

# TEMPERATURE SENSORS

TE Connectivity is a leader in the design and manufacture of NTC thermistors, RTDs, thermocouples, thermopiles, digital output and customized sensor assemblies. Building on our long standing experience, we offer solutions for a wide range of temperature measurement, control and compensation applications. Our broad selection of temperature products meet the specific sensing demands of critical OEM applications, including medical, aerospace, automotive, instrumentation appliances, motor control and HVACR. You can count on us to provide engineering expertise and deliver high quality, cost-effective products and solutions for your application.



## SENSING ELEMENTS—NTC

Analog Output



### MEAS Thermistor Chips

<b>Package</b>	Leadless chips, SMD 0402, 0603, 0805
<b>Type</b>	Gold or silver electrodes, surface mounted
<b>Resistance Range</b>	Chip: 100 to 1MΩ / SMD: 40 to 500KΩ
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Wire bonding compatible</li> <li>• End band SMD</li> </ul>
<b>Accuracy</b>	±1% to 10%
<b>Operating Temp.</b>	-40°C to 125°C
<b>Dimensions (mm)</b>	Chip: 0.6 - 1.0 square SMD 0402: 1 x 0.5 x 0.7 SMD 0603: 1.6 x 0.8 x 1 SMD 0805: 2 x 1.25 x 1.2
<b>Typical Applications</b>	Temperature compensation, communication (DWDM), infrared sensing systems, PCB mounting temperature measurement



### MEAS Radial Leaded Thermistors

<b>Package</b>	Radial, beads
<b>Type</b>	Epoxy or glass coated
<b>Resistance Range</b>	100 to 1MΩ
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Interchangeable</li> <li>• Moisture resistant</li> <li>• Stability</li> </ul>
<b>Accuracy</b>	0.25% to 20%
<b>Operating Temp.</b>	-55°C to 280°C
<b>Dimensions (mm)</b>	0.4 to 4.9
<b>Typical Applications</b>	Temperature sensing for OEM, automotive, medical, HVACR



### MEAS Axial Leaded Thermistors

<b>Package</b>	DO-35
<b>Type</b>	Glass coated
<b>Resistance Range</b>	5KΩ to 100KΩ
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Tight tolerance (±1%)</li> <li>• Max. stability using high density (HD) chip</li> <li>• Hermetically sealed</li> <li>• Tinned and nickel plated leads</li> </ul>
<b>Accuracy</b>	±1% to ±3%
<b>Operating Temp.</b>	-40°C to 300°C
<b>Dimensions (mm)</b>	2.0 x 4.0 body
<b>Typical Applications</b>	Refrigeration including cabinet sensing and evaporator coil, white goods, fire detection units, air-conditioning systems, PCB temp. sensing



### MEAS Space Qualified (Hi-Rel)

<b>Package</b>	Radial, bead, custom
<b>Type</b>	NTC, epoxy, glass, probes
<b>Resistance Range</b>	1KΩ to 100KΩ
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• ESA and NASA approved</li> <li>• High reliability and accuracy</li> </ul>
<b>Accuracy</b>	0.5% to 10%
<b>Operating Temp.</b>	-55°C to 160°C
<b>Dimensions (mm)</b>	From 2.4
<b>Typical Applications</b>	Instrumentation and compensation for aerospace applications

## SENSING ELEMENTS—DIGITAL

Digital Output



### MEAS TSYS Series

<b>Package</b>	QFN16, TDFN8
<b>Type</b>	I <sup>2</sup> C, SPI, PWM, SDM (Convertible to analog voltage)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low power</li> <li>• Small size</li> <li>• Calibrated and ready to use</li> <li>• 16-bit resolution</li> </ul>
<b>Accuracy</b>	Up to ±0.1°C at -5°C to 50°C
<b>Operating Temp.</b>	-40°C to 125°C
<b>Dimensions (mm)</b>	QFN16: 4 x 4 x 0.85 TDFN8: 2.5 x 2.5 x 0.75
<b>Typical Applications</b>	Industrial control, replacement of precision RTDs, thermistors and NTCs, heating and cooling systems, HVACR

