Square Thermometer, for Switch Panels
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
   - 1.2 Magnetic contact

2. **Indirect** (contact-free)
   - 2.1 Electronic contact
   - 2.2 Inductive contact

<table>
<thead>
<tr>
<th>Maximum Possible Number of Contacts</th>
<th>NCS 96 x 96</th>
<th>NCS 144 x 144</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 2 x S</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>3 x S</td>
<td>O</td>
<td>-</td>
</tr>
<tr>
<td>up to 2 x M</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>3 x M</td>
<td>O</td>
<td>-</td>
</tr>
<tr>
<td>up to 2 x E</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>3 x E</td>
<td>O</td>
<td>-</td>
</tr>
<tr>
<td>up to 2 x I</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>3 x I</td>
<td>O</td>
<td>-</td>
</tr>
</tbody>
</table>

O = available

### 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

### 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.

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TFQS

Maximum Possible Number of Contacts

<table>
<thead>
<tr>
<th></th>
<th>NCS 96 x 96</th>
<th>NCS 144 x 144</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 2 x S</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>3 x S</td>
<td>O</td>
<td>-</td>
</tr>
<tr>
<td>up to 2 x M</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>3 x M</td>
<td>O</td>
<td>-</td>
</tr>
<tr>
<td>up to 2 x E</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>3 x E</td>
<td>O</td>
<td>-</td>
</tr>
<tr>
<td>up to 2 x I</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>3 x I</td>
<td>O</td>
<td>-</td>
</tr>
</tbody>
</table>

O = available

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8225.90

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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

<table>
<thead>
<tr>
<th>NCS 96 x 96</th>
<th>NCS 144 x 144</th>
</tr>
</thead>
<tbody>
<tr>
<td>without code letters</td>
<td></td>
</tr>
</tbody>
</table>

![Diagram](image)

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

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

1) The data are examples and relate to model TFQS, A3, dF = 12, L = 200 mm, LFL = 1 m, G1⁄2, M2.
Behaving of the limit setting pointers to each other

<table>
<thead>
<tr>
<th>Type</th>
<th>3 limit setting pointers</th>
<th>NCS 96 x 96</th>
<th>NCS 144 x 144</th>
</tr>
</thead>
<tbody>
<tr>
<td>S, M</td>
<td>adjustable one above the other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E, I</td>
<td>only 2 pointers adjustable one above the other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>Type</th>
<th>NCS 96 x 96</th>
<th>NCS 144 x 144</th>
</tr>
</thead>
<tbody>
<tr>
<td>E, I</td>
<td>35</td>
<td></td>
</tr>
</tbody>
</table>

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 all limit switch types

- adjusting lock with non-removable key
- switching distance fixing (from 2 contacts onwards) upon request
- separated circuits
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- PNP switching output as 2-wire connection
- safety version SN or S1N
- reactionless interval switching for NCS 144 with 2 contacts, interval relay required

Example: TFQS 96, 0 – 300 °C, A5, dF = 12, L = 200 mm, LFL = 3 m, G1⁄2, M2
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)

<table>
<thead>
<tr>
<th>NCS/type</th>
<th>b1</th>
<th>m2</th>
<th>r2</th>
<th>r3</th>
<th>approx. weight TFQS</th>
</tr>
</thead>
<tbody>
<tr>
<td>96 x 96</td>
<td>100</td>
<td>21</td>
<td>24</td>
<td>10</td>
<td>1.00</td>
</tr>
<tr>
<td>144 x 144</td>
<td>104</td>
<td>21</td>
<td>45</td>
<td>35</td>
<td>1.55</td>
</tr>
</tbody>
</table>

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

Construction type A

Construction type C

The plug connectors DIN EN 17 5301-803 have the same position of connection as the plug connectors and terminal boxes, see page 2.

Circular plug connector

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

Angular cable box

Straight cable box upon request

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

1) The data are examples and relate to model TFQS, A3, dF = 12, L = 200 mm, Lm = 1 m, G1⁄2, M2.