

# p-T-Sensor

Type 6188AA...

## for Mold Cavity Pressure and Temperature with Front $\varnothing 1$ mm

Sensor for combined measuring of mold cavity pressure up to 2 000 bar and contact temperature in the cavity is designed for injection molding of plastics. Design without diaphragm but with flat front.

- Pressure sensor with integrated thermocouple for pressure and temperature measurement
- Mounting dimensions compatible with Kistler pressure sensor Type 6183A...
- Sensor cable replaceable by Kistler factory

### Description

The Sensor for mold cavity pressure and temperature has a front diameter of 1 mm.

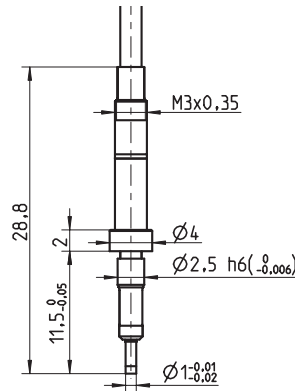
The pressure acts over the entire front of the sensor and is transmitted to the crystal measuring element, which produces a proportional electric charge ( $pC = \text{Picocoloumb}$ ). This is converted into a voltage 0 ... 10 V in the amplifier and is then available as an amplifier output.

The contact temperature of the melt is measured on the front of the sensor by one pair of thermocouples, type K (NiCr-Ni). The sensor front can not be machined. The small sensor dimensions result in a short response time of the temperature sensor. The rugged combi-cable feeds the pressure signal as well as the temperature signal to two connectors.

Sensors without connectors Type 6188AAG are available for multi-cavity molds. The charge cable can then be connected to the multi-channel connector Type 1708A... or 1710A... and the two temperature conductors to the temperature amplifier Type 2205A... .

### Application

Suggested applications are complex and compact injection molds in the field of medical, electrical and precision molding industries. The sensor measures the mold cavity pressure and the contact temperature of the molding in the cavity. It is suitable in



industrial applications for optimising monitoring and controlling the injection molding of thermoplastics and elastomers. The additional temperature data provides valuable process information. This is particularly useful in the analysis of part dimensions, as well as in the evaluation of knit lines in components.

### Technical Data

Range	bar	0 ... 2000
Overload	bar	2500
Sensitivity	pC/bar	$\approx -4,8$
Linearity, all ranges	%FSO	$\leq \pm 1$
Thermocouple, Type K		NiCr-Ni
Operating temperature range		
Mold (Sensor, cable, connector box)	$^{\circ}C$	*0 ... 200
Melt (at the front of the sensor)	$^{\circ}C$	<450
Insulation resistance		
at 20 $^{\circ}C$	T $\Omega$	100
at 200 $^{\circ}C$	T $\Omega$	1

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

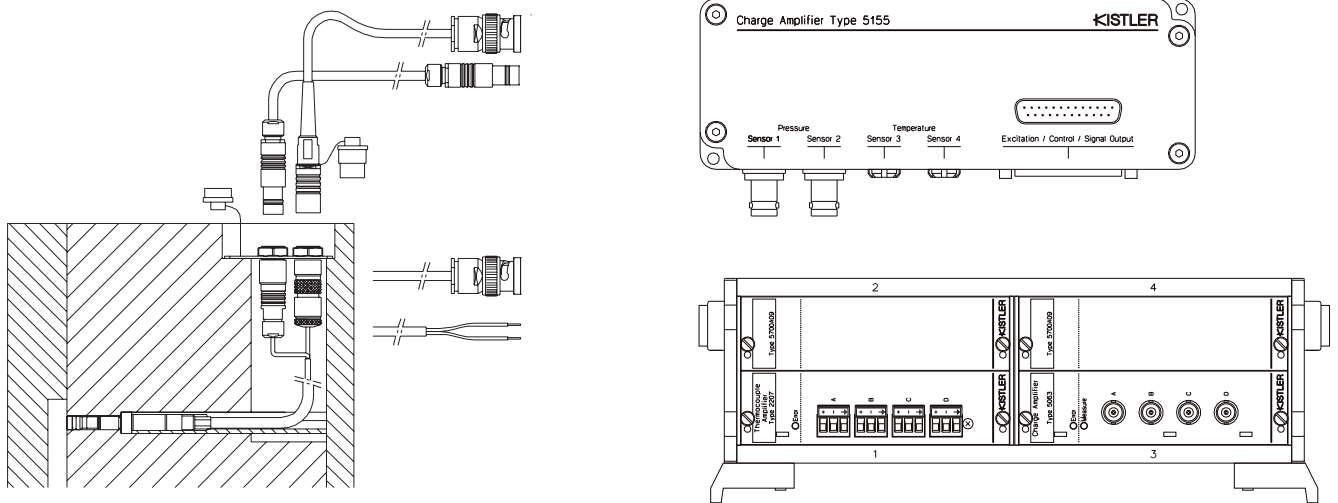
6188AA\_000-887e-01.11

**QUALITY MOLDING**  
powered by Kistler

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.