## SENSING ELEMENTS—RTD

Analog Output



### MEAS Nickel RTD

<b>Package</b>	<ul style="list-style-type: none"> <li>• SOT 23</li> <li>• Bare die on request</li> </ul>
<b>Type</b>	<ul style="list-style-type: none"> <li>• Thin film nickel structure on silicon substrate, protected with a passivation layer</li> <li>• SOT 23 package for SMT</li> <li>• Bare die for COB assembly</li> </ul>
<b>Resistance Range</b>	1000Ω
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Harsh environment compatible</li> <li>• Automotive qualified</li> <li>• Very small dimensions</li> <li>• Very short response time</li> <li>• Good linearity</li> <li>• High temperature coefficient</li> <li>• Low power consumption</li> <li>• Good thermal connection of sensing element through leadframe-pin</li> </ul>
<b>Accuracy</b>	Class B, according to former DIN 43760 standard
<b>Operating Temp.</b>	-55°C to 160°C
<b>Dimensions (mm)</b>	2.1 x 2.5 x 2.1 (SOT 23), 0.7 x 0.7 x 0.4 (Bare die)
<b>Typical Applications</b>	Automotive, industrial, OEM, thermal compensation, thermal management



### MEAS Platinum Thin Film Chips

<b>Package</b>	Leadless chips, SMD 1206
<b>Type</b>	<ul style="list-style-type: none"> <li>• Thin film platinum deposited on ceramic substrate</li> <li>• Contact pads on top and bottom side for NTC chip like assembly</li> <li>• Contact pads on both ends for SMT</li> </ul>
<b>Resistance Range</b>	100Ω, 1000Ω (Other values on request)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Long term stability</li> <li>• Interchangeability</li> <li>• Assembly like NTC chips</li> <li>• Very small dimensions</li> <li>• Short response time</li> </ul>
<b>Accuracy</b>	According to DIN EN 60751
<b>Operating Temp.</b>	-50°C to 400 °C
<b>Dimensions (mm)</b>	1.5 x 1.5 (Top / bottom pads), 1.2 x 3.6 (SMT)
<b>Typical Applications</b>	White goods, automotive, industrial, aerospace, medical, test and measurement



### MEAS Platinum Thin Film Sensors

<b>Package</b>	Wired component
<b>Type</b>	<ul style="list-style-type: none"> <li>• Thin film platinum deposited on ceramic substrate, glass coated</li> <li>• Tube outline available</li> <li>• Connection via radial leads</li> </ul>
<b>Resistance Range</b>	100Ω, 1000Ω (Other values on request)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Long term stability</li> <li>• Interchangeability</li> <li>• Small dimensions</li> <li>• Short response time</li> <li>• High electrical insulation</li> </ul>
<b>Accuracy</b>	Class T (F0.1), A (F0.15), B (F0.3) according to DIN EN 60751
<b>Operating Temp.</b>	-50°C to 600°C (Standard) down to -200°C or up to 1,000°C (On request)
<b>Dimensions (mm)</b>	2.0 x 2.3 x 1.1 (Standard) 1.2 x 4.0 x 1.1 (Standard) Other dimensions (On request)
<b>Typical Applications</b>	White goods, automotive, industrial, aerospace, medical, test and measurement



### MEAS Glass Wire Wound Sensors

<b>Package</b>	GO, GX
<b>Type</b>	Glass rod, radial leads
<b>Resistance Range</b>	100Ω (2X 100Ω on few versions)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Aggressive environments (Acid, oil, solvent)</li> <li>• Small dimensions</li> <li>• Stability</li> <li>• No hysteresis</li> <li>• Short response time</li> <li>• Interchangeability</li> </ul>
<b>Accuracy</b>	Class W0.3, W0.15, W0.1 according to IEC60751
<b>Operating Temp.</b>	-200°C to 400°C
<b>Dimensions (mm)</b>	Ø1.8 / length 5 mm to Ø4.5 / length 48 mm
<b>Typical Applications</b>	Oil and chemical industry, aviation, aeronautic, food industry



