





WHAT CAN WE **SENSE** FOR YOU?

Measurement Specialties (MEAS) designs and manufactures sensors that measure pressure/force, position, flow, level, vibration, inertia, temperature, humidity, torque, water quality and fluid properties. Used as embedded devices by original equipment manufacturers (OEMs) or as stand alone sensors for test and measurement, our products are critical for feedback and control to enhance product functionality, efficiency and safety. We are the heart of many everyday products and provide a vital link to the physical world.

Our sensors often play mission critical roles within the end device in which they are embedded. Accordingly, our customers rely on MEAS™ sensors to operate accurately, every time. At MEAS, we place the highest emphasis on quality in terms of design standards, process control and customer feedback/integration and back up our products with an industry leading warranty. MEAS maintains the highest quality certifications, including:

Quality Statements/Certifications:

- ◇ 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

MEAS is an applications company and understands that embedded often means custom. Our portfolio includes technologies capable of measuring most physical characteristics and allows us to design the right sensor for the right application, including multi-parameter sensors. Physical property, electrical input/output and packaged configuration are all considerations when developing products that meet our customers' needs.

We have expanded our technology portfolio and geographic reach, in part through the acquisition of strategically complementary companies. Our operations in the US, Europe and China provide resources close to our customers. This global footprint allows us to offer the lowest cost of ownership to OEMs.

Our business is understanding your sensing needs and developing solutions that meet your performance and cost objectives. At MEAS, we are Sensing Your World.

Industries Served



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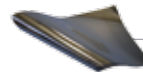
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Measurement Specialties offers competitive programs for high volume automotive sensors using our TS 16949 certified facilities in France, Germany and China. We understand the rigors and demands of on- and off-road vehicles used in the trucking, commercial vehicle, construction, agriculture, forestry and mining markets. Our sensors are manufactured to exacting specifications to tolerate the high temperature, vibration, shock, pressure and long life requirements for these working vehicles.

Sensors for Engine and Vehicle applications are RoHS compliant and are matched with applications to ensure appropriate ingress protection is designed into every product. Signal outputs are provided with protection against EMI/RFI interference and cable interfacing specified to reduce risk of failure due to fatigue or accident. Selection of all materials for construction and fittings is made carefully to minimize installation and routine inspection costs.



Temperature Monitoring

Stand-alone or combined with other sensors, Measurement Specialties offers the largest range of temperature probes based on NTC, RTD Platinum or Nickel and Thermopile.



Auto Braking System

Pressure sensors are used in Electronic Stability Control systems. They detect and measure applied brake pedal pressure in order to distinguish between normal and emergency braking.



Occupant Safety

Seat, handbrake & footbrake position safety interlock switches assist operators in extreme terrains to operate safely and efficiently.



Vehicle Control

Rugged, accurate position sensors for boom position monitoring enhance operator efficiency while minimizing downtime.



Electronic Braking

Tilt sensors measure inclination of vehicle and automatically apply parking brake.



Engine Control

Humidity and temperature sensors are located at the air intake of internal combustion engines. The sensors are key components in systems designed to improve fuel efficiency and reduce emissions.



Off-Road Mobile Hydraulics Control

Linear position and pressure sensors used in hydraulic pumps, valves and actuators provide closed loop control and monitoring in electro-hydraulic systems for such applications as excavators, vehicle lifts and cranes.



Oil and Fuel Levels

Stand alone or combined with temperature and/or fluid quality sensors, Measurement Specialties' level sensors are designed for off-highway, gear box, transmission and tank applications.



Fogging Prevention and Cabin Energy Control

Humidity and temperature sensors are used to prevent windshield fogging, critical for safety, cabin comfort and energy management.



Fluid Quality Monitoring

Fluid property sensors directly monitor the key characteristics of oils, fuels and urea. They detect harmful contaminants and fluid condition in order to improve vehicle up-time and performance. Urea concentration and quality monitoring support proper operation of urea SCR systems to insure NOx emissions compliance.



SCR

SCR sensors measure level, quality, temperature, and as, required provide heating of DEF tanks to help emission control.

Measurement Specialties has proven capabilities supplying to the OEM medical marketplace that include applications for life-sustaining, implantable medical devices. We are ISO 13485 certified and FDA registered for some product lines. We work closely with our customers to pioneer the use of sensor technology in medical equipment, devices and probes. This technology is used for the diagnosis or treatment of many pathologies including heart disease, high blood pressure, respiratory illness, renal failure and sleep apnea.



Pulse Oximeter

Photo Optic sensors provide continuous, non-invasive measurements of saturated oxygen levels in the blood.



Cardiovascular Devices

Temperature, pressure and force sensors are used for invasive cardiac monitoring, cardiac rhythm management, angioplasty and ventricular assist devices (VAD).



Infusion and Syringe Pumps

Pressure, force, ultrasonic bubble and position sensors are used to detect occlusions, bubbles, empty bag and flow rates.



Patient Monitoring

FDA-registered reusable and disposable temperature and pulse oximetry (SpO₂) probes continuously monitor patient core body temperature, pulse and blood oxygen saturation. Pressure sensors provide continuous, intravenous blood pressure measurement while MEAS piezo sensing technology is used to measure breathing patterns and patient movement.



Respiratory Devices

Temperature, humidity, pressure, position and flow sensors are used to provide precise feedback for inspired, expired and tank/wall-supplied gases in respiratory devices including sleep therapy (CPAP), oxygen concentrators and critical care and anesthesia ventilators. Our sensors improve patient comfort and device accuracy and reliability.

environmental monitoring

Measurement Specialties supports customers in the Environmental Monitoring markets; including government agencies, research institutions, academia, engineers and consultants, contractors, integrators, distributors and OEMs. Highly accurate and precise, rugged and reliable instruments meet the most demanding requirements for monitoring surface waters, groundwater, estuary and ocean waters and for managing drinking water, wastewater, storm water, landfill leachate, agricultural and hydropower systems. Our broad technology portfolio and easy-to-use products make us the supplier of choice for professionals responsible for monitoring natural waters or managing water processes.



Water Quality Data Collection

Multiparameter water-quality multiprobes measure your choice of temperature, dissolved oxygen, conductivity, pH, turbidity and a dozen other parameters manually or unattended.



Data Telemetry

Telemetry systems deliver real time water quality and/or water level data to your PC or smart phone.



Water Level Monitoring

Level data loggers and digital submersible level transducers with SDI-12 output provide highly accurate and precise water level measurements for water resource management.



Water Level Transducers

Analog submersible level transducers are extensively used for water management applications, such as pump control, lift station operation, tank level monitoring, remediation and weir and flume measurement.

Measurement Specialties supports OEM customers in many commercial industries, including power generation, utilities, security, telecommunications, traffic, oil & gas, mining and construction. Our engineered sensing solutions meet the unique requirements of a wide variety of applications relating to energy, process control, automation, altitude and depth measurements and beverage flow control markets. Our broad technology portfolio and willingness to customize make us the sensor supplier of choice for industrial OEMs. From pool and spa to fuel pumps, we understand the need for sensors designed to meet challenging OEM specifications.

We provide sensor customization services ranging from special calibrations and connectors to custom label designs. Our modular sensor construction encourages a "mix and match" approach to construction that uses design engineering time efficiently. The results are products that meet user application needs delivered in a timely manner.

Our ISO certifications places the emphasis upon customers, understanding their needs and requirements and performing to their satisfaction. Further, they ensure we meet each product's statutory and regulatory requirements.



Assembly Lines

Gage heads with ultra-precision capabilities and user-adjustable pretravel and overtravel settings ensure reliable assembly line performance.



Wind Farm

Inclinometers are used to level wind turbines during construction and operation. Vibration sensors monitor the gearbox and provide early warning for maintenance.



Traffic/Smart Highway

Piezoelectric axle detectors are used to collect data on highways, as well as providing the timing mechanism for speed and red light cameras.



Industrial Paint Sprayer

Custom designed pressure sensor is used to monitor and precisely control the pressure in the paint canister to prevent splatter due to pressure spikes.



Large Electric Motors / Generators

Temperature sensors for continuous sensing and thermal monitoring. Sensors for use in stator and end windings, bearings and gear boxes.



Gasoline Pump

Rugged electromagnetic rotary encoders provide tamper proof shaft rotation measurements which are converted into gallons or liters of fuel dispensed.

consumer goods/ appliance

Sensors are increasingly being used by home consumers to improve functionality and energy management. Measurement Specialties has partnered with many major manufacturers to break new ground in the creation of “smart” applications that can respond to human touch, sense vibration and adjust automatically to different loads in order to improve efficiency of operation.



Washer/Dryer

Low cost/low power vibration sensor measures load imbalance to avoid “walking”. Humidity or thermopile sensors are used in dryers to automatically shut off when clothes are dry, extending the life of clothes and improving efficiency.



Cycle Computers

Altimeters based on barometric pressure sensors enable measurement of route profiles and contribute to energy monitoring and fitness estimation.



Navigation

Height measurement based on a miniature barometric pressure sensor enables route profile calculation and logging for outdoor devices. Differences in height measurements are used in automotive after-market GPS.



Wellness Body Monitoring

Low-powered miniature digital sensors allow a range of vital body wellness indicators to be calculated, such as energy consumption, sleep quality and activity monitoring.



Sport Watches

Water depth for diving is accurately measured by gel-filled digital pressure sensors. Altimeter watches use barometric pressure variation for height measurement and pressure trends for weather prediction.



Printers

The drying process of ink jet printers is improved by monitoring air and paper humidity content. Measuring air and toner humidity guarantees print quality in laser printers/copiers.



Microwave Oven

Measurement Specialties' infrared temperature sensors monitor heating functions by directly sensing food temperature.



Refrigerator

Humidity control inside refrigerator keeps vegetables fresh while humidity monitoring outside refrigerator improves efficiency by avoiding costly defrost cycles.

Flight Testing

Aircraft manufacturers are constantly pushing the flight envelope of their designs to the new frontier. Unexpected test parameters become the norm rather than the exception, and standard off-the-shelf solutions are usually inadequate. These mission-critical test applications often require the best in DC accelerometers, load cells and miniature pressure transducers, especially when it comes to thermal stability. Measurement Specialties has partnered with many major aerospace suppliers to come up with customized sensing solutions.



Flutter Testing

Silicon MEMS, Plug and Play accelerometers for high accuracy over temperature.

Wind Tunnel Aerodynamics

Aerodynamic testing of aircraft, automobiles and civil engineering structures requires high numbers of pressure measurements, often within confined spaces inside wind tunnel models. The ESP line of miniature pressure scanners combines 16, 32 or 64 pressure sensors with a calibration valve within the industry's smallest package. Individual temperature sensors provide active digital temperature compensation to virtually eliminate thermal sensitivity.



Wind Tunnel

Miniature pressure sensors and pressure scanners for airflow measurements.

Turbo Machinery

Gas turbine engine and component testing requires high numbers of pressure and temperature measurements. The testing environment is often demanding with high vibration, acoustic noise and presence of harsh fluids. The NetScanner instrumentation brand provides a rugged, networkable system solution of multi-channel instruments to measure gas pressure, liquid pressure, temperature and barometric pressure.



Turbo Machinery

Pressure, vibration and temperature instrumentations for engine test cell measurements.

Process Control & Factory Automation

Process control is used extensively to facilitate mass implementation of continuous processes in food production, oil refining, paper manufacturing, chemicals, power plants and many other industries. Process control enables automation on the factory floor to maximize efficiency and improve quality with the help of a variety of sensors, such as string potentiometers, pressure transducers, accelerometers, and temperature sensors.



Process Control & Factory Automation

Position, pressure, vibration, and temperature sensors for monitoring factory equipments.

Automotive Safety Testing

A five-star-rated vehicle can only be designed when the test engineers have accurate crash test data. Measurement Specialties is the largest sensor supplier for auto safety testing, supplying high quality accelerometers, string pots, miniature pressure sensors and other state-of-the-art technologies. We lead the way in product innovations and customer satisfaction.

Automotive Design & Test

From engine and transmission development to vehicle NVH testing, sensors are an integral part of the research and development cycle. Measurement Specialties provides the automotive industry with pressure transducers, load cells, accelerometers, gyros, LVDT's, torque meters, temperature sensors and fluid property analyzers for a wide variety of applications. The broad spectrum of sensing technologies available at our disposal has served our customers especially well in a cost-conscious economic environment.

Motorsports

In auto racing, sensors provide real-time, critical feedback about vehicle dynamics to the engineering team that can often affect the outcome of a race. The high vibration and temperature test environments in an engine or drive train have always been challenging for typical sensing devices. Measurement Specialties has long been a favored supplier to Formula One teams for acceleration, pressure, force, position and other dynamic sensors. We offer the most advanced lines of accelerometers, gyros and pressure transducers and back them up with impeccable reliability records and customer service.



Pedestrian Safety Testing

Sensors with precise damping characteristic provide reliable impact measurements.



Crash Testing

SAE J2570 and ISO-6487 compliant sensors for anthropomorphic instrumentation.



Component Design/ Road Simulation

Rugged IEPE Accelerometers for suspension testing. Standard off-the-shelf accelerometers, steering wheel torque sensors and brake/pedal force sensors.



Racing Sensors

High accuracy silicon MEMS pressure sensors and triaxial accelerometers for track mapping.

Long development cycles and high qualification costs require aerospace firms to identify stable, reliable, cost-effective partners. Measurement Specialties has AS9100 certified facilities in the USA, France and China which support Tier 1, 2 and 3 providers with a wide variety of critical sensor solutions for aerospace applications.



Commercial / Military Aircraft Engine Thrust Reverser

MEAS rugged LVDT's provide feedback to the cockpit to ensure thrust reversers have properly deployed.



Commercial / Military Aircraft Load Path Monitoring

Force sensors for load monitoring on control surfaces and secondary load path. Torque transducers for brake system monitoring.



Commercial / Military Aircraft Fuel Tank Level/Flow

MEAS custom glass thermistor/heater assemblies are an industry standard in fuel systems used to monitor and control fuel level, position and flow.



Commercial / Military Aircraft Brake Pedal Transmitters

MEAS custom potentiometers are used for feedback in brake pedal transmitters.



Commercial / Military Aircraft Flight Controls / Instrumentation

MEAS LVDT's and RVDT's are used in cockpit controls and actuation systems. Flight recorders detect loss of cabin pressure. Pitot tubes measure air speed. Variometers indicate rate of ascent/descent. Force sensors convey information for flight data recording and autopilot disconnection.



Commercial Aircraft Cockpit Controls

MEAS custom potentiometers are used for position feedback in a Flap Position Indicator.



Commercial Aircraft Flight Controls

MEAS custom potentiometers are used in yaw and pitch flight control actuators for position feedback.



**Military Aircraft
Cargo Handling Systems**

MEAS custom hall effect position sensors are used for position feedback on cargo handling systems.



**Space/Satellite
Satellite**

MEAS is the only sensor company who maintains both NASA and ESA qualifications. We developed the interchangeable glass encapsulated thermistor which today is a standard for aerospace high reliability applications. MEAS LVDT's are used for mirror and antenna positioning.



**Commercial / Military Helicopter
Gearbox Monitoring**

MEAS high frequency accelerometers are used for critical Health and Usage Monitoring Systems (HUMS) for helicopters.



**Space/Satellite
Space Propulsion**

MEAS custom potentiometers are used in launch engine fuel valve control applications.



**Commercial Helicopters
Cockpit Instruments**

MEAS custom motorized potentiometers are used in cockpit engine instruments for position feedback.



**Missile
Fin Actuation**

MEAS custom potentiometer/hall effect position sensors provide feedback of fin movement during flight to guidance system.



**Military Helicopter
Position Feedback**

MEAS custom potentiometers are used in yaw and roll flight control actuators for position feedback.



**UAV/Drones
Position Feedback**

MEAS custom potentiometers are used in yaw, roll and pitch flight control actuators for position feedback.

hvacr / building equipment

Our indoor environments are becoming more comfortable and efficient to maintain due to the growth of innovative technologies and supportive sensor networks that regulate heating, ventilation and air conditioning. Sometimes this just entails the control of air velocity to improve convective cooling but more often it requires a complete system to add or remove heat from buildings, control heat and moisture within spaces as well ensure good air quality. While temperature, humidity and pressure sensors are the most common sensors found in HVACR and building equipment applications, one also sees increasing use of sensors for vibration, liquid level, fluid property, and water quality monitoring.



Ice Makers

Water quality, temperature sensors and bin level sensors for control and regulation of ice-making systems.



Hot Water Boilers

Low cost temperature probes with fast response time and rugged brass housings provide accurate temperature measurements for industrial grade boiler systems.



Fire Systems

Sensors are integrated with automated control systems to monitor building temperature and to maintain proper water pressure in the fire suppression system.



Cooling Tower

Measurement Specialties' vibration sensors monitor condition of fan and gearbox to prevent catastrophic failures.



Transport and Case Refrigeration Systems

Temperature sensors are used to measure air supply to control compartments while immersion probes measure refrigerant temperature. Rugged sensors designed specifically for measuring refrigerant pressure are used in conjunction with variable speed compressors to improve system efficiency.



Chillers / Heat-Exchangers

Differential pressure measurements across the chiller provide an indication of flow rate. The higher the flow rate, the higher the differential pressure.

LVDTs provide valve position feedback in variable capacity refrigerant compressor controls.

combination

Measurement Specialties is a global innovator in the design and manufacture of two or more sensing technologies into one compact package. Our combination sensors provide OEMs and end-users with significant cost savings that start with the initial purchase and flow through their respective systems, as they realize economies of time, reduced space requirements and simpler assembly processes.

Combination



Trican (P+T+Rh)

Multi-parameter modules measure pressure, temperature and relative humidity for engine management applications.



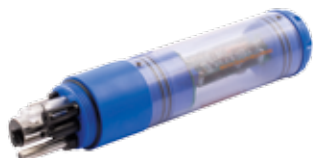
Force and Torque

The multi-axial FN7325 measures force along three axes as well as the corresponding torque.



Pressure and Temperature

Combined pressure and temperature sensing saves weight, space and reduces plumbing and electrical connections in various auto racing, aerospace and industrial applications.



Water Quality Multiprobes

Water quality probes can utilize a wide range of measurement technologies for spot checking/profiling or for deployment in real time web-to-water monitoring.



Fluid Properties Sensor

Novel fluid properties sensor that directly and simultaneously measures the viscosity, density, dielectric constant and temperature of fluids for advanced fluid quality monitoring applications.



