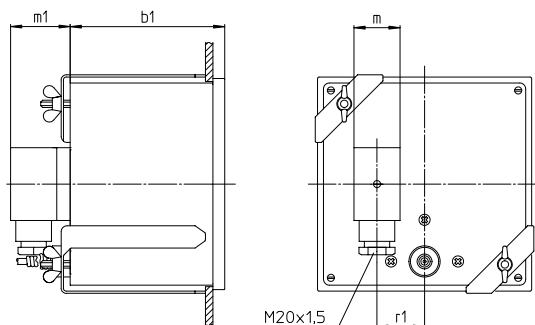
Lower Back Capillary Line Position

NCS 96 x 96

without code letters



NCS 144 x 144



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

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

¹⁾ The data are examples and relate to model TFQS, A3, dF = 12, L = 200 mm, L_{PE} = 1 m, G½, M2.

Ordering Information, Limit Setting Pointer

Basic Model:	Square Thermometer for Switch Panels, with Limit Switch Contact Assembly	TFQS
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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. M
	E electronic contact	
	I inductive contact	
code number for the switching function (clockwise direction of action at rising temperature)		
1	making contact	
2	breaking contact	e.g. 2
3	single change-over contact as low-action or magnetic contact	
11	1 st and 2 nd making contact	
12	1 st making contact / 2 nd breaking contact	
21	1 st breaking contact / 2 nd making contact	
22	1 st and 2 nd 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
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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	

Example: TFQS 96, 0 – 300 °C, A5, dF = 12, L= 200 mm, L_{FL} = 3 m, G^{1/2}, M2

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

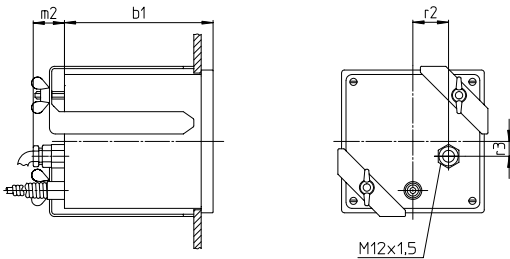
Cable entry

- IP65
- Cable entry M12x1.5 with strain relief and 1 m connection cable (connection cable longer than 1 m upon request)
- Available for types S/M

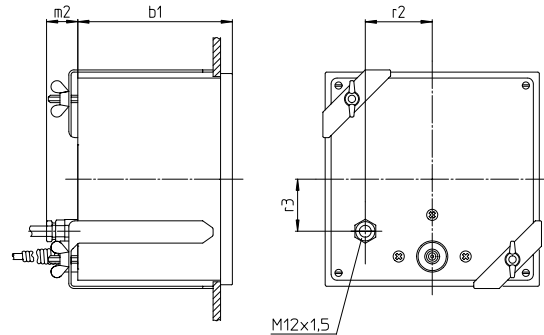
Lower Back Capillary Line Position

NCS 96 x 96

without code letters



NCS 144 x 144



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

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

Plug connector DIN EN 17 5301-803

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

The plug connectors DIN EN 17 5301-803 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. 2 x 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



¹⁾ The data are examples and relate to model TFQS, A3, dF = 12, L = 200 mm, L_{PL} = 1 m, G¹/₂, M2.