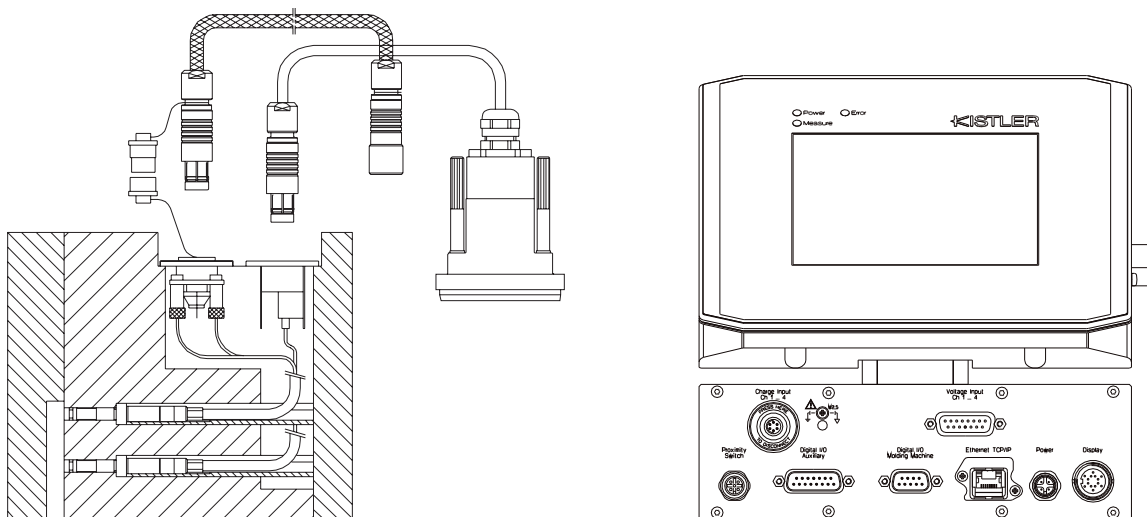
©2010 ... 2011, Kistler Group, Eulachstrasse 22, 8408 Winterthur, Switzerland  
Tel. +41 52 224 11 11, Fax +41 52 224 14 14, info@kistler.com, www.kistler.com  
Kistler is a registered trademark of Kistler Holding AG.

**Cable and Amplifier for Measuring Chain with Sensor Type 6188AA...**



Cable Type 1667B... (BNC connector) for charge	Cable Type 1672B... (TNC connector) for charge	Compensating Line Type 2295A... for Temperature	Compensating Line Type 2290A... (Open Ends) for Temperature
Type 5155AxxBx	Type 5155AxxAx	Type 5155AxxAx	Type 2207A in Type 2859A...
Type 5155AxxDx	Type 5155AxxCx	Type 5155AxxBx	Type 2207A in Type 2865A...
Type 5063A1 in Type 2859A...		Type 5155AxxCx	
Type 5063A1 in Type 2865A...		Type 5155AxxDx	

Fig. 1: Sensor Type 6188AA... with charge and temperature amplifier Type 5155A... or signal conditioner Type 2859/2865A...



4-Channel Cable Type 1995A... to Connector Type 1708A... for Charge	4-Channel Cable Type 1457A1A... to Temperature Amplifier Type 2205A... for Temperature
Type 2869A/B0xx	Type 2869A1xx
Type 2869A/B1xx	Type 2869B...

Fig 2: Sensor Type 6188AA... with monitoring system CoMo Injection Type 2869...

6188AA\_000-887e-01.11

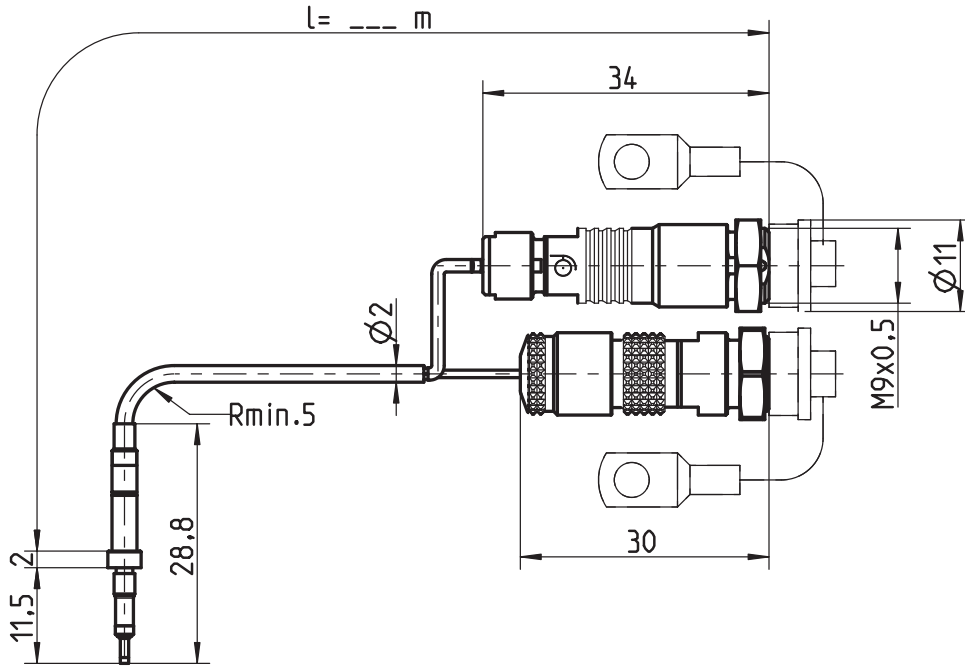


Fig. 3: Sensor Type 6188AA... with connectors for pressure and temperature signal

