

MicroMeltSensor

Type 4004A

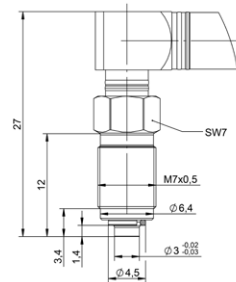
for melt pressure and temperature measurements

With piezo resistive-sensor element for applications with small spaces and high temperatures like hot runners and 3D printing nozzles.

- Most compact dimensions on the market for continuous measuring under high temperatures
- Suitable for filled materials
- Easy maintenance and replacement of sensor and signal conditioner
- No harmful medium for pressure transmission
- High-frequency range

Description

The MicroMeltSensor is a miniaturized, low-mid- and high-pressure measuring chain for high-temperature applications. The design is based on the piezoresistive measurement principle. It, therefore, includes a signal conditioner which is matched to its sensor. The measuring chain allows both pressure and temperature to be measured simultaneously at the same position in the nozzle or hot runner manifold. The pressure is transferred directly to the high-temperature measuring element via a sealed diaphragm.



Application

The MicroMeltSensor is well suited for melt pressure and temperature measurements in hot runner systems and 3D printers where little space is available. The piezoresistive measuring principle allows continuous measuring over a nearly infinite measuring time. Moreover, the excellent repeatability in the whole range and the high accuracy enable it to detect instabilities in the process and adjust them, before the quality is affected.

Technical data

Pressure

Channel 1	bar	0 ... 2 500 (FSO)
	bar	0 ... 1 000 (FSO)
Channel 2	bar	0 ... 1 000 (FSO)
	bar	0 ... 500 (FSO)
Overload	bar	3 000
Output	V	0 ... 10 (FSO)
Repeatability (Tref.)	% FSO	<0.1
Reference temperature (Tref.)	°C	25°C
Linearity (BSL)	% FSO	<1
Hysteresis	% FSO	<1
Zero-point offset (Reset)	mV	<±20
Thermal zero-point change (70 ... 350°C)	% FSO	<±0.5
Interference Frequency (0.1 Hz ... 1 Mhz)	mV _{pp}	<20
Natural frequency	kHz	100

Temperature

Channel 3	°C	0 ... 350 (FSO)
Output	V	0 ... 3.5 (FSO)

Electrical

Max current output signal	mA	5
Output impedance signal	Ω	10
Resolution signal	mV	±5
Supply voltage	VDC	18 ... 30
Power consumption max.	mA	<40
Tare signal	VDC	>3.2 ... 30

Physical

Weight	g	150
Protection (EN 60529) sensor	IP	60
Protection (EN 60529) signal conditioner	IP	65

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This information corresponds to the current state of knowledge. Kistler reserves the right to make technical changes. Liability for consequential damage resulting from the use of Kistler products is excluded.

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Mounting

Sensor placement

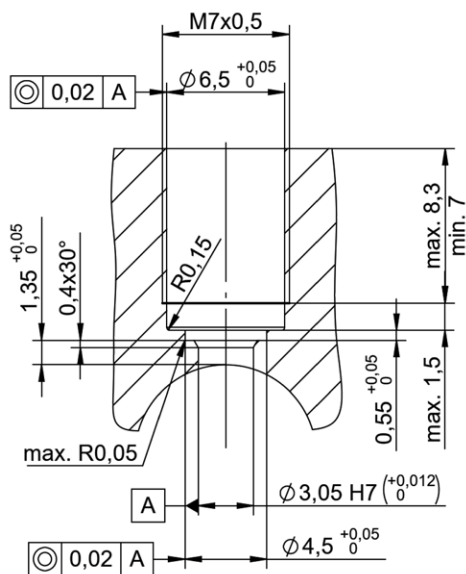
The sensor produces the most relevant data when it is the closest to the produced part. If the sensor is placed into the hot runner nozzle, and more than one nozzle is equipped with a sensor, then the sensor positioning within that nozzle should be the same.

For measurements above 1 000 bar, a steel strength of about 1 000 Mpa and higher plus a min dept of the tread of 7 mm is required to guarantee a correct placement. It depends on the use-case if one, or several sensors should be installed. This can differ significantly depending on the application. Examples for this are:

- the assesment of the melt quality
- behavior of the needles during closing and opening
- cascade injection molding
- pressure differences between machines

Optionally, Kistler can support provide the separate service of risk analysis (see order numbers under optional accessories).

Bore



Sensor installation

To install the sensor in the bore, the sensor and the mounting bore need to be in the same temperature range ($\pm 5^\circ\text{C}$) before tightening the sensor with a torque of 7 N·m. After the installation and the reaching of the working temperature, a tare of the signal is necessary. Only the ambient air pressure must be applied to the sensor during the tare.

