

# Capacitance Level Measurement High Temperature Probe TSP 012656

**Partially insulated rod and rope probes  
with ceramic part-insulation and screening.  
Heavy duty version.**



## Applications with Hot Bulk Materials

Especially for use with materials which tend to form condensation or build-up on silo roof and walls.

The probes are designed for extremely rugged conditions and withstand high loads caused by the movement of bulk solids. They are ideal both for minimum and maximum detection and for continuous measurement of dense bulk materials.

One particular advantage is their resistance to high pressures and temperatures as well as sudden changes in temperature. They are also insensitive to condensation.

The reason for this?

The steel pipe on the basic element acts as a screen and forms an inactive zone to prevent condensation or material build-up close to the threaded boss from affecting the measurement.

## 2 Versions ...

... are available.

The basic element, which is mounted in the vessel and contains the electronic insert on the outside, is exactly the same for both versions. The following probes can be connected to it:

- A »sword« - for limit detection.  
The sword has a large surface area to give large changes in capacitance while presenting only a small resistive surface to the discharging material.
- A rope probe with rigid weight
  - a) for limit detection
  - b) for continuous level measurement with non-conductive bulk materials.

- 1) Basic element comprising the probe head housing, flange, screening, ceramic insulation, connector for probes:
- 2) Sword probe
- 3) Rope probe with tensioning weight



## Mounting

The rope and rod (sword) probes can be mounted in the silo either from above or from the side.

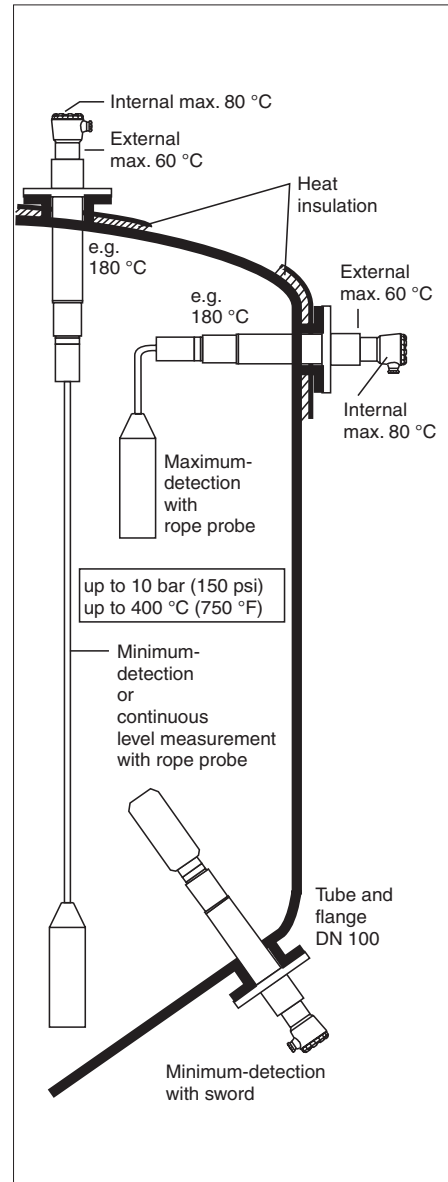
### Sword Probe

For a probe with a sword fitting mounted from the side, the lateral load can be minimised if the narrow edge of the sword is pointing upwards. This orientation should first be marked on the outside on the flange.

### Rope Probe

Rope probes should not be mounted in the middle of the silo as the force of the material discharge is greatest at this point. Install the probe far enough away from the wall so that when the silo is empty the rigid weight does not swing and hit the silo wall. A rope probe can be mounted laterally in the vessel if maximum detection is required.

Make sure that the probes are not subjected to excessive strain by collapsing mounds of material when used for minimum detection or continuous measurement.



Examples showing installation and temperature guidelines  
 $x \text{ °C} = (1.8x+32) \text{ °F}$

## Shortening the Probe

### Sword Probes

A section can be simply sawn off.  
 Note: The longer the sword is, then the greater the change in capacitance between the covered or uncovered probe. This ensures easier calibration and greater reliability with limit detection.

