TE SENSOR SOLUTIONS
TE SENSOR SOLUTIONS

TE Connectivity (TE) is a global technology leader, providing connectivity and sensor solutions essential in today’s increasingly connected world. TE is one of the largest sensor companies in the world. Our sensors are vital to the next generation of data-driven technology. We offer an unmatched portfolio of solutions for applications across a wide range of industries, including Automotive, Industrial, Medical, Appliance, Aerospace & Defense, and Industrial and Commercial Transportation. Our technologies enable measurement capabilities such as pressure, temperature, position, vibration, humidity and fluid property, to name a few. Our engineers help transform concepts into creations — redefining what’s possible using intelligent, efficient and high performing TE products and solutions proven in harsh environments.
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## SENSOR TECHNOLOGIES

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When quality and reliability are paramount, aerospace & defense companies rely on our technology to help solve mission critical challenges. Our core competencies in high reliability sensors for harsh environments such as temperature extremes, RFI, EMI, vibration, and lightning strikes make us a leading choice in sensor technology. Our design engineering capabilities, as well as AS9100 certified sensor manufacturing facilities in North America, Europe and Asia Pacific, support Tier 1, 2 and 3 providers. Regional design and manufacturing capabilities enable us to provide ITAR-free designs and supply products closer to our customers. We work closely with the customer to provide stable, reliable and cost effective solutions that meet the extensive development cycles and qualifications critical to aerospace & defense.

**Cockpit Controls**
- Automatic autopilot disconnect force sensors
- Motorized potentiometers for position feedback
- Brake pedal position sensors
- Rotary panel switches and sensors
- Force sensors for flight data recording of pilot inputs
- Throttle quadrant position sensors
- Flap and spoiler lever position sensors

**Flight Controls & Actuation**
- High lift load sensors
- THSA secondary load path engagement sensors
- Aileron LVDT position sensors
- Resolvers for flap and slat position monitoring
- Force and position sensors for spoiler electromechanical actuation
- Brake actuator force sensors for rotorcraft

**Landing Gear & Brakes**
- Brake torque sensors
- Pressure sensors for nose wheel steering feedback
- Resolvers for steering position
- Load on wheels force sensors
- Center of gravity force sensors

**Cabin, Galley & Cargo**
- Cabin pressure indicator sensors
- Waste tank level sensors
- Environmental cabin control pressure sensors
- Cargo humidity sensors
- Galley temperature sensors
- Air quality temperature sensors
- Oxygen generation pressure transducers

**Launch & Space**
- Payload monitoring vibration sensors
- Thrust vectoring LVDT position sensors
- Electrical actuator position resolvers
- Booster separation potentiometers
- Cryogenic fuel pressure transducers
- Satellite temperature sensors
- Mirror/antenna position LVDT sensors

**Engine, Turbine & APU**
- Thermocouple harnesses for exhaust gas temperature
- LVDT for thrust reverser position monitoring
- Platinum 200 air temperature sensors
- Variable bleed valve LVDT position sensors
- Rotor track and balance accelerometers
- Health and Usage Monitoring Systems (HUMS) accelerometers
- Thermistor heater fuel tank level and flow

**Military (Missile, Ground Vehicle, Marine, UAV)**
- Missile fin actuation
- Fuel tank level and flow sensors
- Gun stabilization and shock measurement
- Tamper detection for missiles
- Electronic safe arm and fire
- Oil pressure and temperature sensors
- Airspeed and altitude sensors
Today’s smart and green appliances are built using more efficient designs, meeting the latest regulations while saving energy, water and time. Customers rely on our sensor technologies to enable appliances to respond to human touch, sense vibration, adjust to loads, and operate more efficiently. We work to develop custom solutions that can monitor humidity and water levels, and temperature. Our products contribute to new levels of convenience and productivity in a wide range of household appliances.

Clothes Dryer
- Humidity sensor monitors process humidity and stops the dryer when clothes are dry
- Thermopile measures clothing temperature to prevent overheating and fabric damage
- Force sensor measures payload weight at the beginning of the cycle

Cooktop
- Temperature sensor monitors glass surface temperature for cooking control and “hot” indication lights for user safety

Dishwasher
- Magnetoresistive (MR) sensor and magnet verifies spray arm rotation
- Temperature sensor measures water temperature and controls heating elements
- Liquid level sensor monitors water level and detergent dispenser level

Household Oven
- Temperature probe monitors cooking temperature
- Temperature sensor monitors pyrolytic cleaning temperature and controls door latch

Microwave Oven
- Humidity sensor monitors food moisture content during cooking
- Thermopile measures food temperature without physical contact
- Force sensor measures food weight on the turntable

Refrigerator
- Temperature sensor monitors the freezer and refrigerator cabinets as part of the control system
- Humidity sensor monitors humidity in produce drawers and compartments
- Humidity sensor monitors ambient room humidity to help manage frost prevention and doorframe condensation

Small Appliances
- Temperature sensor measures liquid and heating element temperatures in toaster ovens, coffee makers, and popcorn poppers
- Humidity sensor monitors relative humidity and steam production for espresso machines, and clothes steamers

Washing Machine
- Temperature sensor measures water temperature and controls heating elements
- Pressure sensor monitors water level
- Vibration sensor detects out-of-balance conditions during spin cycle
- Proximity sensor verifies door closed and latched before start of the wash cycle
- Force sensor measures payload weight at the beginning of the wash cycle
AUTOMATION & CONTROL

Automation & Control includes a wide range of industrial applications that span all markets, and at all levels, from the factory floor and process end users, to integrators and large scale OEM production. Industrial production is increasingly driven by greater automation, safety and energy efficiency. Our broad portfolio of products offers many options to meet custom performance, application and regulation/certification requirements.

APPLICATION SOLUTIONS

Pressure Sensing
- Analog and digital pressure sensing modules
- Altimeter pressure module
- Media isolated pressure sensing modules
- Heavy industrial pressure transducers
- Miniature pressure transducers
- Corrosion-resistant pressure transducers
- Differential pressure transducers

Fluid Sensing
- Ultrasonic liquid level sensors
- Fluid property sensors
- Submersible pressure sensors

Temperature Sensing
- RTDs
- Thermocouples
- Temperature probes

Motion Control
- String and linear potentiometers
- LVDTs and RVDTs
- Rotary encoders and tilt sensors

Vibration Sensing & Position/Presence Sensing/Detection
- LVDT
- Load cells
- MR sensors
- Accelerometers
- Inclinometers

Force & Torque Sensing
- Load cells and multicomponent force sensors
- Contact/non-contact torque sensors

Humidity Sensing
- Humidity sensing modules
- Digital humidity sensors and assemblies
Whether it’s an altimeter built into a wearable band to measure how many steps we climb each day, or a sports watch charting the ascent up one of the world’s highest mountain peaks, our miniature sensors are used to convey critical information for the dashboard of our daily lives. Our dive computer sensors help provide safety in leisure activities, while our piezo film enables your bed to monitor your heart rate, breathing and even how well you sleep. We’ve been making sensors for wearables before there were wearables. We’re recognized for our technical skill in miniaturization, low power consumption, and high-performance. That’s why our sensors are in harsh environments, from the world’s highest parachute jump to the deepest dive.

<table>
<thead>
<tr>
<th>Mobile (Smart) Phones</th>
<th>Hobby Drone/Unmanned Aerial Vehicles (UAV)</th>
<th>Smart Writing Tools</th>
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<tr>
<td>• Barometric pressure sensor to</td>
<td>• Barometric pressure sensor to regulate and report altitude and confirm vertical</td>
<td>• Piezo film ultrasonic components in smartphone and whiteboard digitizers for</td>
</tr>
<tr>
<td>measure altitude and in-building</td>
<td>stability</td>
<td>handwriting capture</td>
</tr>
<tr>
<td>telemetry for emergency call</td>
<td>• MR sensors for the camera 3D stabilization platforms</td>
<td></td>
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<tr>
<td>• Humidity sensor for personal</td>
<td>• NTC temperature sensors to monitor charging for high capacity LiPo batteries</td>
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<tr>
<td>environment adaption and home comfort</td>
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<tr>
<td>system</td>
<td></td>
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<tr>
<td>Multi-Function Watches</td>
<td>Air Quality Monitors/Room Comfort</td>
<td>GPS Devices</td>
</tr>
<tr>
<td>• Barometric pressure sensor to</td>
<td>• Humidity sensor for personal environment adaption and home comfort control</td>
<td>• Barometric pressure sensor for altitude and navigation dead-reckoning</td>
</tr>
<tr>
<td>measure altitude and in-building</td>
<td>system</td>
<td></td>
</tr>
<tr>
<td>telemetry</td>
<td>• Miniature digital pressure sensor for barometric pressure</td>
<td>Cycle Computers</td>
</tr>
<tr>
<td>• Photo optic (SpO₂) sensor for</td>
<td></td>
<td>• Barometric pressure sensor for altitude profile and energy consumption</td>
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<tr>
<td>heart-rate monitoring</td>
<td></td>
<td></td>
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<tr>
<td>• Altimeter to measure floors</td>
<td>Weather Stations</td>
<td>Smart Scales</td>
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<tr>
<td>climbed and calorie estimation</td>
<td>• Miniature digital pressure sensor for barometric pressure and trend</td>
<td>• Force sensor for body weight</td>
</tr>
<tr>
<td></td>
<td>• Miniature digital humidity sensor for atmospheric humidity and trend</td>
<td>• Barometric compensation for air quality sensor</td>
</tr>
<tr>
<td>Sleep Monitors</td>
<td>• Reed switch or MR sensor for wind-speed measurement</td>
<td>Smart Sensor Hub</td>
</tr>
<tr>
<td>• Piezo film detects body movement</td>
<td>• Temperature sensor for environmental monitoring</td>
<td>• TE Connectivity offers a variety of smart sensor hub development tools optimized</td>
</tr>
<tr>
<td>and vital signs to determine sleep</td>
<td></td>
<td>to aid engineers with integrating sensors into their product designs</td>
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<tr>
<td>phase and quality</td>
<td></td>
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<tr>
<td>Dive Computers</td>
<td></td>
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<tr>
<td>• Water pressure sensor to measure</td>
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<tr>
<td>dive depth</td>
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| Fitness Equipment                     |                                                                                 |                                                                                     |
| • Force sensor for pedal force and    |                                                                                  |                                                                                     |
| energy measurement                     |                                                                                  |                                                                                     |

| Smart Sensor Hub                      |                                                                                 |                                                                                     |
| • TE Connectivity offers a variety of |                                                                                  |                                                                                     |
| smart sensor hub development tools    |                                                                                  |                                                                                     |
| to aid engineers with integrating     |                                                                                  |                                                                                     |
| sensors into their product designs    |                                                                                  |                                                                                     |
While the future of the Industrial Internet of Things (IIoT) is not yet certain, one thing is: sensors will play a critical role. Industrial applications span a wide range of applications, from banknote handling to printers and ovens. Our broad portfolio of products offers customers many options to meet specific performance, application and certification requirements. We work closely to help identify the best solution to meet the needs of the customer.

**APPLICATION SOLUTIONS**

**Pressure Sensing**
- Analog and digital pressure sensing modules
- Altimeter pressure module
- Media isolated pressure sensing modules
- Heavy industrial pressure transducers
- Miniature pressure transducers
- Corrosion-resistant pressure transducers
- Differential pressure transducers

**Fluid Sensing**
- Ultrasonic liquid level sensors
- Fluid property sensors
- Submersible pressure sensors

**Temperature Sensing**
- RTDs
- Thermocouples
- Temperature probes

**Motion Control**
- String and linear potentiometers
- LVDTs and RVDTs
- Rotary encoders and tilt sensors

**Vibration Sensing and Position/Presence Sensing/Detection**
- LVDT
- Load cells
- MR Sensors
- Accelerometers
- Inclinometers

**Force and Torque Sensing**
- Load cells and multicomponent force sensors
- Contact and non-contact torque sensors

**Humidity Sensing**
- Humidity sensing modules
- Digital humidity sensors and assemblies
INTELLIGENT BUILDINGS

Buildings today require reliable solutions to confirm they are operating safely and efficiently. As a global designer and manufacturer of sensors and sensor-based systems, we work closely with building engineers in both the development and instrumentation of automated systems. Our sensors are designed and manufactured to exacting specifications, often on a custom basis. Together with our customers, we are working to solve today's toughest challenges. Our portfolio can address the breadth and depth of applications needed for today's intelligent buildings.

APPLICATION SOLUTIONS

Burners & Boilers
- Inlet and outlet water temperature
- Inside and outside air temperature
- Level detection

Chillers, Compressors & Heat Pumps
- Inlet and outlet refrigerant temperature and pressure
- Inside and outside air temperature
- Motor temperature, oil pressure, and temperature

Wall-mount Units & Field Devices
- Air temperature and humidity
- Damper position
- Air differential pressure

Variable Air Volume (VAV)
- Inlet and outlet air temperature and pressure
- Air humidity

Elevators
- Elevator car position

Security
- Door and window position
Because accurate monitoring, diagnosis and treatment counts, today's medical devices rely on our high-performance sensor technologies to meet exacting specifications, including ISO 13485 certification and FDA registration. We are a leading provider of sensor solutions to the medical device market. Our engineers work with device manufacturers to provide application-specific, standard and custom requirements, from product concept through manufacturing. Our sensors meet the rigorous demands of a wide range of medical and healthcare applications.

**Cardiovascular Monitoring & Diagnosis**
- Disposable blood pressure sensor
- Piezo film for electronic stethoscope
- Piezo film sensor for heart rhythm monitoring
- Photo optic sensors for pulse oximetry ($SpO_2$)
- Miniature NTC thermistors for thermo dilution
- Piezo ultrasonic transducers and temperature sensors for ultrasound imaging

**Cardiovascular Treatment**
- Force, pressure and temperature sensors for ablation catheter
- Silicon MEMS pressure sensor for angioplasty balloon inflating pump
- Temperature sensors and silicon MEMS pressure sensors for blood transfusion and oxygenation systems
- Silicon MEMS pressure sensor for contrast dye infusion
- Piezo film for discrete vital signs monitoring
- Temperature sensors for myocardial needle probes
- Piezo film and position MR sensor for pacemaker
- Variety of sensor solutions for ventilators and respirators

**Patient Monitoring & Diagnosis**
- Microfused load cell for body weight
- Piezoelectric transducers for bone density
- Piezo film for hospital bed vital signs
- Temperature sensor for skin temperature
- Pressure and temperature sensors for urinary catheters and urodynamic testing
- Variety of sensors for sleep apnea studies
- Thermopile for non-contact thermometry
- Thermistors for contact thermometry

**Patient Treatment**
- MR sensor for insulin pump
- Ultrasonic sensor for bubble and liquid level detection
- Variety of sensor solutions for dialysis machines, infusion pumps and smart beds
- Silicon MEMS pressure sensor for hospital gas monitoring
- Humidity and temperature sensors for premature newborn cabinet
- Variety of sensor solutions for ventilators and respirators
- Force sensors for infusion pumps

**Surgical/Delivery**
- Silicon MEMS pressure sensor and piezo film for assisted baby delivery
- Miniature temperature sensors for brain tumor hypodermic needle probes
- Force and pressure sensors for endoscopic surgery
- Low-cost miniature silicon MEMS pressure sensors for intrauterine monitoring during labor
- Silicon MEMS pressure sensor for ocular surgery
- Temperature sensor for patient warming/cooling
- Cable extension sensors and rotary encoders for robotic surgery
- Variety of sensor solutions for surgical devices and instruments
- Piezo film sensor for anesthesia delivery

**Home & Mobile Health Care/Wearable Medical Devices**
- Sensors for wearable health devices
- Sensors for mobile infusion and insulin pumps
- Sensors for mobile oxygen delivery
- Altitude pressure sensor for patient fall detection
The energy market continues to face new challenges with deeper drilling, higher temperatures and higher pressures. Our latest sensor technologies with new electronics, materials, and design packages provide safe, reliable, and accurate data measurements—all while enduring some of the harshest application environments on earth. By combining application expertise and global hazardous location certifications, our broad portfolio of standard designs and custom packages are helping to improve performance and reliability for the oil and gas industry.

Sub-sea Valve Position Feedback
- Nickel alloy construction for maximum corrosion resistance for 30 year life expectancy
- Latest analog and digital signal processing including CANbus CiA443
- Sub-sea pressure up to 7,500 psi (517 bar)

Power Generation Valve Position
- Valve position measurement for high temperature steam, gas and nuclear turbines
- CSA and ATEX intrinsically safe certified for hazardous locations
- Signal conditioning with analog and digital RS-485 outputs

Down-hole Borescope Position Sensing
- High pressure designs (Vented designs up to 35,000 psi)
- Continuous operation at 400°F
- Custom designs and packages available

Upstream Well-head Monitoring
- Global certifications including UL, CSA, ATEX, and IECEx
- Latest sensing MEMS technology with solid stainless steel or alloy construction
- Low current consumption options for RTU/SCADA applications

Gas Compression
- Certified for Class I Divisions I and II, ATEX, and IECEx
- Gage, compound, bidirectional, absolute, and differential pressure ranges
- Compact designs

Offshore Rigs
- Intrinsically safe and explosion proof designs up to 20,000 psi (1,379 bar)
- IEC 61508 SIL2 certification
- High strength nickel alloy for high H2S content
- BOP transmitter packaging with sub-sea connectors

Hydraulic Fracturing Equipment
- Hammer union pressure transmitters with modular design
- Flush diaphragm pressure transducers for water pressure monitoring
- Robust temperature transmitters

Work Boats
- ABS type approval
- Flush diaphragm sensors for ballast level monitoring
- PVDF/PTFE submersible sensors for tank level measurement

Chemical Tanks & Totes
- Internally and externally mounted pressure transducers from 1 psi
- Optional PVDF/PTFE materials for corrosive liquids
- Intrinsically safe ratings for hazardous areas
Our sensors for test and measurement applications support customers across all of our market verticals. Our sensor technologies and engineering capabilities are used for product research, development, testing and evaluation (RDT&E). Each of these critical areas has unique technology and performance requirements. We work closely with RDT&E engineers to determine the right solution, as our broad portfolio can address the breadth and depth of applications across a number of markets.

### Application Solutions

#### Aero Test: Aerodynamic Research and Flight Testing
- Pressure scanners for turbine engine R&D for aircraft and power generation
- Pressure scanners to facilitate aerodynamic testing in wind tunnel
- Pressure scanners used in rotorcraft and aircraft flight testing

#### Auto Test: Automotive Safety & Design Testing
- Accelerometers for use in automotive crash testing
- Force sensors used in seat belts and crash test dummies
- Pressure and position transducers designed for use in motorsport

#### Road Traffic Monitoring
- Complete solutions and installation support for weigh-in-motion, speed and vehicle classification/count applications

#### Environmental Monitoring/Water Monitoring
- Pressure sensors for monitoring water usage (i.e. waste water)
- Level transducers used in managing water resources (i.e. reservoir)

#### Test Equipment & Instrumentation
- Standard and custom sensors supporting aerospace and defense industries
- Broad array of sensors supporting general R&D in academic, public and private sectors
## SENSORS & MARKETS

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<th>Quality Certificates:</th>
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<td>Digital Component</td>
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<td>Flow</td>
<td>• ATEX</td>
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<td>Fluid Property</td>
<td>• ATEX 949EC</td>
</tr>
<tr>
<td>Force</td>
<td>• CE-MDD</td>
</tr>
<tr>
<td>Humidity</td>
<td>• CMDR–Health Canada</td>
</tr>
<tr>
<td>Liquid Level</td>
<td>• EN 13980</td>
</tr>
<tr>
<td>Photo Optic</td>
<td>• ESCC266E</td>
</tr>
<tr>
<td>Piezo Film</td>
<td>• ESCC 400C</td>
</tr>
<tr>
<td>Position</td>
<td>• FDA</td>
</tr>
<tr>
<td>Pressure</td>
<td>• ISO 13485</td>
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<tr>
<td>Rate and Inertial</td>
<td>• ISO 14001</td>
</tr>
<tr>
<td>Scanners and Systems</td>
<td>• ISO 9001</td>
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<tr>
<td>Temperature</td>
<td>• Measuring Instruments Directive 2004/22/EC annex D</td>
</tr>
<tr>
<td>Torque</td>
<td>• NASA Qualified</td>
</tr>
<tr>
<td>Ultrasonic</td>
<td>• NSF-61 Water Quality</td>
</tr>
<tr>
<td>Vibration</td>
<td>• PART21G</td>
</tr>
<tr>
<td>Water Level</td>
<td>• TS 16949</td>
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</table>

### Measurement Specialties (MEAS)

#### Quality Certificates:

- AS/EN 9100
- ATEX
- ATEX 949EC
- CE-MDD
- CMDR–Health Canada
- EN 13980
- ESA 266
- ESCC266E
- ESCC 400C
- FDA
- ISO 13485
- ISO 14001
- ISO 9001
- Measuring Instruments Directive 2004/22/EC annex D
- NASA Qualified
- NSF-61 Water Quality
- PART21G
- TS 16949
Many of our digital sensor products are available in low power and small form factors. They are suited for wearable and miniature devices that are used to collect and share critical data for health monitoring, fitness, air quality, aerospace, battery powered, and related applications. To increase knowledge sharing and reduce time to market, we have teamed with semiconductor manufacturers to design and provide plug and play tools for Xplained Pro Sensor Hub, MicroChip PicTail, and Digilent Pmod™ based development platforms. In addition, we offer several wireless demo/development tools to help engineers quickly achieve their design objectives with wireless applications. These tools are supported with software/firmware drivers, documentation, and graphic user interfaces to make the development process easy.

### Wireless Demo and Development Kits

<table>
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<th>MEAS Environmental Sensor Tag</th>
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<th>MEAS Wireless US600 Series</th>
<th>MEAS Wireless FX1951</th>
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<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Humidity, Temperature, Pressure</td>
<td>Pressure</td>
<td>Force</td>
</tr>
<tr>
<td><strong>Specifications</strong></td>
<td>• 0 - 100% RH</td>
<td>• 50 - 15K psi</td>
<td>• 0 - 50 lbf</td>
</tr>
<tr>
<td></td>
<td>• 20°C to 85°C</td>
<td>• Type G/S/C</td>
<td></td>
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<tr>
<td></td>
<td>• 300 to 1,200 mbar</td>
<td>Standard 2.4 GHz</td>
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<tr>
<td></td>
<td></td>
<td>wireless communication</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>iOS 7.0+</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Android™ 4.3+</td>
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<table>
<thead>
<tr>
<th>MEAS HTU21D(F), MS5637, MS8607, TSYS01*</th>
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<tbody>
<tr>
<td><strong>Type</strong></td>
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<tr>
<td><strong>Specifications</strong></td>
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<td></td>
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<tr>
<td><strong>Communication</strong></td>
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<td><strong>Application</strong></td>
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<tr>
<td><strong>TE Demo</strong></td>
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<td><strong>Partner Board</strong></td>
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*Temperature System Sensor (TSYS) Series
**DIGITAL COMPONENT SENSOR DEVELOPMENT TOOLS**

## PERIPHERAL MODULES
**Digilent Pmod™**

<table>
<thead>
<tr>
<th>Type</th>
<th>MEAS HTU21D(F)</th>
<th>MEAS MS5637</th>
<th>MEAS MS8607</th>
<th>MEAS TSYS01*</th>
<th>MEAS TSYS02D*</th>
<th>MEAS KMA36(A)</th>
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<tr>
<td></td>
<td>Humidity</td>
<td>Pressure</td>
<td>Pressure, Temperature, Humidity</td>
<td>Temperature</td>
<td>Temperature</td>
<td>Angular Position</td>
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<tr>
<td></td>
<td>• 0 to 100% RH</td>
<td>• 10 to 2,000 mbar</td>
<td>• 0 to 100% RH, -40°C to 125°C</td>
<td>• -40°C to 125°C</td>
<td>• -40°C to 125°C</td>
<td>• 0 to 360°</td>
</tr>
<tr>
<td></td>
<td>• -40 to 125°C</td>
<td>• -40 to 85°C</td>
<td>• 2.2 to 3.6 V</td>
<td>• -25°C to 85°C</td>
<td>• 1.5 to 3.6 V</td>
<td>• -25 to 85°C</td>
</tr>
<tr>
<td></td>
<td>• 3.3 to 5.5 V</td>
<td>• 1.5 to 3.6 V</td>
<td>• 1.5 to 3.6 V</td>
<td>• 2.9 to 6.0 V</td>
<td>• 1.5 to 3.6 V</td>
<td>• 2.9 to 6.0 V</td>
</tr>
</tbody>
</table>

**Accuracy**
- ±3% RH
- ±2 mBar
- ±3% RH, ±2 mBar, ±0.1°C

**Comm. Interface**
- I²C
- I²C
- I²C

**Board Connections**
- 6 x 2 x 0.1” header input & output
- 6 x 2 x 0.1” header input & output
- 6 x 2 x 0.1” header input & output

**Compatibility**
- Development systems compatible with Digilent Pmod™ connections
- Development systems compatible with Digilent Pmod™ connections
- Development systems compatible with Digilent Pmod™ connections

## WING BOARDS

<table>
<thead>
<tr>
<th>Type</th>
<th>MEAS HTU21D(F)</th>
<th>MEAS MS5637</th>
<th>MEAS MS8607</th>
<th>MEAS TSYS01*</th>
<th>MEAS TSYS02D*</th>
<th>MEAS KMA36(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specifications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Humidity</td>
<td>Pressure</td>
<td>Pressure, Temperature, Humidity</td>
<td>Temperature</td>
<td>Temperature</td>
<td>Angular Position</td>
</tr>
<tr>
<td></td>
<td>• 0 to 100% RH</td>
<td>• 10 to 2,000 mbar</td>
<td>• 0 to 100% RH, -40°C to 125°C</td>
<td>• -40°C to 125°C</td>
<td>• -40°C to 125°C</td>
<td>• 0 to 360°</td>
</tr>
<tr>
<td></td>
<td>• -40 to 125°C</td>
<td>• -40 to 85°C</td>
<td>• 2.2 to 3.6 V</td>
<td>• -25°C to 85°C</td>
<td>• 1.5 to 3.6 V</td>
<td>• -25 to 85°C</td>
</tr>
<tr>
<td></td>
<td>• 3.3 to 5.5 V</td>
<td>• 1.5 to 3.6 V</td>
<td>• 1.5 to 3.6 V</td>
<td>• 2.9 to 6.0 V</td>
<td>• 1.5 to 3.6 V</td>
<td>• 2.9 to 6.0 V</td>
</tr>
</tbody>
</table>

**Accuracy**
- ±3% RH
- ±2 mBar
- ±3% RH, ±2 mBar, ±0.1°C

**Comm. Interface**
- I²C
- I²C
- I²C

**Board Connections**
- 10 x 2 x 0.1” header input & output
- 10 x 2 x 0.1” header input & output
- 10 x 2 x 0.1” header input & output

**Compatibility**
- Configured to operate with the Xplained Pro development platform
- Configured to operate with the Xplained Pro development platform
- Configured to operate with the Xplained Pro development platform

## DRIVERS

<table>
<thead>
<tr>
<th>Type</th>
<th>MEAS HTU21D(F)</th>
<th>MEAS MS5637</th>
<th>MEAS MS8607</th>
<th>MEAS TSYS01*</th>
<th>MEAS TSYS02D*</th>
<th>MEAS KMA36(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>SAMD2x Microchip PIC24x Family FPGA Bare Metal - Linux* / Android™</td>
<td>SAMD2x Microchip PIC24x Family FPGA Bare Metal - Linux* / Android™</td>
<td>SAMD2x Microchip PIC24x Family FPGA Bare Metal - Linux* / Android™</td>
<td>SAMD2x Microchip PIC24x Family FPGA Bare Metal - Linux* / Android™</td>
<td>SAMD2x Microchip PIC24x Family FPGA Bare Metal - Linux* / Android™</td>
<td>SAMD2x Microchip PIC24x Family FPGA Bare Metal - Linux* / Android™</td>
</tr>
<tr>
<td><strong>Language</strong></td>
<td>ANSI C Coding</td>
<td>ANSI C Coding</td>
<td>ANSI C Coding</td>
<td>ANSI C Coding</td>
<td>ANSI C Coding</td>
<td>ANSI C Coding</td>
</tr>
</tbody>
</table>

*Temperature System Sensor (TSYS) Series

Specifications subject to change.
Dimensions for reference purpose only.