Contamination SCR Sensor

The SCR sensor provides a CAN output combination of temperature, level and quality of urea (AdBlue® / DEF) measurement in tank. The sensor also includes various heater designs to connect to coolant loop.

pressure

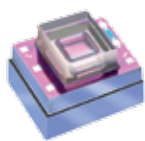
solutions by sensor type

Measurement Specialties leads the industry with a wide array of standard and custom pressure products ranging from board level components to fully amplified and packaged transducers, based on piezoresistive microelectromechanical (MEMS) and silicon strain gauge (Microfused™) technology. Our products measure pressure ranging from inches of water (<5 mbar) to 100K psi (7K bar), making us ideally suited for medical, HVACR, off-road/heavy equipment and general industrial applications. We manufacture 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. Customized packaging and electronics make MEAS the supplier of choice for OEMs.



Silicon Die and Microstructures

For OEM Applications



MS72xx

| | |
|------------------------|---|
| Unique Features | <ul style="list-style-type: none"> –Piezoresistive pressure die –Top cavity - hermetic sensor –For harsh environment |
| Linearity | ±0.05% Typical FSO (MS7212A) |
| Output / Span | 150 mV at 5 V |
| Type | Absolute |
| Pressure Range | 0 - 1, 7, 12, 18, 28 bar / 0 - 14.5, 102, 174, 261, 406 psi |
| Overpressure | FS range dependent 5 bar / 73 psi (MS7201-A2) 170 bar / 2466 psi (MS7228-A) |
| Operating Temp | -40°C to 150°C |
| Dimensions (mm) | 1.35 x 1.79 (MS7201-A2) 1.95 x 1.63 (MS7212-A) |
| Typical Apps | Braking systems, transmission systems, engine controls |



MS7310

| | |
|---|---|
| <ul style="list-style-type: none"> –Piezoresistive pressure die –Low pressure sensor –High sensitivity | <ul style="list-style-type: none"> –Piezoresistive pressure die –Silicon-pyrex construction –Open bridge |
| ±0.5% FSO | ±0.1% FSO |
| 110 mV at 5 V | 110 mV at 1.5 mA |
| Differential | Differential, absolute |
| 0 - 100 mbar / 0 - 1.45 psi | 0 - 0.14, 0.35, 0.69, 1, 2, 3, 17, 34 bar / 0 - 2, 5, 10, 15, 30, 50, 250, 500 psi |
| 6 bar / 87 psi (front side) | 5X |
| -40°C to 125°C | -40°C to 125°C |
| 2.45 x 2.45 | 2.9 x 3.9 |
| Heating ventilation and air conditioning, medical, industrial controls | Process control, automation, refrigeration |



P6393

| | |
|---|---|
| <ul style="list-style-type: none"> –Piezoresistive pressure die –Silicon-pyrex construction –Open bridge | <ul style="list-style-type: none"> –Piezoresistive pressure die for high pressure applications –Open bridge |
| ±0.1% FSO | ±0.25% FSO |
| 110 mV at 1.5 mA | 125 mV at 1.5 mA |
| Differential, absolute | Absolute |
| 0 - 0.14, 0.35, 0.69, 1, 2, 3, 17, 34 bar / 0 - 2, 5, 10, 15, 30, 50, 250, 500 psi | 0 - 69, 207, 345, 689 bar / 0 - 1000, 3000, 5000, 10000 psi |
| 5X | 3X |
| -40°C to 125°C | -40°C to 125°C |
| 2.9 x 3.9 | 1.70 x 1.70 |
| Process control, automation, refrigeration | Can be packaged in an isolated oil-filled transmitter for harsh media |



P7405

| | |
|---|---|
| <ul style="list-style-type: none"> –Piezoresistive pressure die –Low pressure sensor –High sensitivity | <ul style="list-style-type: none"> –Piezoresistive pressure die –Silicon-pyrex construction –Open bridge |
| ±0.5% FSO | ±0.1% FSO |
| 110 mV at 5 V | 110 mV at 1.5 mA |
| Differential | Differential, absolute |
| 0 - 100 mbar / 0 - 1.45 psi | 0 - 0.14, 0.35, 0.69, 1, 2, 3, 17, 34 bar / 0 - 2, 5, 10, 15, 30, 50, 250, 500 psi |
| 6 bar / 87 psi (front side) | 5X |
| -40°C to 125°C | -40°C to 125°C |
| 2.45 x 2.45 | 2.9 x 3.9 |
| Heating ventilation and air conditioning, medical, industrial controls | Process control, automation, refrigeration |

Disposable Medical Products

mV Outputs



1620, 1630

| | |
|------------------------|---|
| Package | Invasive blood pressure monitoring |
| Type | Gage |
| Pressure Range | -30 to 300 mmHg / -1.2 to 11.8 inHg |
| Output / Span | 5 µV/V/mmHg / 0.04 µV/V/inHg |
| Unique Features | <ul style="list-style-type: none"> –Low cost, disposable design –Supplied in tape and reel –Compliant to AAMI spec |
| Accuracy | 1.0% FSO |
| Operating Temp | 10°C to 40°C |
| Dimensions (mm) | 1620: 8.13 x 11.43 x 4.20 1630: 5.08 x 12.7 x 3.94 |
| Typical Apps | Disposable blood pressure, surgical procedures, ICU, kidney dialysis machines, medical instrumentation |



Fully Assembled 1620
(Customized per customer specifications)

| | |
|---|--|
| Invasive blood pressure monitoring | Invasive blood pressure monitoring |
| Gage | Gage |
| -30 to 300 mmHg / -1.2 to 11.8 inHg | -30 to 300 mmHg / -1.2 to 11.8 inHg |
| 5 µV/V/mmHg / 0.04 µV/V/inHg | 5 µV/V/mmHg / 0.04 µV/V/inHg |
| <ul style="list-style-type: none"> –Low cost, disposable design –Compliant to AAMI spec –ISO13485 Certified –Custom designs available | <ul style="list-style-type: none"> –Low cost, disposable design –Compliant to AAMI spec –ISO13485 Certified –Custom designs available |
| 1.0% FSO | 1.0% FSO |
| 10°C to 40°C | 10°C to 40°C |
| 42.8 x 30.3 x 19.0 | 42.8 x 30.3 x 19.0 |
| Disposable blood pressure, surgical procedures, ICU, kidney dialysis machines, medical instrumentation | 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. |

Board Mounted Pressure Sensors

mV Output



1210, 1220, 1230, 1240

| | |
|------------------------|---|
| Package | 8 pin DIL |
| Type | Gage, absolute, differential |
| Pressure Range | 0 - 5 & 10" H ₂ O 0 - 0.07, 0.14, 0.35, 1, 2, 3, 7 bar / 0 - 1, 2, 5, 15, 30, 50, 100 psi |
| Output / Span | 50 mV and 100 mV typical |
| Unique Features | <ul style="list-style-type: none"> –Temperature compensated –High performance UltraStable™ die (1230, 1240) –Current excitation(1210, 1230) –Voltage excitation(1220, 1240) |
| Accuracy | ±0.1% Non-linearity |
| Operating Temp | -40°C to 125°C |
| Dimensions (mm) | 15.2 x 19.2 |
| Typical Apps | Medical instruments, air flow measurement, HVACR, process control, factory automation, leak detection |



13, 23, 33, 43, 17, 27, 37, 47

| | |
|------------------------|---|
| Package | TO-8 |
| Type | Gage, absolute, differential |
| Pressure Range | 0 - 0.07, 0.14, 0.35, 0.69, 1, 2, 3, 7, 17 bar / 0 - 1, 2, 5, 10, 15, 30, 50, 100, 250 psi |
| Output / Span | 100 mV typical |
| Unique Features | <ul style="list-style-type: none"> –Temperature compensated –High performance UltraStable™ die (17, 27, 37, 47) –Can gel fill for humid conditions |
| Accuracy | ±0.1% Non-linearity |
| Operating Temp | -40°C to 125°C |
| Dimensions (mm) | Ø 11.4, height model dependent |
| Typical Apps | Medical instruments, air flow measurement, HVACR, process control, factory automation, leak detection |



MS52xx, MS54xx

| | |
|------------------------|--|
| Package | Surface mount |
| Type | Gage, absolute |
| Pressure Range | 0 - 1, 12 bar / 0 - 15, 174 psi (MS52xx) 0 - 1, 7, 12 bar / 0 - 15, 102, 174 psi (MS54xx) |
| Output / Span | 150 mV, 240 mV |
| Unique Features | <ul style="list-style-type: none"> –Small size (MS54xx) –High linearity or high sensitivity options –Plastic tube or metal ring options –With gel to protect against moisture –High endurance (Option HM) |
| Accuracy | ±0.05% or ±0.2% Non-linearity |
| Operating Temp | -40°C to 125°C |
| Dimensions (mm) | 7.6 x 7.6, height model dependent (MS52xx) 6.4 x 6.2 (MS54xx) |
| Typical Apps | Absolute pressure sensor systems, engine controls, high resolution altimeters, variometers, waterproof watches, divers' computers, barometers, tire pressure monitoring systems (TPMS), medical instrumentation, pneumatic controls |



MS1451, MS1471

| | |
|------------------------|---|
| Package | Surface mount |
| Type | Gage, absolute |
| Pressure Range | 0 - 0.35, 1, 2, 3, 7, 17, 34 bar / 0 - 5, 15, 30, 50, 100, 250, 500 psi |
| Output / Span | 60 mV typical |
| Unique Features | <ul style="list-style-type: none"> –Low cost –Coarse calibrated at room temp (MS1471) –With gel to protect against moisture –Tube or hole |
| Accuracy | ±0.25% Non-linearity |
| Operating Temp | -40°C to 125°C |
| Dimensions (mm) | 7.6 x 7.6, height model dependent |
| Typical Apps | Altitude measurement, barometric pressure, medical instrumentation, consumer appliances, tire pressure |



MS4425, MS4426

| | |
|------------------------|---|
| Package | 6 pin DIL |
| Type | Gage, absolute, differential |
| Pressure Range | 0 - 0.07, 0.35, 1, 2, 3, 7, 10, 21 bar / 0 - 1, 5, 15, 30, 50, 100, 150, 300 psi |
| Output / Span | 60 mV, 90 mV, and 100 mV typical |
| Unique Features | <ul style="list-style-type: none"> –Temperature compensated –High performance UltraStable™ die –Voltage excitation |
| Accuracy | ±0.1% Non-linearity |
| Operating Temp | -25°C to 85°C |
| Dimensions (mm) | 15.2 x 13.7 |
| Typical Apps | Drop-in for 6 pin industrial sensor for PCB mounted medical, HVACR |

Amplified Output



MS4515, MS4525

| | |
|------------------------|--|
| Package | 8 pin DIL |
| Type | Gage, differential (MS4515) Gage, absolute, differential, compound (MS4525) |
| Pressure Range | 0 - 2, 4, 5, 10, 20, 30" H ₂ O (MS4515) 0 - 0.07, 0.14, 0.35, 1, 2, 3, 10 bar / 0 - 1, 2, 5, 15, 30, 50, 150 psi (MS4525) |
| Output / Span | 10% to 90% or 5% to 95% of supply |
| Unique Features | <ul style="list-style-type: none"> –Ratiometric analog output sensor –Single supply of either 3.3 or 5.0 Vdc –Top, side barbed or manifold O-ring port –J lead or thru hole pins –Optional gel coat |
| Accuracy | 0.25% / 1% TEB |
| Operating Temp | -25°C to 105°C |
| Dimensions (mm) | 12.5 x 9.9 |
| Typical Apps | Medical instruments, air flow measurements, process control, leak detection |

Board Mounted Pressure Sensors

Digital Output Modules



MS58xx

| | |
|------------------------------------|---|
| Unique Features | <ul style="list-style-type: none"> –24-bit digital sensor, software calibration and temperature compensation (I²C & SPI), no external components –Supply voltage 1.8 to 3.6V |
| Options | High endurance (Option HM) |
| Linearity/Absolute Accuracy | <ul style="list-style-type: none"> ±1.5 mbar / ±0.02 psi at 25°C (MS5803-01BA) ±250 mbar / ±4 psi at 0°C to 40°C (MS5803-30BA) |
| Output / Span | Digital 24-bit I ² C and SPI (Mode 0, 3) |
| Resolution | <ul style="list-style-type: none"> 12 µbar / 0 psi (MS5803-01BA) 0.5 mbar / 0.01 psi (MS5803-30BA) |
| Type | Absolute |
| Pressure Range | 1, 2, 5, 14, 30 bar / 15, 29, 73, 203, 435 psi |
| Overpressure | <ul style="list-style-type: none"> 10 bar / 145 psi (for 1 & 2 bar modules) 30 bar / 435 psi (for 5 & 14 bar modules) 50 bar / 725 psi (for 30 bar modules) |
| Operating Temp | -40°C to 85°C |
| Dimensions (mm) | 6.4 x 6.2 x 2.9 |
| Typical Apps | Precision altimeter, diving and multi-mode watches, in-building navigation, variometers / flight instruments |



**MS4515DO, MS4525DO
MS4515HRD, MS4525HRD**

| | |
|---|--|
| <ul style="list-style-type: none"> –14-bit digital sensor (MS4515 / 25DO) –24-bit digital sensor (MS4515 / 25HRD) –Pressure and temperature measurement –Single supply of 3.3 or 5.0Vdc (MS4515 / 25DO) –Single supply of 1.8 or 3.6Vdc (MS4515 / 25HRD) –Top, side barbed or manifold O-ring seal –J lead or thru hole pins –Fast conversion up to 0.54ms (MS4515 / 25HRD) –Ultra low power consumption (MS4515 / 25HRD) Gel coat, low power (MS4515 / 25DO) | <ul style="list-style-type: none"> 0.25% / 1% TEB |
| <ul style="list-style-type: none"> 14-bit digital word SPI or I²C protocol (MS4515 / 25DO) 24-bit digital word SPI or I²C protocol (MS4515 / 25HRD) | — |
| <ul style="list-style-type: none"> Gage, differential (MS4515DO, MS4515HRD) Gage, absolute, differential, compound (MS4525DO, MS4525HRD) 0 - 2, 4, 5, 10, 20, 30" H₂O (MS4515DO/HRD) 0 - 0.07, 0.35, 1, 2, 3, 10 bar / 0 - 1, 5, 15, 30, 50, 150 psi (MS4525DO/HRD) 0.69 bar / 10 psi (MS4515DO, MS4515HRD) 3X range (MS4525DO, MS4525HRD) | — |
| -25°C to 125°C | 12.5 x 9.9 |
| Medical instruments, air flow measurements, process control, leak detection | |



MS5525DSO

NEW

| | |
|---|--|
| <ul style="list-style-type: none"> –24-bit digital small outline sensor –Pressure and temperature measurement –Single supply of 1.8 or 3.6Vdc –Top straight/barb, flat top, o-ring seal | — |
| 0.25% / 2.5% TEB | 24-bit digital word SPI or I ² C protocol |
| — | — |
| Gage, absolute, differential, compound | 0 - 0.07, 0.14, 0.35, 1, 2, 3, 10 bar / 0 - 1, 2, 5, 15, 30, 50, 150 psi |
| 3X range | — |
| -40°C to 125°C | 11.4 x 7.4 |
| Medical respirators, ventilators | |

Digital Output Altimeter Modules



MS5637

NEW

| | |
|------------------------------------|---|
| Unique Features | <ul style="list-style-type: none"> –24-bit digital sensor –High-resolution module, 13cm –Supply voltage: 1.5 to 3.6V –Low power, 0.6µA (standby ≤ 0.1 µA at 25°C) |
| Linearity/Absolute Accuracy | ±2.0 mbar / ±0.03 psi at 25°C |
| Output/Span | Digital 24-bit I ² C |
| Resolution | 0.016 mbar / 0 psi |
| Type | Absolute |
| Pressure Range | 10 - 2K mbar / 0.15 - 29 psi |
| Overpressure | 6 bar / 87 psi |
| Operating Temp. | -40 to 85°C |
| Dimensions (mm) | 3 x 3 x 0.9 |
| Typical Apps | Smart-phones, tablet PCs, personal navigation devices |



MS5805

NEW

| | |
|---|---|
| <ul style="list-style-type: none"> –24-bit digital sensor –High resolution module, 20cm –Supply voltage: 1.8 to 3.6V –Low power, 0.6µA (standby ≤ 0.1 µA at 25°C) –Sealing designed for 2.5 x 1 mm O-ring –Silicone gel protection –Waterproof | <ul style="list-style-type: none"> ±2.0 mbar / ±0.03 psi at 25°C |
| Digital 24-bit I ² C | 0.02 mbar / 0 psi |
| Absolute | 10 - 2K mbar / 0.15 - 29 psi |
| 5 bar / 73 psi | -40 to 85°C |
| 4.5 x 4.5 x 3.5 | |
| Mobile altimeter/barometer systems, bike computers, adventure or multi-mode watches, variometers, dataloggers | |



MS5806

NEW

| | |
|--|---|
| <ul style="list-style-type: none"> – 24-bit digital sensor –High resolution module, 20cm –Supply voltage: 1.8 to 3.6V –Low power, 1µA (standby ≤ 0.15 µA) –Hermetically sealable for outdoor devices –Silicone gel protection –Waterproof | <ul style="list-style-type: none"> ±1.5 mbar / ±0.02 psi at 25°C |
| Digital 24-bit I ² C and SPI (Mode 0, 3) | 0.024 mbar / 0 psi |
| Absolute | 10 - 2K mbar / 0.15 - 29 psi |
| 10 bar / 145 psi | -40 to 85°C |
| 6.4 x 4 x 2.75 | |
| Mobile altimeter/barometer systems, bike computers, adventure or multi-mode watches, variometers, dataloggers | |