### MEAS Ceramic Wire Wound Sensors

<b>Package</b>	CWW600, CWW850, CWW1000
<b>Type</b>	Ceramic rod, radial leads
<b>Resistance Range</b>	100Ω (2X 100Ω on few versions)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• High temperature</li> <li>• Stability</li> <li>• No hysteresis</li> <li>• Small dimension</li> <li>• Interchangeability</li> </ul>
<b>Accuracy</b>	Class W0.3, W0.15, W0.1 according to IEC60751
<b>Operating Temp.</b>	-200°C to 600°C (CWW600) -200°C to 850°C (CWW850) -200°C to 1000°C (CWW1000)
<b>Dimensions (mm)</b>	Ø1.5 / length 8 mm to Ø4.5 / length 30 mm Ø2.7 / length 45 mm (CWW1000)
<b>Typical Applications</b>	Process industry, laboratories, reference sensors

## SENSOR ASSEMBLIES



### MEAS Ring Sensors

<b>Package</b>	<ul style="list-style-type: none"> <li>• Ring for surface assembly</li> <li>• Threaded bolt, tube style</li> </ul>
<b>Type</b>	Epoxy potted element
<b>Sensor Range</b>	<ul style="list-style-type: none"> <li>• NTC</li> <li>• RTD: Pt, Ni</li> </ul>
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Surface mount sensing</li> <li>• For use where space is limited</li> <li>• Simple installation</li> </ul>
<b>Accuracy</b>	<ul style="list-style-type: none"> <li>• NTC: Custom tolerances available</li> <li>• Pt RTD: Class AA, A, B according to IEC60751</li> </ul>
<b>Operating Temp.</b>	Varies: -50°C to 250°C
<b>Dimensions (mm)</b>	Case specific dimensions
<b>Typical Applications</b>	Surface plates, heat exchangers, fluid pumping systems, generators



### MEAS Push-in Sensors

<b>Package</b>	Brass, copper or stainless steel closed-end tube
<b>Type</b>	Epoxy potted element, miniature design
<b>Sensor Range</b>	<ul style="list-style-type: none"> <li>• NTC</li> <li>• RTD: Pt, Ni</li> <li>• Thermocouple: Type J, K, T, E</li> </ul>
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Corrosion resistant</li> <li>• Available with mounting tabs or clips</li> </ul>
<b>Accuracy</b>	<ul style="list-style-type: none"> <li>• NTC: Custom tolerances available</li> <li>• Pt RTD: Class AA, A, B according to IEC60751</li> </ul>
<b>Operating Temp.</b>	Varies: -50°C to 250°C
<b>Dimensions (mm)</b>	Case specific dimensions
<b>Typical Applications</b>	Boiler, liquid, evaporator, HVACR, industrial processes control, district heating and cooling, automotive, bearing monitoring, motors, gear boxes



### MEAS Screw-in Sensors

<b>Package</b>	Brass, copper or stainless steel housing with integrated connector
<b>Type</b>	Epoxy potted element, rigid sheath
<b>Sensor Range</b>	<ul style="list-style-type: none"> <li>• NTC</li> <li>• RTD: Pt, Ni, Cu</li> <li>• Thermocouple: Type J, K, T, E</li> </ul>
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Corrosion resistant</li> <li>• Different thread types</li> <li>• Connectors available</li> </ul>
<b>Accuracy</b>	<ul style="list-style-type: none"> <li>• NTC: Custom tolerances available</li> <li>• Pt RTD: Class AA, A, B according to IEC60751</li> </ul>
<b>Operating Temp.</b>	Varies: -50°C to 250°C
<b>Dimensions (mm)</b>	Custom lengths, diameters and threads available
<b>Typical Applications</b>	Boiler, liquid, HVACR, industrial processes control, district heating and cooling, immersion