[te.com/sensors](te.com/sensors)
We manufacture reliable and accurate mass air flow (MAF) sensors for a variety of automotive, medical and industrial gas flow applications. Our flow switches are suitable for hot and cold potable water due to rugged brass housings and the ability to operate from a small head of water. They are typically mounted in a well-defined channel, directly in the flowing media. Our flow switches are designed for water control, power shower, central heating systems, circulation pump protection, cooling and leak detection. They feature reed switch reliability and are easy to install.
## MASS AIR FLOW SENSORS

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS LMM-H03</th>
<th>MEAS LMM-H04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Hybrid</td>
<td>Hybrid</td>
</tr>
<tr>
<td>Type</td>
<td>• Hot film anemometer component</td>
<td>• Hot film anemometer component</td>
</tr>
<tr>
<td>Type</td>
<td>• Bidirectional</td>
<td>• Unidirectional</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-40°C to 125°C</td>
<td>-40°C to 125°C</td>
</tr>
<tr>
<td>Unique Features</td>
<td>High sensitivity at low heater temperatures, fast response time, true air temperature sensor</td>
<td>High sensitivity at low heater temperatures, fast response time, true air temperature sensor</td>
</tr>
<tr>
<td>Calibration / Accuracy</td>
<td>Dependent on electronics</td>
<td>Dependent on electronics</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>23 x 10.15 x 11</td>
<td>24 x 10.15 x 11</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Air intake of combustion engine, spirometer, industrial gas flow</td>
<td>Air intake of combustion engine, spirometer, industrial gas flow</td>
</tr>
</tbody>
</table>

## FLOW SWITCHES

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS FS-01</th>
<th>MEAS FS-02</th>
<th>MEAS FS-05</th>
<th>MEAS FS-06</th>
<th>MEAS FS-90/1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package</td>
<td>Noryl®</td>
<td>Noryl®</td>
<td>Brass</td>
<td>Brass</td>
<td>Copper</td>
</tr>
<tr>
<td>Type</td>
<td>Flow switch for direction of liquid and gas flow</td>
<td>Flow switch for direction of liquid and gas flow</td>
<td>Flow switch for direction of liquid and gas flow</td>
<td>Flow switch for direction of liquid and gas flow</td>
<td>Flow switch for direction of liquid and gas flow</td>
</tr>
<tr>
<td>Type</td>
<td>Flow switch for direction of liquid and gas flow</td>
<td>Flow switch for direction of liquid and gas flow</td>
<td>Flow switch for direction of liquid and gas flow</td>
<td>Flow switch for direction of liquid and gas flow</td>
<td>Flow switch for direction of liquid and gas flow</td>
</tr>
<tr>
<td>Max. Pressure</td>
<td>10 bar at 20°C</td>
<td>10 bar at 20°C</td>
<td>10 bar at 20°C</td>
<td>10 bar at 20°C</td>
<td>10 bar at 20°C</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-30°C to 85°C</td>
<td>-30°C to 85°C</td>
<td>-30°C to 100°C</td>
<td>-30°C to 85°C</td>
<td>-30°C to 85°C</td>
</tr>
<tr>
<td>Unique Features</td>
<td>Triac, normally open, close on flow</td>
<td>SPST reed switch, normally open, close on flow</td>
<td>Triac, normally open, close on flow</td>
<td>SPST reed switch, normally open, close on flow</td>
<td>SPST reed switch, normally open, close on flow</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>106 x 32 x 32</td>
<td>106 x 32 x 32</td>
<td>113 x 53 x 36</td>
<td>113 x 53 x 36</td>
<td>153 x 25 x 15</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Mains water control, power shower, central heating systems, circulation pump protection, cooling systems</td>
<td>Mains water control, power shower, central heating systems, circulation pump protection, cooling systems</td>
<td>Mains water control, power shower, central heating systems, circulation pump protection, cooling systems</td>
<td>Mains water control, power shower, central heating systems, circulation pump protection, cooling systems</td>
<td>Leak detection, flow sensing, mains water control, cooling systems, circulation pump protection</td>
</tr>
</tbody>
</table>

Specifications subject to change. Dimensions for reference purpose only.

Catalog SS-TS-TE300

03/2017
We are a pioneer in the design and manufacture of precision force sensors for applications that require high performance or unique packaging, including electromechanical flight control, test and measurement and ultra-low cost OEM load cells for medium to high volumes. Based on our proprietary piezoresistive silicon strain gage (Microfused) technology, our sensors combine durability and long-term stability in extremely low cost packages. Our flight-qualified sensors monitor secondary load path engagement and supply real-time information from primary flight control forces to the flight data recorder (Black Box). Other applications include force feedback for the autopilot automatic disconnect function and flap jam detection systems. Our OEM and Test and Measurement (T&M) load cells offer custom packaging and electronics with analog or digital outputs, suited for both low and high force environments.
## FORCE SENSORS

### LOAD CELLS

**Low Cost OEM**

<table>
<thead>
<tr>
<th>Model</th>
<th>Package</th>
<th>Operating Mode</th>
<th>Unique Features</th>
<th>Ranges (Lbf)</th>
<th>Max. Over-range</th>
<th>Output / Span</th>
<th>Combined Linearity &amp; Hysteresis</th>
<th>Operating Temp.</th>
<th>Dimensions (mm)</th>
<th>Typical Applications</th>
</tr>
</thead>
</table>
| MEAS FX19 | Low profile “coin cell” design | Compression | • Ultra low cost, low strain design  
• Essentially unlimited cycle life | 10, 25, 50, 100 | 2.5X | 100 mV | ±1.0% FSO | -40°C to 85°C | Ø25.00 x 29.50 x 8.00 | Consumer OEM, exercise machines, physical therapy, vending machines, appliances, pumps, medical devices |
| MEAS FS19 | Stainless steel housing with flexible PCB | Compression | • Low cost  
• Small size and light weight  
1, 2, 4, 6 | 2X | 100 mV | ±1% FSO | 0°C to 40°C | Ø9.5 x 3.45 | Infusion pump, load sensing, contact sensing, weighing, household appliances |
| MEAS FS20 | Miniature, drop in replacement for industry standard | Compression | • Load cell design operates at very low strains  
• Not subject to lead die fatigue | 1.5, 3 | 10 lb | 1.0 to 4.0 V | ±10% FSO | 0°C to 70°C | 30.708 x 17.272 x 8.255 | Infusion pumps, contact sensing, medical devices, consumer appliances |
| MEAS FC22 | Plastic housing, button, flange mounting | Compression | • Low cost button shape  
• Essentially unlimited cycle life | 25, 50, 100 | 2.5X | 100 mV, 0.5 to 4.5 VDC | ±1.0% FSO | -40°C to 85°C | Ø26.00 x 42.00 x 19.50 | Infusion pumps, robotics end-effectors, exercise machines, contact sensing, appliances |
| MEAS FC23 | Stainless steel housing button shape for higher weight loads | Compression | • Industry standard low profile all stainless steel design  
• Resistant to off-axis loads  
250, 500, 1000, 2000 | 1.5X and 2.5X | 100 mV | ±1.0% FSO | -40°C to 85°C | Ø31.75 x 10.20 | Batch weighing, robotics, assembly line force, printing presses, pumps, winch and hoist |
# FORCE SENSORS

## LOAD CELLS

### Standard

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS ELHM, ELHS</th>
<th>MEAS FN1010</th>
<th>MEAS FN3002</th>
<th>MEAS FN2420</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Mode</td>
<td>High capacity dual stud or button style</td>
<td>Load pin design</td>
<td>Very high capacity dual stud</td>
<td>Very high capacity load button</td>
</tr>
<tr>
<td>Unique Features</td>
<td>Tension and compression</td>
<td>Tension and compression</td>
<td>Tension and compression</td>
<td>Compression</td>
</tr>
<tr>
<td></td>
<td>• Tension and compression or compression only</td>
<td>• Keyed anti-rotation slot</td>
<td>• Threaded male fitting</td>
<td>• High stiffness</td>
</tr>
<tr>
<td></td>
<td>• High stability metal foil strain gage (ELHM)</td>
<td>• Bidirectional available</td>
<td>• Optional load button</td>
<td>• Optional load button</td>
</tr>
<tr>
<td></td>
<td>• High output semiconductor strain gage (ELHS)</td>
<td>• Optional watertight construction</td>
<td>• Optional rod end</td>
<td>• Optional high level output module</td>
</tr>
<tr>
<td>Ranges N (Lbf)</td>
<td>1k to 50K (200 to 10K)</td>
<td>10K to 2K (2K to 400K)</td>
<td>10K to 2K (2K to 400K)</td>
<td>20K to 5K (4K to 1K)</td>
</tr>
<tr>
<td>Max. Over-range</td>
<td>1.5X FS</td>
<td>1.5X FS</td>
<td>1.5X FS</td>
<td>1.5X FS</td>
</tr>
<tr>
<td>Output / Span</td>
<td>10 mV (ELHM) 200 mV FSO (ELHS)</td>
<td>±20 mV (4 V; ±5 V; 4 - 20 mA optional)</td>
<td>±0.25% FS</td>
<td>±0.25% FS</td>
</tr>
<tr>
<td>Non-linearity</td>
<td>0.3% to 0.5% FSO</td>
<td>±1% FS</td>
<td>Combined with linearity</td>
<td>Combined with linearity</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>Combined with linearity</td>
<td>Combined with linearity</td>
<td>Combined with linearity</td>
<td>Combined with linearity</td>
</tr>
<tr>
<td>Optional</td>
<td>-50°C to 120°C (ELHM), -20°C to 80°C (ELHS)</td>
<td>-20°C to 80°C</td>
<td>-40°C to 150°C</td>
<td>-40°C to 150°C</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>Application dependent</td>
<td>Application dependent</td>
<td>Application dependent</td>
<td>Application dependent</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>Application dependent</td>
<td>Crane monitoring, offshore, load-limited devices</td>
<td>Assembly forces, tool force, offshore</td>
<td>Calibration presse, robotics and effectors, laboratory and research</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Robust general purpose, low deflection design, machine tool, linkage forces</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Test and Measurement Miniature

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS ELAF</th>
<th>MEAS XFC200R</th>
<th>MEAS XFL212R</th>
<th>MEAS XFTC300 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Mode</td>
<td>Button, dual stud</td>
<td>Small diameter load button</td>
<td>Low profile load button</td>
<td>Low/high capacity dual stud</td>
</tr>
<tr>
<td>Unique Features</td>
<td>Tension and compression</td>
<td>Compression</td>
<td>Compression</td>
<td>Tension and compression</td>
</tr>
<tr>
<td></td>
<td>• Low cost</td>
<td>• High stiffness</td>
<td>• High stiffness</td>
<td>• High stiffness</td>
</tr>
<tr>
<td></td>
<td>• Small, low profile design</td>
<td>• High overload capacity</td>
<td>• High overload capacity</td>
<td>• High overload capacity</td>
</tr>
<tr>
<td></td>
<td>• Low off-axis response</td>
<td>• Static and dynamic</td>
<td>• Threaded male fitting</td>
<td>• Threaded male / female fitting</td>
</tr>
<tr>
<td>Ranges N (Lbf)</td>
<td>50 to 10K (10 to 2K)</td>
<td>2 to 10K (0.4 to 2K)</td>
<td>5 to 500 (1 to 100)</td>
<td>2 to 2K (0.4 to 400)</td>
</tr>
<tr>
<td>Max. Over-range</td>
<td>2.5X FS</td>
<td>2X to 4X FS</td>
<td>2X FS</td>
<td>2X to 4X FS</td>
</tr>
<tr>
<td>Output / Span</td>
<td>100 mV (0.5 - 4.5 V optional)</td>
<td>100 mV</td>
<td>100 mV</td>
<td>100 mV</td>
</tr>
<tr>
<td>Non-linearity</td>
<td>±0.25% FS</td>
<td>≤ 0.5% FS</td>
<td>≤ 0.5% FS</td>
<td>≤ 0.5% FS</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>±0.25% FS</td>
<td>≤ 0.5% FS</td>
<td>≤ 0.5% FS</td>
<td>≤ 0.5% FS</td>
</tr>
<tr>
<td>Optional</td>
<td>-40°C to 120°C</td>
<td>-40°C to 150°C</td>
<td>-40°C to 150°C</td>
<td>-40°C to 150°C</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>Application dependent</td>
<td>Ø12.70 x 9.53 or 8.80 Ø15.88 x 12.70 or 11.70 Ø31.75 x 10.20</td>
<td>Ø12.5 x 3.5</td>
<td>Application dependent</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>Ø12.70 x 9.53 or 8.80 Ø15.88 x 12.70 or 11.70 Ø31.75 x 10.20</td>
<td>Ø10 to Ø16</td>
<td>Ø12.5 x 3.5</td>
<td>Ø10 to Ø16</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Theatrical rigging loads, assembly forces, weighing, thrust measurements, product validation testing</td>
<td>Material test, measuring tools, robotic and effectors</td>
<td>Dental and biomechanical, surface mount assembly system, production validation test</td>
<td>Material test, tool forces, robotics and effectors</td>
</tr>
</tbody>
</table>

Specifications subject to change.
Dimensions for reference purpose only.

Catalog SS-TS-TE300
03/2017
## Load Cells
### S-Beam Standard

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS FN3030</th>
<th>MEAS FN9620</th>
<th>MEAS FN3148</th>
<th>MEAS FN7110</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Mode</td>
<td>S-beam</td>
<td>S-beam</td>
<td>S-beam with stops</td>
<td>Dual S-beam range</td>
</tr>
<tr>
<td></td>
<td>Tension and compression</td>
<td>Tension and compression</td>
<td>Tension and compression</td>
<td>Tension and compression</td>
</tr>
<tr>
<td></td>
<td>Optional rod ends</td>
<td>Optional high accuracy</td>
<td>High accuracy</td>
<td>High accuracy</td>
</tr>
<tr>
<td></td>
<td>Optional high level output</td>
<td>IP68</td>
<td>High resolution</td>
<td>Optional high level output</td>
</tr>
<tr>
<td></td>
<td>Optional high compensation</td>
<td>Entry level</td>
<td>Mechanical stops</td>
<td>Mechanical stops</td>
</tr>
<tr>
<td>Ranges N (Lbf)</td>
<td>50 to 100K (10 to 20K)</td>
<td>500 to 10K (100 to 2K)</td>
<td>10 to 2K (2 to 400)</td>
<td>10, 100 to 1K, 10K</td>
</tr>
<tr>
<td></td>
<td>Max. Over-range</td>
<td>1.5X FS</td>
<td>5X to 100X FS</td>
<td>(2, 20 to 200, 2K)</td>
</tr>
<tr>
<td></td>
<td>±20 mV (4 V; ±5 V optional)</td>
<td>±10 mV to ±20 mV</td>
<td>±20 mV (4 V; ±5 V optional)</td>
<td>±20 mV (4 V; ±5 V optional)</td>
</tr>
<tr>
<td></td>
<td>±0.1% FS</td>
<td>±0.05% FS</td>
<td>±0.05% FS</td>
<td>±0.1% FS</td>
</tr>
<tr>
<td></td>
<td>-40°C to 150°C</td>
<td>-40 to 90°C</td>
<td>-20°C to 80°C</td>
<td>-20°C to 80°C</td>
</tr>
<tr>
<td></td>
<td>Application dependent</td>
<td>56 x 20 x 60</td>
<td>Application dependent</td>
<td>60 x 30 x 100</td>
</tr>
<tr>
<td>Typical</td>
<td>Laboratory and research, process control, customized options</td>
<td>Test bed, dynamic fatigue testing, robotics and effectors</td>
<td>Product validation tests, medical instruments, weighing</td>
<td>Product validation tests, process control, robotics and effectors</td>
</tr>
</tbody>
</table>

### Low Profile and Pan-cake

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS FMT</th>
<th>MEAS FN3050, FN3000</th>
<th>MEAS FN9630, FN9635</th>
<th>MEAS FN7325</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Mode</td>
<td>Washer</td>
<td>Pan-cake</td>
<td>Very high accuracy pan-cake</td>
<td>Custom design and ranges available upon request</td>
</tr>
<tr>
<td></td>
<td>Compression</td>
<td>Tension and compression</td>
<td>Tension and compression</td>
<td>Multiaxial force and torque</td>
</tr>
<tr>
<td></td>
<td>• High stiffness</td>
<td>• High stability</td>
<td>• High stability</td>
<td>• Measures load and torque in 3 directions</td>
</tr>
<tr>
<td></td>
<td>• 1.5X over-range</td>
<td>• All FN3050 have same housing</td>
<td>• High accuracy</td>
<td>• Fatigue rated</td>
</tr>
<tr>
<td></td>
<td>• High temperature</td>
<td>• Optional high level output</td>
<td>• Minimal cross effect</td>
<td>• Minimal cross effects</td>
</tr>
<tr>
<td>Ranges N (Lbf)</td>
<td>20K to 320K (4K to 64K)</td>
<td>100 to 1000K (20 to 200K)</td>
<td>10K to 200K (2K to 40K)</td>
<td>5K to 250K (1K to 50K)</td>
</tr>
<tr>
<td></td>
<td>1.5X FS</td>
<td>1.5X FS (10X FS with stops)</td>
<td>1.5 x FS</td>
<td>1.2X FS</td>
</tr>
<tr>
<td></td>
<td>±15 mV to ±20 mV</td>
<td>15 to 20 mV (4 V; ±5 V optional)</td>
<td>±0.08% FS</td>
<td>±100 to 150 mV (4 V; ±5 V optional)</td>
</tr>
<tr>
<td></td>
<td>±0.1% FS</td>
<td>±0.1% FS</td>
<td>±0.08% FS</td>
<td>±1% FS</td>
</tr>
<tr>
<td></td>
<td>-40°C to 150°C</td>
<td>-40°C to 150°C</td>
<td>-40°C to 90°C</td>
<td>Combined with linearity</td>
</tr>
<tr>
<td></td>
<td>Application dependent</td>
<td>Application dependent</td>
<td>Application dependent</td>
<td>Application dependent</td>
</tr>
<tr>
<td>Typical</td>
<td>Robotics, process control, bolt clamping for bridges</td>
<td>Static fatigue tests, laboratory and research, robotics</td>
<td>Static fatigue tests, weighing calibration, robotics</td>
<td>Structure testing, crash testing, industrial test benches</td>
</tr>
</tbody>
</table>

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te.com/sensors
Specifications subject to change. Dimensions for reference purpose only.
# Automotive Design and Test Sensors

## MEAS FN4055
- **Package**: Seat belt sensor
- **Operating Mode**: Tension
- **Unique Features**:
  - Low operating ranges
  - Protected against overload
  - Compatible with most seat belts
- **Ranges N (Lbf)**: 100 to 300N (20 to 60) to 1,000 and 3,200
- **Max. Over-range**: 1.2X FS
- **Output / Span**: ±7.5 mV (4 V; ±5 V optional)
- **Non-linearity**: ±0.3% FS
- **Hysteresis**: Combined with linearity
- **Optional Operating Temp.**: -40 to 120 °C
- **Dimensions (mm)**: 63.5 x 63.5 x 12.7
- **Typical Applications**: Auto crash testing, tension at the belt receptacle

## MEAS FN4070, FN4080
- **Package**: Seat belt buckle sensor
- **Operating Mode**: Tension
- **Unique Features**:
  - High operating ranges
  - Detachable tongue and cable
  - Compatible with most seat belts
- **Ranges N (Lbf)**: 250 to 50K (50 to 10K) to 200 to 3K (40 to 600)
- **Max. Over-range**: 5X FS
- **Output / Span**: ±20 mV (4 V optional)
- **Non-linearity**: ±0.25% FS
- **Hysteresis**: Combined with linearity
- **Optional Operating Temp.**: Application dependent
- **Dimensions (mm)**: Ø25 spherical
- **Typical Applications**: Change gear force measurement, roughness of material

## MEAS FN2317
- **Package**: Hand brake
- **Operating Mode**: Tension
- **Unique Features**:
  - Easily installed
  - Ergonomic design
  - Fits most vehicles
- **Ranges N (Lbf)**: 500 to 1K (100 to 200) to 5K and 15K (1,000 and 3,200)
- **Max. Over-range**: 1.5X FS
- **Output / Span**: ±20 mV (4 V optional)
- **Non-linearity**: ±0.1% FS
- **Hysteresis**: Combined with linearity
- **Optional Operating Temp.**: Application dependent
- **Dimensions (mm)**: Ø195 x 50
- **Typical Applications**: Auto crash testing, tension at the belt receptacle

## MEAS FN2114, FN2570
- **Package**: Brake pedal
- **Operating Mode**: Compression
- **Unique Features**:
  - High accuracy
  - Extra flat
  - Compact
  - Rugged design
- **Ranges N (Lbf)**: 200 to 3K (40 to 600) to 200 to 3K (40 to 600)
- **Max. Over-range**: 1.5X FS
- **Output / Span**: ±20 mV (4 V optional)
- **Non-linearity**: ±0.5% FS
- **Hysteresis**: Combined with linearity
- **Optional Operating Temp.**: Application dependent
- **Dimensions (mm)**: 100 x 20 x 15
- **Typical Applications**: Hand brake, test bed

## MEAS FN7080
- **Package**: Gear stick design
- **Operating Mode**: Multi-axial
- **Unique Features**: Measures force in three directions, replaces gear knob, ease of mounting
- **Ranges N (Lbf)**: 50 to 500 (10 to 100)
- **Max. Over-range**: 1.2X FS
- **Output / Span**: ±7.5 mV (4 V; ±5 V optional)
- **Non-linearity**: < ±0.3% FS
- **Hysteresis**: Combined with linearity
- **Optional Operating Temp.**: -20°C to 80°C
- **Dimensions (mm)**: Ø25 spherical
- **Typical Applications**: Change gear force measurement, roughness of material

## MEAS FCA7300
- **Package**: Steering wheel adaptable
- **Operating Mode**: Multi-sensing
- **Unique Features**: Dual torque and angle range, steering velocity measurement, fits all road vehicles
- **Ranges N (Lbf)**: 10 to 200 Nm (7 lbf-ft to 150 lbf-ft)
- **Max. Over-range**: 10X FS
- **Output / Span**: ±10 V
- **Non-linearity**: ±0.1% FS
- **Hysteresis**: Combined with linearity
- **Optional Operating Temp.**: -20°C to 80°C
- **Dimensions (mm)**: Ø195 x 50
- **Typical Applications**: On car road test, truck and buses steering test, armored vehicles steering test

## MEAS EL20-S458
- **Package**: Special purpose design optimized for automotive crash test environments
- **Operating Mode**: Seat belt tension
- **Unique Features**:
  - Low mass titanium design for use in high shock environments
  - Mass optimized to minimize acceleration induced errors during SAE J2570 ATD and ISO 6487
  - Optional high level and linearized outputs
  - Smoothed edge design and optional slotted titanium axles eliminate drag errors and dummy damage
  - Ultra robust cable is user replaceable
- **Ranges N (Lbf)**: 5K and 15K (1,000 and 3,200)
- **Max. Over-range**: 2X
- **Output / Span**: 10 mV (0.5 to 4.5 V optional)
- **Non-linearity**: < ±2.5% FS (FN2570)
- **Hysteresis**: Combined with linearity
- **Optional Operating Temp.**: Application dependent
- **Dimensions (mm)**: Application dependent
- **Typical Applications**: Seat belt forces, safety and restraint system crash test, parachute tether and riser forces

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*Specifications subject to change. Dimensions for reference purpose only.*
<table>
<thead>
<tr>
<th>Package</th>
<th>Operating Mode</th>
<th>Unique Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAS ARD154</td>
<td>Din rail mountable</td>
<td>• Suited for full bridge strain gage sensors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 120 to 10,000 Ohm bridge impedance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ±10 V analog or 0/4 to 20 mA current output</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2 kHz or 20 kHz max. bandwidth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Calibration pushbutton from 0.1 to 10 mV/V</td>
</tr>
<tr>
<td></td>
<td>Signal conditioning for wheatstone bridge sensors</td>
<td>• Suitable for full bridge strain gage sensors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ±10 V max.; 4 to 20 mA or 0 to 20 mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ±0.01% FS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• -10°C to 60°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 99 x 17.5 x 112</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Test stands, power plants, manufacturing systems, test and measurement, test bed regulation, automat interfaces</td>
</tr>
<tr>
<td>MEAS CPA150</td>
<td>Hand held indicator</td>
<td>• Suited for 1 or 2 sensors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7½ digits (±19999999)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Front panel programming</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 45 hour life battery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Calibration pushbutton from 0.1 to 10 mV/V</td>
</tr>
<tr>
<td></td>
<td>Portable display suited for strain gage type sensors</td>
<td>• Analog output: ±10 V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Red LED display: ±2,000 count</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High bandwidth: 1,000 Hz at -3 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Low noise level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• suited for 1 or 2 sensors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ±10 V max.; 4 to 20 mA or 0 to 20 mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ±0.005% FS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• -10°C to 50°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 90 x 34 x 152 (3.54 x 1.34 x 5.98)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Outdoor punctual measurements, test and measurement, portable calibration device</td>
</tr>
<tr>
<td>MEAS M210</td>
<td>Front panel or housed in case</td>
<td>• Analog output: ±10 V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Red LED display: ±2,000 count</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High bandwidth: 1,000 Hz at -3 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Low noise level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5 digits: -19999 to 19999</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Front panel programming</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 11 point scaling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Plug-in option boards</td>
</tr>
<tr>
<td>MEAS M905</td>
<td>Front panel or housed in case</td>
<td>• Suited for process or strain gage type sensors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ±10 VDC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ±0.05% FS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• -10°C to 60°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 96 x 48 x 60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Display on test bed, monitoring, laboratory and research</td>
</tr>
</tbody>
</table>

Specifications subject to change. Dimensions for reference purpose only.
We offer a complete range of calibrated and amplified products that measure relative humidity (RH). Based on our robust patented capacitive technology, these sensors provide accurate measurement of dew point and absolute humidity by combining relative humidity and temperature measurements. Our sensors are qualified for the most demanding applications, including automotive, heavy truck, aerospace and home appliances. We offer a variety of output signals such as digital (Frequency, I²C) and analog voltage, as well as, customized and proprietary output signals including PWM, PDM, LIN and CAN.