**Installation Examples**

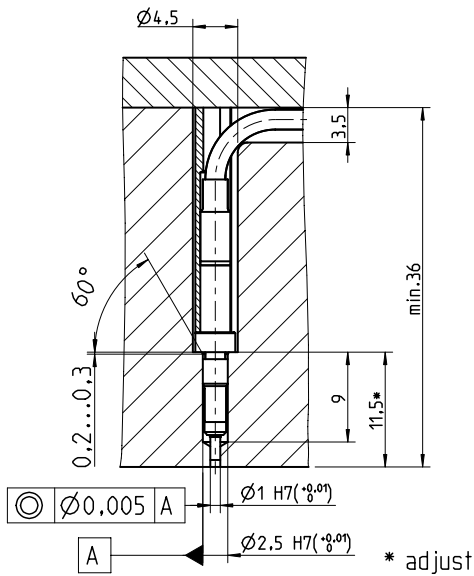


Fig. 4: Mounting with spacer sleeve Type 6464A3

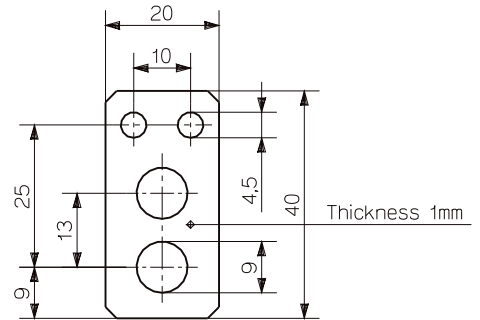


Fig. 5: Mounting plate (Art. No. 3.520.1015)

6188AA\_000-887e-01.11

### Mounting

The sensor is installed with the spacer sleeve Type 6464A3 in the stepped hole.

Since the sensor forms part of the cavity wall, it must be installed in such a way that its front is exactly flush. The sensor is centered in the diameter 2,5 mm/H7 hole.

The cable must be installed completely in the mold. The two connectors are attached in the mounting plate which is mounted into the mold.

The combi-cable uses the single-wire technique, i.e. the pressure signal is transferred via a single cable and the mold acts as a shield.

### Accessories Included

	Type/Art.No.
• Spacer sleeve (L = 50 mm)	6464A3
• Mounting plate	3.520.1015
• Connector (charge)	5.511.364
• Connector (temperature)	5.511.246
• Cap (2 pieces)	7.621.115
• Checking tool	3.050.241
• Identification plate	3.520.1016

### Optional Accessories

	Type/Art.No.
• High-temperature extension cable (pressure) Fischer SE102 A014 – BNC pos. Length 2 m	1667B2
Length 5 m	1667B5
• High-temperature extension cable (pressure) Fischer SE102 A014 – TNC pos. Length 2 m	1672B2
Length 5 m	1672B5
• Compensation lead (Temperature) Connection for Type 5155A... Length 2 m	2295A2
Length 5 m	2295A5
• Compensation lead (Temperature) One way open ended Length 2 m	2290A2
Length 5 m	2290A5
• Extraction tool	1358A
• Dummy sensor	6579

### Optional connectors and temperature amplifiers

To be used only with Type 6188AAG

• 4-channel connector (charge)	1708A...
• 8-channel connector (charge)	1710A...
• 2-channel temperature amplifier	2205A121
• 2-channel temperature amplifier	2205A141
• Cable stripping tool	1367

### Ordering Key

Type 6188A		<input type="checkbox"/>	<input type="checkbox"/>
Basic Type	A	↑	↑
Cable length (L = 0,4 m)	0,4		
Cable length (L = 0,8 m)	0,8	↑	↑
Cable length (L = 1,2 m)	1,2		
Cable length (L = 1,6 m)	1,6		
Cable length (L = 2,0 m)	2		
Combi-cable with special length, specify cable length L in m (L <sub>min</sub> = 0,15 m / L <sub>max</sub> = 3,5 m)	sp	↑	↑
Sensor without connector, Cable length l = 2,0 m	G		

# p-T-Sensor

Type 6189A...

## for Mold Cavity Pressure and Temperature with Front $\varnothing 2,5$ mm

Sensor for combined measuring of mold cavity pressure up to 2 000 bar and contact temperature in the cavity is designed for injection molding of plastics. Design without diaphragm but with flat front.

- Pressure sensor with integrated thermocouple for pressure and temperature measurement
- Mounting dimensions compatible with Kistler pressure sensors 6182A and 6158A...
- Sensor cable replaceable by Kistler factory

### Description

The Sensor for mold cavity pressure and temperature has a front diameter of 2,5 mm.

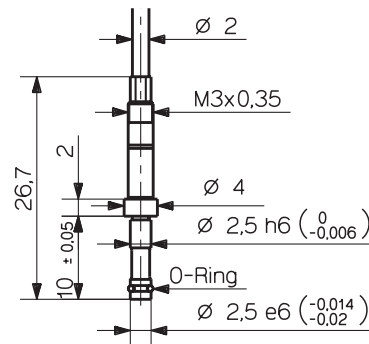
The pressure acts over the entire front of the sensor and is transmitted to the quartz measuring element, which produces a proportional electric charge (pC = Picocolomb). This is converted into a voltage 0 ... 10 V in the amplifier and is then available as an amplifier output.

The contact temperature of the melt is measured on the front of the sensor by one pair of thermocouples, type K (NiCr-Ni). The sensor front can not be machined. The small sensor dimensions result in a short response time of the temperature sensor. The rugged combi-cable feeds the pressure signal as well as the temperature signal to two connectors.

Sensors without connectors Type 6189AG are available for multi-cavity molds. The charge cable can then be connected to the multi-channel connector Type 1708A... or 1710A and the two temperature conductors to the temperature amplifier Type 2205A... .

### Application

The sensor measures the mold cavity pressure and the contact temperature of the molding in the cavity. It is suitable in industrial applications for optimising monitoring and controlling the injection molding of thermoplastics and elastomers. The addi-



tional temperature data provides valuable process information. This is particularly useful in the analysis of the surface of the molding, as well as in the evaluation of knit lines in components with long flow paths.

