

**Purpose:** To advance the sensor development discussion by providing an outline for the design of Ø1mm flush mount strain gauge based pressure sensor and demonstrate available tools to aid in such a design.

**Background:** The [6183D](#) is a pressure sensor popular in the medical industry. An excerpt from the sensor's data sheet is shown in the following image.

## Cavity Pressure Sensor

Type 6183D...

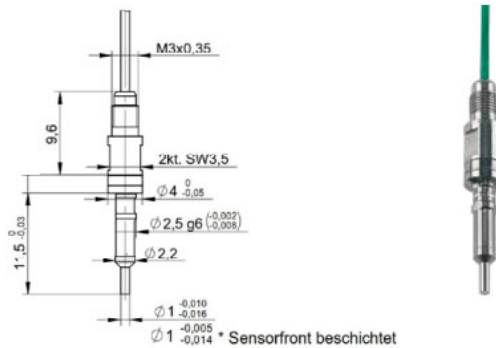
### with front Ø1 mm

Miniaturized piezoelectric sensor with single-wire technology for mold cavity pressures up to 2 000 bar in the injection molding of plastics.

- Ideally suited for industrial applications
- Designed without a diaphragm and with a level, machinable front face
- Also available with TiCN coated face for abrasive plastics
- Exchangeable cable
- With unified sensitivity
- IP67 protected

#### Description

The cavity pressure sensor Type 6183D ... is a direct measuring piezoelectric sensor with a front surface of 1 mm diameter. Its front surface is installed with contact to the melt. For abrasive melts (glass fibers etc.) a TiCN coated version is offered. On the uncoated versions, the front can be machined up to 0,5 mm to be flush with the cavity wall contour. For these types there is the possibility to mount a keyway pin to prevent the sensor from rotating in the mounting bore. Type 6183D... is delivered with unified sensitivity. The maximum deviations of the sensitivities are ± 3% of the nominal sensitivity (2,25 pC/bar). This simplifies the interchangeability of sensors, as the nominal sensitivity can be used. All versions with replaceable cable are IP67 protected. Type 6183D... is available in several different mounting styles as well as different cable types, so that an easy and flexible integration in each mold environment can be achieved. See page 3.



#### Technical data

Range	bar	0 ... 2 000
Overload	bar	2 500
Sensitivity	pC/bar	≈ -2,25
Linearity, all ranges	% FSO	≤ ±1
Operating temperature range		
Mold (Sensor, cable, connector)	°C	0 ... 200*
Melt (on sensor front face)	°C	<450
Insulation resistance		
at 20 °C	TΩ	>10
at 200 °C	TΩ	>1

\* During machine down-time, the mold temperature may be allowed to rise to 240 °C without damaging the sensor. However, measuring errors may occur