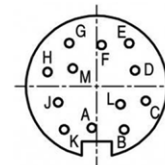
Installation of the signal conditioner

The signal conditioner delivers 3 Signals (two times pressure, one-time temperature). There are two grounds to protect the signal from the influences of the power supply. If possible, they (power and signal) should be connected separately.

The tare connection can be used to tare the sensor over the connected device.

A cable with a suitable D-SUB 15-pin connector for ComoNeo/ComoScout or with open flying leads can be ordered separately.

Electrical connection



Pin	Signal	Wire color
A	Exct GND	white
B	Signal GND	brown
C	Tara	green ***
D	Signal Out 1 (pressure)	yellow
E	Signal Out 2 (pressure)	grey
F	n.c.	pink
G	n.c.	blue
H	+Exct 18 ... 30 VDC	red
J	Signal Out 3 (Temperature)	black

*** if connected, the manual connector must not used anymore.

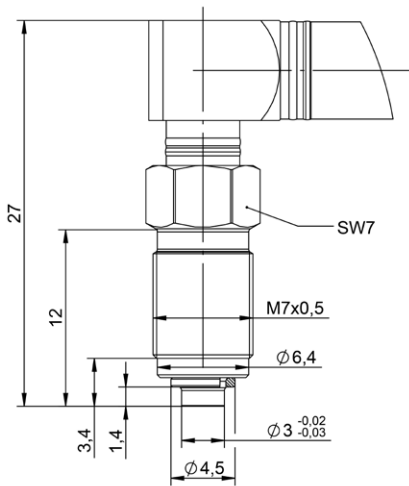
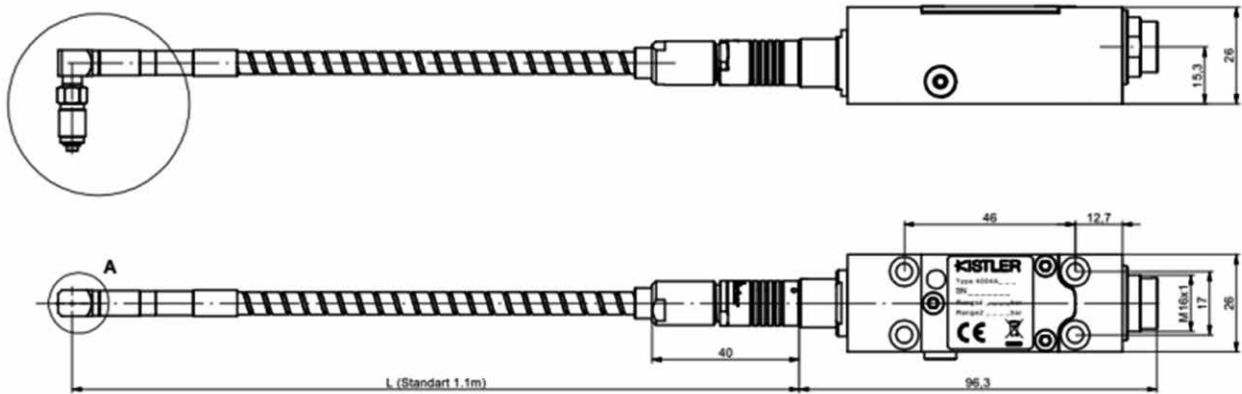
The cable shielding must be connected to the ground to protect the signal wires from electromagnetic interference. Grounds should always be on the same level to avoid interference in the signal.

Temperature range

The sensor can withstand temperatures of up to 350°C. The cable between sensor and signal conditioner is suitable for temperatures of up to 300°C. To extend the distance further, the cable Type 4785A... can be used, which is available as optional accessory. It can be used for up to 200°C.

IMPORTANT: The signal conditioner is only allowed to be used up to 75°C!

Dimensions



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Included accessories

- Sensor with signal conditioner
- M4 fixing screws

Type/Mat. No.

4004A...
65012704

Ordering key

Type 4004A

Pressure channel 1 / 2

Measuring range 2 500 bar / 1 000 bar	251
Measuring range 1 000 bar / 500 bar	105

Optional accessories

(Connecting cable signal conditioner – A/D converter with open ends)

Cable length options:

- Cable length 2 m 1200A227A2
- Special cable length 1 m ... 30 m 1200A227ASp

(Connecting cable between two signal conditioner and ComoNeo/Scout with D-SUB 15-pin connector)

- Cable length 2 m 1200A229A2

(Extension cable sensor – signal conditioner)

- Cable length 1 m 4785A41-1,00
- Cable length 2 m 4785A41-2,00
- Cable length 5 m 4785A41-5,00

(Assembly tools)

- Torque wrench 1300A4004
- Open-end insert for torque wrench 1300A4004SW7
- Tool for the removal of the seal out of the bore 4193Q03
- Seal 55189010

(Riskanalysis service)

- Standard 44002541
- Professional 44002542
- Premium 44002543