### Rope Probes

Rope probes can be shortened at the upper end (where they connect to the basic element):

- separate the two welding spots joining the two parts of the connector;
- unscrew the two parts of the connector;
- with a hammer, hit the end of the rope downwards (towards the tensioning weight);

- remove the conical pin from the rope end;
- shorten the rope with a cut-off disc;
- hammer in the conical pin again in the lower part of the connector;
- screw the connector together and secure with 2 welding spots.

## Electronic Insert

The electronic insert EC ... can be mounted directly in the probe housing if the temperature is not too high. Please refer to Technical Data EC ...

For higher temperatures the electronic insert should be mounted in a separate housing.

# Technical Data

## Basic Element

Operating pressure  $p_e$ :  
 max. 10 bar (150 psi)  
 Operating temperature:  
 max 400 °C (750 °F)  
 Resistance to thermal shock:  
 up to 180 °C (350 °F)  
 Capacitance of connector with 200 mm  
 screening: approx. 60 pF  
 Capacitance for each extra 100 mm  
 screening: approx. 4 pF  
 Insulation: ceramic, resistant to steam  
 and hot water  
 Connecting thread for sword or rope  
 probe: M16 (steel)  
 Maximum lateral load:  
 800 N (80 kg) at connecting thread

## Sword

Connecting thread M16 and sword:  
 steel, primed  
 Standard length: 200 mm, can be  
 shortened

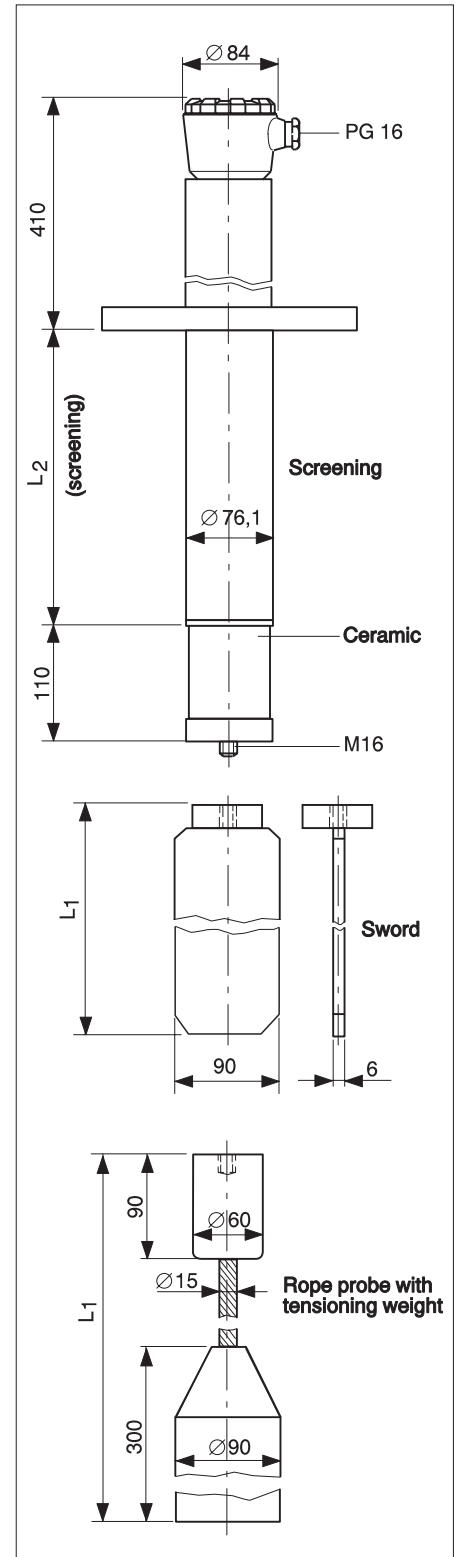
## Rope probe with Rigid Weight

Rigid weight and rope are electrically  
 connected.  
 Connecting thread M16: steel  
 Maximum permissible tensile load:  
 19900 N (not pressurized)

## Probe Length Tolerances

Length:	Tolerances:
up to 1 m	+0/- 5 mm
up to 3 m	+0/-10 mm
up to 6 m	+0/-20 mm
from 6 m	+0/-30 mm

Subject to modification.



Dimensions in mm

100 mm = 3.94 in  
 1 in = 25.4 mm

## Specifications Required When Ordering

- Length L2 of screening in mm
- Length L1 of sword or rope in mm

Assembled delivery where the connection of the probe to the basic element is secured with 2 welding spots.