### HUMIDITY AND TEMPERATURE (NTC) COMPONENTS

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS HS1101LF</th>
<th>MEAS HTU2X Series</th>
<th>MEAS HTU2XF Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Capacitive humidity</td>
<td>Digital RH and NTC temperature</td>
<td>Digital RH and NTC temperature</td>
</tr>
<tr>
<td>Operating RH Range</td>
<td>-60°C to 140°C</td>
<td>0 to 100% RH</td>
<td>0 to 100% RH</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td></td>
<td>-40°C to 125°C</td>
<td>-40°C to 125°C</td>
</tr>
<tr>
<td>Unique Features</td>
<td>Robust and recognized component, Suitable for most humidity applications, Cost effective solution</td>
<td>Low power consumption, Fast response time, Very low temperature coefficient, I²C interface or PWM interface or SDM interface</td>
<td>Low power consumption, Fast response time, Very low temperature coefficient, I²C interface or PWM interface or SDM interface, Optimal filter</td>
</tr>
<tr>
<td>Accuracy</td>
<td>180 pF, ±3 pF at 55% RH</td>
<td>±3% RH at 25°C (10 to 95% RH) ±0.3°C at 25°C</td>
<td>±3% RH at 25°C (10 to 95% RH) ±0.3°C at 25°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>10 x 10 x 19</td>
<td>3.0 x 3.0 x 1.0</td>
<td>3.0 x 3.0 x 1.0</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Applications requiring a robust humidity sensor in automotive, home appliance, outdoor, HVACR, consumer, printer, meteorology</td>
<td>Humidity and temperature plug and play transducers for OEM demanding applications in automotive, home appliance, printer, medical, humidifier</td>
<td>Humidity and temperature plug and play transducers for OEM demanding applications in automotive, home appliance, printer, medical, humidifier</td>
</tr>
</tbody>
</table>
### HUMIDITY AND TEMPERATURE (NTC) MINI-MODULES

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS HTU3535PVBM/Wire</th>
<th>MEAS HTU383X/Wire</th>
<th>MEAS HTG351xCH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Package</strong></td>
<td>Cost effective, small size mini-module</td>
<td>Cost effective small size mini-module</td>
<td>Cost effective small size mini-module</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Analog voltage RH and NTC temperature</td>
<td>Digital RH and NTC temperature</td>
<td>Analog voltage RH and NTC temperature</td>
</tr>
<tr>
<td><strong>Operating RH Range</strong></td>
<td>0 to 100% RH</td>
<td>0 to 100% RH</td>
<td>0 to 100% RH</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-40°C to 110°C</td>
<td>-40°C to 110°C</td>
<td>-40°C to 110°C</td>
</tr>
<tr>
<td><strong>Unique Features</strong></td>
<td>• PTFE filter (Optional) • Electronics fully protected (5 V) • Multiple connector choices (JST, Samtec board to board through hole)</td>
<td>• PTFE filter (Optional) • Electronics fully protected (5 V) • Multiple connector choices (JST, Samtec board to board through hole)</td>
<td>• Electronics fully protected with potting material (3.3 V or 5 V) • Multiple connector choices (JST, Samtec board to board through hole)</td>
</tr>
<tr>
<td><strong>Calibration</strong></td>
<td>±3% RH at 55% RH; ±0.25°C at 25°C</td>
<td>±3% RH at 55% RH; ±0.25°C at 25°C</td>
<td>±3% RH at 55% RH; ±0.25°C at 25°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>27 x 11.9 x YY (Depending on the connector, from 6 to 10.8 mm length)</td>
<td>27 x 11.9 x YY (Depending on the connector, from 6 to 10.8 mm length)</td>
<td>27 x 11.9 x 6.7</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Humidity and temperature plug and play transducers for OEM demanding applications in HVACR, home appliance, printer, medical, and outdoor</td>
<td>Humidity and temperature plug and play transducers for OEM demanding applications in HVACR, home appliance, printer, medical, and outdoor</td>
<td>Humidity and temperature plug and play transducers for OEM low cost consumer applications</td>
</tr>
</tbody>
</table>

### HUMIDITY AND TEMPERATURE (NTC) PROBES AND SENSORS

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS HM1500LF</th>
<th>MEAS HM1520LF</th>
<th>MEAS HTM2500LF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Package</strong></td>
<td>Probe, RH only</td>
<td>Probe, RH only</td>
<td>Probe, RH and temperature</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Cost effective analog voltage RH probe</td>
<td>Dedicated to low RH accurate measurement</td>
<td>Cost effective analog voltage RH</td>
</tr>
<tr>
<td><strong>Operating RH Range</strong></td>
<td>0 to 100% RH</td>
<td>0 to 100% RH</td>
<td>0 to 100% RH</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-40°C to 60°C</td>
<td>-40°C to 60°C</td>
<td>-40°C to 85°C</td>
</tr>
<tr>
<td><strong>Unique Features</strong></td>
<td>• Electronics fully protected with potting material • Optional wiring length and connectors</td>
<td>• Electronics fully protected with potting material • Optional wiring length and connectors</td>
<td>• Electronics fully protected with potting material • Optional wiring length and connectors</td>
</tr>
<tr>
<td><strong>Calibration</strong></td>
<td>±3% RH at 55% RH</td>
<td>±3% RH at 10% RH</td>
<td>±3% RH at 55% RH; ±0.25°C at 25°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>57 x 11 x 11 (Standard wire length of 200 mm)</td>
<td>57 x 11.5 x 11.5 (Standard wire length of 200 mm)</td>
<td>86 x 11.5 x 11.5 (Standard wire length of 200 mm)</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Medical, telecommunication cabinets, green houses, process control, industrial</td>
<td>Medical, drying cabinets, low humidity, meteorology</td>
<td>Hygrostat, data loggers, baby cabinets</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Passenger comfort improvement, hygrostat, HVACR, printer</td>
</tr>
</tbody>
</table>

### Specifications
- Dimensions subject to change.
- Specifications subject to change.
- Catalog SS-TS-TE300
- 03/2017

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Dimensions for reference purpose only.
Our full range of liquid level sensors help address critical requirements for the construction, off-road, and automotive industries. TE solutions include sensors for measuring power steering fluid, coolant, windscreen wash, fuel and oil. Our pride is our experience in serving the heavy duty vehicle markets: truck and bus, emergency, military, recreational, luxury and coach. We also offer level sensors for storage and collection tanks, vending machines, showers for the disabled, heat exchangers, washing machines, central heating systems and boilers. To meet the unique requirements of the food and beverage industry, TE offers a range of standard cost-effective products. We also provide thousands of sensors annually to marine engine manufacturers.
**LIQUID LEVEL SENSORS**

**High or Low Level Sensing**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Level sensor</td>
<td>Level sensor</td>
<td>Level sensor</td>
<td>Level sensor</td>
<td>Level sensor</td>
<td>Level sensor</td>
</tr>
<tr>
<td>Unique Features</td>
<td>SPDT reed switch</td>
<td>SPDT reed switch</td>
<td>SPDT reed switch</td>
<td>SPST reed switch</td>
<td>SPDT reed switch</td>
<td>SPST reed switch</td>
</tr>
<tr>
<td>Max. Pressure</td>
<td>2.0 bar</td>
<td>4.7 bar</td>
<td>2.0 bar</td>
<td>4.7 bar</td>
<td>2.0 bar</td>
<td>4.7 bar</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-30°C to 130°C</td>
<td>-30°C to 130°C</td>
<td>-30°C to 130°C</td>
<td>-30°C to 130°C</td>
<td>-30°C to 110°C</td>
<td>-30°C to 110°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>103 x 29 x 29</td>
<td>88 x 27 x 27</td>
<td>103 x 29 x 29</td>
<td>88 x 27 x 27</td>
<td>103 x 29 x 29</td>
<td>88 x 27 x 27</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection</td>
<td>Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection</td>
<td>Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection</td>
<td>Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection</td>
<td>Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Level sensor</td>
<td>Level sensor</td>
<td>Level sensor</td>
<td>Level sensor</td>
<td>Level sensor</td>
<td>Level sensor</td>
</tr>
<tr>
<td>Unique Features</td>
<td>SPST reed switch</td>
<td>SPST reed switch</td>
<td>SPST reed switch</td>
<td>SPST reed switch</td>
<td>SPST reed switch</td>
<td>SPST reed switch</td>
</tr>
<tr>
<td>Max. Pressure</td>
<td>2.0 bar</td>
<td>4.7 bar</td>
<td>2.0 bar</td>
<td>4.7 bar</td>
<td>2.0 bar</td>
<td>4.7 bar</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-30°C to 110°C</td>
<td>-30°C to 105°C</td>
<td>-30°C to 105°C</td>
<td>-30°C to 105°C</td>
<td>-30°C to 105°C</td>
<td>-30°C to 105°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>103 x 29 x 29</td>
<td>88 x 27 x 27</td>
<td>103 x 29 x 29</td>
<td>88 x 27 x 27</td>
<td>103 x 29 x 29</td>
<td>88 x 27 x 27</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water</td>
<td>Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, boiling water</td>
<td>Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems</td>
<td>Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems</td>
<td>Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems</td>
<td>Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems</td>
</tr>
</tbody>
</table>

Specifications subject to change. Dimensions for reference purpose only.

Catalog SS-TS-TE300 03/2017
Optic-based sensors include both photo optic components and complete sensor solutions. Our component series features dual LED, bi-wavelength emitters and spectrally paired photo detectors. Our optics are suited for medical applications where selection of peak wavelength is a priority, such as pulse oximetry ($\text{SpO}_2$). We also package our optics into complete probe assemblies for pulse oximetry monitoring applications. Our $\text{SpO}_2$ probe platform includes reusable finger clips, soft silicone boots, and a range of disposable sensors.
### PHOTO OPTIC SENSORS

Photo Optic Components

<table>
<thead>
<tr>
<th>MEAS ELM-4000</th>
<th>MEAS EPM-4001</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Package</strong></td>
<td>Lead frame</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Emitter assembly</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>660 nm / 880-940 nm</td>
</tr>
</tbody>
</table>
| **Unique Features** | • Low cost  
|               | • Dual drive  
|               | • Clear epoxy lens |
| **Accuracy**  | Sensor dependent |
| **Operating Temp.** | -55°C to 70°C |
| **Dimensions (mm)** | 4.4 x 5.1 x 1.9 |
| **Typical Applications** | Pulse oximetry, finger and ear probes, disposable |

**Unique Features**
- Low cost
- Fast response
- High efficiency

**Applications**
- Pulse oximetry, finger and ear probes, disposable

Specifications subject to change. Dimensions for reference purpose only.

te.com/sensors

Catalog SS-TS-TE300

03/2017
Our piezo film sensors provide durable vibration, accelerometer, or dynamic switch elements for a wide range of markets and applications. Piezoelectric fluoropolymer film has unique capabilities and produces voltage or charge proportional to dynamic strain. The film is suited for many different custom designs, configurations and applications, including versatile coaxial cable used for everything from security to musical instrument amplification.
## PIEZO FILM SENSORS

### PIEZO FILM

**MEAS DT1, SDT1**

- **Package**: Unshielded element with twisted pair or shielded element with shielded cable
- **Type**: Flexible film, adhesive mount
- **Range**: 15 mV/με up to 1% strain
- **Unique Features**:
  - Thin, flexible, robust
  - Withstands >2% strain
  - Ultra-low power (Self generating)
- **Accuracy**: ±20% (Typical)
- **Operating Temp.**:
  - -40°C to 70°C (Higher available custom)
- **Dimensions (mm)**: Ø3 (Continuous lengths)
- **Typical Applications**: Dynamic strain gage, contact microphone, acoustic pickup

**MEAS Piezo Cable**

- **Package**: Shielded coaxial 20 gage piezo cable
- **Type**: Polymer jacketing, armored jacketing
- **Range**: μPa sensitivity
- **Unique Features**:
  - Continuous lengths of up to 1 km
  - Shielded construction
- **Accuracy**: ±20% (Typical)
- **Operating Temp.**: -40°C to 85°C
- **Dimensions (mm)**: Ø3 (Continuous lengths)
- **Typical Applications**: Perimeter and fence security, geophone, impact sensors, intrusion detection, seat occupancy (e.g. airbag), patient bed vital signs monitor

**MEAS CM-01**

- **Package**: Metallized plastic housing
- **Type**: Contact microphone
- **Range**: 40 V/mm; 8 Hz to 2.2 kHz
- **Unique Features**:
  - Low noise
  - Shielded construction
  - High sensitivity
- **Accuracy**: ±20% (Typical)
- **Operating Temp.**: 5°C to 60°C
- **Dimensions (mm)**: Ø18 x 11 high
- **Typical Applications**: Electronic stethoscope, contact microphone, vibration

**MEAS FLDT1**

- **Package**: Unshielded film element with screen printed leads
- **Type**: Flexible film, adhesive mount
- **Range**: 15 mV/με, up to 1% strain
- **Unique Features**:
  - Thin, flexible
  - Leads screen printed on film
  - Connects to standard connector
- **Accuracy**: ±20% (Typical)
- **Operating Temp.**: -40°C to 70°C; (Higher available custom)
- **Dimensions (mm)**: 12 x 30 active; (Custom available)
- **Typical Applications**: Event timing, dynamic strain, motion detection

**MEAS LDTC Analog PCB**

- **Package**: Evaluation PCB platform for vibration sensor
- **Type**: Amplified analog output
- **Range**: 1 Hz to 117 Hz
- **Unique Features**:
  - Low power
  - High sensitivity
  - Analog and digital signal access points
- **Accuracy**: ±20%
- **Operating Temp.**: -20°C to 85°C
- **Dimensions (mm)**: 33 x 46
- **Typical Applications**: Vibration sensing, wake-up sensor, activity sensor

---

**MEAS Laboratory Amplifier**

- **Package**: Bench top
- **Type**: Piezo film lab amp
- **Range**: 0.1 Hz to 100 kHz
- **Unique Features**:
  - Voltage or charge mode settings
  - Multi-pole high-pass and low-pass filters
  - Adjustable gain
- **Accuracy**: Application dependent
- **Operating Temp.**: 0°C to 40°C
- **Dimensions (mm)**: 150 x 100 x 100
- **Typical Applications**: Air ranging, ultrasonic mouse, digitizers

**MEAS 80 KHz Transducers**

- **Package**: Pin mounted
- **Type**: Air ultrasound transducer
- **Range**: 80 kHz
- **Unique Features**:
  - Small size
  - Low mechanical Q
  - Shielded package
- **Accuracy**: Application dependent
- **Operating Temp.**: -20°C to 80°C
- **Dimensions (mm)**: Ø6 x 9
- **Typical Applications**: Thickness measurement, speed of sound measurement, pulse/echo NDT

**MEAS NDT-1**

- **Package**: Flat film or box mounted
- **Type**: High frequency ultrasound transducer
- **Range**: 3 MHz
- **Unique Features**:
  - Flexible
  - High bandwidth, low Q
  - Low impedance
- **Accuracy**: Application dependent
- **Operating Temp.**: -20°C to 60°C
- **Dimensions (mm)**: 12 x 30
- **Typical Applications**: Encryption modules, POS card readers, PIN entry devices

**MEAS Tamper Box**

- **Package**: Ceramic base, plastic cover, shielded cable
- **Type**: Tamper detection sensor
- **Range**: ±250 g (Typical)
- **Unique Features**:
  - Low power
  - Custom shapes and sizes
  - High security
- **Accuracy**: Application dependent
- **Operating Temp.**: -40°C to 85°C
- **Dimensions (mm)**: 18.80 x 13.21 x 6.10
- **Typical Applications**: Wake-up switch, load imbalance, antitheft devices, impact sensing, vital signs monitoring

**MEAS ACH-01**

- **Package**: Adhesive mount
- **Type**: Ceramic base, plastic cover, shielded cable
- **Range**: ±10 g (Typical)
- **Unique Features**:
  - Extremely high bandwidth
  - Low cost
  - Ultra-low power
- **Accuracy**: Application dependent
- **Operating Temp.**: -40°C to 85°C
- **Dimensions (mm)**: 19.05 x 6.35 x 6.35
- **Typical Applications**: Vibration sensing, gear box and high speed monitoring, high speed bearings and centrifuges, speaker motional feedback

**MEAS LDTC Family**

- **Package**: Piezo film elements with or without mass
- **Type**: Cantilever beam with vertical or horizontal pins
- **Range**: ±10 g (Typical)
- **Unique Features**:
  - Very low cost
  - High sensitivity (1 V/g)
  - Ultra-low power (Self generating)
- **Accuracy**: ±20%
- **Operating Temp.**: -40°C to 70°C
- **Dimensions (mm)**: 19.05 x 6.35 x 6.35
- **Typical Applications**: Wake-up switch, load imbalance, antitheft devices, impact sensing, vital signs monitoring
POSITION SENSORS

We are a leading manufacturer of industrial linear and angular position, tilt and fluid level sensors. Both off-the-shelf and custom position sensing solutions are available featuring our core technologies, including inductive, potentiometric, magnetoresistive, hall effect, reed switch, electrolytic and capacitive sensing. Sophisticated designs and manufacturing techniques provide reliable and cost effective solutions for a broad range of harsh applications such as automotive, power generation, subsea, hydraulics, medical, HVACR, process controls, factory automation, security systems, military/aerospace and nuclear. TE position sensors are available with analog and digital outputs. Our comprehensive range of signal conditioning instrumentation enables us to meet the specific needs of OEMs and end users.
### ANISOTROPIC MAGNETORESISTIVE (AMR) SENSOR COMPONENTS

**Magnetoresistive (MR)**

<table>
<thead>
<tr>
<th><strong>MEAS KMY, KMZ</strong></th>
<th><strong>MEAS MS32</strong></th>
<th><strong>MEAS KMT32B, KMT37</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Package</strong></td>
<td>SOT-223, E-line 4 pin</td>
<td>TDFN</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Linear low field sensor</td>
<td>Low field switch sensor</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>-2 to 2 kA/m magnetic field</td>
<td>1 to 3 kA/m magnetic switching field</td>
</tr>
</tbody>
</table>
| **Unique Features** | • High sensitivity  
  • Low hysteresis  
  • Linear to uniaxial field strength | • Linearized ratiometric output  
  • Temperature compensated switching point | • High accuracy  
  • High resolution |
| **Output**        | Ratiometric with output voltage range 20 mV/V | Ratiometric with output voltage range 10 mV/V | Sine and cosine signals with output voltage range 20 mV/V |
| **Resolution**    | Typ. 0.1% of range | Typ. 0.1 kA/m | Typ. 0.01° to 0.1° |
| **Accuracy**      | Typ. 1.0% of range | Typ. 0.1 kA/m | Typ. 0.1° to 1° |
| **Operating Temp.** | -40°C to 150°C | -25°C to 85°C | -40°C to 150°C (175°C on request) |
| **Dimensions (mm)** | SOT: 6.6 x 7.0 x 1.6 | TDFN: 2.5 x 2.5 x 0.8 | TDFN: 2.5 x 2.5 x 0.8 |
| **Applications**  | Non-destructive material testing, spray arm detection in dish washers, magnetic imaging, brake pedal position | Piston position switch, reed switch replacement | Steering position, flow meters, rpm meters, rotary encoders |

<table>
<thead>
<tr>
<th><strong>MEAS KMT36H</strong></th>
<th><strong>MEAS KMA36</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Package</strong></td>
<td>TDFN 2.5 x 2.5</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Angle sensor</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>360° angle</td>
</tr>
</tbody>
</table>
| **Unique Features** | • High accuracy  
  • High resolution  
  • 360° full turn |
| **Output**       | Three 120° phase shifted output signals with output voltage range 20 mV/V |
| **Resolution**   | Typ. 0.01° to 0.1° |
| **Accuracy**     | Typ. 0.1° to 1° |
| **Operating Temp.** | -40°C to 150°C |
| **Dimensions (mm)** | TDFN: 2.5 x 2.5 x 0.8 |
| **Applications** | Steering position, gage readings, rotary encoders |

<table>
<thead>
<tr>
<th><strong>MEAS KMXP Series</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td><strong>Range</strong></td>
</tr>
</tbody>
</table>
| **Unique Features**  | • For pole pitch  
  • KMXP 1000: p= 1 mm  
  • KMXP 2000: p= 2 mm  
  • KMXP 5000: p= 5 mm |
| **Output**           | Sine and cosine signals with output voltage range 20 mV/V |
| **Resolution**       | 0.01% to 0.1% of pole pitch  
  0.1 to 1.0% of pole pitch |
| **Accuracy**         | -40°C to 125°C |
| **Operating Temp.**  | -40°C to 125°C |
| **Dimensions (mm)**  | DFN: 2 x 6 x 0.8 |
| **Applications**     | Roller conveyors, circular saws, bending machines etc. |

*Specifications subject to change. Dimensions for reference purpose only.*
**POSITION SENSORS**

### ANGULAR POSITION TRANSDUCERS—INDUCTIVE

#### Absolute

<table>
<thead>
<tr>
<th>Model</th>
<th>Package</th>
<th>Resolution</th>
<th>Excitation</th>
<th>Output</th>
<th>Max. Speed</th>
<th>Excitation</th>
<th>Unique Features</th>
<th>Operating Temp.</th>
<th>Dimensions (mm)</th>
<th>Typical Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAS RVIT-Z</td>
<td>PCB for OEM volumes</td>
<td>Infinite</td>
<td>DC voltage</td>
<td>DC voltage, DC current, digital</td>
<td>Up to ±75°</td>
<td>±7.5 VDC</td>
<td>±60° Absolute position, Low momentum of inertia, Encapsulated electronics, sealed unit, No optical degradation</td>
<td>-25°C to 85°C</td>
<td>25.4 x 25.4 x 33.78 Ø19.1 x 37.1</td>
<td>Viscometers, valve position, robotics, HVACR vane position, ATM’s, joysticks, Dancer arm position, rotary actuator position feedback, throttle lever position feedback, ball valve position, textile manufacturing equipment, printing presses</td>
</tr>
<tr>
<td>MEAS R60D</td>
<td>Servo mount with ball bearing</td>
<td>Infinite</td>
<td>DC symmetrical ±15 VDC</td>
<td>±7.5 VDC</td>
<td>±60°</td>
<td>• Absolute position, Low momentum of inertia</td>
<td>-25°C to 85°C</td>
<td>Aluminum case size 11 (Ø27 mm)</td>
<td>Feedback sensor or human machine interface device, servomotor position and speed control</td>
<td></td>
</tr>
<tr>
<td>MEAS R30A</td>
<td>Servo mount with ball bearing</td>
<td>Infinite</td>
<td>AC operated</td>
<td>AC voltage</td>
<td>±30° to ±60°</td>
<td>• Absolute position</td>
<td>-55°C to 150°C</td>
<td>Aluminum case size 11 (Ø27 mm)</td>
<td>Machine tool equipment, rotary actuator feedback, valve positioning, power generation valve position</td>
<td></td>
</tr>
</tbody>
</table>

### ANGULAR POSITION—ENCODERS

#### Absolute

<table>
<thead>
<tr>
<th>Model</th>
<th>Package</th>
<th>Resolution</th>
<th>Max. Speed</th>
<th>Excitation</th>
<th>Unique Features</th>
<th>Operating Temp.</th>
<th>Dimensions (mm)</th>
<th>Typical Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAS ED-18</td>
<td>Medium duty with sleeve or ball bearing</td>
<td>Analog 1.4°</td>
<td>300 RPM (Sleeve bearing)</td>
<td>3000 RPM (Ball bearing)</td>
<td>Low profile, Excellent stability, No optical degradation</td>
<td>-40°C to 85°C</td>
<td>25.4 x 25.4 x 33.78 Ø19.1 x 37.1</td>
<td>Feedback sensor or human machine interface device, servomotor position and speed control</td>
</tr>
<tr>
<td>MEAS ED-22</td>
<td>Medium duty with sleeve bearing</td>
<td>Analog 1.4°</td>
<td>300 RPM</td>
<td>5 VDC</td>
<td>Encapsulated electronics, sealed unit, Highly resistant to vibration, No optical degradation</td>
<td>-40°C to 85°C</td>
<td>25.4 x 25.4 x 33.78 Ø19.1 x 37.1</td>
<td>Low-cost, non-contact human machine interface potentiometer replacement</td>
</tr>
<tr>
<td>MEAS R36</td>
<td>Heavy duty shaftless</td>
<td>Analog 1.4°</td>
<td>5 VDC</td>
<td>• Rugged housing, Shaftless, No optical degradation</td>
<td>Voltage</td>
<td>-40°C to 85°C</td>
<td>37.36 x 25.4 x 7.62</td>
<td>Feedback sensor or human machine interface device, rudder control, servomotor position and speed control</td>
</tr>
</tbody>
</table>
## ANGULAR POSITION—ENCODERS

### Absolute

<table>
<thead>
<tr>
<th><strong>MEAS H005, H009 Series</strong></th>
<th><strong>MEAS H009, 1200 Series</strong></th>
</tr>
</thead>
</table>
| **Package** | • 12.7 mm - 22.19 mm / 500 in - .875 in housing diameter  
• 3.170 mm / .1248 in shaft diameter  
• 16.9 mm - 17.4 mm / .670 in - .680 in housing length |
| **Range** | Up to 359 degrees |
| **Output Options** | Analog / PWM / Serial  
12-bit analog / PWM  
14-bit serial (SPI)  
±0.2% |
| **Nominal Supply** | 5 volts |
| **Operating Temp.** | -40°C to 150°C |
| **Rotational Life** | > 100 million cycles (Bearing life)  
> 100 million cycles (Bearing life) |
| **Typical Applications** | Critical position feedback applications in commercial, industrial, medical, aircraft and military markets |

### Incremental

<table>
<thead>
<tr>
<th><strong>MEAS ED-19</strong></th>
<th><strong>MEAS ED-20</strong></th>
</tr>
</thead>
</table>
| **Package** | Medium duty with sleeve or ball bearing  
1024, 400, 256 CPR (Others on request)  
300 RPM (Sleeve bearing)  
3000 RPM (Ball bearing) |
| **Max. Speed** | 3000 RPM  
5 volts (Dual output)  
-40°C to 150°C |
| **Excitation** | 5 VDC  
360° |
| **Unique Features** | • Sleeve or ball bearing  
• No optical degradation  
• Resistant to contamination  
• Metallic threaded bushing mounting  
• No optical degradation  
360° |
| **Output Options** | Quadrature (TTL level, open collector)  
360° |
| **Operating Temp.** | -40°C to 85°C  
-40°C to 85°C |
| **Dimensions (mm)** | 25.4 x 25.4 x 33.78  
Ø31.75 x 33.24 |
| **Typical Applications** | Feedback sensor or human machine interface device, servo / stepper motor position and speed control  
Feedback sensor or human machine interface device, servo / stepper motor position and speed control |
## TILT SENSORS

### SINGLE AXIS

<table>
<thead>
<tr>
<th>Package</th>
<th>Type</th>
<th>Range</th>
<th>Output</th>
<th>Unique Features</th>
<th>Accuracy</th>
<th>Operating Temp.</th>
<th>Dimensions (mm)</th>
<th>Typical Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAS E-Series</td>
<td>Inclination sensor module</td>
<td>±5°, ±15°</td>
<td>Voltage</td>
<td>• Easy to handle</td>
<td>±0.2° to ±0.5°</td>
<td>-25°C to 85°C</td>
<td>29 x 17 x 16.5</td>
<td>Road construction, building monitoring, weighing systems, mobile and stationary cranes, platform leveling</td>
</tr>
<tr>
<td></td>
<td>LCP housing</td>
<td>±45° to ±60°</td>
<td>Voltage</td>
<td>• Minimal temperature drift</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plastic housing</td>
<td>±45°, ±90°</td>
<td>Voltage</td>
<td>• Good long term stability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEAS AccuStar EA</td>
<td>Inclinometer sensor module</td>
<td></td>
<td>Voltage</td>
<td>• Compact</td>
<td>0° to 10° ±0.1% accuracy</td>
<td>-25°C to 65°C</td>
<td>127.5 x 88 x 32.2</td>
<td>Tower crane safety, RV and mobile trailer leveling, water and oil well drilling rigs, mining equipment</td>
</tr>
<tr>
<td>MEAS APS System</td>
<td>Inclinometer system</td>
<td></td>
<td>Voltage</td>
<td>• Low power</td>
<td>10° to 60° ±0.75% reading</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plastic housing</td>
<td>±45°, ±90°</td>
<td>Voltage</td>
<td>• Vertical and horizontal mount</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plastic housing</td>
<td>±45°, ±90°</td>
<td>Voltage</td>
<td>• Stand alone system</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### MULTIPLE AXES

<table>
<thead>
<tr>
<th>Package</th>
<th>Type</th>
<th>Range</th>
<th>Output</th>
<th>Unique Features</th>
<th>Accuracy</th>
<th>Operating Temp.</th>
<th>Dimensions (mm)</th>
<th>Typical Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAS G-Series</td>
<td>Inclinometer</td>
<td>±10°</td>
<td>Switch</td>
<td>• Programmable</td>
<td>±0.25°</td>
<td>-25°C to 85°C</td>
<td>80 x 75 x 57.5</td>
<td>Lift platforms, building device control, train inclination monitoring, position switch</td>
</tr>
<tr>
<td>MEAS IT9000</td>
<td>Inclinometer</td>
<td>±45° to ±240°</td>
<td>Voltage divider, 4 - 20 mA</td>
<td>• Rugged industrial design, IP67 / 68</td>
<td>±1%</td>
<td>-34°C to 90°C</td>
<td>Ø130 x 100</td>
<td>Waste water control, tainter gates, draw bridges, heavy industrial applications</td>
</tr>
<tr>
<td>MEAS AccuStar IP66</td>
<td>Inclinometer</td>
<td>±3° to ±45°</td>
<td>Current</td>
<td>• EMI and RFI rated</td>
<td>0° to 10° ±0.1% linearity</td>
<td>-25°C to 60°C</td>
<td>98.04 x 63 x 35.05</td>
<td>Tower crane safety, RV and mobile trailer leveling, water and oil well drilling rigs, mining equipment</td>
</tr>
</tbody>
</table>
# POSITION SENSORS

## TILT SENSORS
### Dual Axis

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS DPL, DPN Series</th>
<th>MEAS DOG2 Series</th>
<th>MEAS DPG Series</th>
<th>MEAS D Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>PCB board</td>
<td>Plastic PA 6.6 housing, IP67</td>
<td>Aluminum housing IP67</td>
<td>Aluminum housing IP67</td>
</tr>
<tr>
<td>Range</td>
<td>±2° to ±30°</td>
<td>±25°, ±45°, ±90°</td>
<td>±5° to ±30°</td>
<td>±5° to ±30°</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• High resolution</td>
<td>• Plug and play</td>
<td>• CE approved</td>
<td>• High accuracy</td>
</tr>
<tr>
<td></td>
<td>• Minimal temperature drift</td>
<td>• Wide measurement range</td>
<td>• Rugged housing</td>
<td>• Rugged housing</td>
</tr>
<tr>
<td></td>
<td>• User configurable</td>
<td>• Cost-efficient</td>
<td>• Easy to use</td>
<td>• Programmable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cable with connector</td>
<td>• User configurable</td>
<td>• CE approved</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.05° to ±0.8°</td>
<td>&lt; ± 0.5° (Full temp. range)</td>
<td>±0.05° to ±0.3°</td>
<td>±0.04° to ±0.8°</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-40°C to 85°C</td>
<td>-40°C to 85°C</td>
<td>-40°C to 85°C</td>
<td>-40°C to 85°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>45 x 45 x 20</td>
<td>70.5 x 45 x 15</td>
<td>84 x 70 x 34.2</td>
<td>84 x 70 x 46</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Laser leveling, weighing systems,</td>
<td>Off road vehicle, fork lift, truck leveling, man lift, harvester, farm machine, tip over protection,</td>
<td>Platform leveling, road construction machines, tunnel drilling, mobile leveling</td>
<td>Drilling machines, mobile and stationary cranes, wind power, antenna / radar leveling</td>
</tr>
</tbody>
</table>

## PROXIMITY SENSORS

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS PS801</th>
<th>MEAS PS811</th>
<th>MEAS PS831</th>
<th>MEAS PS2011AB</th>
<th>MEAS PS2021AB</th>
<th>MEAS PS2031AB</th>
<th>MEAS PS501</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Stainless steel</td>
<td>Nylon 6.6</td>
<td>Stainless steel</td>
<td>Glass filled nylon 6.6</td>
<td>Glass filled nylon 6.6</td>
<td>Glass filled nylon 6.6</td>
<td>Glass filled nylon 6.6</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Proximity sensor</td>
<td>• Proximity sensor</td>
<td>• Proximity sensor</td>
<td>• Proximity sensor</td>
<td>• Proximity sensor</td>
<td>• Proximity sensor</td>
<td>• Proximity sensor</td>
</tr>
<tr>
<td></td>
<td>• Used with proximity magnet</td>
<td>• Used with proximity magnet</td>
<td>• Used with proximity magnet</td>
<td>• Used with proximity magnet</td>
<td>• Used with proximity magnet</td>
<td>• Used with proximity magnet</td>
<td>• Used with proximity magnet</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-30°C to 120°C</td>
<td>-30°C to 110°C</td>
<td>-30°C to 130°C</td>
<td>-30°C to 105°C</td>
<td>-30°C to 105°C</td>
<td>-30°C to 130°C</td>
<td>-30°C to 105°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>Ø12 x 65</td>
<td>Ø10 x 38</td>
<td>Ø12 x 32</td>
<td>29 x 7 x 20</td>
<td>29 x 7 x 20</td>
<td>29 x 7 x 20</td>
<td>Ø6 x 32</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Door interlocks, hook switches, security systems, safety interlocks, position indication</td>
<td>Door interlocks, hook switches, security systems, safety interlocks, position indication</td>
<td>Door interlocks, hook switches, security systems, safety interlocks, position indication</td>
<td>Door interlocks, hook switches, security systems, safety interlocks, position indication</td>
<td>Door interlocks, hook switches, security systems, safety interlocks, position indication</td>
<td>Door interlocks, hook switches, security systems, safety interlocks, position indication</td>
<td>Door interlocks, hook switches, security systems, safety interlocks, position indication</td>
</tr>
</tbody>
</table>

Specifications subject to change.
Dimensions for reference purpose only.