Media Isolated Pressure Sensor Modules

Analog Output

O-Ring Mount and Threaded/Weldable



82, 85, 85F, 86, 154N

| | | |
|------------------------|---|--|
| Package | -3/4" (19mm) diameter O-ring mount (82 / 154N) -5/8" (16mm) diameter O-ring mount (86) -1/2" (13mm) diameter O-ring flush mount (85F) -1/2" (13mm) diameter O-ring mount (85) | |
| Type | Gage, absolute, vacuum gage (82 / 85 / 86 / 154N) Gage, absolute (85F) | |
| Pressure Range | 0 - 0.07, 0.35, 1, 2, 3, 7, 21, 34 bar / 0 - 1, 5, 15, 30, 50, 100, 300, 500 psi (absolute, gage: 82 / 154N) 0 - 0.35, 1, 2, 3, 7, 21, 34 bar / 0 - 5, 15, 30, 50, 100, 300, 500 psi (absolute, gage: 85 / 86) 0 - 1, 2, 3, 7, 21, 34 bar / 0 - 15, 30, 50, 100, 300, 500 psi (85F, vacuum gage: 82, 85, 86, 154N) | |
| Output/Span | 100mV typical | |
| Unique Features | -High performance -High stability for OEM applications -Minimizes trapped volume (85F) | |
| Non-Linearity | $\pm 0.3\%$ FSO (1 psi / 0.07 bar) $\pm 0.1\%$ FSO (≥ 15 psi / 1 bar) | $\pm 0.2\%$ FSO (5 psi / 0.35 bar) $\pm 0.1\%$ FSO (85F) |
| Operating Temp. | -40°C to 125°C (82 / 85 / 86 / 154N) | -20°C to 125°C (85F) |
| Dimensions (mm) | 82: $\varnothing 19 \times 6.4$ 154N: $\varnothing 19 \times 13.8$ 85: $\varnothing 15.9 \times 9.3$ | 86: $\varnothing 15.9 \times 9.3$ 85F: $\varnothing 17.2 \times 11.4$ |
| Typical Apps | Hydraulic controls, process control, oceanography, refrigeration/ compressors, pressure transmitters, level systems, dialysis machines, infusion pumps, medical systems | |



DP86 O-Ring Mount, with Fittings/Cable

| | |
|------------------------|--|
| Package | -5/8" (16mm) diameter O-ring mount or threaded process fittings |
| Type | Differential |
| Pressure Range | 0 - 0.07, 0.35, 1, 2, 3, 7, 10, 21, 34 bar / 0 - 1, 5, 15, 30, 50, 100, 300, 500 psi |
| Output/Span | 100mV typical / sensitivity dependent |
| Unique Features | -Wet/wet differential pressure -Line pressure max 1000 psi |
| Non-Linearity | $\pm 0.3\%$ FSO (1 psi / 0.07 bar) $\pm 0.2\%$ FSO (5 psi / 0.35 bar) $\pm 0.1\%$ FSO (≥ 15 psi / 1 bar) |
| Operating Temp. | -40°C to 125°C |
| Dimensions (mm) | O-ring: $\varnothing 15.9 \times 17.5$ Fittings: 55.4 x 26.2 x 25.4 |
| Typical Apps | Level controls, tank level measurement, corrosive fluids and gas measurement systems, flow measurement |



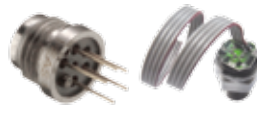
U86B

| | |
|------------------------|---|
| Package | -Mountable with O-ring seal |
| Type | Sealed gage, absolute |
| Pressure Range | 0 - 3, 7, 10, 14 bar / 0 - 50, 100, 150, 200 psi |
| Output/Span | 0.5 - 4.5 Vdc (Ratiometric output) |
| Unique Features | -Amplified |
| Non-Linearity | $\pm 0.5\%$ FSO |
| Operating Temp. | -7°C to 105°C |
| Dimensions (mm) | $\varnothing 15.82 \times 13.6$ Socket spacing: 31.75 |
| Typical Apps | Urea level, urea pressure, air brakes, corrosive fluid measurement for E&V applications |



82, 85 with Fittings

| | |
|------------------------|---|
| Package | Weldable (85) or process fitting |
| Type | Gage, absolute, vacuum gage |
| Pressure Range | 0 - 0.35, 1, 2, 3, 7, 21, 34 bar / 0 - 5, 15, 30, 50, 100, 300, 500 psi (85) 0 - 0.07, 0.35, 1, 2, 3, 7, 21, 34 bar / 0 - 1, 5, 15, 30, 50, 100, 300, 500 psi (82) |
| Output/Span | 100 mV typical |
| Unique Features | -Modular design |
| Non-Linearity | $\pm 0.3\%$ FSO (1 psi / 0.07 bar) $\pm 0.2\%$ FSO (5 psi / 0.35 bar) $\pm 0.1\%$ FSO (≥ 15 psi / 1 bar) |
| Operating Temp. | -40°C to 125°C |
| Dimensions (mm) | 82: $\varnothing 22.2 \times 24.9$ 85: $\varnothing 22.2 \times 29.3$ |
| Typical Apps | Medical, process control, refrigeration compressor, oceanography, level systems |



89 Button, 89 with Fittings

| | |
|------------------------|---|
| Package | Weldable or process fitting |
| Type | Sealed gage, absolute |
| Pressure Range | 0 - 69, 207, 345 bar / 0 - 1K, 3K, 5K psi |
| Output/Span | 100 mV typical |
| Unique Features | -High pressure, modular design |
| Non-Linearity | $\pm 0.25\%$ FSO |
| Operating Temp. | -40°C to 125°C |
| Dimensions (mm) | 89 Button: $\varnothing 9.0 \times 7.5$ 89 with Fittings: $\varnothing 22.2 \times 23.6$ |
| Typical Apps | Air tank pressure, hydraulics, process control, robotics, refrigeration compressors, oceanography |



86A Amplified

| | |
|------------------------|---|
| Package | 5/8" (16 mm) diameter O-ring mount |
| Type | Gage, absolute |
| Pressure Range | 0 - 0.07, 0.14, 0.35, 1, 2, 3, 7, 10 bar / 0 - 1, 2, 5, 15, 30, 50, 100, 150 psi |
| Output/Span | 0.5 - 4.5 Vdc |
| Unique Features | -Small diameter, amplified output -Bar ranges available |
| Non-Linearity | $\pm 1.0\%$ FSO |
| Operating Temp. | -20°C to 85°C |
| Dimensions (mm) | $\varnothing 15.9 \times 9.3$, height model dependent |
| Typical Apps | Level measurement, OEM transmitters and transducers, process control |

Media Isolated Pressure Sensor Modules

Digital Output
O-Ring Mount and Threaded/Weldable



85BSD

NEW

| | |
|-------------------------|--|
| Package | <ul style="list-style-type: none"> –13 mm diaphragm diameter –Weldable or threaded process fittings –Pressure and temperature read-out –Cable and connector options –Low power option |
| Accuracy | ±0.25% Span |
| Output/Span | Digital 14-bit I ² C or SPI |
| Total Error Band | ±1.0% FSO |
| Type | Gage, Absolute |
| Pressure Range | 0 - 0.35, 1, 2, 3, 7, 10, 14, 20 bar / 0 - 5, 15, 30, 50, 100, 150, 200, 300 psi |
| Overpressure | 2X |
| Operating Temp. | -40°C to 125°C |
| Dimensions (mm) | Ø 15.9 x 7.9 |
| Typical Apps | Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, submersible depth monitoring |



86BSD

NEW

| | |
|---|---|
| <ul style="list-style-type: none"> –16 mm diaphragm diameter –O-ring mount –Pressure and temperature read-out –Cable and connector options –Low power option | <ul style="list-style-type: none"> –16 mm diaphragm diameter –O-ring mount –Pressure and temperature read-out –Cable and connector options –Low power option |
| ±0.25% Span | ±0.25% Span |
| Digital 14-bit I ² C or SPI | Digital 14-bit I ² C or SPI |
| ±1.0% FSO | ±1.0% FSO |
| Gage, Absolute | Gage, Absolute |
| 0 - 0.07, 0.14, 0.35, 1, 2, 3, 7, 10, 14, 20 bar / 0 - 1, 2, 5, 15, 30, 50, 100, 150, 200, 300 psi | 0 - 0.07, 0.14, 0.35, 1, 2, 3, 7, 10, 14, 20 bar / 0 - 1, 2, 5, 15, 30, 50, 100, 150, 200, 300 psi |
| 2X | 2X |
| -40°C to 125°C | -40°C to 125°C |
| Ø 15.9 x 9.3 | Ø 15.9 x 9.3 |
| 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 |



89BSD

NEW

| | |
|---|---|
| <ul style="list-style-type: none"> –9 mm diaphragm diameter –Threaded/weldable –Pressure and temperature read-out –Low power: 1 µA (standby < 0.15 µA) | <ul style="list-style-type: none"> –9 mm diaphragm diameter –Threaded/weldable –Pressure and temperature read-out –Low power: 1 µA (standby < 0.15 µA) |
| ±0.3% Span | ±0.3% Span |
| Digital 24-bit I ² C | Digital 24-bit I ² C |
| ±3.0% FSO Max | ±3.0% FSO Max |
| Absolute, Sealed Gage | Absolute, Sealed Gage |
| 0 - 6, 12, 18, 28, 30 bar / 0 - 87, 174, 261, 406, 435 psi | 0 - 6, 12, 18, 28, 30 bar / 0 - 87, 174, 261, 406, 435 psi |
| 2X | 2X |
| -40°C to 85°C | -40°C to 85°C |
| Ø 9.0 x 7.5 | Ø 9.0 x 7.5 |
| Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, dive computers | Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, dive computers |

Transducers and Transmitters

Base Level and Custom



MSP100

| | |
|-------------------------|--|
| Package | Small housing with O-ring and proprietary 'Snap in' feature that lowers the total installed cost and customized housings for OEM applications |
| Type | Gage |
| Pressure Range | 0 - 7 bar thru 0 - 34 bar / 0 - 100 psi thru 0 - 500 psi |
| Output/Span | 100 mV typical |
| Unique Features | <ul style="list-style-type: none"> –Microfused™ technology –Low cost stainless steel isolated transducer –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 Apps | Beverage dispensing systems, automation, HVACR controls, energy and water management, pumps, compressors, pneumatic equipment |
| Agency Approvals | — |



MSP300, MSP340, US300

| | |
|--|--|
| Small housing with a large selection of threaded fittings, electrical connectors, cable options and customized housings for OEM applications | Small housing with a large selection of threaded fittings, electrical connectors, cable options and customized housings for OEM applications |
| Gage (MSP300, MSP340) Gage, Absolute (US300) | Gage (MSP300, MSP340) Gage, Absolute (US300) |
| 0 - 3 bar thru 0 - 2K bar / 0 - 50 psi thru 0 - 30K psi (MSP300) 0 - 7 bar thru 0 - 2K bar / 0 - 100 psi thru 0 - 30K psi (MSP340) 0 - 1 bar thru 0 - 344 bar / 0 - 15 psi, thru 0 - 5K psi (US300) 0 - 100mV, 0.5 - 4.5Vdc, 1 - 5Vdc, 4 - 20mA (MSP300, MSP340) 0 - 10mV/V, 0.5 - 4.5V, 1 - 5V, 4 - 20mA (US300) | 0 - 3 bar thru 0 - 2K bar / 0 - 50 psi thru 0 - 30K psi (MSP300) 0 - 7 bar thru 0 - 2K bar / 0 - 100 psi thru 0 - 30K psi (MSP340) 0 - 1 bar thru 0 - 344 bar / 0 - 15 psi, thru 0 - 5K psi (US300) 0 - 100mV, 0.5 - 4.5Vdc, 1 - 5Vdc, 4 - 20mA (MSP300, MSP340) 0 - 10mV/V, 0.5 - 4.5V, 1 - 5V, 4 - 20mA (US300) |
| –Microfused™ technology (MSP300, MSP340) –UltraStable™ technology (US300) –Highly customized for OEM applications –Small size –Solid state reliability | –Microfused™ technology (MSP300, MSP340) –UltraStable™ technology (US300) –Highly customized for OEM applications –Small size –Solid state reliability |
| <1% FSO | <1% FSO |
| -20°C to 85°C (MSP300, MSP340) -40°C to 105°C (US300) | -20°C to 85°C (MSP300, MSP340) -40°C to 105°C (US300) |
| MSP300: 22.23 x 22.23 x 55.88 MSP340: 15.88 x 15.88 x 75.44 US300: 15.88 x 115.88 x 98.00 | MSP300: 22.23 x 22.23 x 55.88 MSP340: 15.88 x 15.88 x 75.44 US300: 15.88 x 115.88 x 98.00 |
| Paint sprayers, braking systems, HVACR controls, energy and water management, pumps, compressors, pneumatic equipment, off road heavy equipment, agriculture equipment | Paint sprayers, braking systems, HVACR controls, energy and water management, pumps, compressors, pneumatic equipment, off road heavy equipment, agriculture equipment |
| UL 508 (MSP300) | UL 508 (MSP300) |



M5200, U5200, D5100

NEW

| | |
|--|--|
| Industrial stainless steel housing with a large selection of threaded fittings, electrical connectors, cable options and customized housings for OEM and T&M applications | Industrial stainless steel housing with a large selection of threaded fittings, electrical connectors, cable options and customized housings for OEM and T&M applications |
| Gage (M5200) Gage, sealed gage, absolute (U5200) Differential wet-wet (D5100) | Gage (M5200) Gage, sealed gage, absolute (U5200) Differential wet-wet (D5100) |
| 0 - 3 bar thru 0 - 2K bar / 0 - 50 psi thru 0 - 30K psi (M5200) 0 - 0.14 bar thru 0 - 700 bar / 0 - 2 psi thru 0 - 10K psi (U5200) 0 - 0.07 bar thru 0 - 34 bar / 0 - 1 psi thru 0 - 500 psi (D5100) 0.5 - 4.5 Vdc, 1 - 5 Vdc, 0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA | 0 - 3 bar thru 0 - 2K bar / 0 - 50 psi thru 0 - 30K psi (M5200) 0 - 0.14 bar thru 0 - 700 bar / 0 - 2 psi thru 0 - 10K psi (U5200) 0 - 0.07 bar thru 0 - 34 bar / 0 - 1 psi thru 0 - 500 psi (D5100) 0.5 - 4.5 Vdc, 1 - 5 Vdc, 0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA |
| –Microfused™ technology (M5200) –UltraStable™ technology (U5200, D5100) –High performance at a low cost –Solid state reliability 1% total error band (-20°C to 85°C all possible errors combined) (M5200, D5100) –0.75% total error band (-20°C to 85°C all possible errors combined) (U5200) –Line pressure max 1000 psi (D5100) 0.25% FSO (M5200, D5100), 0.1% FSO (U5200) | –Microfused™ technology (M5200) –UltraStable™ technology (U5200, D5100) –High performance at a low cost –Solid state reliability 1% total error band (-20°C to 85°C all possible errors combined) (M5200, D5100) –0.75% total error band (-20°C to 85°C all possible errors combined) (U5200) –Line pressure max 1000 psi (D5100) 0.25% FSO (M5200, D5100), 0.1% FSO (U5200) |
| -40°C to 125°C | -40°C to 125°C |
| M5200: 22.23 x 22.23 x 80.77 U5200: 22.23 x 22.23 x 98.04 D5100: 25.4 x 58.4 x 72.0 | M5200: 22.23 x 22.23 x 80.77 U5200: 22.23 x 22.23 x 98.04 D5100: 25.4 x 58.4 x 72.0 |
| HVACR controls, energy and water management, pumps, compressors, pneumatic equipment, off road heavy equipment, trucks, agriculture equipment, braking systems, filter blockage, pressurized tank level | HVACR controls, energy and water management, pumps, compressors, pneumatic equipment, off road heavy equipment, trucks, agriculture equipment, braking systems, filter blockage, pressurized tank level |
| CE (EMC), UL 508 | CE (EMC), UL 508 |

Transducers and Transmitters

Heavy Duty



M7100, U7100

| | |
|-------------------------|--|
| Package | Automotive grade, stainless steel hermetic pressure ports and integral electrical connector |
| Type | Gage, no vent gage (M7100) Gage, sealed gage, absolute (U7100) |
| Pressure Range | 0 - 10 thru 0 - 689 bar / 0 - 150 thru 0 - 10K psi (M7100) 0 - 1 thru 0 - 10 bar / 0 - 15 thru 0 - 150 psi (U7100) |
| Output/Span | 0.5 - 4.5 Vdc [Ratiometric Output]; 1 - 5 Vdc [Regulated] (M7100) 0.5 - 4.5 Vdc [Ratiometric Output] (U7100) |
| Unique Features | <ul style="list-style-type: none"> -1% total error band (-20°C to 85°C) Solid state reliability Survives high vibration and immersion Microfused™ technology (M7100) UltraStable™ technology (U7100) |
| Accuracy | 0.25% FSO |
| Operating Temp. | -40°C to 125°C |
| Dimensions (mm) | 26.7 x 26.7 x 50.0 |
| Typical Apps | HVACR refrigeration controls, off road vehicles engine control, compressors, hydraulic, energy and water management |
| Agency Approvals | CE (EMC), UL 508 |



U5300

NEW

| |
|---|
| Environmentally protected stainless steel housing with a large selection of threaded fittings, electrical connectors, cable options and customized housings for OEM applications |
| Gage, absolute, sealed gage |
| 0 - 1 thru 0 - 689 bar / 0 - 15 psi thru 0 - 10K psi |
| 0.5 - 4.5 V, 0 - 5 V, 1 - 5 V, 0 - 10 V, 4 - 20 mA |
| <ul style="list-style-type: none"> UltraStable™ technology High accuracy Digitally compensated Pressure calibration standard IP65 rated -0.5% total error band from -25°C to 85°C |
| 0.1% FSO |
| -25°C to 85°C |
| 22.23 x 22.23 x 98.04 |
| Aerospace testing, calibration, high end machinery, automotive, industry |
| CE (EMC), UL 508 |



P900, P981, P1200, P700, P9000

| | |
|-------------------------|--|
| Package | Threaded ports with stainless steel housing and various heavy duty electrical connections, various electrical outputs |
| Type | Gage, absolute |
| Pressure Range | 0 - 5 bar to 0 - 689 bar / 0 - 75 psi to 0 - 10K psi |
| Output / Span | 0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA |
| Unique Features | <ul style="list-style-type: none"> High overpressure (10X over pressure) Shock & 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 Apps | Steel mills, hydraulic controls, power generation equipment, torpedo depth, mil-aero, vehicle braking systems |
| Agency Approvals | CE, CENELEC (Intrinsically Safe) |



P101, P105, P125

| |
|---|
| Threaded port |
| Gage |
| 0 - 10 bar to 0 - 7K bar / 0 - 145 psi to 0 - 101K psi |
| 7.5 to 15 mV (4 V; 5 V optional) |
| <ul style="list-style-type: none"> Stainless steel diaphragm Pressure connector M20 x 1.5 Metal / metal seal |
| ±0.3% FSO |
| -20°C to 80°C |
| Ø 29 x 85 |
| Hostile environments, aggressive liquids |
| — |

