

Melt Temperature Sensors



- Suitable for installation in machine nozzles and hotrunner manifolds
- Ideal reference temperature for viscosity measurement in the mold
- Front diameter: 1 mm
- Machinable sensor front
- Hardened sensor front to hold up longer to abrasive and filled materials
- Robust industrial design with special seal for high temperatures and high pressures

Description and Application

The injection molding process is a thermodynamic process in which the plastics pass different aggregate states. The quality of the manufactured molded parts depends primarily on the pressure and temperature conditions.

The temperature of the material in the different stage of molding will determine the quality of the part that is produced.

Melt temperature sensors are used in areas where the plastic melt does not solidify, but permanently stays in a viscous condition. For this reason the melt temperature can be described as a material parameter while the cavity temperature represents a real process parameter. Melt temperatures are therefore suitable to be used as reference values for viscosities determined by PRIAMUS systems in the mold or in general for the evaluation and monitoring of material properties during the injection molding process.

Cavity temperature sensors however are applied directly in the cavity of an injection mold and usually touch the solidifying plastic melt as soon as it reaches the sensor position. This way both, the mold surface temperature of the cavity wall as well as the temperature change upon arrival of the melt at the sensor can be determined. The automatic detection of the melt front allows a number of control methods, such as the automatic switchover to holding pressure or the automatic balancing of multi cavity molds.

The melt temperature measurement with type 4050A is based on a measurement at the bore hole wall of the melt channel. It can therefore be applied universally and independently from the diameter of the nozzle or the hot runner manifold and is always related to the same reference point. Alternative methods measured inside of the melt are not universally applicable due to the different diameters of the melt channels and because the exact measuring point inside of the melt is not exactly defined. Furthermore the melt flow might be disrupted by using intrusive sensors which can lead to significant measuring errors and also to degraded material.

The melt temperature sensor has been designed for the measurement of melt temperatures in machine nozzles and hotrunner manifolds. Due to its robust and industrial design it is suitable for almost all applications in this area. The hardened sensor front allows the sensor to be used for filled and abrasive plastic melts and guarantees a longer sensor life. The special seal ensures that no leakage occurs even with high pressures as they are common in the nozzle and in the manifold.

Sensor Mounting

The mounting of the sensors occurs with a mounting nut.

With the use of a hotrunner manifold the guidelines of cavity temperature sensors apply:

During the mold design, it is important to ensure that the sensor cable is not too short and the connector can be mounted on the side of the mold. The excess cable length must be placed in the cable channel. By using the PRIAMUS® Multi Channel Connecting Boxes the remaining cable length can be placed into the connecting box.

The sensor connections should not be placed under the connections of the water lines.

The angles in the mold, around which the cables are placed, must be added with a phase ($3 \times 45^\circ$) or a radius (R2), therefore the cable will not be damaged.

The protecting cap has to be fixed on the mounting plate of the connector and should not be placed too close to the parting line of the mold so the connector does not get crushed by the mold closing.

Handling and Cleaning

The contact plug must be kept clean and dry to avoid false signals.





In the not connected status the protecting cap for the sensor must be plugged on. In the connected status the protecting cap will be connected with the cap of the connecting cable, therewith defilements in the protection caps will be avoided.



The sensors with mounted connecting cable can be cleaned in an ultrasonic bath (aqueous tenside solution) if a sealed protecting cap for the connector is used. The cleaning of the sensor front with dry ice is also possible.

Technical Data

Properties	Unit	Specifications
Thermocouple (not insulated)	type	N
Colors / polarity according to IEC 584-3	pink (NiCrSi) white (NiSi)	positive negative
Class		1
Maximum deviations according to IEC 584-3	(-40 ... 1000 °C)	$dT = \pm 0.004 \times T$ or $\pm 1.5 \text{ K}$
Standard operating temperature (sensor front)	°C	up to 600
Operating temperature range (cable)	°C	0 ... 450
Operating pressure range	bar	0 ... 2'000
Bending radius	mm	min. 21.75

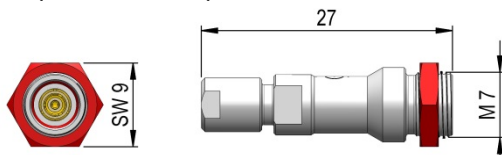
Variants

Type	Cable length in [m]	Connector	Bending radius	Connection to
4050Ax.x-101-H  	x.x = 0.2 / 0.4 / 0.6 / 0.8 / 1.0 / 2.0 / 3.0 / 4.0 / 5.0	Fischer KBE 101 fem., TRIAX	8 mm	Multi Channel Connecting Box 1194A-8T or Connecting cable 1141Ax 1149Bx
4050Asl-101-H  	sl = special length			Multi channel connecting cable 1144Ax 1145Ax 1147Bx