### MEAS Refrigeration Molded Probes

<b>Package</b>	PVC or TPE
<b>Type</b>	Overmolded
<b>Sensor Range</b>	<ul style="list-style-type: none"> <li>• NTC</li> <li>• RTD: Pt</li> </ul>
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Mounting clips available</li> </ul>
<b>Accuracy</b>	<ul style="list-style-type: none"> <li>• NTC: Custom tolerances available</li> <li>• Pt RTD: Class AA, A, B according to IEC60751</li> </ul>
<b>Operating Temp.</b>	-40°C to 125°C
<b>Dimensions (mm)</b>	8 x 30, 6.5 x 25, 6 x 50, 6 x 5 x 15
<b>Typical Applications</b>	HVACR, industrial processes control

## SENSOR ASSEMBLIES



### MEAS Pipe Mount Sensors

Package	Copper or stainless steel housing
Type	<ul style="list-style-type: none"> <li>Overmolded</li> <li>Epoxy potted</li> </ul>
Sensor Range	<ul style="list-style-type: none"> <li>NTC</li> </ul>
Unique Features	<ul style="list-style-type: none"> <li>Fast response time</li> <li>Moisture resistant construction</li> </ul>
Accuracy	<ul style="list-style-type: none"> <li>NTC: custom tolerances available</li> </ul>
Operating Temp.	-40°C to 125°C
Dimensions (mm)	Custom configurations available
Typical Applications	Industrial process, boiler control, HVACR, refrigeration, food service, energy management, test equipment



### MEAS Outdoor Air Sensors

Package	Metal housing with PVC sun shield with or without weatherproof box
Type	<ul style="list-style-type: none"> <li>Fully potted subassembly</li> </ul>
Sensor Range	<ul style="list-style-type: none"> <li>NTC</li> </ul>
Unique Features	<ul style="list-style-type: none"> <li>Easy installation – threads into mounting hole or standard handy box</li> <li>Fully potted housing protects sensing element and provides fast, accurate response</li> </ul>
Accuracy	±0.2°C at 0°C to 70°C
Operating Temp.	-40°C to 105°C
Dimensions (mm)	Ø12 X 64
Typical Applications	Residential and commercial building controls, energy management systems



### MEAS Pool and Spa Sensors

Package	Plastic or metal housing with o-ring seal designed for band clamp or backing nut
Type	<ul style="list-style-type: none"> <li>Overmolded subassembly</li> </ul>
Sensor Range	<ul style="list-style-type: none"> <li>NTC</li> </ul>
Unique Features	<ul style="list-style-type: none"> <li>O-ring seals</li> <li>Compatible with pool and spa chemicals</li> </ul>
Accuracy	±0.2°C
Operating Temp.	0°C to 90°C
Dimensions (mm)	6.4 x 50
Typical Applications	Pools, hot tubs



### MEAS Boiler Sensors

Package	Brass housing
Type	<ul style="list-style-type: none"> <li>Screw</li> </ul>
Sensor Range	<ul style="list-style-type: none"> <li>NTC</li> <li>RTD: Pt, Ni, Cu</li> </ul>
Unique Features	<ul style="list-style-type: none"> <li>Integrated connector</li> <li>Corrosion resistant</li> <li>Different threads types and connectors available</li> </ul>
Accuracy	<ul style="list-style-type: none"> <li>NTC: Custom tolerances available</li> <li>Pt RTD: Class AA, A, B according to IEC60751</li> </ul>
Operating Temp.	Varies: -50°C to 250°C
Dimensions (mm)	Custom lengths, diameters and threads available
Typical Applications	Boiler control, liquid, industrial processes control, district heating and cooling, immersion