Transducers and Transmitters

Miniature



XP Series

NEW

| | |
|------------------------|---|
| Unique Features | <ul style="list-style-type: none"> –Titanium construction (XP5, XPM4) –Stainless steel housing (XPM6, XPM10) –Amplified output options (XP5, XPM6, XPM10) –Cable and connector options (XPM4) –For static and dynamic applications |
| Non linearity | Up to $\pm 0.25\%$ FSO (XP5, XPM6, XPM10) Up to $\pm 0.35\%$ FSO (XPM4) |
| Output / Span | 20, 30, 75, 100mV (XP5) 30mV, 60mV, 100mV (XPM4) 100mV (XPM6) 50, 100mV (XPM10) |
| Pressure Range | 1 - 345 bar / 15 - 5K psi (XP5, XPM10) 5 - 207 bar / 75 - 3K psi (XPM4) 103 - 1K bar / 1.5K - 15K psi (XPM6) |
| Overpressure | 2X |
| Operating Temp | -40°C to 120°C |
| Dimensions (mm) | XP5: Hex 10 XPM4: Hex 8 XPM6: Hex 12 XPM10: Hex 15 |
| Typical Apps | 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 |



XPC10

NEW

| |
|---|
| <ul style="list-style-type: none"> –Amplified output available –For static and dynamic applications –Optional IP67 ingress protection –High temperature operation |
| Up to $\pm 0.25\%$ F.S. |
| 12mV FSO, 4V FSO (amplified) |
| 0 - 10, 21, 34, 52, 69, 103, 207, 345, 517 bar / 0 - 150, 300, 500, 750, 1K, 1.5K, 3K, 5K, 7.5K psi |
| 1.5X |
| -40°C to 220°C |
| Hex 15 |
| Aerospace, test benches, oven monitoring equipment, cooling regulation systems |



EB, EPRB

| | |
|------------------------|---|
| Unique Features | <ul style="list-style-type: none"> –High accuracy –Miniature design –UltraStable™ technology –EMI protected –Combined pressure & temperature |
| Non linearity | $\pm 0.25\%$ FSO |
| Output / Span | 0.5 to 4.5 Vdc |
| Pressure Range | 0 - 21, 34, 69, 103, 207, 345 bar / 0 - 300, 500, 1K, 1.5K, 3K, 5K, psi |
| Overpressure | 2X to 3X |
| Operating Temp | -40°C to 125°C (available option up to 150°C) |
| Dimensions (mm) | 11 body diameter |
| Typical Apps | Motor sport, hydraulic/pneumatic systems, automotive test stands, mil-aero test stands |



EPIH

| |
|--|
| <ul style="list-style-type: none"> –Diffused silicon diaphragm with a large variety of sizes and shapes available as small as 0.05" outside diameter –High frequency response (to 1.7 MHz) |
| $\pm 1.0\%$ FSO |
| 12 mV to 75 mV |
| 0 - 0.35, 0.69, 1, 2, 3, 5, 7, 14, 21 bar / 0 - 5, 10, 15, 25, 50, 75, 100, 200, 300 psi |
| 2X to 5X |
| -40°C to 120°C |
| Application dependent |
| Aerospace testing, wind tunnels, biomedical testing, aircraft body and wing dynamics, high frequency measurements |



EPB, EPB-PW, EPL

| |
|--|
| <ul style="list-style-type: none"> –Miniature flush mountable –Flush stainless steel diaphragm, flanged and / or non-flanged –Bonded silicon gage, high frequency response (to 400 KHz) –IP68 ingress protection in Titanium construction (EPB-PW) |
| ± 0.5 to $\pm 1\%$ FSO |
| 10 mV to 125 mV |
| 0 - 0.35, 0.69, 1, 2, 3, 5, 7, 17, 34, 69, 172, 345 bar / 0 - 5, 10, 15, 25, 50, 100, 250, 500, 1K, 2.5K, 5K psi |
| 2X to 10X |
| -40°C to 120°C |
| 3.2 to 7 outside diameter |
| Air flow testing, hydraulic pressure systems, air pressure systems, bearing studies, ballistics, water hammer, miniature scale model testing, centrifuge pore water pressure measurements |

water resources monitoring

solutions by sensor type

Measurement Specialties leads the water-resources monitoring market with over thirty-five years of industry experience in the design and manufacture of water-quality and water-level sensors and systems. Our expertise in media-isolated pressure sensors provides our customers with unique advantages in creative product development and consistent product performance.

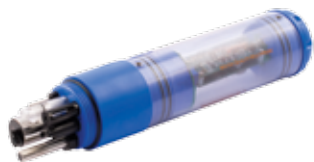
Water-level transducers are available in custom ranges and a wide choice of accuracies, materials, and cabling. With your choice of analog or digital output, our sensors are easily adapted to any data system. Or, use self-powered units with onboard memory for long term deployment.

We also provide multiparameter, water-quality instrumentation for the most demanding analyses of lakes, rivers, estuaries, and aquifers worldwide. Our multiprobes measure your choice of temperature, dissolved oxygen, conductivity, pH, water depth or level, ORP, turbidity, chlorophyll, crude oil, blue-green algae, ammonium, nitrate and a dozen other parameters critical to water-resources improvement and preservation. Call our water-quality specialists today to discuss our solutions to your monitoring problems.



Manta2 Water Quality Multiprobes

Sensors for Multiprobes Are Customer-selectable and Easily Configured



Measurement Specialties' Manta2 line of water-quality multiprobes has a configuration to meet any demanding application. With your choice of 24 different sensors, they can be used as unattended water-quality data loggers with the optional battery pack, or with the rugged field display for spot checking/profiling. Connected to our Eureka TS2 telemetry system they can be deployed for real-time water-to-web monitoring or to other data collection systems. Our water-quality specialists carefully review all monitoring applications prior to making equipment recommendations to ensure all customers receive exactly what is required for their projects.

| | | | | | |
|-----------------|---|---|--|--|---|
| Range | Temperature | Dissolved Oxygen (mg/L) | | Conductivity | |
| | -5°C to 50°C | 0 to 25 mg/L | 25 to 50 mg/L | 0 to 100 mS/cm | |
| | ±0.1°C | 1% of reading or 0.2 mg/L, whichever is greater | ±0.2 mg/L ≤20 mg/L ±0.6 mg/L >20 mg/L | 1% reading ±1 count | |
| | 0.01°C | 0.01 mg/L | 0.01 mg/L | 4 digits | |
| Comments | Never needs calibration | Salinity corrected | Salinity corrected | Automatic temperature compensated; graphite electrodes | |
| Range | Salinity | TDS | Turbidity | | |
| | 0 to 70 PSU (PPT) | 0 to 65 g/L | 0 to 400 NTU | 400 to 3000 NTU | |
| | ±1% of reading or 0.1 PSU, whichever is greater | ±5% of reading | ±1% of reading ±1 count | ±2% of reading | |
| | 4 digits | 4 digits | 4 digits | 4 digits | |
| Comments | Calculated from conductivity | Calculated from conductivity | ISO 7027 | ISO 7027 | |
| Range | pH | ORP | Depth | Level | Ammonium |
| | 0 to 14 units | - 999 to 999 mV | 0 to 10 m, 0 to 25 m, 0 to 50 m, 0 to 100 m, 0 to 200 m | 0 to 10 m | 0 to 100 mg/L Nitrogen |
| | ±0.2 units | ±20 mV | ±0.1% Full Scale | 0.003 m | ±10% of reading or 2 mg/L, whichever is greater |
| | 0.01 units | 1 mV | 0.01 m | 0.001 m | 0.1 mg/L - N |
| Comments | Automatic temperature compensated | Platinum electrode | | Vented transducer; requires vented cable | Ion Selective Electrode with replaceable plasticized tips |
| Range | Nitrate | Chloride | Chlorophyll a | Rhodamine | Blue Green Algae |
| | 0 to 100 mg/L Nitrogen | 0.5 to 18,000 mg/L | 0.03 to 500 µg/L | 0.04 to 1000 ppb | 150 to 300,000 cells/mL |
| | ±10% of reading or 2 mg/L, whichever is greater | ±10% of reading or 2 mg/L, whichever is greater | ±3% of full scale | ±3% of full scale | ±3% of full scale |
| | 4 digits | 4 digits | 0.01 µg/L | 0.01 ppb | 10 cells/mL |
| Comments | Ion Selective Electrode with replaceable plasticized tips | Ion Selective Electrode with replaceable plasticized tips | Turner sensor | Turner sensor | Fresh or marine available, Turner sensor |

Water Resources Monitoring

Level Data Loggers



TruBlue 555, 565 Level, 575 Baro, 585 CTD

| | |
|---------------------|---|
| Accuracy | ±0.1 FS TEB (TruBlue 555, 575) ±0.01 ft H ₂ O (TruBlue 565) 1% of reading or 20 µs/cm (TruBlue 585) |
| Range | 10 - 692 ft (TruBlue 555) 10 - 50 ft (TruBlue 565) 8 - 16 psia (TruBlue 575) 5 - 200,000 µs/cm (TruBlue 585) |
| Max Over-range | 2x FS (TruBlue 555, 565, 585) 32 psia (TruBlue 575) |
| Output | RS-485 |
| Data Logging Memory | 8 MB |
| Operating Temp | 0°C to 50°C |
| Dimensions (mm) | 19 x 390 |
| Typical Apps | Groundwater monitoring, surface water monitoring, oceanographic research, barometric pressure, atmospheric pressure |

Digital Level Transducers



KPSI 500, 501

| | |
|---------------------|--|
| Accuracy | ±0.05% FS TEB (KPSI 500) ±0.01 ft H ₂ O (KPSI 501) |
| Range | 10 - 230 ft (KPSI 500) 10 - 50 ft (KPSI 501) |
| Max Over-range | 2X FS |
| Output | SDI-12 |
| Data Logging Memory | — |
| Operating Temp | -20°C to 60°C |
| Dimensions (mm) | 25.4 x 197 |
| Typical Apps | Groundwater monitoring, surface water monitoring, oceanographic research |



KPSI 351, 353, 355

| | |
|---------------------|--|
| Accuracy | ±0.10% FS TEB (KPSI 353) ±0.05% FS TEB (KPSI 355) ±0.01 ft H ₂ O (KPSI 351) |
| Range | 10 - 230 ft (KPSI 353, 355) 10 - 50 ft (KPSI 351) |
| Max Over-range | 2X FS |
| Output | SDI-12 |
| Data Logging Memory | — |
| Operating Temp | -20°C to 60°C |
| Dimensions (mm) | 19 x 243 |
| Typical Apps | Groundwater monitoring, surface water monitoring, oceanographic research |

Digital Temperature Transducers



KPSI 380

| | |
|-----------------|--|
| Accuracy | ±0.1°C |
| Range | -20°C to 60°C |
| Connection | open port nosepiece |
| Output | SDI-12, RS-485 |
| Operating Temp | -20°C to 60°C |
| Dimensions (mm) | 19.0 x 127.0 |
| Typical Apps | Groundwater monitoring, surface water monitoring, storm water, dam operations and stream gauging |

Telemetry Communication Systems



Eureka TS2

NEW

| | |
|--------------------|--|
| Power | 12 - 24 VDC |
| Environmental | NEMA4 |
| Sensor Ports | RS-485, RS-232 (3 Multiplexed), SDI-12 |
| Communication | GPRS |
| Supported Hardware | Manta2 Multiprobes, TruBlue Data Loggers, KPSI Digital Level Transducers |
| Typical Apps | Surface and groundwater monitoring |

Water Resources Monitoring

Analog Level Transducers — 1" Bore



KPSI 700, 710, 720, 730, 735

| | |
|-------------------------|---|
| Level Accuracy | ±0.10%, ±0.05% FSO (KPSI 730, 735) ±0.25%, ±0.50%, ±1.00% FSO (KPSI 700, 710, 720) |
| Options | — |
| Range | Custom ranges from: 5 - 700 ft H ₂ O (vented, KPSI 730, 735) 35 - 700 ft H ₂ O (sealed, KPSI 730, 735) 2.3 - 700 ft H ₂ O (vented, KPSI 700, 710, 720) 10 - 700 ft H ₂ O (sealed, KPSI 700, 710, 720) 35 -- 700 ft H ₂ O (absolute, KPSI 700, 710, 720) |
| 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) | 25.4 x 86.6 |
| Typical Apps | Groundwater monitoring, surface water monitoring, oceanographic research, pump control, life stations, landfill leachate |
| Agency Approvals | CE, WEEE, RoHS; UL and FM (Intrinsically safe) |



KPSI 705, 745, 750

NEW

| | |
|-------------------------|---|
| Level Accuracy | ±0.25% FSO |
| Options | Optional standoff (KPSI 745) |
| Range | Custom ranges from 6 - 115 ft H ₂ O (KPSI 705) Custom ranges from 10 - 115 H ₂ O (KPSI 745, 750) |
| 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) | KPSI 705: 25.4 x 86.6 KPSI 745: 88.9 x 279.4 (w/ standoff) 88.9 x 253.3 (w/o standoff) KPSI 750: 104.1 x 279.4 |
| Typical Apps | Wastewater, lift stations, pump control, slurry tank liquid level, tank level |
| Agency Approvals | CE, WEEE, RoHS; UL and FM (Intrinsically safe) |



LTA, LTB, LTR, LT Series

| | |
|-------------------------|--|
| Level Accuracy | ±0.25% FSO |
| Options | Optional lightning protection |
| Range | 0 - 1 psi up to 0 - 500 psi (LTA, LT) 0 - 11.5, 34.6, 69.2, 115.4 ft H ₂ O (LTB, LTR) Custom ranges available |
| Max Over-range | 2X FS |
| Output | 4 - 20 mA (LTA, LTB, LT) 4 - 20 mA, 0 - 2.5Vdc, 0 - 4 Vdc, 1.5 - 7.5 Vdc (LTR) |
| Operating Temp | -20°C to 60°C |
| Dimensions (mm) | LTA: 25.4 x 93.0 LTB: 104.1 x 206.5 LTR: 11.30" w/ overmold conduit connection 9.78" w/ gland seal conduit connection LT: Ø 25.4 x 170.5 (dependent on fitting) |
| Typical Apps | 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 |
| Agency Approvals | CE, WEEE, RoHS; with optional UL, CUL, and FM (Intrinsically safe) |

Analog Level Transducers — 0.75" Bore



KPSI 320, 330, 335, 342

| | |
|-------------------------|---|
| Level Accuracy | ±0.10%, ±0.05% FSO (KPSI 330, 335) ±0.25% FSO (KPSI 320) ±0.25% FS TEB (KPSI 342) |
| Range | Custom ranges from: 5 - 700 ft H ₂ O (vented: KPSI 320, 330, 335) 35 - 700 ft H ₂ O (sealed, absolute: KPSI 330, 335) 10 - 700 ft H ₂ O (sealed: KPSI 320, 342) 35 - 700 ft H ₂ O (absolute: KPSI 320, 342) 2.3 - 700 ft H ₂ O (vented: KPSI 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 (KPSI 320, 330, 335) 4 - 20 mA, 0 - 5 Vdc (KPSI 342) |
| Operating Temp | -20°C to 60°C -20°C to 85°C (KPSI 342) |
| Dimensions (mm) | 19 x 151 |
| Typical Apps | Groundwater monitoring, surface water monitoring, oceanographic research, pump control, lift stations, landfill leachate, tailrace and forebay monitoring |
| Agency Approvals | CE, WEEE, RoHS; UL and FM (Intrinsically safe) (KPSI 320, 330, 335) CE, WEEE, RoHS (KPSI 342) |



KPSI 300DS

| | |
|-------------------------|---|
| Level Accuracy | ±0.50% FSO |
| Range | Custom ranges from: 700 - 4614 ft H ₂ O |
| 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) | 19 x 215 |
| Typical Apps | Down hole, level control, pump control |
| Agency Approvals | CE, WEEE, RoHS |

force/torque

solutions by sensor type

Measurement Specialties is a pioneer in the design and manufacture of precision sensors for electro-mechanical flight control applications, test and measurement applications and ultra-low cost OEM load cells for high volume applications. We are experts in developing sensors that require high performance or unique packaging.

Based on our proprietary piezoresistive silicon strain gauge (Microfused™) technology our OEM load cells combine outstanding durability and long-term stability in extremely low cost packages, perfectly suited for medium and high volume applications.

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 autopilot automatic disconnect function and flap jam detection systems.

MEAS' OEM and T&M load cells are tailored for specific customer applications including custom packaging and electronics with analog or digital outputs, suited for both low and high force environments.