Catalog SS-TS-TE300
03/2017
## POSITION SENSORS

### PROXIMITY MAGNET

<table>
<thead>
<tr>
<th>MEAS PM101</th>
<th>MEAS PM50</th>
<th>MEAS PM81</th>
<th>MEAS PM83</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package</td>
<td>Glass filled nylon 6.6</td>
<td>Glass filled nylon 6.6</td>
<td>Nylon 6.6</td>
</tr>
<tr>
<td>Type</td>
<td>• Proximity magnet</td>
<td>• Proximity magnet</td>
<td>• Proximity magnet</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Used with proximity sensor</td>
<td>• Used with proximity sensor</td>
<td>• Used with proximity sensor</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-30°C to 105°C</td>
<td>-30°C to 70°C</td>
<td>-30°C to 120°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>29 x 7 x 20</td>
<td>Ø6 x 32</td>
<td>Ø10 x 38</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Door interlocks, hook switches, security systems, safety interlocks, position indication</td>
<td>Door interlocks, hook switches, security systems, safety interlocks, position indication</td>
<td>Door interlocks, hook switches, security systems, safety interlocks, position indication</td>
</tr>
</tbody>
</table>

### LINEAR POSITION TRANSDUCERS

#### Cable Extension Transducers

<table>
<thead>
<tr>
<th>MEAS PT1, PT5</th>
<th>MEAS PT8000</th>
<th>MEAS PT9000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>0 - 2 to 0 - 250 inches</td>
<td>0 - 2 to 0 - 60 inches</td>
</tr>
<tr>
<td>Output</td>
<td>Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental encoder, CANbus, DeviceNet™, RS-232</td>
<td>Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental / absolute encoder, CANbus, DeviceNet™, RS-232</td>
</tr>
<tr>
<td>IP Rating</td>
<td>IP65, IP67 (PT5)</td>
<td>IP67, IP68</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Aluminum and abs plastic (PT1)</td>
<td>Aluminum or stainless</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.04% to ±0.25%</td>
<td>±0.04% to ±0.25%</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Designed for most factory environments</td>
<td>• Heavy duty, submersible</td>
</tr>
<tr>
<td></td>
<td>• Industry standard output signals</td>
<td>• Designed for extreme industrial and marine environments</td>
</tr>
<tr>
<td></td>
<td>• User serviceable</td>
<td>• CSA, CENELEC certification for hazardous area applications</td>
</tr>
<tr>
<td></td>
<td>• Compact design (PT1)</td>
<td>• High accuracy, high acceleration</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-40°C to 90°C</td>
<td>-40°C to 90°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>85 x 100 x 70 (PT1)</td>
<td>90 x 140 x 135</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Factory automation, industrial, die casting, injection molding</td>
<td>Steel mills, lumber and paper mills, factory automation, die-casting, injection molding, mobile construction and mining</td>
</tr>
</tbody>
</table>

Specifications subject to change. Dimensions for reference purpose only. Catalog SS-TS-TE300 03/2017
# LINEAR POSITION TRANSDUCERS

**Cable Extension Transducers**

<table>
<thead>
<tr>
<th><strong>MEAS M150, MTA</strong></th>
<th><strong>MEAS MT2, MT3</strong></th>
<th><strong>MEAS SM, SP</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range</strong></td>
<td>0 - 1.5 to 0 - 5 inches</td>
<td>0 - 3 to 0 - 30 inches</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>Voltage divider</td>
<td>Voltage divider, incremental encoder</td>
</tr>
<tr>
<td><strong>Environment / IP Rating</strong></td>
<td>IP50</td>
<td>IP50, IP67 (MT3A)</td>
</tr>
<tr>
<td><strong>Enclosure</strong></td>
<td>Aluminum</td>
<td>Aluminum and polycarbonate</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.4% to ±1%</td>
<td>±0.25% to ±1.1%</td>
</tr>
<tr>
<td><strong>Unique Features</strong></td>
<td>M150: one of the world’s smallest stringpots</td>
<td>Designed for space-critical and testing applications</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-40°C to 85°C (M150)</td>
<td>-55°C to 125°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>19 x 19 x 10 (M150)</td>
<td>55 x 45 x 55</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Aerospace, automotive instrumentation, automotive and motorcycle racing</td>
<td>Automotive crash testing, aerospace and flight testing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>MEAS SG, SR</strong></th>
<th><strong>MEAS SK1, SK6</strong></th>
<th><strong>MEAS PTX, PT101</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range</strong></td>
<td>0 - 80 to 0 - 175 inches</td>
<td>0 - 250 and 0 - 400 inches</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental encoder, CANbus</td>
<td>4 - 20 mA, 0 - 10 V, voltage divider, CAN J1939, CANopen®, Encoder drive</td>
</tr>
<tr>
<td><strong>Environment / IP Rating</strong></td>
<td>IP67</td>
<td>IP67</td>
</tr>
<tr>
<td><strong>Enclosure</strong></td>
<td>Polycarbonate with stainless steel bracket</td>
<td>Polycarbonate with stainless steel bracket</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.35% to ±0.5%</td>
<td>±25% F5</td>
</tr>
<tr>
<td><strong>Unique Features</strong></td>
<td>In stock, Low cost, high value stringpot, Versatile stainless steel mounting bracket, Simple one-button user scalable stroke range (SR), Custom configurations available for OEM customers</td>
<td>In stock, Compact design, M12 connectivity, Adjustable mounting bracket</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-40°C to 85°C</td>
<td>-40°C to 85°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>100 x 120 x 200</td>
<td>120 x 140 x 140</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Outdoor mobile construction equipment, outrigger positioning, hydraulic lifts, water and power controls</td>
<td>Mobile construction equipment, factory automation</td>
</tr>
</tbody>
</table>

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Specifications subject to change. Dimensions for reference purpose only. Catalog SS-TS-TE300 03/2017
# LINEAR POSITION TRANSDUCERS—INDUCTIVE

## Absolute

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS HR</th>
<th>MEAS M12</th>
<th>MEAS HC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linearity</td>
<td>AISI-400 series stainless steel</td>
<td>AISI-304 series stainless steel</td>
<td>AISI-400 series stainless steel</td>
</tr>
<tr>
<td>±0.25% of range</td>
<td>±0.25% of range</td>
<td>±0.25% of range</td>
<td>±0.25% of range</td>
</tr>
<tr>
<td>Excitation</td>
<td>AC operated</td>
<td>AC operated</td>
<td>AC operated</td>
</tr>
<tr>
<td>Output</td>
<td>AC voltage</td>
<td>AC voltage</td>
<td>AC operated</td>
</tr>
<tr>
<td>±0.05 to ±10 inches</td>
<td>±10 to ±100 mm</td>
<td>±55°C to 150°C (220°C optional)</td>
<td>±55°C to 150°C (220°C optional)</td>
</tr>
<tr>
<td>Unique Features</td>
<td>Large bore to core clearance</td>
<td>Metric series</td>
<td>Hermetically sealed</td>
</tr>
<tr>
<td></td>
<td>Broad range of excitation</td>
<td>High stroke to length ratio</td>
<td>Welded connector</td>
</tr>
<tr>
<td></td>
<td>AC operated</td>
<td>Constant sum of secondaries</td>
<td>Double shielding</td>
</tr>
<tr>
<td>Output</td>
<td>AC voltage</td>
<td>Excellent temperature coefficient</td>
<td>Intrinsically safe version</td>
</tr>
<tr>
<td>±0.25 ±0.5 and ±1 inches</td>
<td>±10 to ±100 mm</td>
<td></td>
<td>CE mark for DC versions</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-55°C to 150°C (220°C optional)</td>
<td>-55°C to 150°C (220°C optional)</td>
<td>-55°C to 150°C (AC); 0°C to 70°C (DC)</td>
</tr>
<tr>
<td>Diameter (mm)</td>
<td>20.6</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>Typical</td>
<td>General industrial</td>
<td>General industrial</td>
<td>Hydraulic spool valve position feedback, flight simulators, aircraft flight control feedback</td>
</tr>
<tr>
<td>Applications</td>
<td></td>
<td></td>
<td>Harsh environments, submersible applications, process controls, valve position feedback</td>
</tr>
</tbody>
</table>

## MEAS XS-C

<table>
<thead>
<tr>
<th>Package</th>
<th>AISI-304 series stainless steel</th>
<th>AISI-400 series stainless steel</th>
<th>AISI-400 series stainless steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linearity</td>
<td>±0.25% of range</td>
<td>±0.25% of range</td>
<td>±0.2% of range</td>
</tr>
<tr>
<td>Excitation</td>
<td>AC operated</td>
<td>8.5 to 28 VDC</td>
<td>AC operated</td>
</tr>
<tr>
<td>Output</td>
<td>AC voltage</td>
<td>0 - 5 VDC (4 wire), 1 - 6 VDC 3 wire</td>
<td>AC voltage</td>
</tr>
<tr>
<td>±0.25, ±0.5 and ±1 inches</td>
<td>±10 to ±100 mm</td>
<td>0 - 0.1 to 0 - 6 inches</td>
<td>±1 to ±10 inches</td>
</tr>
<tr>
<td>Unique Features</td>
<td>High pressure</td>
<td>CE mark</td>
<td>Very high stroke to body length ratio</td>
</tr>
<tr>
<td></td>
<td>Bulkhead mounting</td>
<td>Low current consumption (6 mA typical)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hermetically sealed welded assembly</td>
<td>Synchronous demodulation</td>
<td></td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-55°C to 150°C</td>
<td>-25°C to 85°C</td>
<td>-55°C to 150°C</td>
</tr>
<tr>
<td>Diameter (mm)</td>
<td>19</td>
<td>19</td>
<td>20.6</td>
</tr>
<tr>
<td>Typical</td>
<td>Hydraulic actuators, other pressurized vessels</td>
<td>Positioning sensing feedback, battery operated systems, test labs, ram guide, platen position</td>
<td>Where sensor installation length is restricted, ideal replacement for linear potentiometers</td>
</tr>
<tr>
<td>Applications</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other models available, please consult MEAS website library.
### Linear Position Transducers—Inductive

**Dimensions for reference purpose only.**

**Catalog: SS-TS-TE300 03/2017**

<table>
<thead>
<tr>
<th><strong>MEAS LBB Spring-Extend</strong></th>
<th><strong>MEAS LBB Air-Extend</strong></th>
<th><strong>MEAS PCA 375</strong></th>
<th><strong>MEAS GC</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Linearity</strong></td>
<td>±0.2% of range</td>
<td>±0.5% of range</td>
<td>±0.25% (Voltage) to ±0.5% (4 - 20 mA) of range</td>
</tr>
<tr>
<td><strong>Excitation</strong></td>
<td>AC operated</td>
<td>AC operated</td>
<td>AC or DC voltage</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>AC voltage</td>
<td>AC voltage</td>
<td>AC or DC voltage, RS-485, or 4 - 20 mA loop</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>±0.02 to ±0.20 inches</td>
<td>±0.04 and ±0.1 inches</td>
<td>±0.05 to ±2 inches</td>
</tr>
<tr>
<td><strong>Unique Features</strong></td>
<td>0.0000004 inch (0.1 μm) repeatability, Removable tungsten carbide contact tip, Double shielded LVDT, Repairable</td>
<td>0.0000004 inch (0.1 μm) repeatability, Removable tungsten carbide contact tip, Double shielded LVDT, Repairable</td>
<td>Hermetically sealed, Welded MS connector (MIL-C-5015), CE mark for DC versions, Special tips available, Air extend spring retract available</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-40°C to 70°C</td>
<td>-20°C to 70°C</td>
<td>-55°C to 150°C (AC), 0°C to 70°C (DC)</td>
</tr>
<tr>
<td><strong>Diameter (mm)</strong></td>
<td>8 or 9.5</td>
<td>9.5</td>
<td>19 mm body, 1/2 - 20 threads</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Process standards, manufacturing on-line inspection, robotics, replaces dial indicators in manual measurement systems</td>
<td>Process standards, manufacturing on-line inspection, robotics, replaces dial indicators in manual measurement systems</td>
<td>High density gaging fixtures, resistance weld verification, pressing applications, X-Y stage position feedback, rough casting inspection</td>
</tr>
</tbody>
</table>

**Linear Position Encoders**

**Incremental**

**MEAS ED32i**

<table>
<thead>
<tr>
<th><strong>Package</strong></th>
<th>IP67 aluminum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range</strong></td>
<td>Magnetic scale, 5 mm pole pitch, typically up to 100 m absolute version up to 100 mm range on request</td>
</tr>
<tr>
<td><strong>Excitation</strong></td>
<td>5 VDC</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>5 V TTL ABZ differential quadrature; RS-485</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>≥10 μm; field programmable</td>
</tr>
<tr>
<td><strong>Max. Speed</strong></td>
<td>4 m/s</td>
</tr>
<tr>
<td><strong>Unique Features</strong></td>
<td>Contactless incremental measurement, Very high accuracy, programmable resolution, High speed up to 4 m/s, Error detection, missing scale function, Adapter plate for easy mounting</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-25°C to 85°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>60 x 20 x 10</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Linear displacement measurement in industrial and medical applications</td>
</tr>
</tbody>
</table>

Specifications subject to change. Dimensions for reference purpose only.

Catalog SS-TS-TE300 03/2017
## ANGULAR POSITION—POTENTIOMETERS

### MEAS 6000 Series
**Servo Mount**
- **Package**
  - 12.7 mm - 50.8 mm / 0.500" - 2.00" housing diameter
  - 3.170 mm - 6.34 mm / 0.1248" - 0.2498" shaft diameter
  - 12.7 mm - 1.74 mm / 0.500" - 0.680" housing length
  - 11.11 mm - 47.62 mm / 0.438" - 1.875" mounting pilot diameter
- **Resistance**
  - 1K - 20KΩ
- **Range**
  - Up to 355°
- **Linearity**
  - ± 0.5%
- **Output Smoothness**
  - <0.1%
- **Resolution**
  - Infinite
- **Operating Temp.**
  - -65°C to 125°C
- **Rotational Life**
  - 50 million cycles / minute
- **Typical Applications**
  - Critical position feedback applications in commercial, industrial, medical, aircraft and military markets

### MEAS 6200 Series
**Bushing Mount**
- **Package**
  - 12.7 mm - 50.8 mm / 0.500" - 2.00" housing diameter
  - 3.170 mm - 6.34 mm / 0.1248" - 0.2498" shaft diameter
  - 12.7 mm - 1.74 mm / 0.500" - 0.680" housing length
  - 3/8 32 NEF thread / 10.31 mm / 0.4062" pilot diameter
- **Resistance**
  - 1K - 20KΩ
- **Range**
  - Up to 355°
- **Linearity**
  - ± 0.5%
- **Output Smoothness**
  - <0.1%
- **Resolution**
  - Infinite
- **Operating Temp.**
  - -65°C to 125°C
- **Rotational Life**
  - 50 million cycles / minute
- **Typical Applications**
  - Critical position feedback applications in commercial, industrial, medical, aircraft and military markets

### MEAS 6900 Series
**Element/Wiper/Insulator**
- **Package**
  - 17.81 mm - 45.85 mm / 0.702" - 1.805" element outside diameter
  - 4.724 mm - 11.05 mm / 0.186" - 0.435" element inside diameter
  - 3.175 mm - 6.35 mm / 0.125" - 0.250" shaft insulator inside diameter
  - 4.064 mm - 7.80 mm / 0.160" - 0.307" mating wiper inside diameter
  - 5.08 mm / 0.200" assembled package height
- **Resistance**
  - 1K - 20KΩ
- **Range**
  - Up to 355°
- **Linearity**
  - ± 0.5%
- **Output Smoothness**
  - < 0.1%
- **Resolution**
  - Infinite
- **Operating Temp.**
  - -65°C to 125°C
- **Rotational Life**
  - 50 million cycles / minute
- **Typical Applications**
  - Critical position feedback applications in commercial, industrial, medical, aircraft and military markets

### MEAS 6100 Series
**Hollow Shaft**
- **Package**
  - 27.94 mm - 66.5 mm / 1.100" - 2.62" housing diameter
  - 3.175 mm - 19 mm / 0.125" - 0.752" hollow shaft diameter
- **Resistance**
  - 1K - 20KΩ
- **Range**
  - Up to 355°
- **Linearity**
  - ± 0.5%
- **Output Smoothness**
  - < 0.1%
- **Resolution**
  - Infinite
- **Operating Temp.**
  - -65°C to 125°C
- **Rotational Life**
  - 50 million cycles / minute
- **Typical Applications**
  - Critical position feedback applications in commercial, industrial, medical, aircraft and military markets

### MEAS RT8, RT9
**Package**
- Aluminum or stainless
- IP67, IP68
- Resolution
  - ±0.15% to ±1.25%
- **Unique Features**
  - • Absolute rotary
  - • Designed for heavy industrial applications
  - • CSA, CENELEC certification for hazardous area applications
- **Output**
  - Voltage divider, 0 - 5 V, 0 - 10 V, 4 - 20 mA, incremental encoder, CANbus, DeviceNet™
- **Range**
  - 0 - 0.125 to 0 - 200 turns
- **Operating Temp.**
  - -40°C to 90°C
- **Dimensions (mm)**
  - Ø65 x 100 (RT8)
  - Ø115 x 60 (RT9)
- **Typical Applications**
  - Valve control, airport passenger loading bridge, water management, factory automation
LINEAR POSITION—POTENTIOMETERS

**MEAS MLP, CLP**

- **Package**: Aluminum body, steel rod, IP65, IP67
- **Range**: 0 - 0.5 to 0 - 6" (MLP) 0 - 1 to 0 - 10" (CLP)
- **Linearity**: ±0.5 to ±1% (MLP) ±0.1 to ±0.2% (CLP)
- **Excitation**: Up to 40 VDC max.
- **Output**: Voltage divider
- **Resolution**: Essentially infinite
- **Max. Speed**: 10 m/s
- **Unique Features**: 
  - Extended temperature range, miniature design
  - First choice for auto racing applications
  - Perfect for high cycle applications
- **Operating Temp.**: -40°C to 90°C
- **Dimensions (mm)**: Diameter / cross section: Ø9.5 mm (MLP) 15 mm x 15 mm (CLP)
- **Typical Applications**: Vehicle testing, auto sport instrumentation, structural and architectural testing and robotics.

**MEAS 5903, 5905 Series**

- **Linear Motion**
- **Package**: 7.94 mm - 12.7 mm / 0.312" - 0.500" housing diameter
- **Resistance**: 1K / 5K / 10K
- **Range**: 5903 series - up to 50.8 mm / 2" stroke 5905 series - up to 101.6 mm / 4" stroke
- **Linearity**: ±1%
- **Output Smoothness**: <0.1%
- **Resolution**: <0.1%
- **Operating Temp.**: Infinite
- **Stoke Life**: -65°C to 125°C
- **Typical Applications**: Critical position feedback applications in commercial, industrial, medical, aircraft and military markets.

LVDT / RVDT INSTRUMENTATION

**MEAS LVM-110, LIM-420**

- **Package**: Open circuit board DIN rail mount 1/8 DIN panel mount 1/8 DIN panel mount 1/4 DIN panel mount
- **Supply**: DC voltage 10 to 30 VDC 115 and 220 VAC, 50 - 400 Hz 90 to 265 VAC, 50 - 60 Hz or 24 VDC 100 to 240 VAC, 47 - 63 Hz
- **Output**: DC voltage or current DC voltage and current DC voltage and current DC voltage and current (RS-485 optional) DC voltage and RS-232
- **Operating Temp.**: 0°C to 55°C -25°C to 85°C -40°C to 85°C 10°C to 55°C 0°C to 55°C
- **Unique Features**: 
  - Master / slave for multi-up applications
  - Dip switch selectable excitation frequencies
  - Plug-in PCB or wire termination
  - Small form factor
- **Dimensions (mm)**: 63 x 56 x 21 115 x 99 x 23
- **Typical Applications**: Vehicle test track instrumentation, gas and steam turbine controls, factory automation

**MEAS LDM-1000**

- **Package**: DIN rail mount
- **Supply**: DC voltage and current
- **Output**: DC voltage and current
- **Operating Temp.**: -25°C to 85°C
- **Unique Features**: 
  - Operates with 4, 5 & 6 wire LVDT / RVDTs
  - Adjustable zero, span and phase
  - Status LEDs
  - CE mark
- **Dimensions (mm)**: 115 x 99 x 23
- **Typical Applications**: Automotive test track instrumentation, gas and steam turbine controls, factory automation

**MEAS ATA-2001**

- **Package**: 1/8 DIN panel mount
- **Supply**: 115 and 220 VAC, 50 - 400 Hz
- **Output**: DC voltage and current
- **Operating Temp.**: -40°C to 85°C
- **Unique Features**: 
  - Push button programmable
  - Splash proof front panel
  - LED status lights
  - Mounting hardware included
  - CE mark
- **Dimensions (mm)**: 267 x 99 x 49
- **Typical Applications**: Precision metrology labs, power generation valve position monitoring

**MEAS PML 1000**

- **Package**: 1/8 DIN panel mount
- **Supply**: 90 to 265 VAC, 50 - 60 Hz or 24 VDC
- **Output**: DC voltage and current
- **Operating Temp.**: 10°C to 55°C
- **Unique Features**: 
  - 5 digit LED display
  - Auto-calibration
  - Programmable
  - Splash proof front panel
  - Mounting hardware included
  - CE mark
- **Dimensions (mm)**: 173 x 97 x 49
- **Typical Applications**: Remote monitoring stations, measurement test stands, process monitoring

**MEAS MP 2000**

- **Package**: 1/4 DIN panel mount
- **Supply**: 100 to 240 VAC, 47 - 63 Hz
- **Output**: DC voltage and RS-232
- **Operating Temp.**: 0°C to 55°C
- **Unique Features**: 
  - Programmable set point controller
  - Dual channel with math functions
  - Digital I/O
  - Large LCD display
  - Splash proof front panel
- **Dimensions (mm)**: 178 x 92 x 92
- **Typical Applications**: LVDT based weighing systems, pass / fail parts sorting, quality inspection
PRESSURE SENSORS

We design and manufacture pressure sensors ranging from the sensing element to system packaging for harsh environments. We are an industry leader for our range of both standard and custom pressure sensors, from board level components to fully amplified and packaged transducers. Based on piezoresistive Microelectromechanical (MEMS) and silicon strain gage (Microfused, Krystal Bond) technology, our sensors measure everything from inches of water column (<5 mbar) to 100K psi (7K bar). Sophisticated design and advanced manufacturing techniques create reliable cost-effective solutions for medical, HVACR, off road/heavy equipment and general industrial applications. We manufacture one of the world’s lowest power and smallest package pressure sensors for altimeter/NAV applications. Our sensors are signal conditioned, calibrated over temperature and include digital or analog outputs.
## BOARD LEVEL PRESSURE SENSORS

### Digital Output and Altimeter

<table>
<thead>
<tr>
<th>Model</th>
<th>Package</th>
<th>Type</th>
<th>Pressure Range</th>
<th>Output / Span</th>
<th>Resolution</th>
<th>Unique Features</th>
<th>Linearity/Absolute Accuracy</th>
<th>Overpressure</th>
<th>Operating Temp.</th>
<th>Dimensions (mm)</th>
<th>Typical Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAS MS4515DO, MS4525DO</td>
<td>8 pin DIL</td>
<td>Gage, compound (MS4515DO) Gage, absolute, differential, compound (MS4525DO)</td>
<td>0 - 2 to 30° H2O (MS4515DO) 0 - 1 to 150 psi (MS4525DO)</td>
<td>14-bit ADC SPI or I²C</td>
<td>—</td>
<td>Optional gel coat, low power • Pressure and temperature measurement • Single supply of 3.3 or 5.0 VDC • Top, side barbed or manifold o-ring port • J lead or thru hole pins</td>
<td>±0.25% / 1% TEB</td>
<td>300 psi</td>
<td>-10°C to 85°C (-25°C to 105°C)</td>
<td>12.5 x 9.9</td>
<td>Medical instruments, air flow measurements, process control, leak detection</td>
</tr>
<tr>
<td>MEAS MS5525DSO</td>
<td>SOIC-14</td>
<td>Gage, absolute, differential, compound</td>
<td>0 - 1 to 30 psi</td>
<td>24-bit ADC SPI or I²C protocol</td>
<td>0.016 mbar</td>
<td>• 24-bit digital small outline sensor • Pressure and temperature measurement • Single supply of 1.8 or 3.6 VDC • Barb, tube and hole package style options</td>
<td>±0.25% / 2.5% TEB</td>
<td>3X range</td>
<td>-40°C to 125°C</td>
<td>12.5 x 7.9</td>
<td>Medical respirators, ventilators, factory automation, altitude and airspeed measurements, leak detection, home appliances</td>
</tr>
<tr>
<td>MEAS MS5503</td>
<td>Surface mountable</td>
<td>Absolute</td>
<td>0 - 1 to 30 bar</td>
<td>24-bit ADC I²C and SPI (Mode 0, 3)</td>
<td>0.5 mbar (MS5803-30BA)</td>
<td>• 24-bit digital sensor, software calibration and temperature compensation I²C and SPI, no external components • Supply voltage 1.8 to 3.6 V</td>
<td>±1.5 mbar at 25°C (MS5803-01BA)</td>
<td>±250 mbar at 0°C to 40°C (MS5803-30BA)</td>
<td>10 bar (1.2 bar), 30 bar (5, 7, 14 bar) 50 bar (30 bar)</td>
<td>6.4 x 6.2 x 2.9</td>
<td>Precision altimeter, diving and multi-mode watches, in-building navigation, variometers / flight instruments</td>
</tr>
<tr>
<td>MEAS MS5803</td>
<td>Surface mountable</td>
<td>Absolute</td>
<td>0 - 30 bar</td>
<td>24-bit ADC I²C</td>
<td>0.2 mbar</td>
<td>• Supply voltage: 1.5 to 3.6 V • Excellent long term stability • Hermetically sealable for outdoor devices • Sealing designed for 1.8 x 0.88 mm o-ring</td>
<td>±400 mbar</td>
<td>50 bar</td>
<td>-20 to 85°C</td>
<td>3.3 x 3.3 x 2.75</td>
<td>Mobile water depth measurement systems, diving computers, adventure or multi-mode watches, data loggers</td>
</tr>
<tr>
<td>MEAS MS5805</td>
<td>Surface mountable</td>
<td>Absolute</td>
<td>10 - 2K mbar</td>
<td>24-bit ADC I²C</td>
<td>0.02 mbar</td>
<td>• 24-bit digital sensor • 20 cm resolution • Supply voltage: 1.8 to 3.6 V • Sealing designed for 2.5 x 1 mm o-ring • Silicone gel protection • Waterproof</td>
<td>±2.0 mbar at 25°C</td>
<td>6 bar</td>
<td>-40 to 85°C</td>
<td>4.5 x 4.5 x 3.5</td>
<td>Mobile altimeter and barometer systems, bike computers, adventure or multi-mode watches, variometers, data loggers</td>
</tr>
<tr>
<td>MEAS MS5807</td>
<td>Surface mountable</td>
<td>Absolute</td>
<td>10 - 2K mbar</td>
<td>24 bit ADC I²C</td>
<td>0.016 mbar</td>
<td>• Integrated pressure, humidity and temperature • Supply voltage: 1.5 to 3.6 V • Fully factory calibrated sensor</td>
<td>±14 mbar</td>
<td>6 bar</td>
<td>-40°C to 85°C</td>
<td>5 x 3 x 1</td>
<td>Smart phones, tablets, HVACR, weather stations, printers, home appliances and humidifiers</td>
</tr>
</tbody>
</table>

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**Pressuresensors**

Specifications subject to change. Dimensions for reference purpose only. Catalog SS-TS-TE300 03/2017

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## BOARD LEVEL PRESSURE SENSORS

### Amplified Output

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS MS4515, MS4525</th>
<th>MEAS MS5525ASO</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 pin DIL</td>
<td>Gage, differential (MS4515)</td>
<td>SOIC-14</td>
</tr>
<tr>
<td>Type</td>
<td>Gage, absolute, differential, compound (MS4525)</td>
<td>Gage, absolute, differential, compound</td>
</tr>
<tr>
<td>Pressure Range</td>
<td>0 - 2 to 30&quot; H2O (MS4515)</td>
<td>0 - 1 to 30 psi (MS4525)</td>
</tr>
<tr>
<td>Output / Span</td>
<td>0 - 1 to 150 psi (MS4525)</td>
<td>0 - 1 to 30 psi</td>
</tr>
<tr>
<td>Unique Features</td>
<td>10% to 90% or 5% to 95% of supply</td>
<td>10 - 90% VDC</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Ratiometric analog output sensor</td>
<td>±0.25% span / ±1% TEB</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>Single supply of either 3.3 or 5.0 VDC</td>
<td>±0.5% span / ±2.5% TEB</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>Top, side barbed or manifold o-ring port</td>
<td>-10°C to 85°C (MS4515), -25°C to 105°C (MS4525)</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>J lead or thru-hole pins</td>
<td>-25°C to 105°C</td>
</tr>
<tr>
<td></td>
<td>Optional gel coat</td>
<td>12.5 x 9.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Factory automation, altitude and airspeed measurements, medical instruments, leak detection</td>
</tr>
</tbody>
</table>