### Technical Data

Range	bar	0 ... 2000
Overload	bar	2500
Sensitivity	pC/bar	-6,5
Linearity, all ranges	%FSO	$\leq \pm 1$
Thermocouple, Type K		NiCr-Ni
Operating temperature range		
Mold (Sensor, cable, connector box)	$^{\circ}\text{C}$	*0 ... 200
Melt (at the front of the sensor)	$^{\circ}\text{C}$	<450
Insulation resistance		
at 20 $^{\circ}\text{C}$	T $\Omega$	100
at 200 $^{\circ}\text{C}$	T $\Omega$	1

\* During machine down-time, the mold temperature may be allowed to rise to 240  $^{\circ}\text{C}$  without damaging the sensor. However, measuring errors may occur.

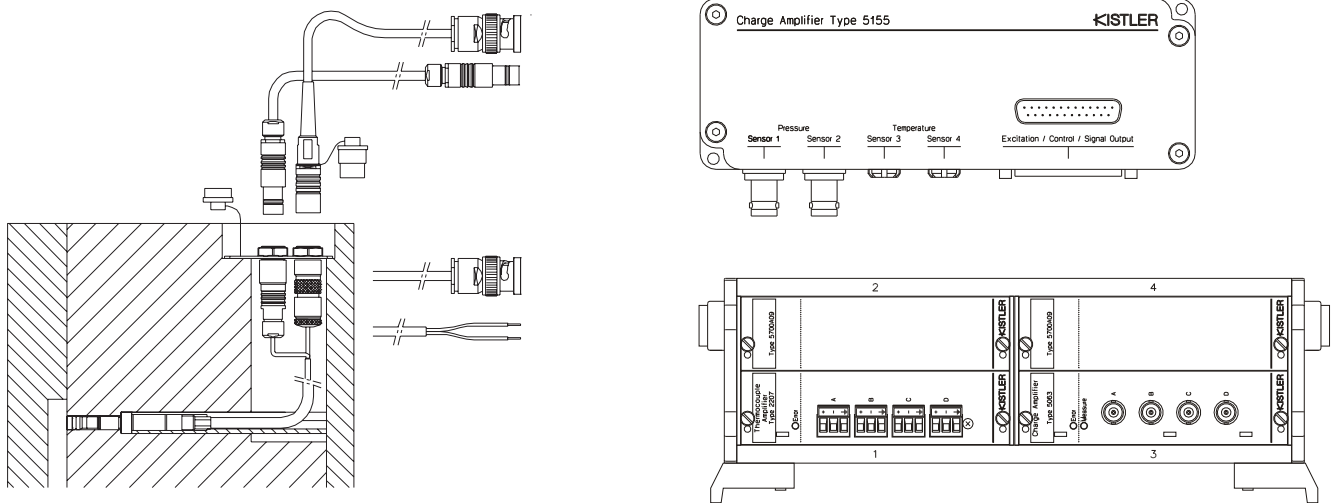
6189A\_000-536e-02.11

**QUALITY MOLDING**  
powered by Kistler

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.

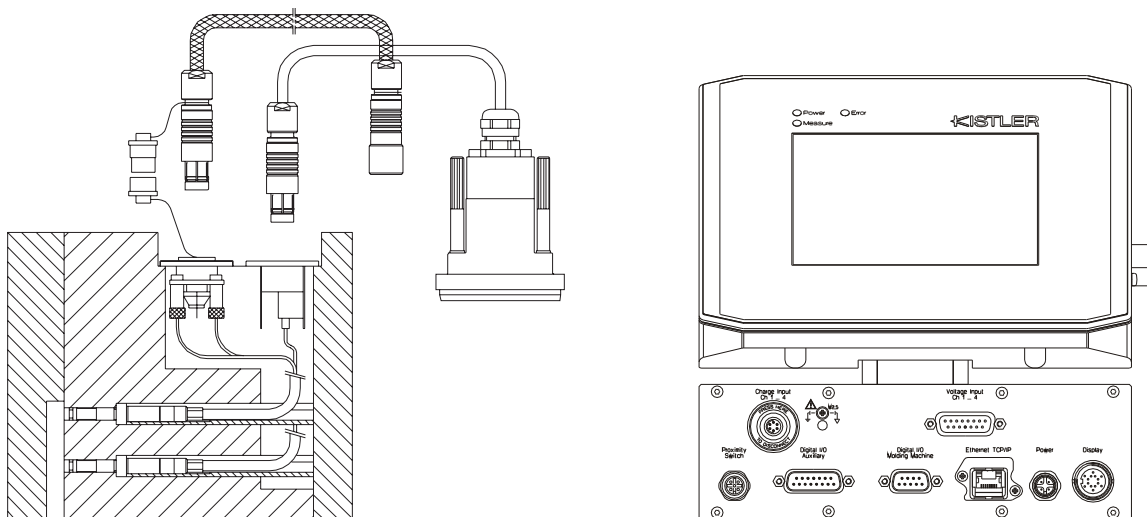
©2006 ... 2011, Kistler Group, Eulachstrasse 22, 8408 Winterthur, Switzerland  
Tel. +41 52 224 11 11, Fax +41 52 224 14 14, info@kistler.com, www.kistler.com  
Kistler is a registered trademark of Kistler Holding AG.