Load Cells

Low Cost OEM



FX19

| | |
|--|---|
| Package | Low profile "coin cell" design |
| Operating Mode | Compression |
| Unique Features | <ul style="list-style-type: none"> –Ultra low cost, low strain design –Essentially unlimited cycle life |
| Ranges (Lbf) | 10, 25, 50, 100 |
| Max Over-range | 2.5X |
| Output / Span | 100 mV |
| Combined Linearity & Hysteresis | ±1.0% FSO |
| Operating Temp | -40°C to 85°C |
| Dimensions (mm) | Ø 25.00 x 29.50 x 8.00 |
| Typical Apps | Consumer OEM, exercise machines, physical therapy, vending machines, appliances, pumps, medical devices |



FS20

| | |
|--|--|
| Package | Miniature; drop in replacement for industry standard |
| Operating Mode | Compression |
| Unique Features | <ul style="list-style-type: none"> –Load cell design operates at very low strains –Not subject to lead die fatigue |
| Ranges (Lbf) | 1.5, 3 |
| Max Over-range | 10 lbf |
| Output / Span | 1.0 to 4.0 V |
| Combined Linearity & Hysteresis | ±1.0% FSO |
| Operating Temp | 0°C to 70°C |
| Dimensions (mm) | 30.708 x 17.272 x 8.255 |
| Typical Apps | Infusion pumps, contact sensing, medical devices, consumer appliances |



FC22

| | |
|--|---|
| Package | Plastic housing, button, flange mounting |
| Operating Mode | Compression |
| Unique Features | <ul style="list-style-type: none"> –Low cost button shape –Essentially unlimited cycle life |
| Ranges (Lbf) | 25, 50, 100 |
| Max Over-range | 2.5X |
| Output / Span | 100 mV, 0.5 to 4.5 Vdc |
| Combined Linearity & Hysteresis | ±1.0% FSO |
| Operating Temp | -40°C to 85°C |
| Dimensions (mm) | Ø 26.00 x 42.00 x 19.50 |
| Typical Apps | Infusion pumps, robotics end-effectors, exercise machines, contact sensing, appliances |



FC23

| | |
|--|--|
| Package | Stainless steel housing button shape for higher weight loads |
| Operating Mode | Compression |
| Unique Features | <ul style="list-style-type: none"> –Industry standard low profile all stainless steel design –Resistant to off-axis loads. |
| Ranges (Lbf) | 250, 500, 1000, 2000 |
| Max Over-range | 1.5X and 2.5X |
| Output / Span | 100 mV |
| Combined Linearity & Hysteresis | ±1.0% FSO |
| Operating Temp | -40°C to 85°C |
| Dimensions (mm) | Ø 31.75 x 10.20 |
| Typical Apps | Batch weighing, robotics, assembly line force, printing presses, pumps, winch and hoist |

Test and Measurement Miniature



ELAF

| | |
|--------------------------------|---|
| Package | <ul style="list-style-type: none"> –Button –Dual stud |
| Operating Mode | <ul style="list-style-type: none"> –Compression –Tension |
| Unique Features | <ul style="list-style-type: none"> –Low cost –Small, low profile design –Low off-axis response –NIST traceable calibration provided |
| Ranges N (Lbf) | 50 to 10K (10 to 2K) |
| Max Over-range | 2.5X F.S. |
| Output / Span | 100 mV (0.5 - 4.5 V optional) |
| Non-linearity | ±0.25% F.S. |
| Hysteresis | ±0.25% F.S. |
| Optional Operating Temp | -40°C to 120°C (-40°F to 248°F) |
| Dimensions (mm) | Ø 12.70 x 9.53 or 8.80 Ø 15.88 x 12.70 or 11.70 Ø 31.75 x 10.20 |
| Typical Apps | Theatrical rigging loads, assembly forces, weighing, thrust measurements, product validation testing |



XFC200R

| | |
|--------------------------------|---|
| Package | Small diameter load button |
| Operating Mode | Compression |
| Unique Features | <ul style="list-style-type: none"> –High stiffness –High overload capacity –Static and dynamic |
| Ranges N (Lbf) | 2 to 10K (0.4 to 2K) |
| Max Over-range | 2X to 4X F.S. |
| Output / Span | 100 mV |
| Non-linearity | ≤ ±0.5% F.S. |
| Hysteresis | ≤ ±0.5% F.S. |
| Optional Operating Temp | -40°C to 150°C (-40°F to 302°F) |
| Dimensions (mm) | Ø10 to Ø16 |
| Typical Apps | Material test, measuring tools, robotics and effectors |



XFL212R

| | |
|--------------------------------|---|
| Package | Low profile load button |
| Operating Mode | Compression |
| Unique Features | <ul style="list-style-type: none"> –Extremely flat –Integrated load button –Small diameter |
| Ranges N (Lbf) | 5 to 500 (1 to 100) |
| Max Over-range | 2X F.S. |
| Output / Span | 100 mV |
| Non-linearity | ≤ ±0.5% F.S. |
| Hysteresis | ≤ ±0.5% F.S. |
| Optional Operating Temp | -40°C to 150°C (-40°F to 302°F) |
| Dimensions (mm) | Ø12.5 x 3.5 |
| Typical Apps | Dental and biomechanical, surface mount assembly system, production validation test |



XFTC300 Series

| | |
|--------------------------------|---|
| Package | Low/high capacity dual stud |
| Operating Mode | Tension and compression |
| Unique Features | <ul style="list-style-type: none"> –High stiffness –High overload capacity –Threaded male / female fitting |
| Ranges N (Lbf) | 2 to 2K (0.4 to 400) |
| Max Over-range | 2X to 4X F.S. |
| Output / Span | 100 mV (4 V; ±5 V optional) |
| Non-linearity | ≤ ±0.5% F.S. |
| Hysteresis | ≤ ±0.5% F.S. |
| Optional Operating Temp | -40°C to 150°C (-40°F to 302°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Material test, tool forces, robotics end effectors |

Load Cells

Standard



ELHM, ELHS

| | |
|--------------------------------|--|
| Package | High capacity dual stud or button style |
| Operating Mode | Tension and compression |
| Unique Features | <ul style="list-style-type: none"> – Tension and compression or compression only – High stability metal foil strain gage (ELHM) – High output semiconductor strain gage (ELHS) – NIST traceable calibration provided |
| Ranges N (Lbf) | 1K to 50K (200 to 10K) |
| Max Over-range | 1.5X F.S. |
| Output / Span | 10 mV (ELHM), 200 mV FSO (ELHS) |
| Non-linearity | 0.3% to 0.5% FSO |
| Hysteresis | Combined with linearity |
| Optional Operating Temp | -50°C to 120°C (ELHM), -20°C to 80°C (ELHS) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Robust general purpose, low deflection design: machine tool, linkage forces |



FN3002

| | |
|--------------------------------|---|
| Package | Very high capacity dual stud |
| Operating Mode | Tension and compression |
| Unique Features | <ul style="list-style-type: none"> – Threaded male fitting – Integrated amplifier – Optional rod end |
| Ranges N (Lbf) | 10K to 2,000K (2K to 400K) |
| Max Over-range | 1.5X F.S. |
| Output / Span | ±20 mV (4 V; ±5 V optional) |
| Non-linearity | ±0.25% F.S. |
| Hysteresis | Combined with linearity |
| Optional Operating Temp | -40°C to 150°C (-40°F to 302°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Assembly forces, tool force, offshore |



FN2420

| | |
|--------------------------------|---|
| Package | Very high capacity load button |
| Operating Mode | Compression |
| Unique Features | <ul style="list-style-type: none"> – High stiffness – Optional load button – Optional high level output module |
| Ranges N (Lbf) | 20K to 5,000K (4K to 1,000K) |
| Max Over-range | 1.5X F.S. |
| Output / Span | 20 mV (4 V; 5 V) |
| Non-linearity | ±0.1% F.S. |
| Hysteresis | ±0.1% F.S. |
| Optional Operating Temp | -40°C to 150°C (-40°F to 302°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Calibration presses, robotics and effectors, laboratory and research |



FN1010

| | |
|--------------------------------|--|
| Package | Load pin design |
| Operating Mode | Tension and compression |
| Unique Features | <ul style="list-style-type: none"> – Keyed antirotation slot – Bidirectional available – Optional watertight construction |
| Ranges N (Lbf) | 10K to 2,000K (2K to 400K) |
| Max Over-range | 1.5X F.S. |
| Output / Span | ±20 mV (4 V; ±5 V; 4 - 20 mA optional) |
| Non-linearity | ±1% F.S. |
| Hysteresis | Combined with linearity |
| Optional Operating Temp | -20°C to 80°C (-4°F to 176°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Crane monitoring, offshore, load-limited devices |

S-Beam Standard



FN3030

| | |
|--------------------------------|---|
| Package | S-beam |
| Operating Mode | Tension and compression |
| Unique Features | <ul style="list-style-type: none"> – Optional rod ends – Optional high level output – Low cost |
| Ranges N (Lbf) | 50 to 100K (10 to 20K) |
| Max Over-range | 1.5X F.S. |
| Output / Span | ±20 mV (4 V; ±5 V optional) |
| Non-linearity | ±0.1% F.S. |
| Hysteresis | Combined with linearity |
| Optional Operating Temp | -40°C to 150°C (-40°F to 302°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Laboratory and research, process control, robotics and effectors |



FN3060

| | |
|--------------------------------|--|
| Package | S-beam |
| Operating Mode | Tension and compression |
| Unique Features | <ul style="list-style-type: none"> – Fatigue rated – Optional high level output – S-beam technology |
| Ranges N (Lbf) | 250 to 2.5K (50 to 500) |
| Max Over-range | 1.5X F.S. |
| Output / Span | ±15 mV (4 V; ±5 V optional) |
| Non-linearity | ±0.1% F.S. |
| Hysteresis | Combined with linearity |
| Optional Operating Temp | -40°C to 120°C (-40°F to 248°F) |
| Dimensions (mm) | 50 x 25 x 60 |
| Typical Apps | Test bed, dynamic fatigue testing, robotics and effectors |



FN3148

| | |
|--------------------------------|---|
| Package | S-beam with stops |
| Operating Mode | Tension and compression |
| Unique Features | <ul style="list-style-type: none"> – Very high accuracy – High resolution – Mechanical stops |
| Ranges N (Lbf) | 10 to 2K (2 to 400) |
| Max Over-range | 5X to 100X F.S. |
| Output / Span | ±20 mV (4 V; ±5 V optional) |
| Non-linearity | < ±0.05% F.S. |
| Hysteresis | Combined with linearity |
| Optional Operating Temp | -40°C to 120°C (-40°F to 248°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Product validation tests, medical instruments, weighing |



FN7110

| | |
|--------------------------------|---|
| Package | Dual S-beam range |
| Operating Mode | Tension and compression |
| Unique Features | <ul style="list-style-type: none"> – High resolution – Optional high level output – Double range |
| Ranges N (Lbf) | 10 / 100 to 1K / 10K (2 / 20 to 200 / 2K) |
| Max Over-range | 1.2X F.S. of the higher range |
| Output / Span | ±20 mV (4 V; ±5 V optional) |
| Non-linearity | ±0.1% F.S. of each range |
| Hysteresis | |
| Optional Operating Temp | -20°C to 80°C (-4°F to 176°F) |
| Dimensions (mm) | 60 x 30 x 100 |
| Typical Apps | Product validation tests, process control, robotics and effectors |

Load Cells

Low Profile and Pan-Cake



FMT

| | |
|--------------------------------|--|
| Package | Washer |
| Operating Mode | Compression |
| Unique Features | <ul style="list-style-type: none"> –High stiffness –1.5X over-range –High temperature |
| Ranges N (Lbf) | 20K to 320K (4K to 64K) |
| Max Over-range | 1.5X F.S. |
| Output / Span | 15 to 20 mV |
| Non-linearity | 1 to 5% F.S. |
| Hysteresis | Combined with linearity |
| Optional Operating Temp | -40°C to 150°C (-40°F to 302°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Robotics, process control, bolt clamping for bridges |



FN3050

| | |
|--------------------------------|--|
| Package | Pan-Cake |
| Operating Mode | Tension and compression |
| Unique Features | <ul style="list-style-type: none"> –Connector or cable gland output –Same housing all ranges –Optional high level output –Optional compression stops |
| Ranges N (Lbf) | 100 to 20K (20 to 4K) |
| Max Over-range | 1.5X F.S. (10X F.S. with stops) |
| Output / Span | ±15 mV (4 V; ±5 V optional) |
| Non-linearity | ±0.1% F.S. |
| Hysteresis | ±0.1% F.S. |
| Optional Operating Temp | -40°C to 150°C (-40°F to 302°F) |
| Dimensions (mm) | Ø70 x 25 |
| Typical Apps | Regulation, laboratory and research, robotics |



FN3000

| | |
|--------------------------------|--|
| Package | High capacity Pan-Cake |
| Operating Mode | Tension and compression |
| Unique Features | <ul style="list-style-type: none"> –High stability –Aluminum or stainless steel –Optional high level output |
| Ranges N (Lbf) | 10K to 1000K (2K to 200K) |
| Max Over-range | 1.5X F.S. |
| Output / Span | ±20 mV (4 V; ±5 V optional) |
| Non-linearity | ±0.1% F.S. |
| Hysteresis | ±0.1% F.S. |
| Optional Operating Temp | -40°C to 150°C (-40°F to 302°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Static fatigue tests, weighing calibration, robotics |



FN7325

| | |
|--------------------------------|---|
| Package | Custom design/ranges available upon request |
| Operating Mode | Multiaxial force and torque |
| Unique Features | <ul style="list-style-type: none"> –Measures Load / Torque in 3 directions –Fatigue rated –Minimal cross effects |
| Ranges N (Lbf) | 5K to 250K (1K to 50K) |
| Max Over-range | 1.2X F.S. |
| Output / Span | ±100 to 150 mV (4 V; ±5 V optional) |
| Non-linearity | ±1% F.S. |
| Hysteresis | Combined with linearity |
| Optional Operating Temp | -20°C to 80°C (-4°F to 176°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Structure testing, crash testing, industrial test benches |

Torque Meters

Reaction and Rotary



CS1060

| | |
|--|---|
| Package | Square male coupling |
| Operating Mode | Reaction |
| Unique Features | <ul style="list-style-type: none"> –Optional high level output –Static measurements |
| Ranges Nm(Lbf-ft) | ±5 to ±7K (±4 to ±5.6K) |
| Max Over-range | 1.5X F.S. |
| Output / Span | ±20 mV (4 V; ±5 V optional) |
| Combined Non-linearity & Hysteresis | < ±0.25% F.S. |
| Optional Operating Temp | -20°C to 100°C (-4°F to 212°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Non-rotating parts torque measurement, robotics and effectors, laboratory and research |



CS1120

| | |
|--|---|
| Package | Keyed shaft connections |
| Operating Mode | Reaction |
| Unique Features | <ul style="list-style-type: none"> –Optional high level output –Excellent temp. stability |
| Ranges Nm(Lbf-ft) | ±5 to ±2.5K (±4 to ±2K) |
| Max Over-range | 1.5X F.S. |
| Output / Span | ±20 mV (4 V; ±5 V optional) |
| Combined Non-linearity & Hysteresis | < ±0.25% F.S. |
| Optional Operating Temp | -20°C to 100°C (-4°F to 212°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Non-rotating parts torque measurement, robotics and effectors, laboratory and research |



CS1210

| | |
|--|--|
| Package | Collar mechanical fittings |
| Operating Mode | Reaction |
| Unique Features | <ul style="list-style-type: none"> –High stiffness –Optional high level output |
| Ranges Nm(Lbf-ft) | ±160 to ±10K (±128 to ±8K) |
| Max Over-range | 1.5X F.S. |
| Output / Span | ±20 mV (4 V; ±5 V optional) |
| Combined Non-linearity & Hysteresis | < ±0.25% F.S. |
| Optional Operating Temp | -40°C to 150°C (-40°F to 302°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Non-rotating parts torque measurement, robotics and effectors, laboratory and research |



CD1050

| | |
|--|--|
| Package | Square male couplings |
| Operating Mode | Dynamic rotary |
| Unique Features | <ul style="list-style-type: none"> –Optional high level output –Rugged |
| Ranges Nm(Lbf-ft) | ±5 to ±7K (±4 to ±5.6K) |
| Max Over-range | 1.5X F.S. |
| Output / Span | ±20 mV (4 V; ±5 V optional) |
| Combined Non-linearity & Hysteresis | < ±0.25% F.S. |
| Optional Operating Temp | -20°C to 80°C (-4°F to 176°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Engine efficiency, robotics and effectors, laboratory and research |

Automotive Design and Test Sensors



FN4070 - FN4080

| | |
|--------------------------------|--|
| Package | Seat belt buckle sensor |
| Operating Mode | Tension |
| Unique Features | <ul style="list-style-type: none"> –High operating ranges –Detachable tongue and cable –Compatible with most seat belts |
| Ranges N (Lbf) | 250 to 50K (50 to 10K) |
| Max Over-range | 1.5X F.S. |
| Output / Span | 15 to 20 mV |
| Non-linearity | ±0.5% F.S. |
| Hysteresis | Combined with linearity |
| Optional Operating Temp | -20°C to 80°C (-4°F to 176°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Auto crash testing, tension at the belt receptacle |



FN2317

| | |
|--------------------------------|---|
| Package | Hand brake |
| Operating Mode | Compression |
| Unique Features | <ul style="list-style-type: none"> –Easily installed –Ergonomic design –Fits most vehicles |
| Ranges N (Lbf) | 500 to 1K (100 to 200) |
| Max Over-range | 1.5X F.S. |
| Output / Span | ±20 mV (4 V optional) |
| Non-linearity | ±0.5% F.S. |
| Hysteresis | Combined with linearity |
| Optional Operating Temp | -20°C to 80°C (-4°F to 176°F) |
| Dimensions (mm) | 100 x 20 x 15 |
| Typical Apps | Hand brake, test bed |



FN2114 - FN2570

| | |
|--------------------------------|---|
| Package | Brake pedal |
| Operating Mode | Compression |
| Unique Features | <ul style="list-style-type: none"> –High accuracy –Extra flat –Compact –Rugged design |
| Ranges N (Lbf) | 200 to 3K (40 to 600) |
| Max Over-range | 1.5X F.S. |
| Output / Span | 15 to 20 mV (4 V optional) |
| Non-linearity | < ±1% F.S. (FN2114); < ±2.5% F.S. (FN2570) |
| Hysteresis | Combined with linearity |
| Optional Operating Temp | -20°C to 80°C (-4°F to 176°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Brake pedal, clutch pedal, test bed |



FN7080

| | |
|--------------------------------|---|
| Package | Gear stick design |
| Operating Mode | Multi-axial |
| Unique Features | <ul style="list-style-type: none"> –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 F.S. |
| Output / Span | ±7.5 mV (4 V; ±5 V optional) |
| Non-linearity | < ±0.3% F.S. |
| Hysteresis | Combined with linearity |
| Optional Operating Temp | -20°C to 80°C (-4°F to 176°F) |
| Dimensions (mm) | Ø 25 (0.98) spherical |
| Typical Apps | Change gear force measurement, roughness of material |



FCA7300

| | |
|--------------------------------|---|
| Package | Steering wheel adaptable |
| Operating Mode | Multi-sensing |
| Unique Features | <ul style="list-style-type: none"> –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 F.S. |
| Output / Span | ±10 V |
| Non-linearity | ±0.1% F.S. |
| Hysteresis | ±0.1% F.S. |
| Optional Operating Temp | -20°C to 80°C (-4°F to 176°F) |
| Dimensions (mm) | Ø 195 x 50 |
| Typical Apps | On car road test, truck and buses steering test, armored vehicles steering test |



EL20-S458

| | |
|--------------------------------|---|
| Package | Special purpose design optimized for automotive crash test environments |
| Operating Mode | Seat-belt tension |
| Unique Features | <ul style="list-style-type: none"> –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 (1000 and 3200) |
| Max Over-range | 2X |
| Output / Span | 10 mV (0.5 - 4.5 V optional) |
| Non-linearity | 1.0% to 3.0% F.S.O. |
| Hysteresis | Combined with linearity |
| Optional Operating Temp | -40°C to 120°C (-40°F to 248°F) |
| Dimensions (mm) | Application dependent |
| Typical Apps | Seat belt forces, safety and restraint system crash test, parachute tether/riser forces |



ARD154

| | |
|--------------------------------|---|
| Package | Din rail mountable |
| Operating Mode | Signal conditioning for Wheatstone bridge sensors |
| Unique Features | <ul style="list-style-type: none"> – Suited for full bridge strain gage sensors – 120 to 10000 Ohm bridge Impedance – ± 10 V Analogue or 0 / 4 - 20 mA current output – 2 kHz or 20 kHz max. bandwidth – Calibration pushbutton from 0.1 to 10 mV/V |
| Ranges N (Lbf) | Application dependent |
| Output / Span | ± 10 V max; 4 - 20 mA or 0 - 20 mA |
| Accuracy | 0.01% F.S. |
| Optional Operating Temp | -10°C to 60°C (14°F to 140°F) |
| Dimensions (mm) | 99 x 17.5 x 112 |
| Typical Apps | Test stands, power plants, manufacturing systems, test and measurement, test bed regulation, automat interfaces |



M210

| | |
|--------------------------------|---|
| Package | Front panel or housed in case |
| Operating Mode | Signal conditioning and display meter |
| Unique Features | <ul style="list-style-type: none"> – Analog output : ± 10 V – Red LED display : $\pm 2,000$ count – High bandwidth: 1,000 Hz at -3 dB – Low noise level |
| Ranges N (Lbf) | Application dependent |
| Output / Span | ± 10 Vdc |
| Accuracy | $\pm 0.05\%$ F.S. |
| Optional Operating Temp | 0°C to 50°C (32°F to 122°F) |
| Dimensions (mm) | 96 x 48 x 155 |
| Typical Apps | High bandwidth test bed display, monitoring, laboratory and research, process control equipment |



M905

| | |
|--------------------------------|--|
| Package | Front panel or housed in case |
| Operating Mode | Display suited for process or strain gauge type sensors |
| Unique Features | <ul style="list-style-type: none"> – Suited for process or strain gauge type sensors – 5 digits: -19999 to 19999 – Front panel programming – 11 point scaling – Plug-in option boards |
| Ranges N (Lbf) | Application dependent |
| Output / Span | ± 10 Vdc or 4 - 20 mA with option |
| Accuracy | ± 15 bits, 20 sample/sec |
| Optional Operating Temp | -10°C to 60°C (14°F to 140°F) |
| Dimensions (mm) | 96 x 48 x 60 |
| Typical Apps | Display on test bed, monitoring, laboratory and research |

temperature

solutions by sensor type

Measurement Specialties (MEAS) is the market leader in temperature measurement. MEAS manufactures NTC thermistors, RTDs, thermocouples, thermopiles, digital output and customized sensor assemblies. Building on over 100 years of experience, our unique know-how allows MEAS to cover the largest range of temperature measurement, control and compensation applications in the industry. We offer the widest selection of temperature products which meet the specific demands of temperature sensing OEM applications including medical, aerospace, automotive, instrumentation appliances, motor control and HVACR. MEAS has years of extensive and successful support to these industries. You can count on Measurement Specialties to deliver high quality products, engineering expertise and cost-effective temperature solutions that make us the number one choice for your application.