### mV Output

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS 1210, 1220, 1230, 1240</th>
<th>MEAS 13, 23, 33, 43, 17, 27, 37, 47</th>
<th>MEAS MS4425, MS4426</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 pin DIL</td>
<td>Gage, absolute, differential</td>
<td>TO-8</td>
<td>6 pin DIL</td>
</tr>
<tr>
<td>Type</td>
<td>Gage, absolute, differential</td>
<td>Gage, absolute, differential</td>
<td>Gage, absolute, differential</td>
</tr>
<tr>
<td>Pressure Range</td>
<td>0 - 5 and 10&quot; H2O</td>
<td>0 - 250 psi</td>
<td>0 - 1 to 300 psi</td>
</tr>
<tr>
<td>Output / Span</td>
<td>0 - 1 to 100 psi</td>
<td>100 mV typical</td>
<td>60 mV, 90 mV, 100 mV, and 150 mV typical</td>
</tr>
<tr>
<td>Unique Features</td>
<td>50 mV and 100 mV typical</td>
<td>100 mV typical</td>
<td>±0.1% non-linearity</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Temperature compensated</td>
<td>±0.1% non-linearity</td>
<td>Temperature compensated</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>High performance UltraStable die (1230, 1240)</td>
<td>-40°C to 125°C</td>
<td>High performance UltraStable die</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>Current excitation (1210, 1230)</td>
<td>Ø11.4, application dependent</td>
<td>Voltage excitation</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Voltage excitation (1220, 1240)</td>
<td>Medical instruments, air flow measurement, process control, factory automation, leak detection</td>
<td>±0.1% non-linearity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medical instruments, air flow measurement, HVACR, process control, factory automation, leak detection</td>
<td>-25°C to 85°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drop-in for 6 pin industrial sensor for PCB mounted medical</td>
<td>15.2 x 13.7</td>
</tr>
</tbody>
</table>
### BOARD LEVEL PRESSURE SENSORS

**mV Output**

<table>
<thead>
<tr>
<th><strong>MEAS MS1451, MS1471</strong></th>
<th><strong>MEAS MS52xx, MS54xx</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Package</td>
<td>Surface mountable</td>
</tr>
<tr>
<td>Type</td>
<td>Gage, absolute</td>
</tr>
<tr>
<td>Pressure Range</td>
<td>0 - 5 to 500 psi</td>
</tr>
<tr>
<td>Output / Span</td>
<td>60 mV typical</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Low cost</td>
</tr>
<tr>
<td></td>
<td>• Coarse calibrated at room temp. (MS1471)</td>
</tr>
<tr>
<td></td>
<td>• With gel to protect against moisture</td>
</tr>
<tr>
<td></td>
<td>• Tube or hole</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.25% non-linearity</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-40°C to 125°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>7.6 x 7.6, application dependent</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Altitude measurement, barometric pressure, medical instrumentation, consumer appliances, tire pressure</td>
</tr>
</tbody>
</table>

-50% linearity ±0.05%, ±0.15% FS non-linearity (MS52xx)
-50% linearity ±0.05%, ±0.2% FS non-linearity (MS54xx)

### DISPOSABLE MEDICAL PRESSURE SENSORS

**mV Output**

<table>
<thead>
<tr>
<th><strong>MEAS 1620, 1630</strong></th>
<th><strong>MEAS Fully Assembled 1620</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Package</td>
<td>Hybrid assembly</td>
</tr>
<tr>
<td>Type</td>
<td>Gage</td>
</tr>
<tr>
<td>Pressure Range</td>
<td>-30 to 300 mmHg</td>
</tr>
<tr>
<td>Output / Span</td>
<td>5 μV/V/mmHg</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Low cost, disposable design</td>
</tr>
<tr>
<td></td>
<td>• Supplied in tape and reel</td>
</tr>
<tr>
<td></td>
<td>• Compliant to AAMI spec</td>
</tr>
<tr>
<td></td>
<td>• ISO13485 certified</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±1.0% FSO</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>10°C to 40°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>1620: 11.43 x 8.13 x 4.20</td>
</tr>
<tr>
<td></td>
<td>1630: 12.7 x 5.08 x 3.94</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Disposable blood pressure, surgical procedures, ICU, kidney dialysis machines, medical instrumentation</td>
</tr>
</tbody>
</table>

- Disposable blood pressure, kidney dialysis machines, surgical procedures and intensive care units. Ready to use, fully assembled disposable sensor units with cable, connector, stop cock, flush device in a plastic housing.
## MEDIA ISOLATED PRESSURE SENSOR MODULES

### Digital Output

<table>
<thead>
<tr>
<th>Module</th>
<th>Package</th>
<th>Type</th>
<th>Pressure Range</th>
<th>Output / Span</th>
<th>Unique Features</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAS 85BSD</td>
<td>Weldable (85)</td>
<td>Gage, absolute</td>
<td>0 - 0.35 to 20 bar / 0 - 5 to 300 psi</td>
<td>14-bit ADC I2C or SPI</td>
<td>Pressure and temperature read-out, Cable and connector options, Low power option</td>
<td>±0.25% span</td>
</tr>
<tr>
<td>MEAS 86BSD</td>
<td>Weldable (85)</td>
<td>Gage, absolute</td>
<td>0 - 0.07 to 20 bar / 0 - 1 to 300 psi</td>
<td>14-bit ADC I2C or SPI</td>
<td>Pressure and temperature read-out, Cable and connector options, Low power option</td>
<td>±0.25% span</td>
</tr>
<tr>
<td>MEAS 89BSD</td>
<td>Threaded (89)</td>
<td>Absolute, sealed gage</td>
<td>0 - 6 to 30 bar</td>
<td>24-bit ADC I2C</td>
<td>Pressure and temperature read-out, Low power: 1 μA (Standby &lt; 0.15 μA)</td>
<td>±0.3% span, ±1% FSO</td>
</tr>
<tr>
<td>MEAS 154BSD</td>
<td>Weldable (85)</td>
<td>Gage, absolute</td>
<td>0 - 1 to 300 psi</td>
<td>14-bit ADC I2C or SPI</td>
<td>Pressure and temperature read-out, Cable and connector options, Low power option</td>
<td>±0.25% span</td>
</tr>
</tbody>
</table>

### Analog Output

<table>
<thead>
<tr>
<th>Module</th>
<th>Package</th>
<th>Type</th>
<th>Pressure Range</th>
<th>Output / Span</th>
<th>Unique Features</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAS 82, 85 with Fittings</td>
<td>Weldable (85) or process fitting</td>
<td>Gage, absolute, vacuum gage</td>
<td>0 - 5 to 500 psi (85)</td>
<td>100 mV typical</td>
<td>Modular design</td>
<td>±0.3% FSO (1 psi), ±0.2% FSO (5 psi), ±0.1% FSO (35 psi)</td>
</tr>
<tr>
<td>MEAS 89 Button, 89 with Fittings</td>
<td>Weldable or process fitting</td>
<td>Sealed gage, absolute</td>
<td>0 - 1K to 10K psi</td>
<td>100 mV typical</td>
<td>Modular design</td>
<td>±0.25% FSO</td>
</tr>
<tr>
<td>MEAS 86A Amplified</td>
<td>5/8” (16 mm) diameter o-ring mount</td>
<td>Gage, absolute</td>
<td>0 - 1 to 150 psi</td>
<td>0.5 - 4.5 VDC</td>
<td>High pressure, Small diameter, amplified output, Bar ranges available</td>
<td>±1.0% FSO</td>
</tr>
</tbody>
</table>

### Typical Applications

- Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, submersible depth monitoring
- Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, submersible depth monitoring
- Medical, process control, refrigeration compressors, oceanography, level systems
- Air tank pressure, hydraulics, process control, robotics, refrigeration compressors, oceanography
- Level measurement, OEM transmitters and transducers, process control
MEDIA ISOLATED PRESSURE SENSOR MODULES

Analog Output

**MEAS 82, 85, 85F, 86, 154N**

- **Package**
  - 3/4” (19 mm) diameter o-ring mount (82, 154N)
  - 5/8” (16 mm) diameter o-ring mount (85)
  - 1/2” (13 mm) diameter o-ring flush mount (85F)
  - 1/2” (13 mm) diameter o-ring mount (85)

- **Type**
  - Gage, absolute, vacuum gage (82, 85, 86, 154N)
  - Gage, absolute (85F)

- **Pressure Range**
  - 0 - 1 to 500 psi (Absolute, gage: 82, 154N)
  - 0 - 5 to 500 psi (Absolute, gage: 85, 86)
  - 0 - 15 to 500 psi (85F, vacuum gage: 82, 85, 86, 154N)

- **Output / Span**
  - 100 mV typical

- **Unique Features**
  - High performance
  - High stability for OEM applications
  - Minimizes trapped volume (85F)

- **Non-linearity**
  - ±0.3% FSO (1 psi), ±0.2% FSO (5 psi)
  - ±0.1% FSO (15 psi), ±0.1% FSO (85F)

- **Operating Temp.**
  - -40°C to 125°C (82 / 85 / 86 / 154N), -20°C to 125°C (85F)

- **Dimensions (mm)**
  - 82: Ø19 x 6.48
  - 86: Ø15.82 x 11.4
  - 154N: Ø18.97 x 13.8
  - 85F: Ø17.2 x 11.33
  - 85: Ø15.85 x 9.3

- **Applications**
  - Hydraulic compressors, process control, oceanography, refrigeration/compressors, pressure transmitters, level systems, dialysis machines, infusion pumps, medical systems

**MEAS DP86 O-Ring Mount, with Fittings/Cable**

- **Type**
  - 5/8” (16 mm) diameter o-ring mount or threaded process fittings

- **Pressure Range**
  - 0 - 1 to 500 psi

- **Output / Span**
  - 100 mV typical / sensitivity dependent

- **Unique Features**
  - Wet/wet differential pressure
  - Line pressure max. 1000 psi

- **Non-linearity**
  - ±0.3% FSO (1 psi)
  - ±0.2% FSO (5 psi)

- **Operating Temp.**
  - -40°C to 125°C

- **Dimensions (mm)**
  - Ø15.82 x 17.5

- **Applications**
  - Level controls, tank level measurement, corrosive fluids and gas measurement systems, flow measurement

**MEAS U86B**

- **Type**
  - Sealed gage, absolute

- **Pressure Range**
  - 0 - 5 to 100 bar / 0 - 50 to 200 psi

- **Output / Span**
  - 100 mV typical

- **Unique Features**
  - Amplified

- **Non-linearity**
  - ±0.5% FSO

- **Operating Temp.**
  - -7°C to 105°C

- **Dimensions (mm)**
  - Ø15.82 x 13.6

- **Applications**
  - Urea level, urea pressure, air brakes, corrosive fluid measurement for E&B applications

---

TRANSDUCERS AND TRANSMITTERS

Wireless

**MEAS M5600, U5600**

- **Type**
  - Gage, sealed, absolute, compound

- **Pressure Range**
  - 0 – 50 to 15K psi (M5600)
  - 0 – 5 to 10K psi (U5600)

- **Output / Span**
  - 24-bit ADC I²C

- **Unique Features**
  - Pressure and temperature
  - 2.3 – 3.6 V supply voltage
  - Compact and battery-powered
  - Weather resistant (IP66 and IP67)
  - Stainless steel and polycarbonate enclosure

- **Accuracy**
  - ±0.25% F5 (M5600)
  - Down to ±0.1% F5 (U5600)

- **Operating Temp.**
  - -20°C to 85°C

- **Dimensions (mm)**
  - 24 x 24 x 69

- **Applications**
  - Industrial process control and monitoring, advanced HVAC systems, refrigeration systems, automotive test stands, off-road vehicles, pumps and compressors, hydraulic and pneumatic systems, agriculture equipment, energy generation and management

- **Agency Approvals**
  - CE, FCC

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Specifications subject to change. Dimensions for reference purpose only.

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### MEAS MSP100
- **Type:** Gage
- **Pressure Range:** 0 - 100 to 500 psi
- **Output / Span:** 100 mV typical
- **Unique Features:**
  - Microfused
  - No threads needed for pressure connect
  - Highly customized for OEM application
  - Small size
  - Solid state reliability
- **Accuracy:** ±0.5% FSO
- **Operating Temp.:** 0°C to 55°C
- **Dimensions (mm):** 12.7 x 24.38 x 20.32
- **Typical Applications:**
  - Beverage dispensing systems,
  - automation, HVACR controls, energy and water management, pumps,
  - compressors, pneumatic equipment

### MEAS MSP300, MSP340
- **Type:** Gage
- **Pressure Range:**
  - MSP300: 0 - 100 mV, 0.5 - 4.5 VDC, 1 - 5 VDC, 4 - 20 mA
  - MSP340: 0 - 10 mV/V, 0.5 - 4.5 V, 1 - 5 V, 4 - 20 mA
- **Unique Features:**
  - Microfused
  - Highly customized for OEM applications
  - Solid state reliability
  - UltraStable technology
  - Highly customized for OEM applications
  - Small size
  - Solid state reliability
- **Accuracy:** ±1% FSO
- **Operating Temp.:** -20°C to 85°C
- **Dimensions (mm):**
  - MSP300: 22.23 x 22.23 x 55.88
  - MSP340: 15.88 x 15.88 x 75.44
- **Typical Applications:**
  - Paint sprayers, braking systems,
  - HVACR controls, energy and water management, pumps, compressors,
  - pneumatic equipment, off road heavy equipment, agriculture equipment

### MEAS US300
- **Type:** Gage, absolute
- **Pressure Range:** 0 - 15 to 5K psi
- **Output / Span:**
  - 0 - 10 mV/V, 0.5 - 4.5 V, 1 - 5 V, 4 - 20 mA
- **Unique Features:**
  - Microfused
  - Highly customized for OEM applications
  - Small size
  - Solid state reliability
- **Accuracy:** ±0.15% FSO (15 - 1K psi), ±0.25% FSO (>1K psi)
- **Operating Temp.:** -40°C to 105°C
- **Dimensions (mm):** 15.88 x 15.88 x 98.00
- **Typical Applications:**
  - Paint sprayers, braking systems,
  - HVACR controls, energy and water management, pumps, compressors,
  - pneumatic equipment, off road heavy equipment, agriculture equipment

### MEAS M5200
- **Type:** Gage, sealed, compound
- **Pressure Range:**
  - 0 - 3.5 to 1K bar / 0 - 50 to 15K psi
  - 0.5 - 4.5 V, 1 - 5 V, 0 - 5 V,
  - 0 - 10 V, 4 - 20 mA, 1 - 6 V
- **Unique Features:**
  - Microfused technology
  - High performance at a low cost
  - Solid state reliability
  - ±1% FSO TEB (-20°C to 85°C)
  - Weatherproof
  - 17 - 4 PH or 316L SS
- **Accuracy:** ±0.25% FSO
- **Operating Temp.:** -40°C to 125°C
- **Dimensions (mm):** 24 X 24 X 82 max.
- **Typical Applications:**
  - Industrial process control and monitoring, advanced HVACR systems, refrigeration systems, automotive test stands, off road vehicles, pumps and compressors, hydraulic and pneumatic systems, agriculture equipment, energy generation and management
- **Agency Approvals:** CE (EMC)

### MEAS U5200, U5300
- **Type:** Gage, sealed, absolute, compound
- **Pressure Range:**
  - 0 - 0.14 to 700 bar / 0 - 2 to 10K psi
  - 0.5 - 4.5 V, 1 - 5 V, 0 - 5 V,
  - 0 - 10 V, 4 - 20 mA, 1 - 6 V
- **Unique Features:**
  - Microfused technology
  - High performance at a low cost
  - ±0.75% FSO TEB (-20°C to 85°C, >5 psi and ≤5000 psi) (U5200)
  - ±0.5% FSO TEB (-20°C to 85°C) (U5300)
  - Weatherproof
  - High accuracy (U5300)
  - ±0.1% FSO (>5 and ≤500 psi)
- **Accuracy:** ±0.25% FSO
- **Operating Temp.:** -40°C to 125°C
- **Dimensions (mm):** 24 X 24 X 82 max.
- **Typical Applications:**
  - Industrial process control and monitoring, advanced HVACR systems, refrigeration systems, automotive test stands, off road vehicles, pumps and compressors, hydraulic and pneumatic systems, agriculture equipment, energy generation and management, military and aerospace test stands, calibration equipment, high accuracy applications, stationary motor fuel control, high end industry machinery
- **Agency Approvals:** CE (EMC), UL 508
TE CONNECTIVITY

PRESSURE SENSORS

TRANSDUCERS AND TRANSMITTERS

Industrial

MEAS D5100

- Type: Differential wet/wet
- Pressure Range: 0 - 0.07 to 35 bar / 0 - 1 to 500 psi
- Output / Span: 80 mV / 100 mV, 0.5 - 4.5 VDC, 1 - 5 VDC, 4 - 20 mA
- Unique Features:
  - UltraStable technology
  - High performance at a low cost
  - Solid state reliability
  - ±1% FSO TEB (-20°C to 85°C)
  - Line pressure max. 1000 psi
- Accuracy: ±0.3% FSO (<5 psi), ±0.25% FSO (5 psi), ±0.1 % FSO (>15 psi)
- Operating Temp.: -40°C to 125°C
- Dimensions (mm): 25.4 x 58.4 x 72.0
- Typical Applications:
  - Process controls, tank level measurement, filter performance monitoring, corrosive fluids and gas measurement systems, flow measurement
- Agency Approvals: CE (EMC)

MEAS M7100, U7100

- Gage, no vent gage (M7100)
- Gage, sealed gage, absolute (U7100)
- Pressure Range:
  - M7100: 0 - 10 to 70 bar / 0 - 150 to 10K psi
  - U7100: 0 - 1 to 10 bar / 0 - 15 to 150 psi
- Output / Span:
  - M7100: 0.5 - 4.5 VDC [Ratiometric output] 1 - 5 VDC [Regulated]
  - U7100: 0.5 - 4.5 VDC [Ratiometric output]
- Unique Features:
  - ±1% FSO TEB (-20°C to 85°C)
  - Solid state reliability
  - Survives high vibration and immersion
  - Microfused technology (M7100)
  - UltraStable technology (U7100)
  - Copper tube for HVACR (M7100)
- Accuracy: ±0.25% FSO
- Operating Temp.: -40°C to 125°C
- Dimensions (mm): 26.7 x 26.7 x 50.0
- Typical Applications:
  - HVACR refrigeration controls, off road vehicles engine control, compressors, hydraulic, energy and water management
  - CE (EMC), UL 508

Heavy Industrial

MEAS P900, P981, P1200, P700, P9000

- Type: Gage, absolute
- Pressure Range: 0 - 5 bar to 700 bar / 0 - 75 to 10K psi
- Output / Span: 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA
- Unique Features:
  - High overpressure (10X over pressure)
  - Shock and vibration resistant
  - Heavy industrial grade transducer (P9000)
  - Advanced digital compensation / calibration
  - Mechanical over pressure stops
  - High temperature operation
- Accuracy: 0.1% to 0.2% FSO
- Operating Temp.: -54°C to 120°C
- Dimensions (mm): Application dependent
- Typical Applications:
  - Steel mills, hydraulic controls, power generation equipment, torpedo depth, military and aerospace, vehicle braking systems
- Agency Approvals: CE, CENELEC (Intrinsically Safe)

MEAS P101, P105, P125

- Type: Gage
- Pressure Range: 0 - 10 to 7K bar / 0 - 150 to 100K psi
- Output / Span: 7.5 to 20 mV (4 V; 5 V optional)
- Unique Features:
  - Stainless steel diaphragm
  - Female pressure connectors: M16 x 1.5, M20 x 1.5, 1/4 NPT
  - Metal to metal seal
- Accuracy: ±0.3% FSO
- Operating Temp.: -20°C to 80°C
- Dimensions (mm): Ø29 x 85 max.
- Typical Applications:
  - Harsh environments, aggressive liquids

Specifications subject to change.
Dimensions for reference purpose only.

Catalog SS-TS-TE300
03/2017
## PRESSURE SENSORS

### MINIATURE SENSORS

#### MEAS XP Series

<table>
<thead>
<tr>
<th>Type</th>
<th>Gage, sealed, absolute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Range</td>
<td>0 - 1 to 350 bar / 0 - 15 to 5K psi (XPS, XPM10)</td>
</tr>
<tr>
<td></td>
<td>0 - 5 to 200 bar / 0 - 75 to 3K psi (XPM4)</td>
</tr>
<tr>
<td></td>
<td>0 - 100 to 1K bar / 0 - 1.5K to 15K psi (XPM6)</td>
</tr>
<tr>
<td>Output / Span</td>
<td>20 - 100 mV, 4 V FSO (Amplified)</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Titanium construction (XPS, XPM4)</td>
</tr>
<tr>
<td></td>
<td>• Stainless steel housing (XPM6, XPM10)</td>
</tr>
<tr>
<td></td>
<td>• Amplified output options (XPS, XPM6, XPM10)</td>
</tr>
<tr>
<td></td>
<td>• Cable and connector options</td>
</tr>
<tr>
<td></td>
<td>• For static and dynamic applications</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Down to ±0.25% FSO (XPS, XPM6, XPM10), down to ±0.35% FSO (XPM4)</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-40°C to 120°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>XPM4: M4 x 0.7 thread; Hex 8</td>
</tr>
<tr>
<td></td>
<td>XPS: M5 x 0.8 or 10-32 UNF thread; Hex 10</td>
</tr>
<tr>
<td></td>
<td>XPM6: M6 x 1 thread; Hex 12</td>
</tr>
<tr>
<td></td>
<td>XPM10: M10 x 1 thread; Hex 15</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Corrosive liquids and gases, braking system pressure, onboard equipment monitoring, military and aerospace, explosive test benches, robotics and effectors, laboratory and research, extreme miniature devices</td>
</tr>
</tbody>
</table>

#### MEAS XPC10

<table>
<thead>
<tr>
<th>Type</th>
<th>Gage, sealed, absolute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Range</td>
<td>0 - 10 to 500 bar / 0 - 150 to 7.5K psi</td>
</tr>
<tr>
<td>Output / Span</td>
<td>12 mV FSO, 4 V FSO (Amplified)</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Amplified output available</td>
</tr>
<tr>
<td></td>
<td>• For static and dynamic applications</td>
</tr>
<tr>
<td></td>
<td>• Optional IP67 ingress protection</td>
</tr>
<tr>
<td></td>
<td>• High temperature operation</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Down to ±0.25% FSO</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-40°C to 220°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>M10 x 1 or 3/8-24 UNF thread; Hex 15</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Aerospace, test benches, oven monitoring equipment, cooling regulation systems</td>
</tr>
</tbody>
</table>

#### MEAS EB, EPRB

<table>
<thead>
<tr>
<th>Type</th>
<th>Gage, sealed, absolute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Range</td>
<td>0 - 0.35 to 700 bar / 0 - 5 to 10K psi</td>
</tr>
<tr>
<td>Output / Span</td>
<td>0.5 to 4.5 VDC</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• High accuracy</td>
</tr>
<tr>
<td></td>
<td>• Miniature design</td>
</tr>
<tr>
<td></td>
<td>• UltraStable technology</td>
</tr>
<tr>
<td></td>
<td>• EMI protected</td>
</tr>
<tr>
<td></td>
<td>• Combined pressure and temperature</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.25% FSO</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-40°C to 125°C (Available option up to 150°C)</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>11 body diameter</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Motor sport, hydraulic / pneumatic systems, automotive test stands, military and aerospace test stands</td>
</tr>
<tr>
<td>Agency Approvals</td>
<td>CE (EMC)</td>
</tr>
</tbody>
</table>

#### MEAS EPIH

<table>
<thead>
<tr>
<th>Type</th>
<th>Gage, sealed, absolute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Range</td>
<td>0 - 0.35 to 20 bar / 0 - 5 to 300 psi</td>
</tr>
<tr>
<td>Output / Span</td>
<td>12 mV to 75 mV</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Diffused silicon diaphragm with a large variety of sizes and shapes available as small as 0.05” outside diameter</td>
</tr>
<tr>
<td></td>
<td>• High frequency response (To 1.7 MHz)</td>
</tr>
<tr>
<td></td>
<td>• Ultra-miniature design</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.5% FSO</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-40°C to 120°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>Application dependent</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Aerospace testing, wind tunnels, biomedical testing, aircraft body and wing dynamics, high frequency measurements</td>
</tr>
</tbody>
</table>

#### MEAS EPB, EPB-PW, EPL

<table>
<thead>
<tr>
<th>Type</th>
<th>Gage, sealed, absolute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Range</td>
<td>0 - 0.35 to 350 bar / 0 - 5 to 5K psi</td>
</tr>
<tr>
<td>Output / Span</td>
<td>10 mV to 125 mV</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Miniature flush mountable</td>
</tr>
<tr>
<td></td>
<td>• Flush stainless steel diaphragm, flanged or non-flanged</td>
</tr>
<tr>
<td></td>
<td>• Bonded silicon gage, high frequency response (To 400 KHz)</td>
</tr>
<tr>
<td></td>
<td>• IP68 ingress protection in Titanium construction (EPB-PW)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.5 to ±1% FSO</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-40°C to 120°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>3.2 to 7 outside diameter</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Air flow testing, hydraulic pressure systems, air pressure systems, bearing studies, ballistics, water hammer, miniature scale model testing, centrifuge pore water pressure measurements</td>
</tr>
</tbody>
</table>

---

Note: Specifications subject to change. Dimensions for reference purpose only.

Catalog SS-TS-TE300
03/2017
## MEAS U5700

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th>Gage, sealed, absolute, compound</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pressure Range</strong></td>
<td>0 - 2 to 10K psi</td>
</tr>
<tr>
<td><strong>Output / Span</strong></td>
<td>0.5 - 4.5 V, 1 - 5 V, 0 - 5 V, 0 - 10 V, 4 - 20 mA, 1 - 6 V</td>
</tr>
</tbody>
</table>
| **Unique Features** | • UltraStable technology  
• High accuracy  
• IP68 rated connection and submersible polyurethane jacketed cable  
• Optional Polyoxymethylene cap |
| **Accuracy** | 0.1 % FSO |
| **Operating Temp.** | -10°C to 60°C |
| **Dimensions (mm)** | 22.23 x 22.23 x 98.04 |
| **Typical Applications** | Industrial process control and monitoring, advanced HVACR systems, refrigeration systems, automotive test stands, off road vehicles, pumps and compressors, hydraulic / pneumatic systems, agriculture equipment, energy generation and management, liquid level applications |
| **Agency Approvals** | CE (EMC) |
TE Connectivity is a proven leader in providing electronic test and measurement solutions and inertial sensors for demanding industrial, military, aerospace, and research applications. Our accurate, rugged, and easy-to-use line of MEMS accelerometers, rate gyros, and inertial measurement systems meet the complex measurement needs of OEMs as well as test and measurement labs worldwide.
## RATE AND INERTIAL SENSORS

### GYROS, ANGULAR RATE SENSORS

**Plug and Play**

<table>
<thead>
<tr>
<th><strong>MEAS GY407D</strong></th>
<th><strong>MEAS 11206AC</strong></th>
<th><strong>MEAS 11207AC</strong></th>
<th><strong>MEAS 3120XB</strong></th>
<th><strong>MEAS 65210E</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Package</strong></td>
<td>Anodized aluminum</td>
<td>Anodized aluminum</td>
<td>Anodized aluminum</td>
<td>Anodized aluminum</td>
</tr>
<tr>
<td><strong>FS Range (°/s)</strong></td>
<td>±300</td>
<td>±50, 180, 300, 600</td>
<td>±250, 300, 450</td>
<td>Up to ±20K on roll axis</td>
</tr>
<tr>
<td><strong>Unique Features</strong></td>
<td>• Digital output, Built-in analyses, Dynamic interface, Performance over temperature</td>
<td>• Identical interchangeable sensor, Best performance over temperature, Gain and offset compensation, Expanded environmental tests</td>
<td>• Identical interchangeable sensor, High stability, Low noise, Vibration-rejecting</td>
<td>• Complete six-degree of freedom (6DoF) and TM kit, External inputs, User configurable, Self-powered</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±1.0% non-linearity</td>
<td>±0.1% non-linearity</td>
<td>±0.01% non-linearity</td>
<td>±0.1% non-linearity</td>
</tr>
<tr>
<td><strong>Excitation Voltage</strong></td>
<td>8.5 - 36 VDC</td>
<td>8.5 - 36 VDC</td>
<td>10 - 36 VDC</td>
<td>8.5 to 36 VDC</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-40°C to 85°C</td>
<td>-40°C to 85°C</td>
<td>-40°C to 85°C</td>
<td>-40°C to 85°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>36.50 x 25.40 x 17.50</td>
<td>24 x 24 x 27.30</td>
<td>24 x 24 x 27.30</td>
<td>Ø69.85 x 201.42 length</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Non-navigation heading, vehicle dynamics, test and measurement</td>
<td>Wind turbine, weapons testing, test and measurement</td>
<td>Wind turbine, weapons testing, test and measurement</td>
<td>Weapons testing, boat stabilization, test and measurement</td>
</tr>
</tbody>
</table>

**MEAS 620**

| **Package**      | Stainless steel |
| **FS Range (°/s)** | ±500, 1500, 6000, 12K, 18K, 24K, 50K |
| **Unique Features** | • Small, lightweight package, Insensitive to shock, SAEJ211 compliant |
| **Accuracy**     | ±0.5% non-linearity |
| **Excitation Voltage** | 5 - 16 VDC |
| **Operating Temp.** | -40°C to 105°C |
| **Dimensions (mm)** | 16.5 x 11.4 x 7.9 |
| **Typical Applications** | Automotive safety crash testing, roll-over testing, motor sports, biomechanics, weapons testing |

**MEAS 603**

| **Package**      | Stainless steel |
| **FS Range (°/s)** | ±500, 1500, 6000, 12K, 18K, 24K |
| **Unique Features** | • MEMS triaxial rate sensor, SAEJ211 compliant, Shock resistant housing |
| **Accuracy**     | ±0.5% non-linearity |
| **Excitation Voltage** | 5 - 16 VDC |
| **Operating Temp.** | -40°C to 105°C |
| **Dimensions (mm)** | 20.8 x 20.8 x 14.5 |
| **Typical Applications** | Automotive safety crash testing, pedestrian impact, biomechanics, robotics |

**MEAS 633, 634**

| **Package**      | Stainless steel |
| **FS Range (°/s)** | ±100, 500, 1500, 6000, 12K, 18K, 24K |
| **Unique Features** | • 6DoF analog sensor, Rugged, compact housing, Signal conditioned |
| **Accuracy**     | ±0.5% non-linearity |
| **Excitation Voltage** | 5 - 16 VDC |
| **Operating Temp.** | -40°C to 105°C |
| **Dimensions (mm)** | 21.3 x 21.3 x 15.2 |
| **Typical Applications** | Aerospace testing, weapons testing, biomechanics, shock and impact testing |

Specifications subject to change.
Dimensions for reference purpose only.