**Cable and Amplifier for Measuring Chain with Sensor Type 6189A...**



Cable Type 1667B... (BNC connector) for charge	Cable Type 1672B... (TNC connector) for charge	Compensating Line Type 2295A... for Temperature	Compensating Line Type 2290A... (Open Ends) for Temperature
Type 5155AxxBx	Type 5155AxxAx	Type 5155AxxAx	Type 2207A in Type 2859A...
Type 5155AxxDx	Type 5155AxxCx	Type 5155AxxBx	Type 2207A in Type 2865A...
Type 5063A1 in Type 2859A...		Type 5155AxxCx	
Type 5063A1 in Type 2865A...		Type 5155AxxDx	

Fig. 1: Sensor Type 6189A... with charge and temperature amplifier Type 5155A... or signal conditioner Type 2859/2865A...



<b>4-Channel Cable Type 1995A... to Connector Type 1708A... for Charge</b>	<b>4-Channel Cable Type 1457A1A... to Temperature Amplifier Type 2205A... for Temperature</b>
Type 2869A/B0xx	Type 2869A1xx
Type 2869A/B1xx	Type 2869B...

Fig 2: Sensor Type 6189A... with monitoring system CoMo Injection Type 2869...

6189A\_000-536e-02.11

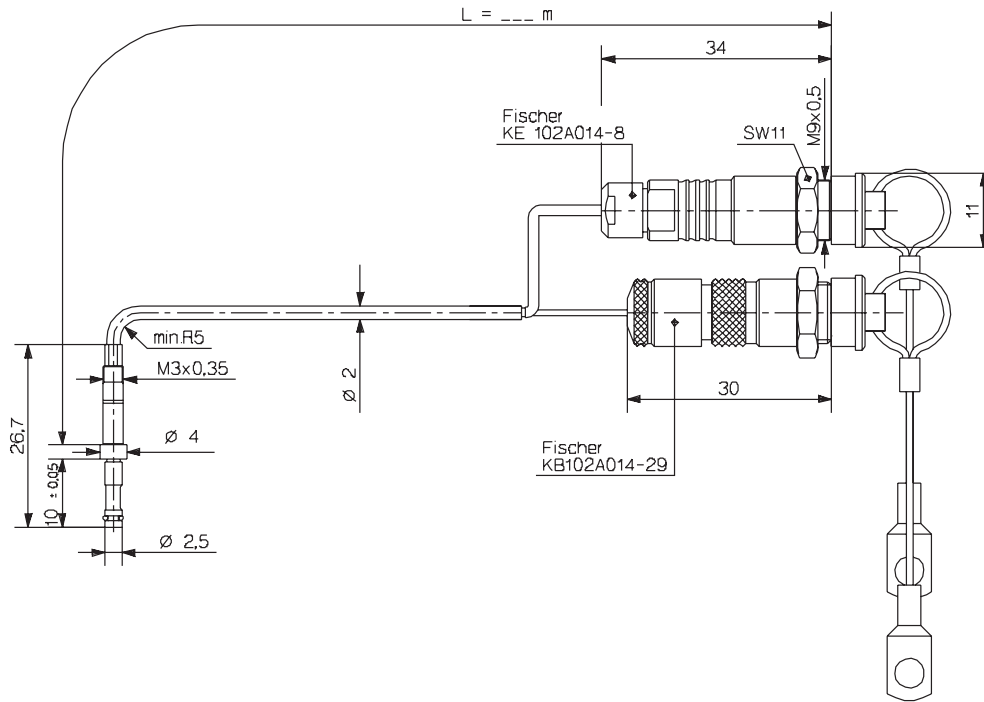


Fig. 1 : Sensor Type 6189A... with connectors for pressure and temperature signal

### Installation Examples

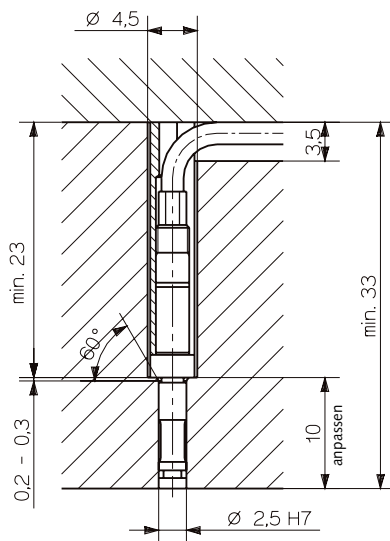


Fig. 2: Mounting with spacer sleeve Type 6464A3

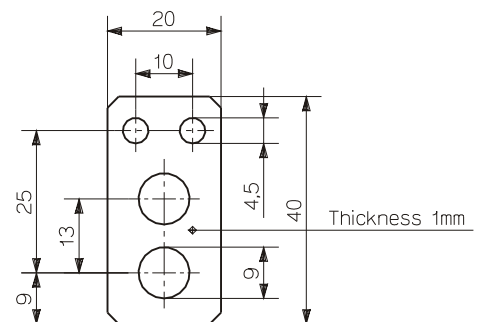


Fig. 3: Mounting plate (Art. No. 3.520.1015)

## Mounting

The sensor is installed with the spacer sleeve Type 6464A3 in the stepped hole.

Since the sensor forms part of the cavity wall, it must be installed in such a way that its front is exactly flush. The sensor is centered in the diameter 2,5 mm/H7 hole.

The cable must be installed completely in the mold. The two connectors are attached in the mounting plate which is mounted into the mold.

The combi-cable uses the single-wire technique, i.e. the pressure signal is transferred via a single cable and the mold acts as a shield.