Sensing Elements— NTC, RTD, Digital Output

Analog Output



NTC Thermistor Chips

| | |
|-------------------------|---|
| Package | Leadless Chips SMD 0402, 0603, 0805 |
| Type | Gold or silver electrodes, Surface mounted |
| Resistance Range | Chip: 100 to 1M Ω / SMD: 40 to 500k Ω |
| Unique Features | –Wire bonding compatible –End band SMD |
| Accuracy | $\pm 1\%$ to 10% |
| Operating Temp. | -40°C to 125°C |
| Dimensions (mm) | Chip: 0.6mm - 1.0 mm square SMD 0402: 1 x 0.5 x 0.7 SMD 0603: 1.6 x 0.8 x 1 SMD 0805: 2 x 1.25 x 1.2 |
| Typical Apps | Temperature compensation, communication (DWDMM), infrared sensing systems, PCB mounting temperature measurement |



Radial Leaded Thermistors

| | |
|-------------------------|--|
| Package | Radial, beads |
| Type | Epoxy or glass coated |
| Resistance Range | 100 to 1M Ω |
| Unique Features | –Interchangeable –Moisture resistant –Stability |
| Accuracy | 0.25% to 20% |
| Operating Temp. | -55°C to 280°C |
| Dimensions (mm) | 0.4 to 4.9 |
| Typical Apps | Temperature sensing for OEM, automotive, medical, HVAC |



Axial Leaded Thermistors

| | |
|-------------------------|--|
| Package | DO-35 |
| Type | Glass coated |
| Resistance Range | 5k Ω to 100k Ω |
| Unique Features | –Tight tolerance ($\pm 1\%$) –Max stability using high density (HD) chip –Hermetically sealed –Tinned & Nickel plated leads |
| Accuracy | $\pm 1\%$ to $\pm 3\%$ |
| Operating Temp. | -40°C to 300°C |
| Dimensions (mm) | 2.0 x 4.0 body |
| Typical Apps | Refrigeration including cabinet sensing and evaporator coil, white goods, fire detection units, air-conditioning systems, PCB temp sensing |



Space Qualified (Hi-Rel)

| | |
|-------------------------|---|
| Package | Radial, bead, custom |
| Type | NTC, Epoxy, glass, probes |
| Resistance Range | 1k Ω to 100k Ω |
| Unique Features | –ESA and NASA approved –High reliability and accuracy |
| Accuracy | 0.5% to 10% |
| Operating Temp. | -55°C to 115°C |
| Dimensions (mm) | From 2.4 |
| Typical Apps | Instrumentation and compensation for aerospace applications |



Nickel RTD

| | |
|-------------------------|--|
| Package | –SOT 23 –Bare die on request |
| Type | –Thin film nickel structure on silicon substrate, protected with a passivation layer –SOT23 package for SMT –Bare die for COB assembly |
| Resistance Range | 1000 Ω |
| Unique Features | –Harsh environment compatible –Automotive qualified –Very small dimensions –Very short response time –Good linearity –High temperature coefficient –Low power consumption –Good thermal connection of sensing element through leadframe-pin |
| Accuracy | Class B, according to former DIN 43760 standard |
| Operating Temp. | -55 °C to 160 °C |
| Dimensions (mm) | 2.1 x 2.5 x 2.1 (SOT23) 0.7 x 0.7 x 0.4 (bare die) |
| Typical Apps | Automotive, industrial, OEM, thermal compensation, thermal management |

Digital Output



TSYS Series

| | |
|------------------------|---|
| Package | QFN16, TDFN8 |
| Type | I ² C, SPI, PWM, SDM (convertible to analog voltage) |
| Unique Features | –Low power –Small size –Calibrated and ready to use –16 bit resolution |
| Accuracy | Up to $\pm 0.1^\circ\text{C}$ at -5°C to 50°C |
| Operating Temp. | -40°C to 125°C |
| Dimensions (mm) | QFN16: 4 x 4 x 0.85 TDFN8: 2.5 x 2.5 x 0.75 |
| Typical Apps | Industrial control, replacement of precision RTDs, thermistors and NTCs, heating/cooling systems, HVACR |

Sensing Elements— NTC, RTD, Digital Output

Analog Output



RTD **Platinum Thin Film Chips**

NEW

Package Leadless chips

Type

- Thin film platinum deposited on ceramic substrate
- Contact pads on top and bottom side for NTC chip like assembly
- Contact pads on both ends for SMT

Resistance Range 100Ω, 1000Ω (Other values on request)

Unique Features

- Long term stability
- Interchangeability
- 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 Apps White goods, automotive, industrial, aerospace, medical, test and measurement



Platinum Thin Film Sensors

NEW

Wired component

–Thin film platinum deposited on ceramic substrate, glass coated
–Tube outline available
–Connection via radial leads

100Ω, 1000Ω (Other values on request)

–Long term stability
–Interchangeability
–Small dimensions
–Short response time
–High electrical insulation

Class T (F0.1), A (F0.15), B (F0.3) according to DIN EN 60751

-50 °C to 600°C (standard) down to -200 °C or up to 1000 °C (on request)

2.0 x 2.3 x 1.1 (standard)
1.2 x 4.0 x 1.1 (standard)
other dimensions (on request)

White goods, automotive, industrial, aerospace, medical, test and measurement



Glass Wire Wound Sensors

GO, GX

Glass rod, radial leads

100Ω (2x100Ω on few versions)

–Aggressive environments (acid, oil, solvent)
–Small dimensions
–Stability
–No hysteresis
–Short response time
–Interchangeability

Class W0.3, W0.15, W0.1 according to IEC60751

-200°C to 400°C

Ø 1.8 / Length 5mm to Ø 4.5 / Length 48mm

Oil and chemical industry, aviation, aeronautic, food industry



Ceramic Wire Wound Sensors

CWW600, CWW850, CWW1000

Ceramic rod, radial leads

100Ω (2x100Ω on few versions)

–High temperature
–Stability
–No hysteresis
–Small dimension
–Interchangeability

Class W0.3, W0.15, W0.1 according to IEC60751

-200°C to 600°C (CWW600)
-200°C to 850°C (CWW850)
-200°C to 1000°C (CWW1000)

Ø 1.5 / Length 8 mm to Ø 4.5 / Length 30 mm
Ø 2.7 / Length 45 mm (CWW1000)

Process industry, laboratories, reference sensors

Sensor Assemblies



Ring Sensors

Package

- Ring for surface assembly
- Threaded bolt, tube style

Type Epoxy potted element

Sensor Range

- NTC
- RTD: Pt, Ni

Unique Features

- Surface mount sensing
- For use where space is limited
- Simple installation

Accuracy

- NTC: Custom tolerances available
- Pt RTD: Class AA, A, B according to IEC60751

Operating Temp. Varies: -50°C to 250°C

Dimensions (mm) Case specific dimensions

Typical Apps Surface plates, heat exchangers, fluid pumping systems, generators



Push-in Sensors

Brass, copper or stainless steel closed-end tube

Epoxy potted element, miniature design

–NTC
–RTD: Pt, Ni
–Thermocouple: Type J, K, T, E

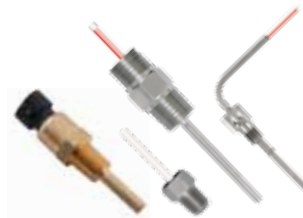
–Corrosion resistant
–Available with mounting tabs or clips

–NTC: Custom tolerances available
–Pt RTD: Class AA, A, B according to IEC60751

Varies: -50°C to 250°C

Case specific dimensions

Boiler, liquid, evaporator, HVACR, industrial processes control, district heating/cooling, automotive, bearing monitoring, motors, gear boxes



Screw-in Sensors

Brass, copper or stainless steel housing with integrated connector

Epoxy potted element, rigid sheath

–NTC
–RTD: Pt, Ni, Cu
–Thermocouple: Type J, K, T, E

–Corrosion resistant
–Different threads types
–Connectors available

–NTC: Custom tolerances available
–Pt RTD: Class AA, A, B according to IEC60751

Varies: -50°C to 250°C

Custom lengths, diameters and threads available

Boiler, liquid, HVACR, industrial processes control, district heating/cooling, immersion



Refrigeration Molded Probes

PVC or TPE

Overmolded

–NTC
–RTD: Pt

–Mounting clips available

–NTC: Custom tolerances available
–Pt RTD: Class AA, A, B according to IEC60751

-40°C to 125°C

8 x 30, 6.5 x 25, 6 x 50, 6 x 5 x 15

HVACR, industrial processes control



| | Pipe Clamp Sensors | Pipe Mount Sensors NEW | Outdoor Air Sensors NEW | Boiler Sensors |
|------------------------|---|---|---|--|
| Package | Plastic housing with metal insert | Copper or Stainless Steel housing | Metal housing with PVC sun shield with or without weatherproof box | Brass housing |
| Type | –Overmolded –Epoxy potted | –Overmolded –Epoxy potted | Fully potted subassembly | Screw |
| Sensor Range | –NTC –RTD: Pt | –NTC | –NTC | –NTC –RTD: Pt, Ni, Cu |
| Unique Features | –Different pipe diameters available | –Fast response time –Moisture resistant construction | –Easy installation – just threads into mounting hole or standard handy box –Fully potted housing protects sensing element and provides fast, accurate response | –Integrated connector –Corrosion resistant –Different threads types and connectors available |
| Accuracy | –NTC: Custom tolerances available | –NTC: Custom tolerances available | ±0.2°C at 0°C to 70°C | –NTC: Custom tolerances available –Pt RTD: Class AA, A, B according to IEC60751 |
| Operating Temp. | -40°C to 105°C | -40°C to 125°C | -40°C to 105°C | Varies: -50°C to 250°C |
| Dimensions (mm) | Custom diameters available | Custom configurations available | 12mm dia X 64mm | Custom lengths, diameters and threads available |
| Typical Apps | Pipe surface temperature sensing, HVACR | Industrial process, boiler control, HVACR, refrigeration, food service, energy management, test equipment | Residential and commercial building controls, energy management systems | Boiler control, liquid, industrial processes control, district heating/cooling, immersion |



| | Oven Sensors | Pool and Spa Sensors NEW | Urea Temperature Sensors NEW | Exhaust Gas Temperature Probes |
|------------------------|--|--|---|---|
| Package | Stainless steel housing | Plastic or metal housing with O-ring seal designed for band clamp or backing nut | Plastic housing with screw hole mountings | EGT thermocouple probe |
| Type | –Pt element encapsulated into ceramic tube, with rigid stainless steel housing –High temperature cable | Overmolded sub-assembly | Overmolded plastic housing with integrated 2 pin connector | –Mineral insulated alloy sheath, screwed mechanical interface, cable extension and automotive connector –Option: CAN bus interface (from 1 to 4 thermocouples, fully configurable) |
| Sensor Range | Pt100, Pt500, Pt1000 sensor | NTC | NTC | Thermocouple: Type K, N |
| Unique Features | –High temperature –Easy integration/installation –Higher dielectric strength according to type | –O-ring seals –Compatible with pool and spa chemicals | –Temperature measurement of urea liquid used in selective catalytic reduction (SCR) systems –Suitable for high pressure applications | –High temperature, robust design –Vibration and corrosion resistant –Fast response time |
| Accuracy | Class B, C according to IEC60751 | ±0.2°C | –NTC: Custom tolerances available –±2%, 3% and 5% –Beta 25/85 : 3976 | Class 1 according to IEC584 |
| Operating Temp. | -20°C to 750°C (according to version) | 0°C to 90°C | -40°C to 125°C | -40°C to 900°C |
| Dimensions (mm) | –OD Ø 4 mm to Ø 6 mm –Immersion length 35 mm to 100 mm –Custom mechanical interface and cable length | 6.4 x 50mm | Sensor tip 8mm diameter | –Ø OD 4 to Ø OD8 mm –Custom immersion length and cable length |
| Typical Apps | Drying oven, domestic oven | Pools, hot tubs | Temperature measurement of urea liquid used in SCR systems | Automotive, truck, mining, power unit, racing |

Sensor Assemblies



| | Micro-Thermocouples | Patient Monitoring Probes | TLH Reference Probe | USB Temperature Probe NEW |
|------------------------|--|--|---|---|
| Package | – Fine gage thermocouples | Sensor with cable and connector | TLH100 / TLH600 | Push-in probe with handle |
| Type | – Micro sized thermocouple: 44 AWG, 40 AWG, 38 AWG, 36 AWG – Polymer encapsulated or bare junction | Reusable: Skin; 10FR & 12FR GP Disposable: Skin; 9FR & 12FR GP; 12FR, 18FR, 24FR Esoph/Stethoscope; 14FR, 16FR, 18FR Foley Catheter | Rigid protective external sheath of Inconel600 and stainless steel handle, unique internal design to insure stability | – Versatile Push-in probe with stainless steel or Inconel600 sheath and plastic or stainless steel handle – High precision sensing element combined with integrated electronics for signal processing, calibration and USB interface |
| Sensor Range | Thermocouple Type: T, K | 400 Series, 700 Series (Reusable only) | Pt100 sensor | Not applicable due to direct digital output |
| Unique Features | – Welded or soldered junction – Low profile, fast response – Polyesterimide wire insulation | – Autoclavable reusables – Sterile disposables | – Stability – Provided with calibration report or option of calibration certificate by national committee for accreditation (COFRAC) | – USB conformal interface – Calibrated digital output, recalibration possible on request – Robust design for general purpose applications – Long term stability |
| Accuracy | Varies by Type: standard, special and custom limits or error available | Probes meet both: EN-12470: $\pm 0.1^{\circ}\text{C}$ at 25°C to 45°C ISO-80601-2-56: $\pm 0.2^{\circ}\text{C}$ at 35°C to 42°C | Class B (TLH600), A (LTH100) according to IEC60751 | $\pm 0.1^{\circ}\text{C}$ for temperature range -5°C to 55°C $\pm 0.2^{\circ}\text{C}$ for temperature range -40°C to 160°C Other accuracies on request |
| Operating Temp. | Varies by Type: Rated up to 240°C | -40°C to 100°C Patient: 0°C to 50°C | -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 Other temperature ranges on request |
| Dimensions (mm) | Varies by thermocouple gauge | Reusable: 3 m cable with sensor Disposable: Sensor < 1 m; 3 m reusable adaptor cable | OD $\varnothing 5 \times 500$ + handle $\varnothing 15 \times 100$ typical cable length = 2 m | OD $\varnothing 6 \times 200$ + handle $\varnothing 19 \times 100$ typical cable length = 2000 |
| Typical Apps | Medical, catheters | Patient monitoring, laboratory | Laboratory, temperature sensors calibration by comparison | Laboratory, mobile research, test and measurement |



| | Stator Sensors NEW | Surface Sensors NEW | Bearing Sensors NEW |
|------------------------|---|---|--|
| Package | – TPE / CPME – G11 Epoxy glass laminated, Class F or H | – Silicone rubber or polyimide laminated element – SP683 | – Copper alloy tip – Stainless steel, isolated stainless steel or epoxy glass case |
| Type | – Rigid flat / slot sensor – Cable / leadwire options | – Flat, flexible, rectangular sensor – Variety of designs available | – Rigid sheath – Tip sensitive – Cable / leadwire options |
| Sensor Range | – RTD: Pt, Ni, Cu – Thermocouple: Type J, K, T, E | – RTD: Pt, Ni, Cu – Thermocouple: Type J, K, T, E | – RTD: Pt, Ni, Cu – Thermocouple: Type J, K, T, E |
| Unique Features | – Extended sensitive length – Single or dual elements – Smackproof design – Calibration available | – Surface sensing for curved or uneven surfaces – Noninvasive, simple installation – Adhesive backing option | – Cut-to-length – Copper tip for fast time response – Assemblies with fluid seal and spring loading – Single or dual elements |
| Accuracy | RTD: Class A, B according to IEC60751 | RTD: Class A, B according to IEC60751 | RTD: Class A, B, C according to IEC60751 |
| Operating Temp. | Max. temp: Class F, 155°C Max. temp: Class H, 180°C Available up to 200°C | Varies: -50°C to 200°C Available up to 220°C | Sheath specific, up to 250°C |
| Dimensions (mm) | Custom dimensions available | Custom dimensions available | Custom lengths Standard sheath diameters: 4.78, 5.46, 6.35 |
| Typical Apps | Monitor temperature between stator coils, electric motors, generators | Chemical and pharmaceutical industry, process industry, laboratory, aerospace, motor end windings of stator coils, generators | Bearing monitoring, electric motors, generators |