### MEAS Oven Sensors

Package	Stainless steel housing
Type	<ul style="list-style-type: none"> <li>Pt element encapsulated into ceramic tube, with rigid stainless steel housing</li> <li>High temperature cable</li> </ul>
Sensor Range	Pt100, Pt500, Pt1000 sensor
Unique Features	<ul style="list-style-type: none"> <li>High temperature</li> <li>Easy integration / installation</li> <li>Higher dielectric strength according to type</li> </ul>
Accuracy	Class B, C according to IEC60751
Operating Temp.	-20°C to 750°C (According to version)
Dimensions (mm)	<ul style="list-style-type: none"> <li>OD Ø4 mm to Ø6 mm</li> <li>Immersion length 35 mm to 100 mm</li> <li>Custom mechanical interface and cable length</li> </ul>
Typical Applications	Drying oven, domestic oven



### MEAS Urea Temperature Sensors

Package	Plastic housing with screw hole mountings
Type	<ul style="list-style-type: none"> <li>Overmolded plastic housing with integrated 2 pin connector</li> </ul>
Sensor Range	<ul style="list-style-type: none"> <li>NTC</li> </ul>
Unique Features	<ul style="list-style-type: none"> <li>Temperature measurement of urea liquid used in Selective Catalytic Reduction (SCR) systems</li> <li>Suitable for high pressure applications</li> </ul>
Accuracy	<ul style="list-style-type: none"> <li>NTC: custom tolerances available</li> <li>±2%, 3% and 5%</li> <li>Beta 25/85: 3976</li> </ul>
Operating Temp.	-40°C to 125°C
Dimensions (mm)	Sensor tip 8 mm diameter
Typical Applications	Temperature measurement of urea liquid used in SCR systems



### MEAS Exhaust Gas Temperature Probes

Package	EGT thermocouple probe
Type	<ul style="list-style-type: none"> <li>Mineral insulated alloy sheath, screwed mechanical interface, cable extension and automotive connector</li> <li>Option: CANbus interface (From 1 to 4 thermocouples, fully configurable)</li> </ul>
Sensor Range	<ul style="list-style-type: none"> <li>Thermocouple: Type K, N</li> </ul>
Unique Features	<ul style="list-style-type: none"> <li>High temperature, robust design</li> <li>Vibration and corrosion resistant</li> <li>Fast response time</li> </ul>
Accuracy	Class 1 according to IEC584
Operating Temp.	-40°C to 900°C
Dimensions (mm)	<ul style="list-style-type: none"> <li>ØOD 4 to ØOD 8</li> <li>Custom immersion length and cable length</li> </ul>
Typical Applications	Automotive, truck, mining, power unit, racing

## SENSOR ASSEMBLIES



### MEAS Micro-Thermocouples

<b>Package</b>	Fine gage thermocouples
<b>Type</b>	<ul style="list-style-type: none"> <li>• Micro sized thermocouple: 44 AWG, 40 AWG, 38 AWG, 36 AWG</li> <li>• Polymer encapsulated or bare junction</li> </ul>
<b>Sensor Range</b>	Thermocouple type: T, K
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Welded or soldered junction</li> <li>• Low profile, fast response</li> <li>• Polyesterimide wire insulation</li> </ul>
<b>Accuracy</b>	Varies by type: standard, special and custom limits or error available
<b>Operating Temp.</b>	Varies by type: Rated up to 240°C
<b>Dimensions (mm)</b>	Varies by thermocouple gage
<b>Typical Applications</b>	Medical, catheters