## Accessories Included

	Type/Art.No.
• Spacer sleeve (L = 50 mm)	6464A3
• Mounting plate	3.520.1015
• Connector (charge)	5.511.364
• Connector (temperature)	5.511.246
• Cap (2 pieces)	7.621.115
• Checking tool	3.050.243
• Identification plate	3.520.1016
• O-ring	1100A55

## Optional Accessories

	Type/Art.No.
• High-temperature extension cable (pressure) Fischer SE102 A014 – BNC pos. Length 2 m	1667B2
Length 5 m	1667B5
• High-temperature extension cable (pressure) Fischer SE102 A014 – TNC pos. Length 2 m	1672B2
Length 5 m	1672B5
• Compensation lead (Temperature) Connection for Type 5155A...	
Length 2 m	2295A2
Length 5 m	2295A5
• Compensation lead (Temperature) One way open ended	
Length 2 m	2290A2
Length 5 m	2290A5
• Extraction tool	1358A
• Dummy sensor	6558

## Optional connectors and temperature amplifiers

To be used only with Type 6189AG

• 4-channel connector (charge)	1708A...
• 8-channel connector (charge)	1710A...
• 2-channel temperature amplifier	2205A121
• 2-channel temperature amplifier	2205A141
• Cable stripping tool	1367

## Ordering Key

	Type 6189A
Cable length (L = 0,4 m)	0,4
Cable length (L = 0,8 m)	0,8
Cable length (L = 1,2 m)	1,2
Cable length (L = 1,6 m)	1,6
Cable length (L = 2,0 m)	2
Combi-cable with special length, specify cable length L in m ( $L_{min} = 0,15$ m / $L_{max} = 3,5$ m)	sp
Sensor without connector, Cable length l = 2,0 m	G



# p-T-Sensor

Type 6190CA...

## for Mold Cavity Pressure and Temperature with Front $\varnothing 4$ mm

Sensor for the combined measurement of mold cavity pressure up to 2 000 bar and contact temperature in the cavity during the injection molding of plastics. Design without diaphragm and with flat front.

- Pressure sensor with integral thermocouple for pressure and temperature measurement
- Mounting dimensions compatible with Kistler pressure sensors Types 6157B... and 6177A...
- Replaceable connecting cable

### Description

The sensor for mold cavity pressure and temperature measurement has a front face of 4 mm diameter.

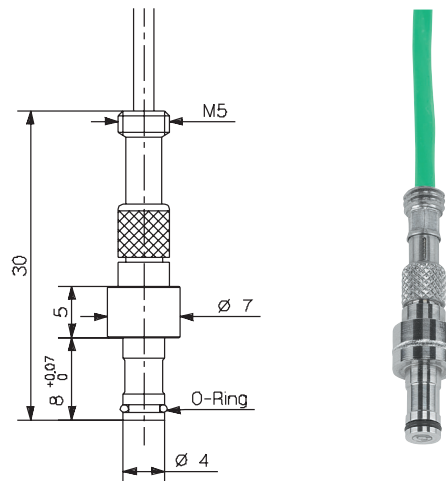
The pressure acts directly on the entire front face of the sensor and is transferred to the crystal force link, which produces an electric charge ( $pC = \text{picocoulomb}$ ) proportional to the pressure. This is converted by an amplifier into a voltage of 0 ... 10 V which is available at the amplifier output.

The contact temperature of the melt is measured on the front side of the sensor by a thermocouple pair Type K (NiCr-Ni). The front face of the sensor cannot be machined. The small sensor dimensions result in a quick temperature-sensor response time. The rugged combi-cable feeds both the pressure signal and the temperature signal to two connectors. The cable is screwed behind the sensor with a union nut and can be exchanged.

Sensors without connectors Type 6190CAG are available for multi-cavity molds. The charge cable can then be connected to the multi-channel connector Type 1708... or 1710... and the two temperature conductors to the temperature amplifier Type 2205A...

### Application

The sensor measures the mold cavity pressure and the contact temperature of the molding in the cavity. It is suitable in industrial applications for optimising monitoring and controlling the injection molding of thermoplastics and elastomers. The additional temperature data provides valuable process information.



This is particularly useful in the analysis of the surface of the molding, as well as in the evaluation of knit lines in components with long flow paths.