Catalog SS-TS-TE300
03/2017
The test and measurement group of TE Connectivity provides data systems based on the electronic pressure and temperature scanners of legacy brand Pressure Systems (PSI). These products have been developed specifically for wind tunnel testing, flight testing and turbomachinery test and measurement applications. Extensive factory calibration combined with custom MEMS-like technology provide system solutions with high accuracy digital interface to host computers and networks. Pressure ranges are available from 1.3” H₂O (300 Pa) to 10,000 psi (69 MPa). Temperature inputs can be acquired from standard and custom thermocouples as well as RTDs. Software is included with each solution.

**PRESSURE AND TEMPERATURE**
NetScanner Complete Data Acquisition Devices

<table>
<thead>
<tr>
<th><strong>MEAS 9116</strong></th>
<th><strong>MEAS 9146-R</strong></th>
<th><strong>MEAS 9146-T</strong></th>
<th><strong>MEAS 9022</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measurement Type</strong></td>
<td>Pressure</td>
<td>Temperature</td>
<td>Temperature</td>
</tr>
<tr>
<td><strong>Media</strong></td>
<td>Dry</td>
<td>RTD / TC / Volt</td>
<td>TC</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.05% FS</td>
<td>±0.25°C</td>
<td>±0.25°C</td>
</tr>
<tr>
<td><strong># of Channels</strong></td>
<td>16</td>
<td>16 / 32</td>
<td>16</td>
</tr>
<tr>
<td><strong>EU Throughput Rate</strong></td>
<td>500 Hz</td>
<td>33 Hz</td>
<td>33 Hz</td>
</tr>
<tr>
<td><strong>Enclosure</strong></td>
<td>IP66 / 30 g vibration</td>
<td>IP66 / 30 g vibration</td>
<td>IP54 / 30 g vibration</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Engine testing, portable data acquisition, wind tunnel research, process monitoring</td>
<td>Engine testing, portable data acquisition, wind tunnel research, process monitoring</td>
<td>Engine testing, portable data acquisition, wind tunnel research, process monitoring</td>
</tr>
</tbody>
</table>
## PRESSURE

**NetScanner Complete Data Acquisition Devices**

<table>
<thead>
<tr>
<th>Model</th>
<th>Measurement Type</th>
<th>Media</th>
<th>Accuracy</th>
<th># of Channels</th>
<th>EU Throughput Rate</th>
<th>Enclosure</th>
<th>Typical Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAS 9032</td>
<td>Barometer</td>
<td>Dry</td>
<td>±0.01% FS</td>
<td>1</td>
<td>10 Hz</td>
<td>Laboratory grade</td>
<td>Barometric monitor, precision reference</td>
</tr>
<tr>
<td>MEAS 9034, 9038</td>
<td>Calibrator</td>
<td>Dry</td>
<td>±0.01% FS</td>
<td>1</td>
<td>10 Hz</td>
<td>Laboratory grade</td>
<td>Calibration, transfer standard, verification testing</td>
</tr>
<tr>
<td>MEAS 98RK-1, 9816</td>
<td>Pressure</td>
<td>Dry</td>
<td>±0.05% FS</td>
<td>128</td>
<td>100 Hz</td>
<td>Flight grade</td>
<td>Turbine engine test, control room location</td>
</tr>
<tr>
<td>MEAS Flight Data System</td>
<td>Pressure</td>
<td>Dry</td>
<td>±0.05% FS</td>
<td>512</td>
<td>10 / 100 Base-T</td>
<td>Flight grade</td>
<td>Flight testing</td>
</tr>
</tbody>
</table>

## PRESSURE SCANNERS

**Miniature High Density Pressure Scanners**

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Media</th>
<th>Accuracy</th>
<th># of Channels</th>
<th>Thermal Comp.</th>
<th>Port Sizes (Inches)</th>
<th>Typical Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAS 64HD DTC</td>
<td>Pressure</td>
<td>Dry</td>
<td>±0.03% FS</td>
<td>64</td>
<td>Active (DTC)</td>
<td>0.040</td>
<td>Wind tunnel research, flight test, on vehicle research</td>
</tr>
<tr>
<td>MEAS 32HD DTC</td>
<td>Pressure</td>
<td>Dry</td>
<td>±0.03% FS</td>
<td>32</td>
<td>Active (DTC)</td>
<td>0.040 or 0.063</td>
<td>Wind tunnel research, flight test, on vehicle research</td>
</tr>
<tr>
<td>MEAS 64HD, 32HD, 16HD</td>
<td>Pressure</td>
<td>Dry</td>
<td>±0.05% FS</td>
<td>64, 32 or 16</td>
<td>Passive</td>
<td>0.040 or 0.63</td>
<td>Wind tunnel research, flight test, on vehicle research</td>
</tr>
<tr>
<td>MEAS MicroScanner</td>
<td>Pressure</td>
<td>Dry</td>
<td>±0.05% FS</td>
<td>16</td>
<td>Active</td>
<td>Direct mount</td>
<td>For confined space, wind tunnel, flight test</td>
</tr>
</tbody>
</table>

## DATA ACQUISITION SYSTEMS

**Multi-Scanner Data Acquisition Systems**

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Media</th>
<th>Accuracy</th>
<th># of Channels</th>
<th>EU Throughput Rate</th>
<th>Enclosure</th>
<th>Typical Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAS Optimus</td>
<td>Pressure scanning</td>
<td>Dry</td>
<td>±0.03% FS</td>
<td>2048</td>
<td>2000 Hz</td>
<td>Laboratory grade</td>
<td>Aerospace development</td>
</tr>
<tr>
<td>MEAS Initium</td>
<td>Pressure scanning</td>
<td>Dry</td>
<td>±0.05% FS</td>
<td>512</td>
<td>1200 Hz</td>
<td>Laboratory grade</td>
<td>Wind engineering</td>
</tr>
<tr>
<td>MEAS Interface</td>
<td>A/D conversion</td>
<td>Dry</td>
<td>±0.05% FS</td>
<td>512</td>
<td>2000 Hz</td>
<td>Miniature</td>
<td>In-model placement, Optimus System interface</td>
</tr>
<tr>
<td>MEAS Pneumatics</td>
<td>Quick disconnect</td>
<td>Dry</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Miniature</td>
<td>Pressure connections for confined spaces</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>MEAS Thermistor Chips</th>
<th>MEAS Radial Leaded Thermistors</th>
<th>MEAS Axial Leaded Thermistors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Package</strong></td>
<td>Radial, beads</td>
<td>DO-35</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Gold or silver electrodes, surface mounted</td>
<td>Glass coated</td>
</tr>
<tr>
<td><strong>Resistance Range</strong></td>
<td>Epoxy or glass coated</td>
<td>5KΩ to 100KΩ</td>
</tr>
<tr>
<td><strong>Unique Features</strong></td>
<td>• Wire bonding compatible</td>
<td>• Tight tolerance (±1%)</td>
</tr>
<tr>
<td></td>
<td>• End band SMD</td>
<td>• Max. stability using high density (HD) chip</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±1% to 10%</td>
<td>• Tinned and nickel plated leads</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-40°C to 125°C</td>
<td>±1% to ±3%</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>Chip: 0.6 - 1.0 square</td>
<td>-40°C to 300°C</td>
</tr>
<tr>
<td></td>
<td>SMD 0402: 1 x 0.5 x 0.7</td>
<td>2.0 x 4.0 body</td>
</tr>
<tr>
<td></td>
<td>SMD 0603: 1.6 x 0.8 x 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SMD 0805: 2 x 1.25 x 1.2</td>
<td></td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Temperature compensation, communication (DWDM), infrared sensing systems, PCB mounting temperature measurement</td>
<td>Temperature sensing for OEM, automotive, medical, HVAC</td>
</tr>
</tbody>
</table>

**SENSING ELEMENTS—DIGITAL**

Digital Output

<table>
<thead>
<tr>
<th>MEAS Space Qualified (Hi-Rel)</th>
<th>MEAS Temperature System Sensor (TSYS) Series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Package</strong></td>
<td>QFN16, TDFN8</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>PC, SPI, PWM, SDM (Convertible to analog voltage)</td>
</tr>
<tr>
<td><strong>Resistance Range</strong></td>
<td>1KΩ to 100KΩ</td>
</tr>
<tr>
<td><strong>Unique Features</strong></td>
<td>• ESA and NASA approved</td>
</tr>
<tr>
<td></td>
<td>• High reliability and accuracy</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>0.5% to 10%</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-55°C to 160°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>From 2.4</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Instrumentation and compensation for aerospace applications</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Industrial control, replacement of precision RTDs, thermistors and NTCs, heating and cooling systems, HVAC</td>
</tr>
</tbody>
</table>

Specifications subject to change. Dimensions for reference purpose only.

Catalog SS-TS-TE300

03/2017
# TEMPERATURE SENSORS

## SENSING ELEMENTS—RTD

### Analog Output

<table>
<thead>
<tr>
<th><strong>MEAS Nickel RTD</strong></th>
<th><strong>MEAS Platinum Thin Film Chips</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Package</strong></td>
<td>Leadless chips, SMD 1206</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Thin film platinum deposited on ceramic substrate, protected with a passivation layer</td>
</tr>
<tr>
<td><strong>Resistance Range</strong></td>
<td>100Ω, 1000Ω (Other values on request)</td>
</tr>
</tbody>
</table>
| **Unique Features** | • Long term stability  
  • Assembly like NTC chips  
  • Very small dimensions  
  • Short response time |
| **Accuracy** | According to DIN EN 60751 |
| **Operating Temp.** | -50°C to 400°C |
| **Dimensions (mm)** | 1.5 x 1.5 (Top / bottom pads), 1.2 x 3.6 (SMT) |
| **Typical Applications** | White goods, automotive, industrial, aerospace, medical, test and measurement |

### MEAS Nickel RTD

- SOT 23
- Bare die on request
- Thin film nickel structure on silicon substrate, protected with a passivation layer
- Bare die for COB assembly
- Good thermal connection of sensing element through leadframe-pin

### MEAS Platinum Thin Film Chips

- Leadless chips, SMD 1206
- Thin film platinum deposited on ceramic substrate
- Contact pads on top and bottom side for NTC chip like assembly

### MEAS Glass Wire Wound Sensors

<table>
<thead>
<tr>
<th><strong>GO, GX</strong></th>
<th><strong>MEAS Glass Wire Wound Sensors</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resistance Range</strong></td>
<td>1000Ω (2X 1000Ω on few versions)</td>
</tr>
</tbody>
</table>
| **Unique Features** | • Aggressive environments (Acid, oil, solvent)  
  • Small dimensions  
  • Stability  
  • No hysteresis  
  • Short response time  
  • Interchangeability |
| **Accuracy** | Class W0.3, W0.15, W0.1 according to IEC60751 |
| **Operating Temp.** | -200°C to 400°C |
| **Dimensions (mm)** | Ø1.8 / length 5 mm to Ø4.5 / length 48 mm |
| **Typical Applications** | Oil and chemical industry, aviation, aeronautic, food industry |

### MEAS Ceramic Wire Wound Sensors

<table>
<thead>
<tr>
<th><strong>CWW600, CWW850, CWW1000</strong></th>
<th><strong>MEAS Ceramic Wire Wound Sensors</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resistance Range</strong></td>
<td>100Ω (2X 1000Ω on few versions)</td>
</tr>
</tbody>
</table>
| **Unique Features** | • High temperature  
  • Stability  
  • Small dimension  
  • Interchangeability |
| **Accuracy** | Class W0.3, W0.15, W0.1 according to IEC60751 |
| **Operating Temp.** | -200°C to 600°C (CWW600)  
  -200°C to 850°C (CWW850)  
  -200°C to 1000°C (CWW1000) |
| **Dimensions (mm)** | Ø1.5 / length 8 mm to Ø4.5 / length 30 mm  
  Ø2.7 / length 45 mm (CWW1000) |
| **Typical Applications** | Process industry, laboratories, reference sensors |
# SENSOR ASSEMBLIES

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS Ring Sensors</th>
<th>MEAS Push-in Sensors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package</td>
<td>• Ring for surface assembly</td>
<td>Brass, copper or stainless steel closed-end tube</td>
</tr>
<tr>
<td>Type</td>
<td>• Threaded bolt, tube style</td>
<td>Epoxy potted element, miniature design</td>
</tr>
<tr>
<td>Sensor Range</td>
<td>• NTC</td>
<td>• NTC, Pt, Ni</td>
</tr>
<tr>
<td></td>
<td>• RTD: Pt, Ni</td>
<td>• RTD: Pt, Ni, Cu</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Surface mount sensing</td>
<td>• Thermocouple: Type J, K, T, E</td>
</tr>
<tr>
<td></td>
<td>• For use where space is limited</td>
<td>• Corrosion resistant</td>
</tr>
<tr>
<td></td>
<td>• Simple installation</td>
<td>• Available with mounting tabs or clips</td>
</tr>
<tr>
<td>Accuracy</td>
<td>• NTC: Custom tolerances available</td>
<td>• NTC: Custom tolerances available</td>
</tr>
<tr>
<td></td>
<td>• RTD: Class AA, A, B according to IEC60751</td>
<td>• Pt RTD: Class AA, A, B according to IEC60751</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>Varies: -50°C to 250°C</td>
<td>Varies: -50°C to 250°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>Case specific dimensions</td>
<td>Case specific dimensions</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Surface plates, heat exchangers, fluid pumping systems, generators</td>
<td>Boiler, liquid, evaporator, HVACR, industrial processes control, district heating and cooling, automotive, bearing monitoring, motors, gear boxes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS Screw-in Sensors</th>
<th>MEAS Refrigeration Molded Probes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package</td>
<td>Brass, copper or stainless steel housing with integrated connector</td>
<td>PVC or TPE</td>
</tr>
<tr>
<td>Type</td>
<td>Epoxy potted element, rigid sheath</td>
<td>Overmolded</td>
</tr>
<tr>
<td>Sensor Range</td>
<td>• NTC</td>
<td>• NTC, Pt</td>
</tr>
<tr>
<td></td>
<td>• RTD: Pt, Ni, Cu</td>
<td>• RTD: Pt</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Corrosion resistant</td>
<td>• Mounting clips available</td>
</tr>
<tr>
<td></td>
<td>• Different thread types</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Connectors available</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>• NTC: Custom tolerances available</td>
<td>• NTC: Custom tolerances available</td>
</tr>
<tr>
<td></td>
<td>• Pt RTD: Class AA, A, B according to IEC60751</td>
<td>• Pt RTD: Class AA, A, B according to IEC60751</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>Varies: -50°C to 250°C</td>
<td>-40°C to 125°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>Custom lengths, diameters and threads available</td>
<td>8 x 30, 6.5 x 25, 6 x 50, 6 x 5 x 15</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Boiler, liquid, HVACR, industrial processes control, district heating and cooling, immersion</td>
<td>HVACR, industrial processes control</td>
</tr>
</tbody>
</table>
# TEMPERATURE SENSORS

## SENSOR ASSEMBLIES

### MEAS Pipe Mount Sensors
- **Package**: Copper or stainless steel housing
- **Type**:
  - Overmolded
  - Epoxy potted
- **Sensor Range**: NTC
- **Unique Features**:
  - Fast response time
  - Moisture resistant construction
- **Accuracy**: NTC: custom tolerances available
- **Operating Temp.**: -40°C to 125°C
- **Dimensions (mm)**: Custom configurations available
- **Typical Applications**: Industrial process, boiler control, HVAC, refrigeration, food service, energy management, test equipment

### MEAS Outdoor Air Sensors
- **Package**: Metal housing with PVC sun shield with or without weatherproof box
- **Type**:
  - Fully potted subassembly
  - NTC
- **Sensor Range**:
  - Easy installation – threads into mounting hole or standard handy box
  - Fully potted housing protects sensing element and provides fast, accurate response
- **Unique Features**:
  - O-ring seals
  - Compatible with pool and spa chemicals
- **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**:
  - Overmolded subassembly
  - NTC
- **Sensor Range**:
  - O-ring seals
- **Unique Features**:
  - Corrosion resistant
  - Different threads types and connectors available
- **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**:
  - Screw
  - NTC
  - RTD: Pt, Ni, Cu
- **Sensor Range**:
  - Integrated connector
  - Corrosion resistant
  - Different threads types and connectors available
- **Operating Temp.**: -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**:
  - Pt element encapsulated into ceramic tube, with rigid stainless steel housing
  - High temperature cable
- **Sensor Range**: Pt100, Pt500, Pt1000 sensor
- **Unique Features**:
  - High temperature
  - Easy integration / installation
  - Higher dielectric strength according to type
- **Accuracy**: Class B, C according to IEC60751
- **Operating Temp.**:
  - -20°C to 750°C (According to version)
- **Dimensions (mm)**:
  - OD Ø4 mm to Ø6 mm
  - Immersion length 35 mm to 100 mm
  - Custom mechanical interface and cable length
- **Typical Applications**: Drying oven, domestic oven

### MEAS Urea Temperature Sensors
- **Package**: Plastic housing with screw hole mountings
- **Type**:
  - Overmolded plastic housing with integrated 2 pin connector
- **Sensor Range**:
  - NTC
- **Unique Features**:
  - Temperature measurement of urea liquid used in Selective Catalytic Reduction (SCR) systems
  - Suitable for high pressure applications
  - NTC: custom tolerances available
  - β2%: 3% and 5%
  - β25/85: 3976
- **Accuracy**: Class 1 according to IEC584
- **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**:
  - Mineral insulated alloy sheath, screwed mechanical interface, cable extension and automotive connector
  - Option: CANbus interface (From 1 to 4 thermocouples, fully configurable)
- **Sensor Range**:
  - Thermocouple: Type K, N
  - High temperature, robust design
  - Vibration and corrosion resistant
  - Fast response time
- **Accuracy**: Class 1 according to IEC584
- **Operating Temp.**: -40°C to 900°C
- **Dimensions (mm)**:
  - ØOD 4 to ØOD 8
  - Custom immersion length and cable length
- **Typical Applications**: Automotive, truck, mining, power unit, racing
## SENSOR ASSEMBLIES

### MEAS Micro-Thermocouples

**Package**
- Fine gage thermocouples

**Type**
- Micro sized thermocouple:
  - 44 AWG, 40 AWG, 38 AWG, 36 AWG
- Polymer encapsulated or bare junction

**Sensor Range**
- Thermocouple type: T, K

**Unique Features**
- Welded or soldered junction
- Low profile, fast response
- Polyesterimide wire insulation

**Accuracy**
- Varies by type: standard, special and custom limits or error available

**Operating Temp.**
- Varies by type: Rated up to 240°C

**Dimensions (mm)**
- Varies by thermocouple gage

**Typical Applications**
- Medical, catheters

### MEAS Patient Monitoring Probes

**Package**
- Sensor with cable and connector

**Type**
- Reusable: Skin; 10FR and 12FR GP
- Disposable: Skin; 9FR and 12FR GP; 12FR, 18FR, 24FR Esoph/Stethoscope; 14FR, 16FR, 18FR Foley catheter

**Sensor Range**
- 400 series, 700 series (Reusable only)
- ±0.1°C at 25°C to 45°C
- ±0.2°C at 35°C to 42°C
- -40°C to 100°C, Patient: 0°C to 50°C

**Unique Features**
- Autoclavable reusables
- Sterile disposables

**Accuracy**
- ±0.1°C at 25°C to 45°C
- ±0.2°C at 35°C to 42°C
- -40°C to 100°C, Patient: 0°C to 50°C

**Operating Temp.**
- -80°C to 350°C (TLH100)
- -180°C to 600°C (TLH600)
- -55 °C to 160 °C for probe tip
- -40 °C to  85 °C for handle with electronics

**Dimensions (mm)**
- OD Ø5 x 500 + handle Ø15 x 100 (Typical cable length = 2 m)
- OD Ø6 x 200 + handle Ø19 x 100 (Typical cable length = 2,000)

**Typical Applications**
- Laboratory, mobile research, test and measurement

### MEAS TLH Reference Probe

**Package**
- TLH100 / TLH600

**Type**
- Rigid protective external stainless steel sheath and stainless steel handle, unique internal design to insure stability

**Sensor Range**
- Pt100 sensor

**Unique Features**
- Stability
- Provided with calibration report or option of calibration certificate by national committee for accreditation (COFRAC)

**Accuracy**
- Class B (TLH600), A (LTH100) according to IEC60751

**Operating Temp.**
- -80°C to 350°C (TLH100)
- -180°C to 600°C (TLH600)

**Dimensions (mm)**
- OD Ø5 x 500 + handle Ø15 x 100 (Typical cable length = 2 m)

**Typical Applications**
- Laboratory, temperature sensors calibration by comparison

### MEAS USB Temperature Probe

**Package**
- Push-in probe with handle

**Type**
- Versatile push-in probe with stainless steel sheath and plastic or stainless steel handle
- High precision sensing element combined with integrated electronics for signal processing, calibration and USB interface

**Sensor Range**
- Not applicable due to direct digital output

**Unique Features**
- USB conformal interface
- Calibrated digital output, recalibration possible on request
- Robust design for general purpose applications
- Long term stability

**Accuracy**
- ±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)

**Operating Temp.**
- -55 °C to 160 °C for probe tip
- -40 °C to  85 °C for handle with electronics
(Other temperature ranges on request)

**Dimensions (mm)**
- OD Ø6 x 200 + handle Ø19 x 100 (Typical cable length = 2,000)

**Typical Applications**
- Laboratory, mobile research, test and measurement

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*Specifications subject to change. Dimensions for reference purpose only.*
### SENSOR ASSEMBLIES

#### MEAS Stator Sensors
- **Package**: TPE / CPME
- **Type**: Rigid flat, slot sensor
- **Sensor Range**: RTD: Pt, Ni, Cu
- **Unique Features**: Extended sensitive length
- **Accuracy**: RTD: Class A, B according to IEC60751
- **Operating Temp.**: Max. temperature: Class F, 155°C
- **Dimensions (mm)**: Custom dimensions available
- **Typical Applications**: Monitor temperature between stator coils, electric motors, generators

#### MEAS Surface Sensors
- **Package**: Silicone rubber or polyimide laminated element
- **Type**: Flat, flexible, rectangular sensor
- **Sensor Range**: RTD: Pt, Ni, Cu
- **Unique Features**: Surface sensing for curved or uneven surfaces
- **Accuracy**: RTD: Class A, B according to IEC60751
- **Operating Temp.**: Varies: -50°C to 200°C
- **Dimensions (mm)**: Custom dimensions available
- **Typical Applications**: Chemical and pharmaceutical industry, process industry, laboratory, aerospace, motor end windings of stator coils, generators

#### MEAS Bearing Sensors
- **Package**: Copper alloy tip
- **Type**: Rigid sheath
- **Sensor Range**: RTD: Pt, Ni, Cu
- **Unique Features**: Cut-to-length
- **Accuracy**: RTD: Class A, B according to IEC60751
- **Operating Temp.**: Sheath specific, up to 250°C
- **Dimensions (mm)**: Custom lengths
- **Typical Applications**: Bear monitoring, electric motors, generators

#### MEAS Thermocouple
- **Package**: Screw-in or push-in design with cable extension, connector, or connecting head
- **Type**: Collapsible Mineral Insulated (MI) with alloy sheath (Radius ≥5*OD)
- **Sensor Range**: Type T, J, K, N, R, S, B (According to TC type and insulation type)
- **Unique Features**: High temperature and high vibration level (For MI)
- **Accuracy**: Class 1 according to IEC584
- **Operating Temp.**: -40°C to 1,700°C (According to TC type and insulation type)
- **Dimensions (mm)**: ø0.3 mm to ø8 mm for MI
- **Typical Applications**: Aeronautic, process industry, medical, semiconductor industry (Spike, profile)

#### MEAS Transmitter
- **Package**: Brass, copper and stainless steel housing, flexible sheath with integrated connector.
- **Type**: Epoxy potted element
- **Sensor Range**: 4 - 20 mA output
- **Unique Features**: Compact, welded design
- **Accuracy**: 0.5 or 1% FS
- **Operating Temp.**: -20°C to 120°C
- **Dimensions (mm)**: Customer sheath length, thread type
- **Typical Applications**: Heavy industry, general industrial monitoring
TEMPERATURE SENSORS

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
- High signal output
- Accurate reference sensors

Accuracy
Depends on 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
- Calibrated and ready to use, I2C interface
- Direct assembly to PCB, no additional components needed

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 Series

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
- Calibrated, Interfaces: I²C, SPI
- Different field of views: 5° at 50%, 10° at 50%, 90° at 50%, others on request

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
- Calibrated and ready to use
- Digital output
- Small field of view

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

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
- Calibrated and ready to use
- Digital or analog outputs
- Small field of view

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
Our torque sensors use advanced strain gage technology to satisfy the most demanding requirements for static and dynamic applications. We offer solutions for measuring reaction torque and rotating torque. Our torque meters complete with integral mechanical stops increase overload capacity and provide additional protection during mounting and operation. We offer a variety of small capacity sensors for dynamic and reaction torque measurements. Our combination sensors simultaneously measure reaction torques and forces with a single device. They can also detect angle position and provide velocity measurement. We can customize a wide range of available models to meet your specific needs.
TORQUE SENSORS

TORQUE METERS
Reaction and Rotary

**MEAS CS1060**
- Package: Square male coupling
- Operating Mode: Reaction
- Unique Features:
  - Optional high level output
  - Static measurements
- Ranges Nm (Lbf-ft):
  - ±5 to ±7K (±4 to ±5.6K)
- Max. Over-range: 1.5X FS
- Output / Span: 120 mV (4 V; ±5 V optional)
- Combined Non-linearity & Hysteresis:
  - < ±0.25% FS
- Operating Temp.: -20°C to 100°C
- Typical Applications: Non-rotating parts torque measurement, robotics and effectors, laboratory and research

**MEAS CS1120**
- Package: Square male coupling
- Operating Mode: Reaction
- Unique Features:
  - Optional high level output
  - Excellent temperature stability
- Ranges Nm (Lbf-ft):
  - ±5 to ±2.5K (±4 to ±2K)
- Max. Over-range: 1.5X FS
- Output / Span: 120 mV (4 V; ±5 V optional)
- Combined Non-linearity & Hysteresis:
  - < ±0.25% FS
- Operating Temp.: -20°C to 100°C
- Typical Applications: Non-rotating parts torque measurement, robotics and effectors, laboratory and research

**MEAS CS1210**
- Package: Collar mechanical fittings
- Operating Mode: Reaction
- Unique Features:
  - High stiffness
  - Optional high level output
- Ranges Nm (Lbf-ft):
  - ±160 to ±10K (±128 to ±8K)
- Max. Over-range: 1.5X FS
- Output / Span: 120 mV (4 V; ±5 V optional)
- Combined Non-linearity & Hysteresis:
  - < ±0.25% FS
- Operating Temp.: -40°C to 150°C
- Typical Applications: Non-rotating parts torque measurement, robotics and effectors, laboratory and research

**MEAS CD1050**
- Package: Square male couplings
- Operating Mode: Dynamic rotary
- Unique Features:
  - Optional high level output
  - Rugged
- Ranges Nm (Lbf-ft):
  - ±5 to ±7K (±4 to ±5.6K)
- Max. Over-range: 1.5X FS
- Output / Span: 120 mV (4 V; ±5 V optional)
- Combined Non-linearity & Hysteresis:
  - < ±0.25% FS
- Operating Temp.: -20°C to 80°C
- Typical Applications: Engine efficiency, robotics and effectors, laboratory and research

**MEAS CD1140**
- Package: Keyed shaft couplings
- Operating Mode: Contactless
- Unique Features:
  - High accuracy
  - Built-in amplifier
  - Speed and angle detection
- Ranges Nm (Lbf-ft):
  - ±0.05 to ±20,000 Nm (±0.04 to ±16,000 lbf-ft)
- Max. Over-range: 2X FS
- Output / Span: ±10 V (Pulses / Rev. 6.0 / 360)
- Non-linearity ±0.1% FS
- Hysteresis ±0.1% FS
- Operating Temp.: 0°C to 60°C
- Dimensions (mm): Application dependent
- Typical Applications: Process control equipment, robotics and effectors, test and measurement

**MEAS CD1095**
- Package: Keyed shaft couplings
- Operating Mode: Dynamic rotary
- Unique Features:
  - High accuracy
  - Built-in amplifier
- Ranges Nm (Lbf-ft):
  - ±5 to ±2,500 Nm (±4 to 2,000 lbf-ft)
- Max. Over-range: 1.5X FS
- Output / Span: ±20 mV (4 V; ±5 V optional)
- Non-linearity < ±0.25% FS
- Hysteresis Combined with linearity
- Operating Temp.: -20°C to 80°C
- Dimensions (mm): Application dependent
- Typical Applications: Process control equipment, robotics and effectors, test and measurement

AUTOMOTIVE DESIGN AND TEST SENSORS

**MEAS FCA7300**
- Package: Steering wheel adaptable
- Operating Mode: Multi-sensing
- Unique Features:
  - Dual torque / angle range
  - Steering velocity measurement
  - Fits all road vehicles
- Ranges N (Lbf):
  - 10 to 200 Nm (7 lbf-ft to 150 lbf-ft)
- Max. Over-range: 10X FS
- Output / Span: ±10 V
- Non-linearity ±0.1% FS
- Hysteresis ±0.1% FS
- Operating Temp.: -20°C to 80°C
- Dimensions (mm): Ø195 x 50
- Typical Applications: On-car road test, truck and buses steering test, armored vehicles steering test

Specifications subject to change.
Dimensions for reference purpose only.
STANDARD CONTACT POINT LEVEL

TE Connectivity offers a wide range of level sensors using ultrasonic technology. Our ultrasonic sensors measure liquid level despite variations in transparency, viscosity, color or dielectric. These solutions include air bubble detection for medical pumps; point and continuous level sensors for the semiconductor and high purity markets; and point level sensors for a variety of process control applications. We offer high accuracy, high frequency, short range continuous measurement sensors through air for process control. We also offer standard products that provide a system without moving parts, adjustments, or maintenance. TE works closely with OEMs to offer custom sensors suited for temperature ranges of -30°C to 150°C, pressures to 1,000 psi, various input/output configurations and multiple sensing points.