### MEAS Patient Monitoring Probes

<b>Package</b>	Sensor with cable and connector
<b>Type</b>	Reusable: Skin; 10FR and 12FR GP Disposable: Skin; 9FR and 12FR GP; 12FR, 18FR, 24FR Esoph/Stethoscope; 14FR, 16FR, 18FR Foley catheter
<b>Sensor Range</b>	400 series, 700 series (Reusable only)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Autoclavable reusables</li> <li>• Sterile disposables</li> </ul>
<b>Accuracy</b>	±0.1°C at 25°C to 45°C ISO-80601-2-56: ±0.2°C at 35°C to 42°C  -40°C to 100°C, Patient: 0°C to 50°C
<b>Operating Temp.</b>	
<b>Dimensions (mm)</b>	Reusable: 3 m cable with sensor Disposable: Sensor <1 m; 3 m reusable adaptor cable
<b>Typical Applications</b>	Patient monitoring, laboratory



### MEAS TLH Reference Probe

<b>Package</b>	TLH100 / TLH600
<b>Type</b>	Rigid protective external stainless steel sheath and stainless steel handle, unique internal design to insure stability
<b>Sensor Range</b>	Pt100 sensor
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Stability</li> <li>• Provided with calibration report or option of calibration certificate by national committee for accreditation (COFRAC)</li> </ul>
<b>Accuracy</b>	Class B (TLH600), A (LTH100) according to IEC60751
<b>Operating Temp.</b>	-80°C to 350°C (TLH100) -180°C to 600°C (TLH600)
<b>Dimensions (mm)</b>	OD Ø5 x 500 + handle Ø15 x 100 (Typical cable length = 2 m)
<b>Typical Applications</b>	Laboratory, temperature sensors calibration by comparison



### MEAS USB Temperature Probe

<b>Package</b>	Push-in probe with handle
<b>Type</b>	<ul style="list-style-type: none"> <li>• Versatile push-in probe with stainless steel sheath and plastic or stainless steel handle</li> <li>• High precision sensing element combined with integrated electronics for signal processing, calibration and USB interface</li> </ul>
<b>Sensor Range</b>	Not applicable due to direct digital output
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• USB conformal interface</li> <li>• Calibrated digital output, recalibration possible on request</li> <li>• Robust design for general purpose applications</li> <li>• Long term stability</li> </ul>
<b>Accuracy</b>	±0.1°C for temperature range -5°C to 55°C ±0.2°C for temperature range -40°C to 160°C (Other accuracies on request)
<b>Operating Temp.</b>	-55 °C to 160 °C for probe tip -40 °C to 85 °C for handle with electronics (Other temperature ranges on request)
<b>Dimensions (mm)</b>	OD Ø6 x 200 + handle Ø19 x 100 (Typical cable length = 2,000)
<b>Typical Applications</b>	Laboratory, mobile research, test and measurement

## SENSOR ASSEMBLIES



### MEAS Stator Sensors

<b>Package</b>	<ul style="list-style-type: none"> <li>TPE / CPME</li> <li>G11 epoxy glass laminated, Class F or H</li> </ul>
<b>Type</b>	<ul style="list-style-type: none"> <li>Rigid flat, slot sensor</li> <li>Cable or leadwire options</li> </ul>
<b>Sensor Range</b>	<ul style="list-style-type: none"> <li>RTD: Pt, Ni, Cu</li> <li>Thermocouple: Type J, K, T, E</li> </ul>
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>Extended sensitive length</li> <li>Single or dual elements</li> <li>Calibration available</li> </ul>
<b>Accuracy</b>	RTD: Class A, B according to IEC60751
<b>Operating Temp.</b>	Max. temperature: Class F, 155°C Max. temperature: Class H, 180°C Available up to 200°C
<b>Dimensions (mm)</b>	Custom dimensions available
<b>Typical Applications</b>	Monitor temperature between stator coils, electric motors, generators