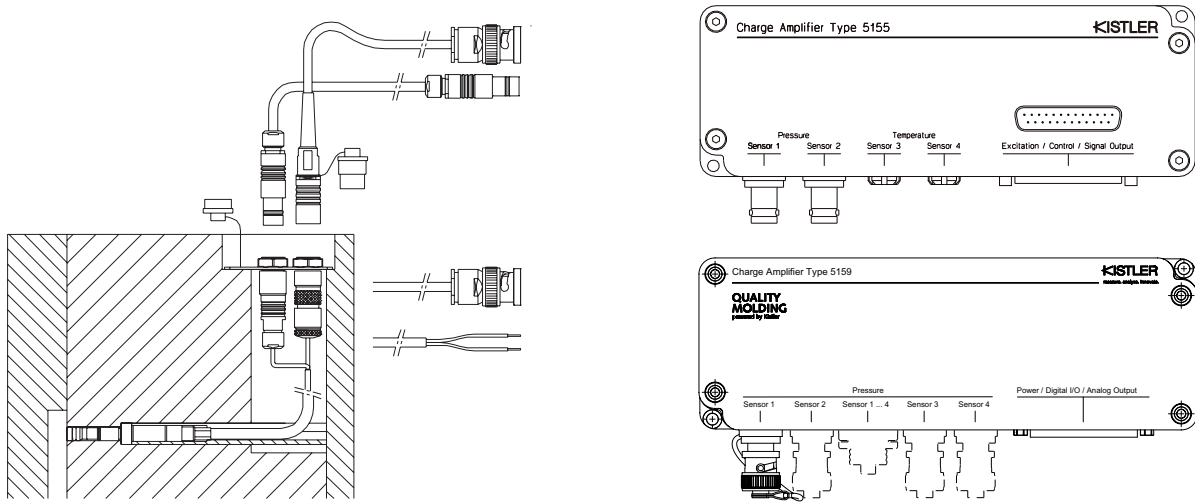
### Technical Data

Range	bar	0 .. 2 000
Overload	bar	2 500
Sensitivity	pC/bar	-9
Linearity, all ranges	%FSO	$\leq \pm 1$
Thermocouple Type K		NiCr-Ni
Leads		
positive	+	green
negative	-	white
Operating temperature range		
Mold (sensor, cable, connector housing)	$^{\circ}C$	*0 ... 200
Melt (at the front of the sensor)	$^{\circ}C$	<450
Insulation resistance		
at 20 $^{\circ}C$	$\Omega$	$>10^{13}$
at 200 $^{\circ}C$	$\Omega$	$>10^{12}$

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

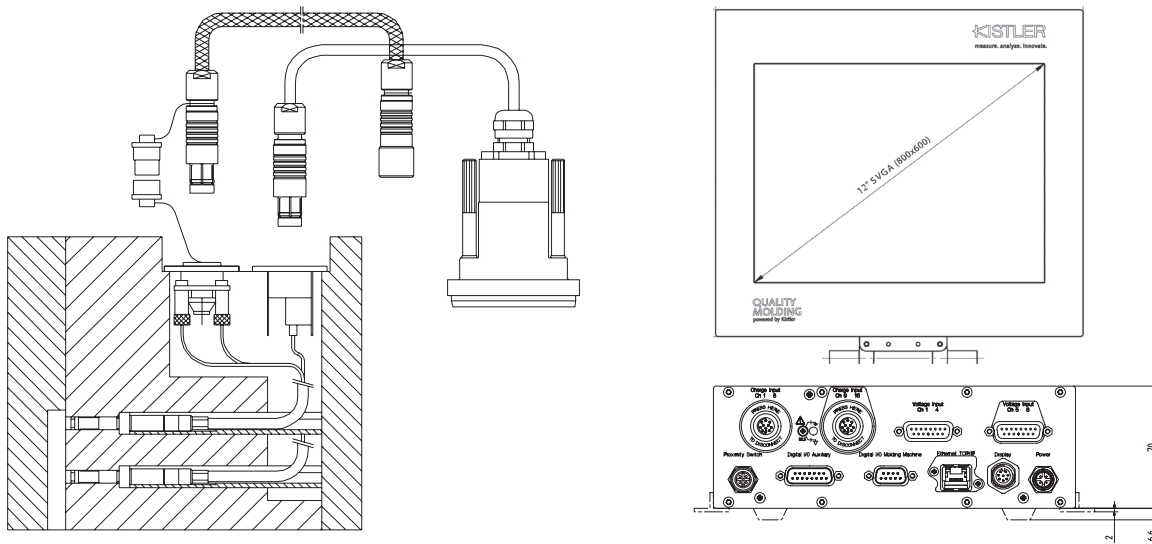
6190CA\_000-680e-01\_14

**Cable and Amplifier for Measuring Chains with Sensor Type 6190CA...**



Cable Type 1667B... (BNC connector) for charge	Cable Type 1672B... (TNC connector) for charge	Compensating line Type 2295A... for temperature	Compensating line Type 2290A... (open ends) for temperature
Type 5155AxxBx/AxxDx	Type 5155AxxAx	Type 5155AxxAx/AxxBx	
	Type 5155AxxCx	Type 5155AxxCx/AxxDx	Type 2205A in Type 2865A...

Fig. 1: Sensor Type 6190CA... with charge and temperature amplifier Type 5155A...



4-channel cable Type 1995A... to connector Type 1708... for charge	4-channel cable Type 1457A1A... to temperature amplifier Type 2205A... for temperature
Type 2869B0xx	Type 2869B1xx
Type 2869B1xx	

Fig. 2: Sensor Type 6190CA... with monitoring system CoMo Injection Type 2869A...

6190CA\_000-680e-01\_14

**Mounting Examples**

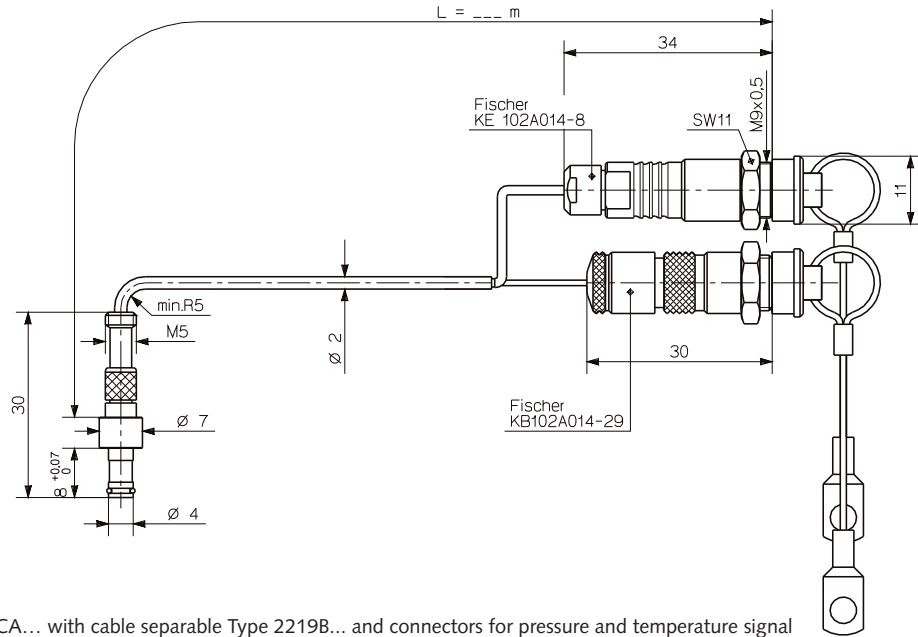


Fig. 3: Sensor Type 6190CA... with cable separable Type 2219B... and connectors for pressure and temperature signal