MEAS LL-01
- Type: Gap
- Unique Features:
  - All 316L SS
  - Integral electronics
  - Miniature threads
  - No adjustment for viscosity, density
- Input: 5 - 30 VDC
- Output: 30 V, 3 W relay
- Pressure Range: 250 psi
- Operating Temp: -30°C to 80°C
- Actuation point: 0.25 inches
- Process Connection: 1/4"NPT and 1/2"NPT
- Cable: 1, 4, 10, 20 feet
- Approvals: CE
- Typical Applications: Medical waste tanks, histology processors, compressors, chillers, coolant reservoirs

MEAS LL-10
- Type: Tip
- Unique Features:
  - All 316L SS
  - Integral electronics
  - No adjustment for viscosity, density
- Input: 5 - 30 VDC
- Output: 1 A SPDT
- Pressure Range: 1000 psi
- Operating Temp: -30°C to 80°C
- Actuation point: Custom (2.25, 6, 12, 18, 24 inches)
- Process Connection: 3/4"NPT
- Cable: 1, 4, 10, 20 feet
- Approvals: CE
- Typical Applications: Hydraulic reservoirs, storage tanks, pipe lines, sewage systems

MEAS LL-100
- Type: Tip
- Unique Features:
  - All 316L SS
  - Integral electronics
  - No adjustment for viscosity, density
  - Remote electronics available
- Input: 5 - 30 VDC
- Output: Analog 4 - 20 mA power loop
- Pressure Range: 1000 psi
- Operating Temp: -40°C to 150°C
- Actuation point: Custom (2.25 to 36 inches)
- Process Connection: 3/4"NPT
- Cable: 10 to 40 feet optional
- Approvals: CE
- Typical Applications: Hydraulic supply lines, storage tanks

MEAS LL-101
- Type: Gap
- Unique Features:
  - High / normal fail-safe
  - Integral electronics
  - No adjustment for viscosity, density
  - Demand self-test
  - Remote electronics available
- Input: DC and AC options
- Output: 10A DPDT or analog
- Pressure Range: 1000 psi
- Operating Temp: -40°C to 150°C
- Process Connection: Custom (1 to 36 inches)
- Cable: 3/4"NPT
- Approvals: CE
- Typical Applications: Food processing tank, chemical tanks, oil and fuel level, liquid pharmaceuticals

Specifications subject to change. Dimensions for reference purpose only. Catalog SS-TS-TE300 03/2017
## AIR-BUBBLE AND NON-INVASIVE POINT LEVEL

<table>
<thead>
<tr>
<th>Type</th>
<th>MEAS AD-101</th>
<th>MEAS SL-630</th>
<th>MEAS SL-900</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unique Features</strong></td>
<td>Non-invasive</td>
<td>Non-invasive</td>
<td>Contact</td>
</tr>
<tr>
<td></td>
<td>• Bubble detection from 1 to 10 mm (+) tube</td>
<td>• Stick on dry contact</td>
<td>• Miniature</td>
</tr>
<tr>
<td></td>
<td>• Temperature option</td>
<td>• Point level detection</td>
<td>• 10 μRA electropolished finish</td>
</tr>
<tr>
<td></td>
<td>• Occlusion option</td>
<td></td>
<td>• 316 LSS body</td>
</tr>
<tr>
<td></td>
<td>• Fluid differentiation</td>
<td></td>
<td>• Designed for high purity market</td>
</tr>
<tr>
<td><strong>Input</strong></td>
<td>6 - 24 VDC standard</td>
<td>5 - 24 VDC</td>
<td>Variable</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>Open collector</td>
<td>TTL (High), dry condition</td>
<td>Dual color LED and ½ A relay</td>
</tr>
<tr>
<td><strong>Pressure Range</strong></td>
<td>Standard</td>
<td>Atmosphere</td>
<td>250 PSI</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>0°C to 65°C</td>
<td>-30°C to 70°C</td>
<td>-30°C to 93°C</td>
</tr>
<tr>
<td><strong>Actuation point</strong></td>
<td>—</td>
<td>Variable</td>
<td>Variable</td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>—</td>
<td>Reusable sensor, disposable tape</td>
<td>1/2&quot;, 3/4&quot; VCR, male/female</td>
</tr>
<tr>
<td><strong>Connection</strong></td>
<td>—</td>
<td>CE</td>
<td>Up to 24&quot; shielded with strain relief, 9 pin connector</td>
</tr>
<tr>
<td><strong>Approvals</strong></td>
<td>CE</td>
<td>CE</td>
<td>NEMA 1 housing</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Infusion pumps, dialysis machines, apheresis, auto-transfusion</td>
<td>Chromatography, chemical analyzer, hemodialysis, reagent vessels</td>
<td>Pharmaceutical and semiconductor industries, high pressure vessels</td>
</tr>
</tbody>
</table>

## CONTINUOUS LEVEL

<table>
<thead>
<tr>
<th>Type</th>
<th>MEAS SL-700</th>
<th>MEAS ML Series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Continuous transmitter through liquid</td>
<td>Continuous transmitter through air</td>
</tr>
<tr>
<td><strong>Unique Features</strong></td>
<td>• Contact</td>
<td>• Non-contact</td>
</tr>
<tr>
<td></td>
<td>• Remotely mounted</td>
<td>• Remotely mounted</td>
</tr>
<tr>
<td></td>
<td>• 316 SS sensor</td>
<td>• 316 SS or epoxy sensor material</td>
</tr>
<tr>
<td></td>
<td>• Configurable via RS-232</td>
<td>• Configurable via RS-232</td>
</tr>
<tr>
<td><strong>Input</strong></td>
<td>24 VDC</td>
<td>24 VDC</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>RS-232, analog, relay setpoints</td>
<td>RS-232, analog, relay setpoints</td>
</tr>
<tr>
<td><strong>Pressure Range</strong></td>
<td>250 psi</td>
<td>Atmosphere</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-30°C to 93°C</td>
<td>-30°C to 70°C</td>
</tr>
<tr>
<td><strong>Sensing Range</strong></td>
<td>1.25&quot; to 15&quot; inches</td>
<td>0.5&quot; to 5&quot; inches</td>
</tr>
<tr>
<td></td>
<td>3/4&quot; VCR, male/female</td>
<td>—</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>0.06&quot;</td>
<td>±0.0075&quot;</td>
</tr>
<tr>
<td><strong>Elect Connection</strong></td>
<td>Terminal block</td>
<td>Terminal block</td>
</tr>
<tr>
<td><strong>Approvals</strong></td>
<td>NEMA 1 housing</td>
<td>NEMA 1 housing</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Semiconductor tanks, ampoules and bubblers, high purity fluids, level in vacuum</td>
<td>Microplate well level, test tubes and vials, bottle fill level, surface flaw detection</td>
</tr>
</tbody>
</table>
TE has spent more than 20 years designing and manufacturing accelerometers based on our proprietary Microelectromechanical System (MEMS), bonded gage and piezoelectric ceramic/film technologies. Voltage mode piezoelectric is the most popular accelerometer design due to its high level output and wide bandwidth. We offer voltage mode accelerometers in the traditional 3-wire or 2-wire (IEPE) configurations. Charge mode piezoelectric accelerometers measure shock and vibration in high temperature environments. In addition to its high temperature operating capability when used with a high quality charge amplifier, a charge mode accelerometer offers dynamic range scalability. To measure motion (velocity, displacement) accurately, an accelerometer or with DC response is required. Incorporating MEMS technologies and the latest analog and digital ASICs, our DC accelerometers offer high performance and exceptional value. All products are EAR99 and RoHS compliant.
### MEMS DC ACCELEROMETERS

#### Embedded

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS 3022, 3028</th>
<th>MEAS 3052A, 3058A</th>
<th>MEAS 3038</th>
<th>MEAS 3255A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Pins or pads</td>
<td>Pins or pads</td>
<td>SMD</td>
<td>SMD</td>
</tr>
<tr>
<td>FS Range (g)</td>
<td>±2, 5, 10, 20, 50, 100</td>
<td>±2, 5, 10, 20, 50, 100</td>
<td>±50, 100, 200, 500, 2000, 6000</td>
<td>±25, 50, 100, 250, 500</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• mV output</td>
<td>• Temperature compensated</td>
<td>• Hermetically sealed</td>
<td>• Self test enabled</td>
</tr>
<tr>
<td></td>
<td>• Gas damping</td>
<td>• Gas damping</td>
<td>• High over-range protection</td>
<td>• Gas damping</td>
</tr>
<tr>
<td></td>
<td>• Pin or pad option</td>
<td>• Pin or pad option</td>
<td>• Gas damping</td>
<td>• Bidirectional mounting</td>
</tr>
<tr>
<td></td>
<td>±0.5% non-linearity</td>
<td>±0.5% non-linearity</td>
<td>±0.5% non-linearity</td>
<td>±1.0% non-linearity</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-40°C to 125°C</td>
<td>-40°C to 125°C</td>
<td>-54°C to 125°C</td>
<td>-40°C to 125°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>22.86 x 15.24 x 5.33</td>
<td>22.86 x 15.24 x 5.33</td>
<td>7.62 x 7.62 x 3.3</td>
<td>13.46 x 7.62 x 3.81</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Vibration and shock monitoring, tilt applications, motion control, impact testing</td>
<td>Vibration and shock monitoring, tilt applications, motion control, impact testing</td>
<td>Vibration and shock monitoring, embedded systems, shock testing, safe and arm</td>
<td>Vibration and shock monitoring, aerospace testing, impact testing, transportation</td>
</tr>
</tbody>
</table>

### PIEZOELECTRIC ACCELEROMETERS

#### Embedded Single Axis

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS 805, 805M1</th>
<th>MEAS 808, 808M1</th>
<th>MEAS 810M1</th>
<th>MEAS LDTC Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>TO - 5</td>
<td>TO - 8</td>
<td>Board level</td>
<td>Piezo film elements with or without mass and pins</td>
</tr>
<tr>
<td>FS Range (g)</td>
<td>±50, 500 / ±20, 200</td>
<td>±10, 50 / ±4, 20</td>
<td>±25, 100</td>
<td>Cantilever beam with vertical or horizontal pins</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Hermetically sealed</td>
<td>• Hermetically sealed</td>
<td>• Small size, low cost</td>
<td>±10 (Typical)</td>
</tr>
<tr>
<td></td>
<td>• Case grounded design</td>
<td>• Case grounded design</td>
<td>• Dynamic response</td>
<td>• Very low cost</td>
</tr>
<tr>
<td></td>
<td>• Bandwidth to 12 kHz</td>
<td>• Bandwidth to 8 kHz</td>
<td>• 6 kHz bandwidth</td>
<td>• High sensitivity (1 V/g)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±1.0% non-linearity</td>
<td>±1.0% non-linearity</td>
<td>±2.0% non-linearity</td>
<td>±Ultra-low power (Self generating)</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-50°C to 100°C</td>
<td>-50°C to 100°C</td>
<td>-40°C to 125°C</td>
<td>±20.0% (Typical)</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>Ø8.9 x 10.16</td>
<td>Ø15.2 x 16.6</td>
<td>12.70 x 15.24</td>
<td>-40°C to 70°C</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Machine monitoring, data loggers, permanent structures</td>
<td>Machine monitoring, data loggers, embedded applications</td>
<td>Data logging, impact detection</td>
<td>Wake-up switch, load imbalance, anti-theft devices, impact sensing, vital signs monitoring</td>
</tr>
</tbody>
</table>
# Vibration Sensors

## Piezoelectric Accelerometers

**Embedded Triaxial**

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS 832, 832M1</th>
<th>MEAS 834, 834M1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>SMD</td>
<td>SMD</td>
</tr>
<tr>
<td><strong>FS Range (g)</strong></td>
<td>±25, 50, 100, 200, 500</td>
<td>±2000, 6000</td>
</tr>
<tr>
<td><strong>Unique Features</strong></td>
<td>- Low cost, Hermetically sealed, Piezo-ceramic</td>
<td>- Low cost, Hermetically sealed, Piezo-ceramic</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±2.0% non-linearity</td>
<td>±2.0% non-linearity</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-20°C to 80°C (832)</td>
<td>-20°C to 80°C (834)</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>18.8 x 14.22 x 4.32</td>
<td>18.8 x 14.22 x 4.32</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Data logging, asset monitoring, impact monitoring</td>
<td>Data logging, asset monitoring, impact monitoring</td>
</tr>
</tbody>
</table>

## DC Accelerometers

**Plug and Play, Unamplified**

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS 40A, 40B</th>
<th>MEAS 832, 834M1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Package</strong></td>
<td>Anodized aluminum</td>
<td>SMD</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Screw mount</td>
<td>Board mount</td>
</tr>
<tr>
<td><strong>FS Range (g)</strong></td>
<td>±25, 100, 250, 500, 1000, 2000</td>
<td>±50, 200, 500, 2000</td>
</tr>
<tr>
<td><strong>Unique Features</strong></td>
<td>- Critically damped, SAE J211 / 2570 compliant, Compact</td>
<td>- Low cost, Gas damping, Over-range stops</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±1.0% non-linearity</td>
<td>±1.0% non-linearity</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-20°C to 80°C</td>
<td>-20°C to 90°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>16.7 x 10.0 x 5.0</td>
<td>11.2 x 10.2 x 3.8</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>In-dummy and pedestrian crash testing</td>
<td>Vibration and shock monitoring, shock testing, safety impact testing, side-impact testing</td>
</tr>
</tbody>
</table>

Specifications subject to change.
Dimensions for reference purpose only.
## DC ACCELEROMETERS
Plug and Play, Unamplified

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS 3801A</th>
<th>MEAS 3700</th>
<th>MEAS S8</th>
<th>MEAS 1201, 1201F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Stainless steel</td>
<td>Stainless steel</td>
<td>Anodized Aluminum</td>
<td>Anodized aluminum</td>
</tr>
<tr>
<td><strong>FS Range (g)</strong></td>
<td>±2, 10, 20, 50, 100, 200, 500, 1000</td>
<td>±50, 200, 500, 2000, 6000</td>
<td>±50, 100, 200, 500, 2000</td>
<td>±50, 100, 200, 500, 1000</td>
</tr>
<tr>
<td><strong>Unique Features</strong></td>
<td>• Hermetically sealed sensor • Gas damping • 10,000 g over-range protection</td>
<td>• No zero shift • mV output • 20,000 g over-range protection</td>
<td>• SAE J211 / 2570 compliant • Flexible, rugged cable • Over-range stops</td>
<td>• Small size • Flexible, rugged cable • Over-range stops</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.5% non-linearity</td>
<td>±2.0% non-linearity</td>
<td>±1.0% non-linearity</td>
<td>±1.0% non-linearity</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-54°C to 121°C</td>
<td>-54°C to 121°C</td>
<td>-40°C to 85°C</td>
<td>-20°C to 85°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>15.88 x 15.24</td>
<td>14.22 x 8.13 x 3.81</td>
<td>14.0 x 6.35 x 6.35</td>
<td>8.89 x 8.89 x 9.4</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Impact testing, structural testing, test and instrumentation, environmental testing</td>
<td>Impact and shock testing, structural testing, drop testing, aerospace testing</td>
<td>Crash testing, impact testing, off road testing</td>
<td>On-vehicle crash and impact testing, vibration and shock monitoring</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS EGAXT</th>
<th>MEAS EGCS-DO, EGCS-DIS</th>
<th>MEAS EGCS-S425</th>
<th>MEAS EGCS-D5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Stainless steel</td>
<td>Stainless steel</td>
<td>Anodized aluminum</td>
<td>Stainless steel</td>
</tr>
<tr>
<td><strong>FS Range (g)</strong></td>
<td>-54°C to 121°C</td>
<td>-40°C to 120°C</td>
<td>±50, 100, 250, 500, 1000</td>
<td>±1.0% non-linearity</td>
</tr>
<tr>
<td><strong>Unique Features</strong></td>
<td>• Sub-miniature • Lightweight • 10,000 g over-range protection</td>
<td>• Rugged housing • Critically damped • 10,000 g over-range protection</td>
<td>• Critically damped • Compact • Mechanical stops</td>
<td>Impact and shock testing, drop testing, structural testing</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±1.0% non-linearity</td>
<td>±1.0% non-linearity</td>
<td>±1.0% non-linearity</td>
<td>±1.0% non-linearity</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-40°C to 120°C</td>
<td>-40°C to 120°C</td>
<td>-20°C to 80°C</td>
<td>-40°C to 100°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>14.22 x 8.13 x 3.81</td>
<td>7.2 x 4.6 x 4.6</td>
<td>14.73 x 9.9 x 4.83</td>
<td>14.2 x 12.7 x 5.6</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Flight test and control, launch, crash, impact testing, robotics</td>
<td>General purpose, machine control, destructive testing, engine testing</td>
<td>Auto safety testing for side impact, on-vehicle, sled and in-dummy</td>
<td>Impact and shock testing, drop testing, structural testing</td>
</tr>
</tbody>
</table>
## DC ACCELEROMETERS

**Plug and Play, Amplified**

### MEAS 4000A, 4001A
- **Package**: Anodized aluminum
- **Type**: Screw mount
- **FS Range (g)**: ±2, 5, 10, 20, 50, 100, 200
- **Unique Features**:
  - Integral connector option
  - Gas damping
  - Low power
- **Accuracy**: ±1.0% non-linearity
- **Excitation Voltage**: 8 - 32 VDC
- **Operating Temp.**: -20°C to 85°C
- **Dimensions (mm)**: 18.54 x 18.54 x 8.64
- **Typical Applications**: Low frequency monitoring, transportation, vibration monitoring, motion control

### MEAS 4602, 4604
- **Package**: Anodized aluminum
- **Type**: Screw mount
- **FS Range (g)**: ±2, 5, 10, 30, 50, 100, 200, ±2, 10, 30, 50, 100, 200, ±2, 10, 30, 50, 100, 200, 500
- **Unique Features**:
  - Exceptional temp. compensation
  - High over-range
  - Hermetically sealed
- **Accuracy**: ±1.0% non-linearity
- **Excitation Voltage**: 8 - 36 VDC
- **Operating Temp.**: -54°C to 125°C
- **Dimensions (mm)**: 21.08 x 21.59 x 7.62
- **Typical Applications**: Flight testing on engines, flutter test, weapons development

### MEAS 4610, 4610A
- **Package**: Anodized aluminum
- **Type**: Screw mount
- **FS Range (g)**: ±2, 10, 30, 50, 100, 200, 1000, 2000
- **Unique Features**:
  - Low power
  - Exceptional temp. compensation
  - High over-range
  - Hermetically sealed
- **Accuracy**: ±1.0% non-linearity
- **Excitation Voltage**: 8 - 36 VDC
- **Operating Temp.**: -40°C to 115°C
- **Dimensions (mm)**: 21.59 x 25.4 x 7.62
- **Typical Applications**: Rail motion control, modal analysis, flight test, structural test

### MEAS 4801A
- **Package**: Stainless steel
- **Type**: Stud mount
- **FS Range (g)**: ±2, 10, 20, 50, 100, 200, 500, 2000
- **Unique Features**:
  - Hermetically sealed sensor
  - Integral connector
  - Signal conditioned
- **Accuracy**: ±1.0% non-linearity
- **Excitation Voltage**: 8 - 36 VDC
- **Operating Temp.**: -55°C to 125°C
- **Dimensions (mm)**: 15.33 x 20.83
- **Typical Applications**: Impact testing, structural testing, test and instrumentation, environmental testing

### MEAS 4807A
- **Package**: Stainless steel
- **Type**: Screw mount
- **FS Range (g)**: ±2, 5, 10, 20, 30, 50, 100, 200, 500
- **Unique Features**:
  - Low noise ranges
  - Temperature compensation
  - Hermetically sealed
- **Accuracy**: ±1.0% non-linearity
- **Excitation Voltage**: 8 - 18 VDC
- **Operating Temp.**: -55°C to 125°C
- **Dimensions (mm)**: 18.54 x 18.54 x 8.64
- **Typical Applications**: Seismic, structural monitoring, flight testing, trains, machine control, road test

### MEAS 4810A
- **Package**: Stainless steel
- **Type**: Screw mount
- **FS Range (g)**: ±2, 5, 10, 20, 30, 50, 100, 200
- **Unique Features**:
  - Ultra low noise
  - Micro-g resolution
  - Hermetically sealed
  - Detachable cable
- **Accuracy**: ±1.0% non-linearity
- **Excitation Voltage**: 8 - 36 VDC
- **Operating Temp.**: -55°C to 125°C
- **Dimensions (mm)**: 25.4 x 29.1 x 7.6
- **Typical Applications**: Low frequency monitoring, road testing, motion analysis
**VIBRATION SENSORS**

**DC ACCELEROMETERS**
Plug and Play, Triaxial

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS EGAXT3</th>
<th>MEAS 53/53A</th>
<th>MEAS 68CM1</th>
<th>MEAS 4650, 4630A</th>
<th>MEAS 4020, 4030</th>
<th>MEAS 606M1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Stainless steel</td>
<td>Anodized aluminum</td>
<td>Stainless steel</td>
<td>Anodized aluminum</td>
<td>Screw mount</td>
<td>Nitrile rubber pad</td>
</tr>
<tr>
<td>FS Range (g)</td>
<td>±5 through 2500</td>
<td>±50, 200, 500, 2000</td>
<td>±500, 1000, 2000</td>
<td>±2, 5, 10, 30, 50, 100, 200, 500</td>
<td>Screw mount</td>
<td>Removable</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Sub-miniature</td>
<td>• Low cost</td>
<td>• World SMD</td>
<td>• Low cost</td>
<td>• Low cost</td>
<td>±0.7 damping ratio</td>
</tr>
<tr>
<td></td>
<td>• Lightweight</td>
<td>• Gas damping</td>
<td>• Temperature compensated</td>
<td>• Gas damping</td>
<td>• Triaxial, hermetic</td>
<td>• Triaxial, hermetic</td>
</tr>
<tr>
<td></td>
<td>• 10,000 g over-range protection</td>
<td>• Low power</td>
<td>• High over-range</td>
<td>• Hermetically sealed</td>
<td>• Seat pad accelerometer</td>
<td>• Seat pad accelerometer</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±1.0% non-linearity</td>
<td>±1.0% non-linearity</td>
<td>±1.0% non-linearity</td>
<td>±1.0% non-linearity</td>
<td>±1.0% non-linearity</td>
<td>±1.0% non-linearity</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-40°C to 120°C</td>
<td>-20°C to 85°C</td>
<td>-20°C to 85°C</td>
<td>-40°C to 115°C</td>
<td>-40°C to 85°C</td>
<td>-20°C to 85°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>12.7 x 12.7 x 12.7</td>
<td>18.29 x 13.21 x 7.11</td>
<td>12.7 x 12.7 x 12.7</td>
<td>26.16 x 26.16 x 23.37</td>
<td>199 x 4</td>
<td>199 x 4</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Flight test, crash, shock monitoring</td>
<td>Auto safety, passenger comfort, transport, NVH analysis</td>
<td>Auto safety, in-dummy crash, on-vehicle crash</td>
<td>Road testing, motion control, structural testing</td>
<td>Structural monitoring, seismic array, bridge testing</td>
<td>Off road equipment, amusement rides, commercial aircraft</td>
</tr>
</tbody>
</table>

**CHARGE MODE, PIEZOELECTRIC ACCELEROMETERS**
Plug and Play

<table>
<thead>
<tr>
<th>Package</th>
<th>MEAS 7500A</th>
<th>MEAS 7501A</th>
<th>MEAS 7502A</th>
<th>MEAS 7504A, 7505A</th>
<th>MEAS 7514A</th>
<th>MEAS 7531A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Stainless steel</td>
<td>Titanium</td>
<td>Titanium</td>
<td>Stainless steel</td>
<td>Stainless steel</td>
<td>Titanium</td>
</tr>
<tr>
<td>Sensitivity (pC/g)</td>
<td>20, 13, 7</td>
<td>5.6</td>
<td>Center-hole mount</td>
<td>1.8</td>
<td>1.8</td>
<td>Center-hole mount</td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Single axis</td>
<td>• Single axis</td>
<td>• Single axis</td>
<td>• Single axis</td>
<td>• Single axis</td>
<td>• Triaxial, shear mode</td>
</tr>
<tr>
<td></td>
<td>shear mode</td>
<td>shear mode</td>
<td>shear mode</td>
<td>shear mode</td>
<td>shear mode</td>
<td>shear mode</td>
</tr>
<tr>
<td></td>
<td>• Hermetically sealed</td>
<td>• Hermetically sealed</td>
<td>• Hermetically sealed</td>
<td>• Hermetically sealed</td>
<td>• Hermetically sealed</td>
<td>• Miniature, light</td>
</tr>
<tr>
<td></td>
<td>• Isolated mounting surface</td>
<td>• Bandwidth to &gt;15 kHz</td>
<td>• Bandwidth to &gt;15 kHz</td>
<td>• Bandwidth to &gt;15 kHz</td>
<td>• Bandwidth to &gt;15 kHz</td>
<td>• &gt;10 kHz bandwidth</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-73°C to 260°C</td>
<td>-73°C to 260°C</td>
<td>-73°C to 260°C</td>
<td>-73°C to 260°C</td>
<td>-73°C to 260°C</td>
<td>-73°C to 260°C</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>8.38 x 22.35</td>
<td>5.84 x 14.48</td>
<td>4.40 x 11.94</td>
<td>11.11 x 14.10 (7504A)</td>
<td>14.99 x 14.99</td>
<td>11.02 x 13.6 x 11.02</td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Gearbox vibration monitoring, flight test, high temp. applications</td>
<td>Gearbox vibration monitoring, flight test, high temp. applications</td>
<td>Small structures monitoring, minimal mass loading, high temp. applications</td>
<td>Small structures monitoring, general purpose, high temp. applications</td>
<td>Low frequency vibration, general purpose, high temp. applications</td>
<td>High temp. applications, flight testing, structural monitoring</td>
</tr>
</tbody>
</table>

Specifications subject to change.
Dimensions for reference purpose only.