Explanation: With hardened sensor front: , With machinable sensor front: 

One Pin TRIAX Connector

Easy connection by TRIAX format

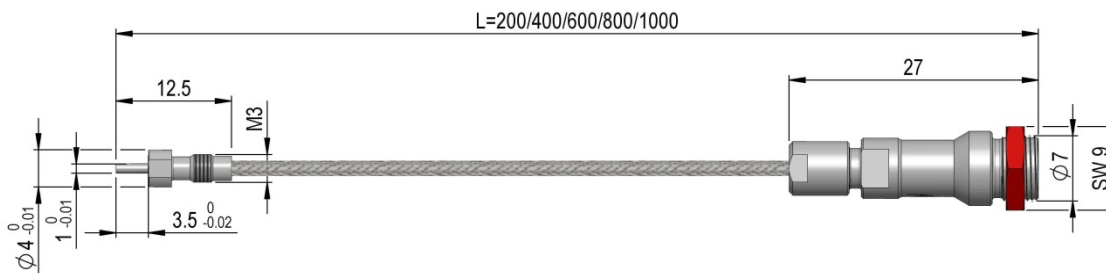


Fischer Type KBE 101 female TRIAX

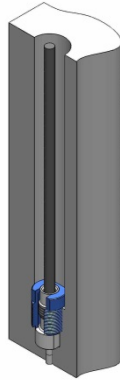
Dimensions Melt Temperature Sensor with Cable and Connector

Type 4050Ax.x-101-H with machinable sensor front

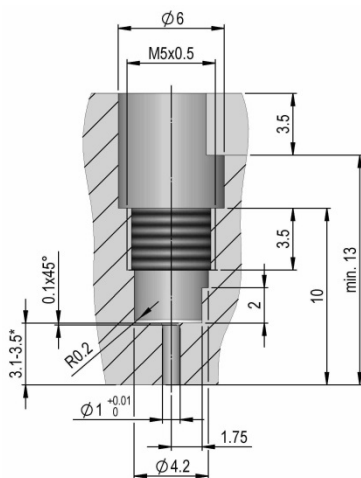
The dimension from the lowest point of manufacturing to the sensor shoulder must imperatively be manufactured 3.1 mm +0.1/-0.



Example for Installation Situation with Mounting Nut



Mounting Holes for Mounting Nut Mounting



* = Adjust dimension

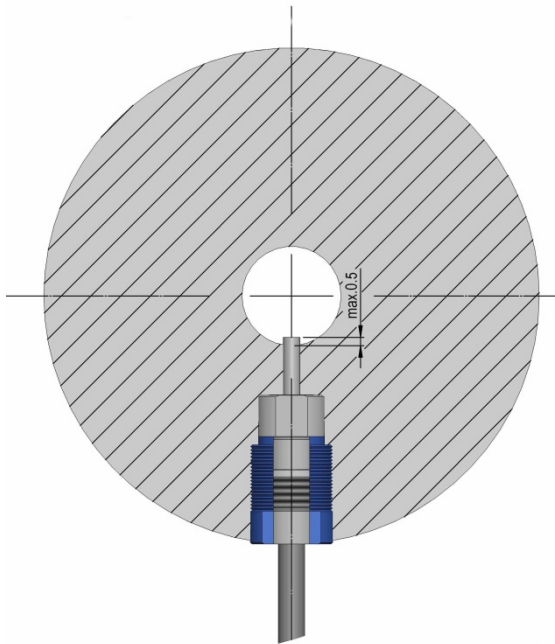
Mounting of the Melt Temperature Sensors with Mounting Nut

By mounting with mounting nut type 4545A, the sensors should be put in with a tightening torque of 1.0 Nm