Thermocouple

| | |
|------------------------|---|
| Package | Screw-in or push-in design with cable extension, connector, or connecting head |
| Type | <ul style="list-style-type: none"> –Collapsible Mineral Insulated (MI) with alloy sheath (radius $\geq 5 \times OD$) –Flexible cable with plastic or composite insulation –Rigid protection sheath: ceramic, quartz or alloy sheath |
| Sensor Range | Type T, J, K, N, R, S, B (According to TC type and insulation type) |
| Unique Features | <ul style="list-style-type: none"> –High temperature and high vibration level (for MI) –Available in small diameters for fast respond time –Grounded or ungrounded or apparent hot junction –Single or multiple measuring points |
| Accuracy | Class 1 according to IEC584 |
| Operating Temp. | -40°C to 1700°C (according to TC type and insulation type) |
| Dimensions (mm) | <ul style="list-style-type: none"> –OD Ø0.3 mm to Ø8 mm for MI –Ø0.15mm for smallest flexible cable –Custom dimensions, fittings and cable lengths (from few centimeters to many meters) |
| Typical Apps | Aeronautic, process industry, medical, semiconductor industry (spike, profile) |

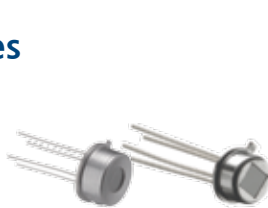


Transmitter

NEW

| |
|---|
| Brass, copper and stainless steel housing, flexible sheath with integrated connector. |
| <ul style="list-style-type: none"> –Epoxy potted element –Screw In |
| 4-20mA Output |
| <ul style="list-style-type: none"> –Compact, welded design –Highly sensitive and stable –High vibration application –Good waterproof properties |
| 0.5 or 1%FS |
| -20°C to 120°C |
| <ul style="list-style-type: none"> –Customer sheath length, thread type –Probe diameter: Ø4.75 mm; Ø5 mm; Ø6 mm; Ø6.35 mm; Ø8 mm |
| Heavy industry, general industrial monitoring |

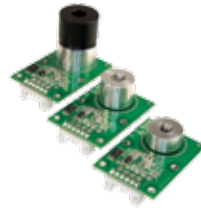
Thermopiles



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 1000°C) |
| Unique Features | <ul style="list-style-type: none"> –High signal output –Accurate reference sensors |
| Accuracy | Depends on applied electronics and calibration |
| Operating Temp. | Ambient temperature range: -20°C to 85°C |
| Dimensions (mm) | 9 x 9 x 17.6 |
| Typical Apps | Medical thermometer (ear, forehead), pyrometer |



TSEV

Single Pixel Series

| |
|---|
| OEM-module |
| Single-pixel thermopile module |
| Object temperature range 0°C to 300°C Other temperature ranges available upon request |
| <ul style="list-style-type: none"> –Calibrated, Interfaces: I²C, SPI –Different field of views: 5° at 50%, 10° at 50%, 90° at 50%, others on request |
| Depends on temperature range, typical 1% full scale, max. accuracy 0.1°C |
| Ambient temperature range: 0°C to 85°C |
| 35 x 25 x 13 to 31 |
| Contactless temperature measurement, e.g. on moving parts or heated rolls, laminators, people detection, microwave oven, air conditioner |



TSEV

Multi Pixel Series

| |
|--|
| OEM-module |
| 8-pixels-linear array thermopile module |
| Object temperature range -20°C to 120°C |
| <ul style="list-style-type: none"> –Calibrated and ready to use –Digital output –Small field of view |
| Depends on temperature range, typical 2% full scale |
| Ambient temperature range: -20°C to 85°C |
| 25 x 35 x 15.2 |
| Contactless temperature measurement, e.g. on moving parts or heated rolls, laminators, people detection, microwave oven, air conditioner |



TPT Series

TPT300V

| |
|--|
| IP65 stainless steel tube |
| Thermopile system for industrial use |
| Object temperature range 0°C to 300°C |
| <ul style="list-style-type: none"> –Calibrated and ready to use –Digital or analogue outputs –Small field of view |
| Depends on temperature range, typical 1% full scale |
| Ambient temperature range: 0°C to 85°C |
| 111 x 17 x 17 |
| Contactless temperature measurement, e.g. on moving parts or heated rolls, control of assembly lines, paper fabrication, drying applications |

humidity

solutions by sensor type

Based on a robust patented capacitive technology, Measurement Specialties offers a complete range of calibrated and amplified products measuring relative humidity. Accurate dew point and absolute humidity measurements are made possible through the combination of relative humidity and temperature measurements. Our products are qualified for the most demanding applications including automotive, heavy truck, aerospace and home appliance. We offer a variety of output signals including digital (frequency, I²C) and analog voltage, as well as customized and proprietary output including PWM, PDM, LIN and CAN.



Humidity and Temperature (NTC) Components

Analog Output



HS1101LF

| | |
|---------------------------|--|
| Package | Through hole TO39 with side opening plastic cap |
| Type | Capacitive humidity |
| Operating RH Range | 0 to 100% RH |
| Operating Temp | -60°C to 140°C |
| Unique Features | <ul style="list-style-type: none"> –Very robust and recognized component capable of withstanding most of the applications in the humidity world in very cost effective ways |
| Accuracy | 180 pF \pm 3 pF at 55% RH |
| Dimensions (mm) | 10 x 10 x 19 |
| Typical Apps | Applications requiring a robust humidity sensor in automotive, home appliance, outdoor, HVACR, consumer, printer, meteorology |

Digital Output



HTU2X Series

NEW

| | |
|---------------------------|---|
| Package | DFN type |
| Type | Digital RH and temperature |
| Operating RH Range | 0 to 100% RH |
| Operating Temp | -40°C to 125°C |
| Unique Features | <ul style="list-style-type: none"> –Low power consumption –Fast response time –Very low temperature coefficient –I²C interface or PWM interface or SDM interface |
| Accuracy | \pm 3% RH at 25°C (10 to 95% RH) \pm 0.3°C at 25°C |
| Dimensions (mm) | 3.0 x 3.0 x 1.0 |
| Typical Apps | Humidity and temperature plug and play transducers for OEM demanding applications in automotive, home appliance, printer, medical, humidifier |



HTU2XF Series

NEW

| | |
|---------------------------|--|
| Package | DFN type |
| Type | Digital RH and temperature |
| Operating RH Range | 0 to 100% RH |
| Operating Temp | -40°C to 125°C |
| Unique Features | <ul style="list-style-type: none"> –Low power consumption –Fast response time –Very low temperature coefficient –I²C interface or PWM interface or SDM interface –Optimal filter |
| Accuracy | \pm 3% RH at 25°C (10 to 95% RH) \pm 0.3°C at 25°C |
| Dimensions (mm) | 3.0 x 3.0 x 1.0 |
| Typical Apps | Humidity and temperature plug and play transducers for OEM demanding applications in automotive, home appliance, printer, medical, humidifier |

Humidity and Temperature (NTC) Mini-Modules

Analog Voltage and Digital Output



HTU3535PVBW/Wire

NEW

| | |
|---------------------------|--|
| Package | Cost effective small size mini-module |
| Type | Analog voltage RH and NTC temperature |
| Operating RH Range | 0 to 100% RH |
| Operating Temp | -40°C to 110°C |
| Unique Features | <ul style="list-style-type: none"> –PTFE filter (optional) –Electronics fully protected (5 Volt) –Multiple connector choices (JST, samtec board to board through hole) –Based on HTU21 |
| Calibration | \pm 3% RH at 55% RH; \pm 0.25°C at 25°C |
| Dimensions (mm) | 27 x 11.9 x YY (depending on the connector, from 6 to 10.8 mm length) |
| Typical Apps | Humidity and temperature plug and play transducers for OEM demanding applications in HVACR, home appliance, printer, medical, and outdoor |



HTU383X/Wire

NEW

| | |
|---------------------------|--|
| Package | Cost effective small size mini-module |
| Type | Digital RH and temperature |
| Operating RH Range | 0 to 100% RH |
| Operating Temp | -40°C to 110°C |
| Unique Features | <ul style="list-style-type: none"> –PTFE filter (optional) –Electronics fully protected (5 Volt) –Multiple connector choices (JST, samtec board to board through hole) –Based on HTU21 |
| Calibration | \pm 3% RH at 55% RH; \pm 0.25°C at 25°C |
| Dimensions (mm) | 27 x 11.9 x YY (depending on the connector, from 6 to 10.8 mm length) |
| Typical Apps | Humidity and temperature plug and play transducers for OEM demanding applications in HVACR, home appliance, printer, medical, and outdoor |



HTG351xCH

| | |
|---------------------------|--|
| Package | Cost effective small size mini-module |
| Type | Analog voltage RH and NTC temperature |
| Operating RH Range | 0 to 100% RH |
| Operating Temp | -40°C to 110°C |
| Unique Features | <ul style="list-style-type: none"> –Electronics fully protected with potting material (3.3 Volt or 5 Volt) –Multiple connector choices (JST, samtec board to board through hole) |
| Calibration | \pm 3% RH at 55% RH; \pm 0.25°C at 25°C |
| Dimensions (mm) | 27 x 11.9 x 6.7 |
| Typical Apps | Humidity and temperature plug and play transducers for OEM low cost consumer applications |

Humidity and Temperature (NTC) Sensors

Frequency Output Systems (Digital)



HTF3000LF

| | |
|---------------------------|---|
| Package | PCB for Board to Board |
| Type | Frequency output for RH, direct NTC for temperature |
| Operating RH Range | 0 to 100% RH |
| Operating Temp | -40°C to 85°C |
| Unique Features | <ul style="list-style-type: none"> –Voltage supply from 3 to 8 Vdc –Through hole or SMD –T&R available |
| Calibration | ±3% RH at 55% RH ±0.25°C at 25°C |
| Dimensions (mm) | 12.5 x 18.5 x 11.2 |
| Typical Apps | Passenger comfort improvement, hygostat, HVACR, printer |

Humidity and Temperature (NTC) Probes

Analog Voltage



HM1500LF

| |
|--|
| Probe / RH only |
| Cost effective analog voltage RH probe |
| 0 to 100% RH |
| -40°C to 60°C |
| <ul style="list-style-type: none"> –Electronics fully protected with potting material –Optional wiring length and connectors |
| ±3% RH at 55% RH |
| 57 x 11 x 11 (standard wire length of 200 mm) |
| Medical, telecommunication cabinets, green houses, process control, industrial |



HM1520LF

| |
|--|
| Probe / RH only |
| Dedicated to low RH accurate measurement |
| 0 to 100% RH |
| -40°C to 60°C |
| <ul style="list-style-type: none"> –Electronics fully protected with potting material –Optional wiring length and connectors |
| ±3% RH at 10% RH |
| 57 x 11.5 x 11.5 (standard wire length of 200 mm) |
| Medical, drying cabinets, low humidity, meteorology |



HTM2500LF

| |
|--|
| Probe RH and temperature |
| Cost effective analog voltage RH |
| 0 to 100% RH |
| -40°C to 85°C |
| <ul style="list-style-type: none"> –Electronics fully protected with potting material –Optional wiring length and connectors |
| ±3% RH at 55% RH ±0.25°C at 25°C |
| 86 x 11.5 x 11.5 (standard wire length of 200 mm) |
| Hygostat, data loggers, baby cabinets |

E&V Humidity and Temperature Modules



H2TG/H2TD Series*

| | |
|---------------------------|--|
| Package | Cost effective module for automotive defogging application |
| Type | <ul style="list-style-type: none"> –Dew point and windshield temperature measurement –Analog or digital (LIN) output |
| Operating RH Range | 0 to 100% RH |
| Operating Temp | -40°C to 85°C |
| Pressure Range | — |
| Unique Features | –Electronics fully protected with potting material |
| Calibration | ±1.5°DP at 10°C ±0.8°C at 25°C |
| Dimensions (mm) | 27 x 32 x YY (depending on the connector, from 6 to 10.8 mm length) |
| Typical Apps | Fogging and cabin energy control |



H2TD368x* NEW

| |
|--|
| Cost effective module for truck defogging application |
| <ul style="list-style-type: none"> –Dew point and windshield temperature measurement –LIN output |
| 0 to 100% RH |
| -40°C to 85°C |
| — |
| <ul style="list-style-type: none"> –Optional Bracket and Cover for installation –Electronics fully protected with potting material –12V or 24V power supply |
| ±1.5°DP at 10°C ±0.8°C at 25°C |
| 22 x 43 x 10 |
| Fogging and cabin energy control |



HTM2500B6Cy*

| |
|--|
| Engine probe for truck and automotive |
| <ul style="list-style-type: none"> –Dew point measurement –Analog output |
| 0 to 100% RH |
| -40°C to 105°C |
| — |
| –Electronics fully protected with potting material |
| ±3% RH at 55% RH ±0.8°C at 25°C |
| 70 x 64.5 x 54.5 (integrated connector) |
| Humidity and temperature engine control |



HTD2800B11C6*

| |
|---|
| TRICAN engine probe for truck and automotive |
| <ul style="list-style-type: none"> –Temperature, SH, pressure measurement –CAN output |
| 0 to 100%RH 0 to 150g/Kg |
| -40°C to 125°C |
| 1 kPa to 115 kPa |
| <ul style="list-style-type: none"> –Configurable CAN Frame –Self diagnostic capabilities to comply with J1939, EPA / EURO and CARB requirements |
| SH: ±2.5g/Kg Temp: ±2°C at 25°C Pressure: ±1% FS |
| 76.3 x 64.3 x 55.9 (integrated connector) |
| Emission control application such as NOx control with air intake measurements, engine management |



HTD2610* NEW



| |
|---|
| Engine probe for truck and automotive |
| <ul style="list-style-type: none"> –Dew point measurement –LIN output |
| 0 to 100% RH |
| -40°C to 125°C |
| — |
| –12V power supply |
| ±1°DP at 25°C |
| 62.24 x 24.0 x 54.0 (integrated connector) |
| Humidity and temperature automotive passenger car, engine and emission management |

* Please consult us for specific request



Measurement Specialties manufactures Mass Air Flow (MAF) sensors for a variety of Automotive, Medical and Industrial Gas Flow applications where reliable and accurate measurements are specified. 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 easily installed. Suitable for hot and cold potable water, these sensors have rugged brass housings and operate from a small head of water.

Mass Air Flow Sensors

| |  |  |
|-------------------------------|--|--|
| Package Type | LMM-H03 Hybrid –Hot Film Anemometer Component –Bi-Directional | LMM-H04 Hybrid –Hot Film Anemometer Component –Uni-Directional |
| Max Pressure | — | — |
| Operating Temp | –40°C to 125°C | –40°C to 125°C |
| Unique Features | High sensitivity at low heater temperatures, fast response time, true air temperature sensor | High sensitivity at low heater temperatures, fast response time, true air temperature sensor |
| Calibration / Accuracy | Dependent on electronics | Dependent on electronics |
| Dimensions (mm) | 23 x 10.15 x 1.1 | 24 x 10.15 x 1.1 |
| Typical Apps | Air intake of combustion engine, spirometer, industrial gas flow | Air intake of combustion engine, spirometer, industrial gas flow |

Flow Switches

For Direction of Liquid and Gas Flow

| | | | | |
|--|--|--|--|--|
|  |  |  |  |  |
| FS-01 | FS-02 | FS-05 | FS-06 | FS-90/1 |
| Noryl | Noryl | Brass | Brass | Copper |
| –Flow switch | –Flow switch | –Flow switch | –Flow switch | –Flow switch |
| 10 Bar at 20°C -30°C to 85°C | 10 Bar at 20°C -30°C to 85°C | 10 Bar at 20°C -30°C to 100°C | 10 Bar at 20°C -30°C to 100°C | 10 Bar at 20°C -30°C to 85°C |
| SPST reed switch, normally open, close on flow | Triac, normally open, close on flow | SPST reed switch, normally open, close on flow | Triac, normally open, close on flow | SPST reed switch, normally open, close on flow |
| N/A | N/A | N/A | N/A | N/A |
| 106 x 32 x 32 | 106 x 32 x 32 | 113 x 53 x 36 | 113 x 53 x 36 | 153 x 25 x 15 |
| Mains water control, power shower, central heating systems, circulation pump protection, cooling systems | Mains water control, power shower, central heating systems, circulation pump protection, cooling systems | Mains water control, power shower, central heating systems, circulation pump protection, cooling systems | Mains water control, power shower, central heating systems, circulation pump protection, cooling systems | Leak detection, flow sensing, mains water control, cooling systems, circulation pump protection |

NEW

position

solutions by sensor type







Measurement Specialties is 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, magneto-resistive, Hall effect, reed switch, electrolytic and capacitive sensing. Sophisticated designs and state-of-the-art manufacturing techniques provide reliable and cost effective solutions for a broad range of applications. MEAS applications range from automotive, power generation, subsea, hydraulics, medical, HVACR, process controls, factory automation, security systems and many other industrial areas, to the most severe environments in Military/Aerospace and Nuclear. Measurement Specialties position sensors are available with analog and digital outputs. Our comprehensive range of signal conditioning instrumentation allows us to meet the specific needs of both OEMs and end users.