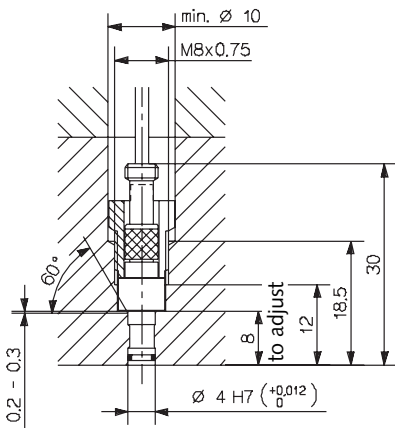


Fig. 4: Mounting with mounting nut Type 6457

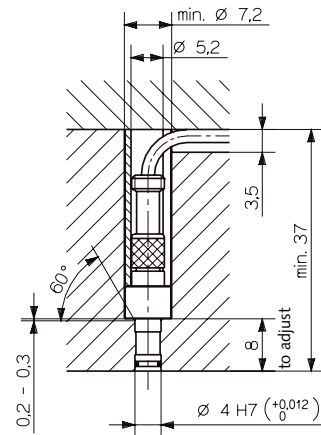


Fig. 5: Mounting with spacer sleeve Type 6459

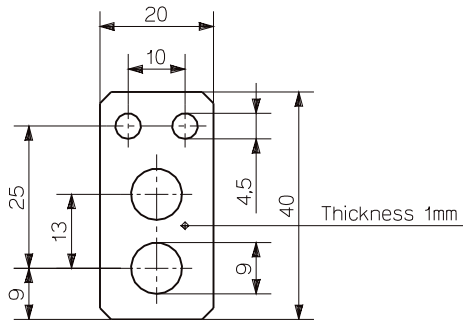


Fig. 6: Mounting plate Art. No. 3.520.1015

6190CA\_000-680e-01\_14

**Mounting**

The sensor is normally installed in the mounting hole with a mounting nut Type 6457. A spacer sleeve Type 6459 can also be used. Since the sensor forms part of the cavity wall, it must be mounted in such a way that its front face is exactly flush. The sensor is therefore center aligned in the hole with 4mm/H7 diameter.

The cable must be mounted completely in the mold. The two connectors are attached in the mounting plate which is inserted in the mold. The multiconductor cable uses the single-wire technique, that is the pressure signal is fed via a single cable and the mold acts as a shield.

**Accessories Included**

	Type/Art. No.
• Mounting nut	6457
• Mounting plate (only for sensor with cable)	3.520.1015
• Connector (charge)	5.511.364
• Connector (temperature)	5.511.246
• Cap	7.621.115
• Identification plate	3.520.1016
• O-ring	1100A57

**Optional Accessories**

	Type
Sensor connecting cable with connectors as spare cable	
• Length l = 0,4 m	2219B0,4
• Length l = 0,8 m	2219B0,8
• Length l = 1,2 m	2219B1,2
• Length l = 1,6 m	2219B1,6
• Length l = 2 m	2219B2
• Length l = 5 m for special cable length	2219Bsp

Sensor connecting cable without connector as spare cable	
• Length l = 2 m	2219BG
• Length l = 5 m for special cable length	2219BG1

High temperature extension cable (pressure) Fischer SE102 A014 – BNC pos.	
• Length l = 2 m	1667B2
• Length l = 5 m	1667B5

High temperature extension cable (pressure) Fischer SE102 A014 – TNC pos.	
• Length l = 2 m	1672B2
• Length l = 5 m	1672B5

Temperature compensation cable for connection to Type 5155A...	
• Length l = 2 m	2295A2
• Length l = 5 m	2295A5

**Optional Accessories**

	Type
Temperature compensation cable	
One way open ended	
• Length l = 2 m	2290A2
• Length l = 5 m	2290A5
• Extraction tool	1315A
• Socket wrench for mounting nut	1383
• Dummy sensor	6545
• Spacer sleeve (length l = 70 mm)	6459

**Optional connectors and temperature amplifiers**

To be used only with Type 6190CAG/G1	
• 4-channel connector (charge)	1708...
• 8-channel connector (charge)	1710...
• 2-channel temperature amplifier	2205A...2...
• 4-channel temperature amplifier	2205A...4...
• Adapterplatte für 2 Stecker	5700A25
• Cable stripping tool	1367

**Checking Tools**

	Art. No.
• Limit plug gage, diameter 4 H7	5.210.162
• Checking tool	7.110.300

**Ordering Key**

Type 6190CA	
<b>Cable Length</b>	
Length l = 0,4 m	0,4
Length l = 0,8 m	0,8
Length l = 1,2 m	1,2
Length l = 1,6 m	1,6
Length l = 2 m	2
Combi-cable with special length, specify cable length L in m (L <sub>min</sub> = 0,15 m/L <sub>max</sub> = 5 m)	sp
Sensor without connector, Cable length l = 2 m	G
Sensor without connector, Cable length l = 5 m	G1

6190CA\_000-680e-01\_14