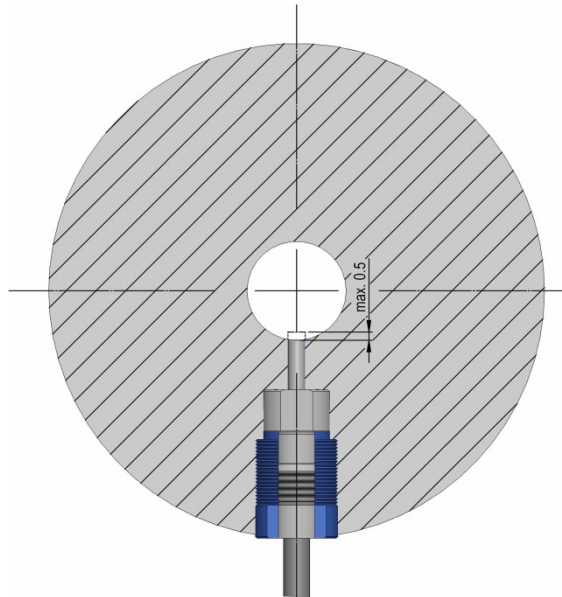
Machining of the Sensor Front

Minimum diameter melt channel = 2.5 mm

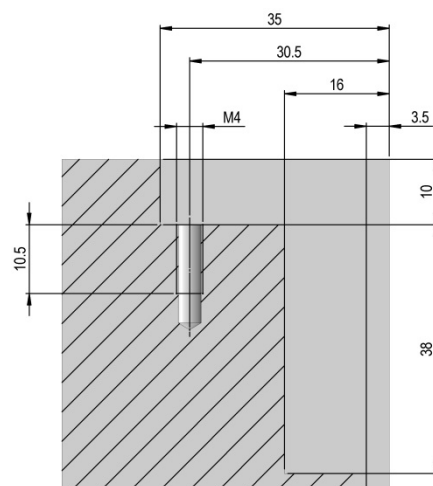
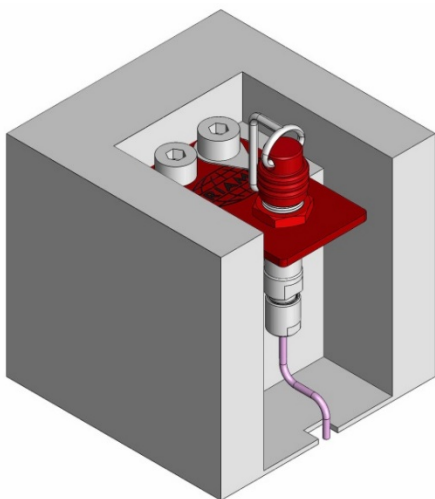
Sensor unmachined



Sensor machined



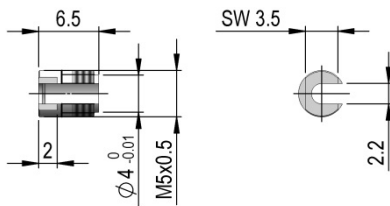
Installation Situation – Connector with Mounting Plate



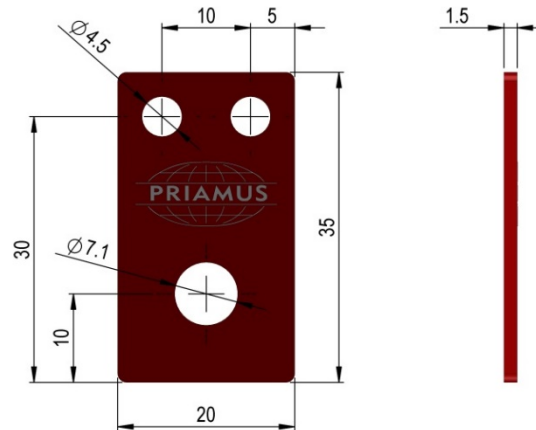
Scope of Delivery

Article	Type	Article	Type
Mounting nut	4545A	Identification plate	-
Mounting plate	4584A		

Mounting nut type 4545A



Mounting plate type 4584A



Accessories (optional)

Connecting and extension cables

Type	Coat material	Bending radius [mm]	Connector ¹⁾ TRIAx / ²⁾ Code 2	Number of channels
Connecting cables:				
1141Ax	Plastic	11	Fischer Type S 101 male ¹⁾ Fischer Type S 101 male ¹⁾	1
1149Bx	Metal hose	20	Fischer Type S 101 male ¹⁾ Fischer Type S 101 male ¹⁾	1
Multi pin connecting cables:				
1144Ax	Plastic	50	Fischer Type S 104 fem. 19-pin ²⁾ Fischer Type S 104 fem. 19-pin ²⁾	8
1145Ax	Plastic	11	Fischer Type S 104 fem. 19-pin ²⁾ 1 x Fischer Type S 101 male ¹⁾	1
1147Bx	Plastic	11 (bundled: 25)	Fischer Type S 104 fem. 19-pin ²⁾ 4 x Fischer Type S 101 male ¹⁾	4
Extension cable:				
1142Bx	Metal hose	20	Fischer Type S 101 male ¹⁾ Fischer Type KBE 101 fem ¹⁾	1

Article	Type
Mounting / extraction tool for sensor	4576A
Dummy	4550A
BlueLine temperature amplifier	5080A-xT

Article	Type
Assembly tool for mounting nut	4575B
Multi channel connecting box	1194A-8T
BlueLine charge and temperature amplifier	5070A-2p2T