### MEAS Surface Sensors

<b>Package</b>	<ul style="list-style-type: none"> <li>Silicone rubber or polyimide laminated element</li> <li>SP683</li> </ul>
<b>Type</b>	<ul style="list-style-type: none"> <li>Flat, flexible, rectangular sensor</li> <li>Variety of designs available</li> </ul>
<b>Sensor Range</b>	<ul style="list-style-type: none"> <li>RTD: Pt, Ni, Cu</li> <li>Thermocouple: Type J, K, T, E</li> </ul>
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>Surface sensing for curved or uneven surfaces</li> <li>Noninvasive, simple installation</li> <li>Adhesive backing option</li> </ul>
<b>Accuracy</b>	RTD: Class A, B according to IEC60751
<b>Operating Temp.</b>	Varies: -50°C to 200°C Available up to 220°C
<b>Dimensions (mm)</b>	Custom dimensions available
<b>Typical Applications</b>	Chemical and pharmaceutical industry, process industry, laboratory, aerospace, motor end windings of stator coils, generators



### MEAS Bearing Sensors

<b>Package</b>	<ul style="list-style-type: none"> <li>Copper alloy tip</li> <li>Stainless steel, isolated stainless steel or epoxy glass case</li> </ul>
<b>Type</b>	<ul style="list-style-type: none"> <li>Rigid sheath</li> <li>Tip sensitive</li> <li>Cable / leadwire options</li> </ul>
<b>Sensor Range</b>	<ul style="list-style-type: none"> <li>RTD: Pt, Ni, Cu</li> <li>Thermocouple: Type J, K, T, E</li> </ul>
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>Cut-to-length</li> <li>Copper tip for fast time response</li> <li>Assemblies with fluid seal and spring loading</li> <li>Single or dual elements</li> </ul>
<b>Accuracy</b>	RTD: Class A, B, C according to IEC60751
<b>Operating Temp.</b>	Sheath specific, up to 250°C
<b>Dimensions (mm)</b>	Custom lengths Standard sheath diameters: 4.78, 5.46, 6.35
<b>Typical Applications</b>	Bearing monitoring, electric motors, generators



### MEAS Thermocouple

<b>Package</b>	Screw-in or push-in design with cable extension, connector, or connecting head
<b>Type</b>	<ul style="list-style-type: none"> <li>Collapsible Mineral Insulated (MI) with alloy sheath (Radius <math>\geq 5 \times OD</math>)</li> <li>Flexible cable with plastic or composite insulation</li> <li>Rigid protection sheath: ceramic, quartz or alloy sheath</li> </ul>
<b>Sensor Range</b>	Type T, J, K, N, R, S, B (According to TC type and insulation type)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>High temperature and high vibration level (For MI)</li> <li>Available in small diameters for fast response time</li> <li>Grounded or ungrounded or apparent hot junction</li> <li>Single or multiple measuring points</li> </ul>
<b>Accuracy</b>	Class 1 according to IEC584
<b>Operating Temp.</b>	-40°C to 1,700°C (According to TC type and insulation type)
<b>Dimensions (mm)</b>	<ul style="list-style-type: none"> <li>OD <math>\varnothing 0.3</math> mm to <math>\varnothing 8</math> mm for MI</li> <li><math>\varnothing 0.15</math> mm for smallest flexible cable</li> <li>Custom dimensions, fittings and cable lengths (From few centimeters to many meters)</li> </ul>
<b>Typical Applications</b>	Aeronautic, process industry, medical, semiconductor industry (Spike, profile)



### MEAS Transmitter

<b>Package</b>	Brass, copper and stainless steel housing, flexible sheath with integrated connector.
<b>Type</b>	<ul style="list-style-type: none"> <li>Epoxy potted element</li> <li>Screw-in</li> </ul>
<b>Sensor Range</b>	4 - 20 mA output
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>Compact, welded design</li> <li>Highly sensitive and stable</li> <li>High vibration application</li> <li>Good waterproof properties</li> </ul>
<b>Accuracy</b>	0.5 or 1% FS
<b>Operating Temp.</b>	-20°C to 120°C
<b>Dimensions (mm)</b>	<ul style="list-style-type: none"> <li>Customer sheath length, thread type</li> <li>Probe diameter: <math>\varnothing 4.75</math> mm; <math>\varnothing 5</math> mm; <math>\varnothing 6</math> mm; <math>\varnothing 6.35</math> mm; <math>\varnothing 8</math> mm</li> </ul>
<b>Typical Applications</b>	Heavy industry, general industrial monitoring