Catalog SS-TS-TE300
03/2017
### VOLTAGE MODE, PIEZOELECTRIC (IEPE) ACCELEROMETERS

**Plug and Play**

<table>
<thead>
<tr>
<th>Model</th>
<th>Package</th>
<th>Type</th>
<th>Sensitivity (mV/g)</th>
<th>Unique Features</th>
<th>Operating Temp.</th>
<th>Dimensions (mm)</th>
<th>Typical Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAS 7100A, 7101A</td>
<td>Stainless steel / titanium</td>
<td>Center-hole mount</td>
<td>100, 10, 5</td>
<td>• Single axis, shear mode • Isolated mounting surface • Hermetically sealed • Wide bandwidth, &gt;10 kHz</td>
<td>7100A: -55°C to 150°C 7101A: -55°C to 125°C</td>
<td>7100A: 9.9 x 22.35 7101A: 5.84 x 14.48</td>
<td>Flight testing, general purpose, vibration monitoring</td>
</tr>
<tr>
<td>MEAS 7102A</td>
<td>Titanium</td>
<td>Adhesive mount</td>
<td>100, 50, 20, 10, 5</td>
<td>• Single axis, shear mode • Wide bandwidth • &lt;1 g weight</td>
<td>-55°C to +125°C</td>
<td>4.40 x 11.94</td>
<td>Vibration monitoring, minimal mass loading, general purpose testing</td>
</tr>
<tr>
<td>MEAS 7108A</td>
<td>Stainless steel</td>
<td>Adhesive mounting</td>
<td>100, 10</td>
<td>• Single axis, shear mode • Wide bandwidth • Welded construction • Small size</td>
<td>-55°C to 125°C</td>
<td>9.53 x 10.16</td>
<td>Vibration monitoring, modal testing, general purpose</td>
</tr>
<tr>
<td>MEAS 7104A, 7105A</td>
<td>Stainless steel</td>
<td>Stud mounting</td>
<td>100, 50, 20, 10, 5</td>
<td>• Single axis, shear mode • Wide bandwidth • Top and side connector option</td>
<td>-55°C to 125°C</td>
<td>7104A: 11.11 x 14.10 7105A: 11.11 x 19.05</td>
<td>General purpose, IEPE accel, vibration monitoring, lab testing</td>
</tr>
<tr>
<td>MEAS 7131A, 7132A</td>
<td>Titanium</td>
<td>Adhesive / stud mounting</td>
<td>500, 100, 50, 10, 5, 2.5</td>
<td>• Triaxial, shear mode • &gt;12 kHz bandwidth • 4-pin connector • Hermetically sealed</td>
<td>-55°C to 125°C</td>
<td>7131A: 11 x 11 x 11 7132A: 15.24 x 20.32 x 13.46</td>
<td>General purpose, modal testing, vibration monitoring, small structures monitoring</td>
</tr>
</tbody>
</table>

### VOLTAGE MODE, PIEZOELECTRIC ACCELEROMETERS

**Plug and Play**

<table>
<thead>
<tr>
<th>Model</th>
<th>Package</th>
<th>Type</th>
<th>Sensitivity (mV/g)</th>
<th>Unique Features</th>
<th>Operating Temp.</th>
<th>Dimensions (mm)</th>
<th>Typical Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAS 8042</td>
<td>Titanium</td>
<td>Stud mount</td>
<td>500, 100, 10</td>
<td>• Industrial applications • Submersible • IP68, &gt;100 meters • 16 kHz bandwidth</td>
<td>-20°C to 80°C</td>
<td>22.23 x 48.26</td>
<td>Submersed pump monitoring, underwater research, gearbox monitoring</td>
</tr>
<tr>
<td>MEAS 8011, 8021-01</td>
<td>Stainless steel</td>
<td>Stud / center-hole mount</td>
<td>500, 100, 10</td>
<td>• Industrial accelerometer • Case isolated, internal shielding • Reverse wiring protection • ±1% non-linearity</td>
<td>-55°C to 125°C</td>
<td>22.23 x 48.26</td>
<td>Industrial applications, machine monitoring, intrinsic safety</td>
</tr>
<tr>
<td>MEAS 8032-01</td>
<td>Stainless steel</td>
<td>Stud mount</td>
<td>100, 10</td>
<td>• Industrial accelerometer • Case isolated, internal shielding • Low cost • Molded strain relief</td>
<td>-55°C to 100°C</td>
<td>14.3 x 45.3</td>
<td>Industrial applications, machine monitoring</td>
</tr>
<tr>
<td>MEAS 8711-01</td>
<td>Stainless steel</td>
<td>Stud / center-hole mount</td>
<td>1000, 500, 250, 100</td>
<td>• Industrial accelerometer • Case isolated, internal shielding • Low cost • Molded strain relief</td>
<td>-55°C to +125°C</td>
<td>22.23 x 48.26</td>
<td>Industrial applications, machine monitoring, wind turbines</td>
</tr>
<tr>
<td>MEAS 8011, 8021-AR/AP</td>
<td>Stainless steel</td>
<td>Stud / center-hole mount</td>
<td>4 - 20 mA RMS or peak</td>
<td>• Industrial accelerometer • Case isolated, internal shielding • Low cost • Molded strain relief</td>
<td>-40°C to 85°C</td>
<td>22.23 x 48.26</td>
<td>Industrial applications, machine monitoring, intrinsic safety</td>
</tr>
<tr>
<td>MEAS 8011, 8021-VR/VP</td>
<td>Stainless steel</td>
<td>Stud / center-hole mount</td>
<td>4 - 20 mA RMS or peak</td>
<td>• Industrial accelerometer • Reverse wiring protection • ±1% non-linearity</td>
<td>-40°C to 85°C</td>
<td>22.23 x 48.26</td>
<td>Industrial applications, machine monitoring, intrinsic safety</td>
</tr>
<tr>
<td>Type</td>
<td>MEAS 121</td>
<td>MEAS 130</td>
<td>MEAS 140/142</td>
<td>MEAS 160</td>
<td>MEAS 161</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
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<td>------------------</td>
<td>-------------------</td>
<td>------------------</td>
<td>------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Bench top</td>
<td>In-line charge converter</td>
<td>Auto-zero inline amplifier</td>
<td>Bench top</td>
<td>Bench top</td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Channels</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gain Range</td>
<td>0.001 to 9999</td>
<td>0.1, 1, 10</td>
<td>10, 25, 50, 100, 200, 500</td>
<td>1, 10</td>
<td>0.001 to 999.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unique Features</td>
<td>• Universal DC amplifier</td>
<td>• Low noise</td>
<td>• Low noise auto-zero</td>
<td>• Economical IEPE</td>
<td>• Charge and IEPE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Low noise operation with auto-zero</td>
<td>• Small package</td>
<td>• For bridge type sensor (140)</td>
<td>power supply</td>
<td>conditioner</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• For bridge type sensors</td>
<td>• Wide bandwidth</td>
<td>• For strain gage (142)</td>
<td>• Portable, compact</td>
<td>• Sensitivity normalization</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• μP controlled, programmable</td>
<td>• BNC male or female</td>
<td>• Lowest noise</td>
<td>• Rechargeable battery</td>
<td>• LCD display</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Low pass filter options</td>
<td></td>
<td>• 5 to 30 VDC excitation</td>
<td></td>
<td>• Support IEEE 1451.4 TEDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>301 x 258 x 102</td>
<td>Ø13.8 x 52.2</td>
<td>56.9 x 25.4 x 12.7</td>
<td>3.95 x 2.83 x 1.58</td>
<td>310 x 180 x 115</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Instrumentation labs, test benches, R&amp;D facilities</td>
<td>Instrumentation labs, high temperature testing PE accelerometer</td>
<td>Instrumentation labs, test benches, R&amp;D facilities</td>
<td>Instrumentation labs, PE / IEPE sensors</td>
<td>Instrumentation labs, PE / IEPE sensors</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Specifications subject to change.
Dimensions for reference purpose only.

Catalog SS-TS-TE300
03/2017
We are a leader in the water resources monitoring market with long standing experience in the design and manufacture of water level and water quality sensors. Our expertise in media isolated pressure sensors offers unique advantages in creative product development and consistent product performance. Water level transducers can be customized and are available in a wide range of accuracies, materials, and cabling. With your choice of analog or digital output, our sensors are easily adapted to any data system. Or, use self-powered units with onboard memory for long term deployment. We also provide water quality instrumentation for analyzing lakes, rivers, estuaries, and aquifers worldwide. Our CTD models measure conductivity, temperature, and depth critical to water resources improvement and preservation.
## WATER LEVEL SENSORS

### WATER LEVEL DATA LOGGERS

**MEAS TruBlue Logger 555 Level, 575 Baro, 585 CTD**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.05% FS TEB (TruBlue 555, 575, 585)</td>
</tr>
<tr>
<td></td>
<td>±0.01 ft H₂O (TruBlue 555)</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>0 - 692 ft (TruBlue 555, 585)</td>
</tr>
<tr>
<td></td>
<td>8 - 16 psia (TruBlue 575)</td>
</tr>
<tr>
<td></td>
<td>5 - 200,000 μs/cm (TruBlue 585)</td>
</tr>
<tr>
<td><strong>Max. Over-range</strong></td>
<td>2X FS (TruBlue 555, 585)</td>
</tr>
<tr>
<td></td>
<td>32 psia (TruBlue 575)</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>RS-485, SDI - 12</td>
</tr>
<tr>
<td><strong>Data Logging</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>0°C to 50°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>Ø19.0 x 390.0</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Groundwater monitoring, surface water monitoring, oceanographic research</td>
</tr>
</tbody>
</table>

**MEAS TruBlue Logger 255 Level**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.05% FS TEB</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>0 - 658 ft H₂O</td>
</tr>
<tr>
<td><strong>Max. Over-range</strong></td>
<td>3X full scale</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>RS 485, SDI - 12</td>
</tr>
<tr>
<td><strong>Data Logging</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>0°C to 50°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>Ø19.0 x 222.0</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Flood and storm monitoring, wave studies and rapid sampling, stream and stage gaging, slug and pump test, aquifer characterization</td>
</tr>
</tbody>
</table>

**MEAS TruBlue Logger 275 Baro**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.05% FS TEB</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>8 - 16 psia</td>
</tr>
<tr>
<td><strong>Max. Over-range</strong></td>
<td>3X full scale</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>RS 485, SDI - 12</td>
</tr>
<tr>
<td><strong>Data Logging</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>0°C to 50°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>Ø19.0 x 222.0</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Barometric pressure monitoring</td>
</tr>
</tbody>
</table>

### DIGITAL LEVEL SENSORS

**MEAS KPSI 500, 501**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.05% FS TEB (KPSI 500)</td>
</tr>
<tr>
<td></td>
<td>±0.01 ft H₂O (KPSI 501)</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>10 - 230 ft (KPSI 500)</td>
</tr>
<tr>
<td></td>
<td>10 - 50 ft (KPSI 501)</td>
</tr>
<tr>
<td><strong>Max. Over-range</strong></td>
<td>2X FS</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>SDI - 12, RS-485</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-20°C to 60°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>Ø25.4 x 197.0</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Groundwater monitoring, surface water monitoring, oceanographic research</td>
</tr>
</tbody>
</table>

**MEAS KPSI 351, 353, 355**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.10% FS TEB (KPSI 351)</td>
</tr>
<tr>
<td></td>
<td>±0.05% FS TEB (KPSI 353)</td>
</tr>
<tr>
<td></td>
<td>±0.01 ft H₂O (KPSI 355)</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>10 - 230 ft (KPSI 351, 355)</td>
</tr>
<tr>
<td></td>
<td>10 - 50 ft (KPSI 351)</td>
</tr>
<tr>
<td><strong>Max. Over-range</strong></td>
<td>2X FS</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>SDI - 12, RS-485</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-20°C to 60°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>Ø19.0 x 243.0</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Groundwater monitoring, surface water monitoring, oceanographic research</td>
</tr>
</tbody>
</table>

### DIGITAL TEMPERATURE SENSORS

**MEAS KPSI 380**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.1°C</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>-20°C to 60°C</td>
</tr>
<tr>
<td><strong>Connection</strong></td>
<td>Open port nosepiece</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>SDI - 12, RS-485</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-20°C to 60°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>Ø19.0 x 127.0</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Groundwater monitoring, surface water monitoring, storm water, dam operations and stream gaging</td>
</tr>
</tbody>
</table>

---

Specifications subject to change.
Dimensions for reference purpose only.

te.com/sensors

Catalog SS-TS-TE300

03/2017

PAGE 79 WATER LEVEL SENSORS

Authorized Distributor
## ANALOG LEVEL SENSORS

### 1" Bore

#### MEAS KPSI 700, 710, 720

- **Accuracy:**
  - ±0.00%, ±0.50%, ±0.25% FSO
- **Range:**
  - Custom ranges from:
    - 2.3 - 700 ft H2O (Vented)
    - 10 - 700 ft H2O (Sealed)
    - 35 - 700 ft H2O (Absolute)
- **Max. Over-range:**
  - 2X FS
- **Output:**
  - 4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC
- **Operating Temp.:**
  - -20°C to 60°C
- **Dimensions (mm):**
  - Ø19.0 x 151.0
- **Typical Applications:**
  - Groundwater monitoring, surface water monitoring, oceanographic research, pump control, lift stations, landfill leachate
- **Agency Approvals:**
  - CE, WEEE, RoHS, UL and FM (Intrinsically safe)

#### MEAS KPSI 730, 735

- **Accuracy:**
  - ±0.00%, ±0.05% FSO
- **Range:**
  - Custom ranges from:
    - 5 - 700 ft H2O (Vented: KPSI 730)
    - 0 - 5 ft H2O to 0 - 700 ft H2O (Sealed, Absolute: KPSI 730)
    - 6 - 700 ft H2O (Vented KPSI 735)
- **Max. Over-range:**
  - 2X FS
- **Output:**
  - 4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC
- **Operating Temp.:**
  - -20°C to 60°C
- **Dimensions (mm):**
  - Ø25.4 x 86.6
- **Typical Applications:**
  - Groundwater monitoring, surface water monitoring, oceanographic research, pump control, lift stations, landfill leachate
- **Agency Approvals:**
  - CE, WEEE, RoHS, UL and FM (Intrinsically safe)

### 0.75" Bore

#### MEAS KPSI 320, 330, 335, 342

- **Accuracy:**
  - ±0.10%, ±0.05% FSO (KPSI 330, 335)
  - ±0.25% FSO (KPSI 320, 342)
  - ±0.25% FS TEB (KPSI 330, 342)
- **Range:**
  - Custom ranges from:
    - 2.3 - 700 ft H2O (Vented: KPSI 320, 330, 335)
    - 10 - 700 ft H2O (Sealed: KPSI 320, 330, 342)
    - 35 - 700 ft H2O (Absolute: KPSI 320, 330, 342)
- **Max. Over-range:**
  - 2X FS
- **Output:**
  - 4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC
- **Operating Temp.:**
  - -20°C to 60°C
- **Dimensions (mm):**
  - Ø19.0 x 151.0
- **Typical Applications:**
  - Groundwater monitoring, surface water monitoring, oceanographic research, pump control, lift stations, landfill leachate
- **Agency Approvals:**
  - CE, WEEE, RoHS, UL and FM (Intrinsically safe)

#### MEAS KPSI 300DS

- **Accuracy:**
  - ±0.50% FSO
- **Range:**
  - Custom ranges from:
    - 700 - 6,921 ft H2O
- **Max. Over-range:**
  - 2X FS
- **Output:**
  - 4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC
- **Operating Temp.:**
  - -20°C to 60°C
- **Dimensions (mm):**
  - Ø19.0 x 215.0
- **Typical Applications:**
  - Down hole, level control, pump control
- **Agency Approvals:**
  - CE, WEEE, RoHS
WATER LEVEL SENSORS

LEVEL SENSORS

OEM Level Sensors

<table>
<thead>
<tr>
<th>MEAS KPSI 705</th>
<th>MEAS KPSI 745, 750</th>
<th>MEAS LTA, LT Series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.25% FSO</td>
<td>±0.25% FSO</td>
</tr>
<tr>
<td><strong>Options</strong></td>
<td>Optional ETFE</td>
<td>Optional standoff (KPSI 745)</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>Custom ranges from 6 - 115 ft H₂O</td>
<td>Custom ranges from 0 - 115 ft H₂O</td>
</tr>
<tr>
<td><strong>Max. Over-range</strong></td>
<td>2X FS</td>
<td>2X FS</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC</td>
<td>4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-20°C to 60°C</td>
<td>-20°C to 60°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>Ø25.4 x 86.6</td>
<td>KPSI 745: Ø88.9 x 279.4 (With standoff) Ø88.9 x 253.3 (Without standoff) KPSI 750: Ø104.1 x 279.4</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Wastewater, lift stations, pump control, slurry tank liquid level, tank level</td>
<td>Wastewater, lift stations, pump control, slurry tank liquid level, tank level</td>
</tr>
<tr>
<td><strong>Agency Approvals</strong></td>
<td>CE, WEEE, RoHS, UL and FM (Intrinsically safe)</td>
<td>CE, WEEE, RoHS, UL and FM (Intrinsically safe)</td>
</tr>
</tbody>
</table>

| OEM Level Sensors |

<table>
<thead>
<tr>
<th>MEAS LTB, LTR Series</th>
<th>KPSI 27, 28</th>
<th>KPSI 30</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.25% FSO</td>
<td>±0.5%, ±0.25%</td>
</tr>
<tr>
<td><strong>Options</strong></td>
<td>Optional lightning protection</td>
<td>IP68 submersible option</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>0 - 11.5, 23.1, 34.6, 69.2, 115.4 ft H₂O</td>
<td>1 - 300 psi (Vented) 5 - 2000 psi (Sealed) 15 - 2000 psi (Absolute)</td>
</tr>
<tr>
<td><strong>Max. Over-range</strong></td>
<td>2X FS</td>
<td>2X FS</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>4 - 20 mA, 0 - 5 VDC, 0 - 10 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC</td>
<td>4-20 mA, 0-5 VDC, 0-2.5 VDC 0-4 VDC, 0-10 VDC, 1.5-7.5 VDC</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-20°C to 60°C</td>
<td>-20°C to 60°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>LTB: Ø104.1 x 206.5 LTR: 287.1 with overmold conduit connection, 253.5 with gland seal conduit connection</td>
<td>Ø25.4 x 86.6</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Pump control, tank liquid level, landfill leachate monitoring, construction bypass pumping, dewatering, lift station monitoring, submersible tank liquid level, liquid line pressure, slurry tank liquid level, wastewater</td>
<td>Line pressure monitoring, pump and lift stations, pump control, tank level monitoring, underwater research</td>
</tr>
<tr>
<td><strong>Agency Approvals</strong></td>
<td>CE, WEEE, RoHS, with optional UL, CUL, and FM (Intrinsically safe)</td>
<td>CE, WEEE, RoHS, UL and FM (Intrinsically safe)</td>
</tr>
</tbody>
</table>

NON-SUBMERSIBLE PRESSURE TRANSDUCERS

<table>
<thead>
<tr>
<th>MEAS KPSI 705</th>
<th>MEAS KPSI 745, 750</th>
<th>MEAS LTA, LT Series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.25% FSO</td>
<td>±0.25% FSO</td>
</tr>
<tr>
<td><strong>Options</strong></td>
<td>Optional lightning protection</td>
<td>Optional standoff (KPSI 745)</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>Custom ranges from 0 - 115 ft H₂O</td>
<td>Custom ranges from 0 - 300 psi</td>
</tr>
<tr>
<td><strong>Max. Over-range</strong></td>
<td>2X FS</td>
<td>2X FS</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC</td>
<td>4 - 20 mA</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-20°C to 60°C</td>
<td>-20°C to 60°C</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>Ø25.4 x 86.6</td>
<td>LTA: Ø25.4 x 93.0 LT: Ø25.4 x 170.5 (Dependent on fitting)</td>
</tr>
<tr>
<td><strong>Typical Applications</strong></td>
<td>Wastewater, lift stations, pump control, slurry tank liquid level, tank level</td>
<td>Pump control, tank liquid level, landfill leachate monitoring, construction bypass pumping, dewatering, lift station monitoring, submersible tank liquid level, liquid line pressure, slurry tank liquid level, wastewater</td>
</tr>
<tr>
<td><strong>Agency Approvals</strong></td>
<td>CE, WEEE, RoHS, UL and FM (Intrinsically safe)</td>
<td>CE, WEEE, RoHS, with optional UL, CUL, and FM (Intrinsically safe)</td>
</tr>
</tbody>
</table>
EVERY CONNECTION COUNTS

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Galway, Ireland
MEAS Temperature Mfg/R&D

Nuremberg, Germany
MEAS Temperature Mfg/R&D

Bensheim, Germany
Automotive Mfg/R&D

Speyer, Germany
Sensor Mfg/R&D

Dortmund, Germany
MEAS Position & Temperature Mfg/R&D

Bevaix, Switzerland
MEAS Pressure Mfg/R&D

Fontenay Tresigny, France
MEAS Temperature Mfg/R&D

Les Clayes-Sous-Bois, France
MEAS Force, Torque, Vibration & Pressure Mfg/R&D

Oreux, France
MEAS Force Mfg/R&D

Toulouse, France
MEAS Humidity & Fluid Property Mfg/R&D
GLOSSARY OF COMMON SENSOR TERMS

Calibration
Testing of a sensor to confirm output is within a specified range for particular values of the input.

Compensated Temperature Range
The temperature range in which the sensor meets the specifications for Thermal Zero Shift and Thermal Sensitivity Shift.

DeviceNet™
Device level network for industrial automation.

Excitation
The recommended voltage with which a standard sensor should be excited.

Full Scale Output (FSO)
Full Scale Output (FSO) is the span between the lowest range limit and the highest range limit of the sensor. Published values are approximate values and may vary with each sensor.

Hysteresis
Hysteresis is the difference in sensor output signal at a specific input when applied in the increasing and then decreasing sectors of a single cycle of short time duration at constant temperature. It is expressed as a percentage of FSO.

Natural Frequency
Natural Frequency is the frequency at which the sensor’s active sensing element goes into resonance and responds with maximum movement for a specific applied input.

Non-linearity
Non-linearity is the deviation of the sensor output signal from a theoretical straight line which has been fitted to the data points of an actual calibration. It expresses the maximum deviation of all data points in that calibration and is sometime expressed as a percentage of FSO, usually as a ±% error band, or % of reading.

Non-Repeatability
Non-repeatability is the deviation in sensor output signal levels when a specific input is applied in consecutive cycles of short time duration under the same conditions, such as temperature and direction of increasing or decreasing input. It can be determined by performing two consecutive short time duration calibration cycles and can be expressed as ±%FSO.

Operating Temperature
The temperature range within which a sensor will meet all of its stated specifications while powered and in operation.

Over-range Limit
The over-range limit is the maximum input to which the sensor can be exposed without damage.

Plug and Play
Sensors designed for end-users who expect sensors to meet calibration performance standards once power and signal cables are properly connected to instrumentation.

Root Mean Square
The square root of the arithmetical mean of a set of squared instantaneous values.

Sealing
Sealing is the assembly method by which the sensor is protected from moisture in the surrounding environment. The most desirable sealing method is hermetically seal. This can be achieved by joining the individual piece parts together by soldering, welding, brazing, glassing, or other commonly accepted manufacturing processes. Another common sealing method is epoxy seal. It is achieved by joining the piece parts by applying adhesive or potting compound to mitigate the incursion of moisture into the sensor assembly.

Sensitivity
The sensor’s change in output per the unit change in the physical parameter being measured. The change may be linear or non-linear.

Thermal Sensitivity Shift (TSS)
The change in sensitivity of the sensor as a function of temperature. It is usually expressed as a percent reading change in sensitivity for a specified change in temperature such as ±0.01%/°C and is generally linear with moderate temperature changes. The Thermal Sensitivity Shift can be eliminated or minimized by using sensitivity numbers determined at or near the temperature of use.

Thermal Zero Shift (TZS)
The change in the Zero Offset as a function of temperature is the Thermal Zero Shift. It may be expressed as either a %FSO for a specific temperature change such as ±0.01%FSO/°C or in voltage units such as ±0.2 mV/°C and it is not a linear function.

Total Error Band (TEB)
Typically expressed as a percentage, the TEB is the combination of possible errors for a sensing device within its measurement range and temperature of operation.
**GLOSSARY OF COMMON SENSOR ABBREVIATIONS**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS</td>
<td>American Bureau of Shipping</td>
</tr>
<tr>
<td>AC</td>
<td>Alternating Current</td>
</tr>
<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
</tr>
<tr>
<td>ASIC</td>
<td>Application-Specific Integrated Circuit</td>
</tr>
<tr>
<td>ATEX</td>
<td>Appareils destinés à être utilisés en Atmosphères Explosibles</td>
</tr>
<tr>
<td>BOP</td>
<td>Blow Out Prevention</td>
</tr>
<tr>
<td>CAN</td>
<td>Controller Area Network</td>
</tr>
<tr>
<td>CE</td>
<td>Communauté Européenne</td>
</tr>
<tr>
<td>CENELEC</td>
<td>European Committee for Electrotechnical Standardization</td>
</tr>
<tr>
<td>CSA</td>
<td>Canadian Standards Association</td>
</tr>
<tr>
<td>CT</td>
<td>Computed Tomography</td>
</tr>
<tr>
<td>cUL</td>
<td>Tested to Canadian Standards by Underwriters' Laboratories</td>
</tr>
<tr>
<td>DC</td>
<td>Direct Current</td>
</tr>
<tr>
<td>DCS</td>
<td>Distributed Control System</td>
</tr>
<tr>
<td>DEF</td>
<td>Diesel Exhaust Fluid</td>
</tr>
<tr>
<td>DTC</td>
<td>Digital Temperature Compensation</td>
</tr>
<tr>
<td>ECU</td>
<td>Engine Control Unit</td>
</tr>
<tr>
<td>EGR</td>
<td>Exhaust Gas Recirculation</td>
</tr>
<tr>
<td>EMC</td>
<td>Electromagnetic Compatibility</td>
</tr>
<tr>
<td>EMI</td>
<td>Electromagnetic Interference</td>
</tr>
<tr>
<td>ESA</td>
<td>European Space Agency</td>
</tr>
<tr>
<td>FLS</td>
<td>Field Loadable Software</td>
</tr>
<tr>
<td>FM</td>
<td>Factory Mutual</td>
</tr>
<tr>
<td>FPGA</td>
<td>Field Programmable Gate Array</td>
</tr>
<tr>
<td>FS</td>
<td>Full Scale</td>
</tr>
<tr>
<td>FSO</td>
<td>Full Scale Output</td>
</tr>
<tr>
<td>FT LBS</td>
<td>Foot Pounds</td>
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<td>Global Positioning System</td>
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<td>Health Usage and Monitoring System</td>
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<tr>
<td>HVACR</td>
<td>Heating, Ventilation, Air Conditioning, and Refrigeration</td>
</tr>
<tr>
<td>HVD</td>
<td>High-Voltage Differential</td>
</tr>
<tr>
<td>Hz</td>
<td>Hertz</td>
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<tr>
<td>IC</td>
<td>Inter-Integrated Circuit</td>
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<tr>
<td>IEC</td>
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<tr>
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<td>Institute of Electrical and Electronics Engineers</td>
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<tr>
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<td>Ingress Protection</td>
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<tr>
<td>ISO</td>
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<tr>
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<td>International Traffic in Arms Regulations</td>
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<tr>
<td>kHz</td>
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<tr>
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<td>LIN</td>
<td>Local Interconnect Network</td>
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<tr>
<td>LVD</td>
<td>Low Voltage Differential</td>
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<tr>
<td>LVDT</td>
<td>Linear Variable Displacement Transducers</td>
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<td>mA</td>
<td>Milliamp</td>
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<td>Mass Air Flow</td>
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<tr>
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<tr>
<td>NTC</td>
<td>Negative Temperature Coefficient</td>
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<tr>
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<tr>
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<td>Pulse Density Modulation</td>
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<tr>
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<td>Piezoelectric</td>
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<td>Polyphenylene Sulfide</td>
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<tr>
<td>PSI</td>
<td>Pounds Per Square Inch</td>
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<tr>
<td>PSA</td>
<td>Pounds Per Square Inch-Absolute Reference</td>
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<tr>
<td>PSID</td>
<td>Pounds Per Square Inch-Differential Reference</td>
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<td>PSIG</td>
<td>Pounds Per Square Inch-Gage Reference</td>
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<td>PSIS</td>
<td>Pounds Per Square Inch-Sealed Gage Reference</td>
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<td>Polytetrafluoroethylene</td>
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<tr>
<td>PUDF</td>
<td>Public Use Data File</td>
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<td>Pulse Width Modulation</td>
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<td>Research and Development</td>
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<td>Research, Development, Test &amp; Evaluation</td>
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<td>Radio Frequency Interference</td>
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<tr>
<td>RH</td>
<td>Relative Humidity</td>
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<td>Root Mean Square</td>
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<td>Revolutions Per Minute</td>
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<td>Resistance Temperature Detector</td>
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<td>Rotary Variable Differential Transformer</td>
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<td>Society of Automotive Engineering</td>
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<td>Serial Data Interface at 1200 Baud</td>
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<td>Surface Mount Device</td>
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<td>SpO₂</td>
<td>Pulse Oximeter Oxygen Saturation</td>
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<tr>
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<td>Single Pole, Double Throw</td>
</tr>
<tr>
<td>SPI</td>
<td>Serial Peripheral Interface</td>
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<tr>
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<td>Test &amp; Measurement</td>
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<td>Thin Film Gauges No Leads</td>
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<td>THSA</td>
<td>Trimble Horizontal Stabilizer Actuators</td>
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<td>Tire Pressure Monitoring System</td>
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<tr>
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<td>Temperature System Sensor</td>
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<tr>
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<td>Microcontroller</td>
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<td>Underwriters Laboratories</td>
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<td>Universal Serial Bus</td>
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<td>Variable Air Volume</td>
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<td>Volts Direct Current</td>
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<td>WEEE</td>
<td>Waste Electrical and Electronic Equipment</td>
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