## THERMOPILES



**MEAS TS Series**  
TS318-3B0814, TS318-5C50, TS305-10C50

Package	TO-18, TO-5
Type	Thermopile sensor components
Temp. Range	Depends on applied electronics and calibration, filter types optimal for object temperature range -40°C to 300°C (Extended range: -60°C to 1,000°C)
Unique Features	<ul style="list-style-type: none"> <li>• High signal output</li> <li>• Accurate reference sensors</li> </ul>
Accuracy	Depends on applied electronics and calibration
Operating Temp.	Ambient temperature range: -20°C to 85°C
Dimensions (mm)	Ø9.15 x 4.4 (Body)
Typical Applications	Medical thermometer (Ear, forehead), pyrometer



**MEAS TSD Series**  
Single Pixel Digital Output Series

Package	TO-5
Type	Digital thermopile sensor component
Temp. Range	Object temperature range 0°C to 300°C (Other temperature ranges available upon request)
Unique Features	<ul style="list-style-type: none"> <li>• Calibrated and ready to use, I<sup>2</sup>C interface</li> <li>• Direct assembly to PCB, no additional components needed</li> </ul>
Accuracy	Depends on temperature range, typical 1% full range
Operating Temp.	Ambient temperature range: -20°C to +85°C
Dimensions (mm)	Ø9.15 x 4.4 (Body)
Typical Applications	Contactless temperature measurement, e.g. on moving parts like heated rolls, laminators, people detection, body temperature, microwave oven, air conditioner



**MEAS TSEV**  
Single Pixel Series

Package	OEM-module
Type	Single-pixel thermopile module
Temp. Range	Object temperature range 0°C to 300°C (Other temperature ranges available upon request)
Unique Features	<ul style="list-style-type: none"> <li>• Calibrated, Interfaces: I<sup>2</sup>C, SPI</li> <li>• Different field of views: 5° at 50%, 10° at 50%, 90° at 50%, others on request</li> </ul>
Accuracy	Depends on temperature range, typical 1% full scale, max. accuracy 0.1°C
Operating Temp.	Ambient temperature range: 0°C to 85°C
Dimensions (mm)	35 x 25 x 13 to 31
Typical Applications	Contactless temperature measurement, e.g. on moving parts or heated rolls, laminators, people detection, microwave oven, air conditioner



**MEAS TSEV**  
Multi Pixel Series

Package	OEM-module
Type	8-pixel-linear array thermopile module
Temp. Range	Object temperature range -20°C to 120°C
Unique Features	<ul style="list-style-type: none"> <li>• Calibrated and ready to use</li> <li>• Digital output</li> <li>• Small field of view</li> </ul>
Accuracy	Depends on temperature range, typical 2% full scale
Operating Temp.	Ambient temperature range: -20°C to 85°C
Dimensions (mm)	25 x 35 x 15.2
Typical Applications	Contactless temperature measurement, e.g. on moving parts or heated rolls, laminators, people detection, microwave oven, air conditioner



**MEAS TPT Series**  
TPT300V

Package	IP65 stainless steel tube
Type	Thermopile system for industrial use
Temp. Range	Object temperature range 0°C to 300°C
Unique Features	<ul style="list-style-type: none"> <li>• Calibrated and ready to use</li> <li>• Digital or analog outputs</li> <li>• Small field of view</li> </ul>
Accuracy	Depends on temperature range, typical 1% full scale
Operating Temp.	Ambient temperature range: 0°C to 85°C
Dimensions (mm)	Ø18 x 111
Typical Applications	Contactless temperature measurement, e.g. on moving parts or heated rolls, control of assembly lines, paper fabrication, drying applications