Anisotropic Magnetoresistive (or AMR) Sensor Components

Magnetoresistive




Anisotropic magnetoresistive or AMR sensors offer robust non-contact measurement of changes in the angle of the magnetic field as seen by the sensor. This effect allows for the creation of sensors that can detect disturbance in extremely weak fields, as found in traffic detection sensors, to strong field sensors that are used in precision encoders.

| |  |  |  |  |  |  |
|------------------------|--|--|--|---|--|--|
| | KMY, KMZ | MS32 | KMT32B | KMT36H | MLS | KMA36 <small>NEW</small> |
| Package | SOT-223, E-line 4 pin | TDFN 2.5 x 2.5 | TDFN 2.5 x 2.5, SO-8 | TDFN 2.5 x 2.5 | Die, hybrid | TSSOP |
| Type | Linear low field sensor | Low field switch sensor | Angle sensor | Angle sensor | Linear displacement sensor | Angle sensor |
| Range | -2 to +2 kA/m magnetic field | 1 to 3 kA/m magnetic switching field | 180° angle | 360° angle | Absolute within pole pitch, else incremental | 360° angle |
| Unique Features | <ul style="list-style-type: none"> –High sensitivity –Low hysteresis –Linear to uniaxial field strength | <ul style="list-style-type: none"> –Linearized ratiometric output –Temperature compensated switching point | <ul style="list-style-type: none"> –High accuracy –High resolution | <ul style="list-style-type: none"> –High accuracy –High resolution –360° full turn | <ul style="list-style-type: none"> –For pole pitch –MLS-1000: p=1 mm –MLS-2000: p=2 mm –MLS-5000: p=5 mm | <ul style="list-style-type: none"> –Low cost MR encoder for rotational and incremental measurements |
| Output | Ratiometric with output voltage range 20 mV/V | Ratiometric with output voltage range 10 mV/V | Sine / cosine signals with output voltage range 20 mV/V | Three 120° phase shifted output signals with output voltage range 20 mV/V | Sine / cosine signals with output voltage range 20 mV/V | Voltage 0 - 5 V I°C Customer specific |
| Resolution | Typ. 0.1% of range | Typ. 0.1 kA/m | Typ. 0.01° to 0.1° | Typ. 0.01° to 0.1° | 0.01% to 0.1% of pole pitch | Typ. 0.1° |
| Accuracy | Typ. 1.0% of range | Typ. 0.1 kA/m | Typ. 0.1° to 1.0° | Typ. 0.1° to 1° | 0.1% to 1.0% of pole pitch | Typ. 0.3° |
| Operating Temp | -40°C to 150°C | -25°C to 85°C | -40°C to 150°C (175°C on request) | -40°C to 150°C | -40°C to 125°C | -25°C to 85°C |
| Dimensions (mm) | SOT: 6.6 x 7.0 x 1.6 E-line: 16 x 4.2 x 2.4 | TDFN: 2.5 x 2.5 x 0.8 | TDFN: 2.5 x 2.5 x 0.8 SO-8: 5 x 4 x 1.75 | TDFN: 2.5 x 2.5 x 0.8 | Die: 5.2 x 1.2 x 0.5 HK: 7.6 x 5.3 x 1.4 HS: 18 x 8 x 2 | TSSOP20: 6.5 x 6.4 x 1.2 |
| Typical Apps | 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 | Steering position, gauge readings, rotary encoders | Roller conveyors, circular saws, bending machines etc. | Knobs, small robotics, angular / linear position |

Angular Position Transducers, Inductive

Absolute

Measurement Specialties offers many different OEM and end-user, non-contact angular position solutions. We have a technology for virtually any automotive, industrial or mil-aero application. Absolute angular technologies include RVDT and RVIT, with outputs and packaging to match most application requirements.

| |  |  |  |
|------------------------|---|---|--|
| | RVIT-Z | R60D | R30A |
| Package | PCB for OEM volumes | Servo mount with ball bearing | Servo mount with ball bearing |
| Resolution | Infinite | Infinite | Infinite |
| Excitation | DC Voltage | DC symmetrical ±15 VDC | AC operated |
| Output | DC voltage, DC current, digital | ±7.5 VDC | AC voltage |
| Range | Up to ±75° | ±60° | ±30° to ±60° |
| Unique Features | –Absolute position | <ul style="list-style-type: none"> –Absolute position –Low momentum of inertia | –Absolute position |
| Operating Temp | -25°C to 85°C | -25°C to 85°C | -55°C to 150°C |
| Dimensions (mm) | Custom | Aluminum case size 11 (Ø 27 mm) | Aluminum case size 11 (Ø 27 mm) |
| Typical Apps | Viscometers, valve position, robotics, HVACR vane position, ATM's, joysticks | Dancer arm position, rotary actuator position feedback, throttle lever position feedback, ballvalve position, textile manufacturing equipment, printing presses | Machine tool equipment, rotary actuator feedback, valve positioning, power generation valve position |

Other models available, Please consult MEAS web site library.

Angular Position Sensors, Encoders

Absolute

Measurement Specialties designs and manufactures many absolute and incremental angular encoders based on our Magneto Resistive and Rotary Hall Effect technology. These encoders are designed to OEM specifications or standard off-the-shelf. Outputs are either analog or digital and we also have submersible packages.



ED-18



ED-22



R36

NEW

| | | | | | |
|------------------------|--|------------------------|--|------------------------|--|
| Package | Medium duty with sleeve or ball bearing | Package | Medium duty with sleeve bearing | Package | Heavy duty shaftless |
| Resolution | Analog 1.4° | Resolution | Analog 1.4° | Resolution | Analog 0.7° |
| MAX Speed | 300 RPM (sleeve bearing) 3000 RPM (ball bearing) | MAX Speed | 300RPM | MAX Speed | — |
| Excitation | 5 Vdc | Excitation | 5 Vdc | Excitation | 5 Vdc |
| Unique Features | —Low profile —Excellent stability —No optical degradation | Unique Features | —Encapsulated electronics / sealed unit —Highly resistant to vibration —No optical degradation | Unique Features | —Rugged housing —Shaftless —No optical degradation |
| Output | Voltage or current | Output | Voltage | Output | Voltage |
| Range | 360° | Range | 270° | Range | 180° |
| Operating Temp | -40°C to 85°C | Operating Temp | -40°C to 85°C | Operating Temp | -40°C to 85°C |
| Dimensions (mm) | 25.4 x 25.4 x 33.78 | Dimensions (mm) | Ø 19.05 x 38.1 | Dimensions (mm) | 38.1 x 25.4 x 7.62 |
| Typical Apps | Feedback sensor or human machine interface device, servomotor position and speed control | Typical Apps | Low-cost non-contact HMI potentiometer replacement | Typical Apps | Feedback sensor or human machine interface device, rudder control, servomotor position and speed control |

Absolute



H005 / H009 Series

NEW



H009-1200 Series

NEW

| | | | |
|------------------------|--|------------------------|--|
| 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 | Package | —22.23 mm / .875 in housing diameter —3.170 mm / .1248 in shaft diameter —26.1 mm / 1.03 in housing length |
| Range | up to 359 degrees | Range | up to 359 degrees (dual output) |
| Output Options | Analog / PWM / Serial | Output Options | Analog / PWM / Serial |
| Resolution | 12 Bit - Analog / PWM 14 Bit - Serial | Resolution | 12 Bit - Analog / PWM 14 Bit - Serial |
| Linearity | ± 0.2% | Linearity | ± 0.2% (dual output) |
| Nominal Supply | 5 volts | Nominal Supply | 5 volts (dual output) |
| Operating Temp | -40°C to 150°C | Operating Temp | -40°C to 150°C |
| Rotational Life | > 100 million cycles (bearing life) | Rotational Life | > 100 million cycles (bearing life) |
| Typical Apps | Critical position feedback apps in commercial, industrial, medical, aircraft and military markets | Typical Apps | Critical position feedback apps in commercial, industrial, medical, aircraft and military markets |

Incremental



ED-19



ED-20

| | | | |
|----------------------------|---|----------------------------|---|
| Package | Medium duty with sleeve or ball bearing | Package | Medium duty with ball bearing |
| Resolution/Accuracy | 1024, 400, 256 CPR (others on request) | Resolution/Accuracy | 1024, 400, 256 CPR (others on request) |
| MAX Speed | 300 RPM (sleeve bearing) 3000 RPM (ball bearing) | MAX Speed | 3000 RPM |
| Excitation | 5 Vdc | Excitation | 5 Vdc (NPN and LVD) 12 - 32 Vdc (HVD) |
| Unique Features | —Sleeve or ball bearing —No optical degradation | Unique Features | —Resistant to contamination —Metallic threaded bushing mounting —Custom housings, shafts, connectors available —No optical degradation |
| Output | Quadrature (TTL level, open collector) | Output | Quadrature (NPN, LVD and HVD) |
| Range | 360° | Range | 360° |
| Operating Temp | -40°C to 85°C | Operating Temp | -40°C to 85°C |
| Dimensions (mm) | 25.4 x 25.4 x 33.78 | Dimensions (mm) | Ø 31.75 x 33.78 |
| Typical Apps | Feedback sensor or human machine interface device, servo/stepper motor position and speed control | Typical Apps | Feedback sensor or human machine interface device, servo/stepper motor position and speed control |

Other models available, please consult MEAS website library.

Tilt Sensors

Single Axis

Measurement Specialties offers both capacitive and electrolytic tilt sensing technology in rugged die-cast aluminum or ceramic packaging. These products are available in ranges up to ± 240 degrees and are provided with many analog as well as digital I/O options. Linearized and temp-compensated outputs are available. OEM and end-user packaging is available as well as raw sensors for high volume OEM applications.

| |  |  |  |  |  |  |
|------------------------|--|--|--|---|---|--|
| | E-Series | AccuStar® | APS System | G-Series | AccuStar® IP66 | IT9000 NEW |
| Package | Ceramic housing | LCP housing | Plastic housing | AL housing IP 67 | AL housing IP 66 | Aluminum or stainless |
| Type | Inclination sensor module | Inclination sensor module | Inclination system | Inclinometer | Inclinometer | Inclinometer |
| Range | $\pm 5^\circ$, $\pm 15^\circ$ | $\pm 45^\circ$ to $\pm 60^\circ$ | $\pm 20^\circ$, $\pm 45^\circ$, $\pm 90^\circ$ | $\pm 10^\circ$ | $\pm 3^\circ$ to $\pm 45^\circ$ | $\pm 45^\circ$ to $\pm 240^\circ$ |
| Output | Voltage | Voltage | Analogue / digital | Switch | Current | Voltage divider, 4 - 20 mA |
| Unique Features | <ul style="list-style-type: none"> –Easy to handle –Minimal temperature drift –Good long term stability | <ul style="list-style-type: none"> –Compact –Low power –Vertical and horizontal mount | <ul style="list-style-type: none"> –Stand alone system –Separate system and sensor | <ul style="list-style-type: none"> –Programmable –EMC standard –High switch accuracy | <ul style="list-style-type: none"> –EMI + RFI rated –CE pending –Water tight enclosure | <ul style="list-style-type: none"> –Rugged industrial design, IP67 / 68 –Submersible –Designed for brutal environments –CSA, CENELEC certification for hazardous area applications |
| Accuracy | $\pm 0.2^\circ$ to $\pm 0.5^\circ$ | 0° to 10° $\pm 0.1\%$ accuracy 10° to 45° $\pm 1\%$ of reading | 0° to 10° $\pm 0.1\%$ accuracy 10° to 45° $\pm 1\%$ of reading | $\pm 0.25^\circ$ | 0° to 10° $\pm 0.1\%$ linearity 10° to 45° $\pm 1\%$ linearity | $\pm 0.04\%$ to $\pm 0.25\%$ |
| Operating Temp | -25°C to 85°C | -30°C to 65°C | -25°C to 65°C | -25°C to 85°C | -25°C to 60°C | -34°C to 90°C |
| Dimensions (mm) | 29 x 17 x 16.5 | 65.91 x 51.56 x 30.5 | 127.5 x 88 x 32.2 | 80 x 75 x 57.5 | 98.04 x 63 x 35.05 | Ø 130 x 100 |
| Typical Apps | Road construction, building monitoring, weighing systems, mobile and stationary cranes, platform leveling | Wheel alignment, construction, equipment, antenna positioning, robotics, crane / boom angle | Tower crane safety, RV and mobile trailer leveling, water and oil well drilling rigs, mining equipment | Lift platforms, building device control, train inclination monitoring, position switch | Tower crane safety, RV and mobile trailer leveling, water and oil well drilling rigs, mining equipment | Waste water control, tainter gates, draw bridges, heavy industrial applications |

Dual Axis

All of the same features of the Measurement Specialties' single axis sensors and modules in a dual axis package.

| |  |  |  |  |
|------------------------|--|---|---|--|
| | DPL/DPN-Series | DOG2-Series NEW | DPG-Series | D-Series |
| Package | PCB board | Plastic PA 6.6 housing, IP 67 | AL housing IP 67 | AL housing IP 67 |
| Type | Inclination board module | Inclinometer | Inclinometer | Inclinometer |
| Range | $\pm 2^\circ$ to $\pm 30^\circ$ | $\pm 25^\circ$, $\pm 45^\circ$, $\pm 90^\circ$ | $\pm 5^\circ$ to $\pm 30^\circ$ | $\pm 5^\circ$ to $\pm 30^\circ$ |
| Output | Voltage / RS 232 / SPI | Voltage / Current / J1939 | RS232 / Voltage | RS232 / Voltage / Current / Switch / PWM / CAN open |
| Unique Features | <ul style="list-style-type: none"> –High resolution –Minimal temperature drift –User configurable | <ul style="list-style-type: none"> –Plug & play –Wide measurement range –Cost-efficient –Cable with Tyco Amp connector –Fast MEMS sensor | <ul style="list-style-type: none"> –CE approved –Rugged housing –Easy to use –User configurable | <ul style="list-style-type: none"> –High accuracy –Rugged housing –Programmable –CE approved |
| Accuracy | $\pm 0.05^\circ$ to $\pm 0.8^\circ$ | $< \pm 0.5^\circ$ (full temp. range) | $\pm 0.3^\circ$ | $\pm 0.04^\circ$ to $\pm 0.8^\circ$ |
| Operating Temp | -40°C to 85°C | -40°C to 85°C | -40°C to 85°C | -40°C to 85°C |
| Dimensions (mm) | 45 x 45 x 14 | 70.5 x 45 x 15 | 84 x 70 x 30.2 | 84 x 70 x 46 |
| Typical Apps | Laser leveling, weighing systems, mobile and stationary cranes, hydraulic leveling, building monitoring, wind power | Off-road vehicle, fork lift, truck leveling, man lift, harvester, farm machine, tip over protection, solar panel control | Platform leveling, road construction machines, tunnel drilling, mobile leveling | Drilling machines, mobile and stationary cranes, wind power, antenna / radar leveling |

Proximity Sensors

Proximity Sensing When Used with a Proximity Magnet

NEW

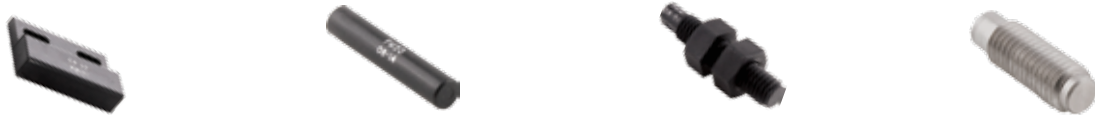


| | PS2011AB | PS2021AB | PS2031AB | PS501 | PS801 | PS811 | PS831 |
|------------------------|--|--|--|--|--|--|--|
| Package | Glass filled nylon 6.6 | Glass filled nylon 6.6 | Glass filled nylon 6.6 | Glass filled nylon 6.6 | Stainless steel | Nylon 6.6 | Stainless steel |
| Type | Proximity sensor | Proximity sensor | Proximity sensor | Proximity sensor | Proximity sensor | Proximity sensor | Proximity sensor |
| Unique Features | SPST reed switch, normally open | SPST reed switch, normally closed | SPDT reed switch | SPST reed switch, normally open | SPST reed switch, normally open | SPST reed switch, normally open | SPST reed switch, normally open |
| Operating Temp | -30°C to 105°C | -30°C to 105°C | -30°C to 105°C | -30°C to 130°C | -30°C to 120°C | -30°C to 110°C | -30°C to 130°C |
| Dimensions (mm) | 29 x 7 x 20 | 29 x 7 x 20 | 29 x 7 x 20 | Ø 6 x 32 | Ø 12 x 65 | Ø 10 x 38 | Ø 12 x 32 |
| Typical Apps | Door interlocks, hook switches, security systems, safety interlocks, position indication | Door interlocks, hook switches, security systems, safety interlocks, position indication | Door interlocks, hook switches, security systems, safety interlocks, position indication | Door interlocks, hook switches, security systems, safety interlocks, position indication | Door interlocks, hook switches, security systems, safety interlocks, position indication | Door interlocks, hook switches, security systems, safety interlocks, position indication | Door interlocks, hook switches, security systems, safety interlocks, position indication |

Proximity Magnet

Proximity Magnet for Use with Proximity Sensors

NEW



| | PM101 | PM50 | PM81 | PM83 |
|------------------------|--|--|--|--|
| Package | Glass filled nylon 6.6 | Glass filled nylon 6.6 | Nylon 6.6 | Stainless steel |
| Type | Proximity magnet | Proximity magnet | Proximity magnet | Proximity magnet |
| Unique Features | Housed magnet | Housed magnet | Housed magnet | Housed magnet |
| Operating Temp | -30°C to 105°C | -30°C to 70°C | -30°C to 120°C | -30°C to 120°C |
| Dimensions (mm) | 29 x 7 x 20 | Ø 6 x 32 | Ø 10 x 38 | Ø 12 x 32 |
| Typical Apps | Door interlocks, hook switches, security systems, safety interlocks, position indication | Door interlocks, hook switches, security systems, safety interlocks, position indication | Door interlocks, hook switches, security systems, safety interlocks, position indication | Door interlocks, hook switches, security systems, safety interlocks, position indication |

Linear Position Transducers

Cable Extension Transducers

NEW

Commonly called stringpots or draw-wire sensors, cable extension transducers provide a linear position feedback signal for both short and long stroke measurement ranges. These sensors have been designed to provide the utmost in flexibility, long life and high accuracy. The benefits of string pots are that they are easy to install, don't require precise alignment and the retractable spring loaded measuring eliminates the need for the extra space required by most rod-type position sensors.



M150, MTA



MT2, MT3



SM, SP



SG, SR



Z115, Z250

| | | | | | |
|--------------------------------|--|---|--|---|---|
| Range | 0 - 1.5 to 0 - 5 inches | 0 - 3 to 0 - 30 inches | 0 - 2.5 to 0 - 50 inches | 0 - 80 to 0 - 175 inches | 0 - 100 to 0 - 2400 mm |
| Output | Voltage divider | Voltage divider, incremental encoder | Voltage divider, 0 - 10 Vdc, 4 - 20 mA | Voltage divider, 0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA, incremental encoder, CANbus | Voltage divider |
| Environment / IP Rating | IP50 | IP50, IP67 (MT3A) | IP50 | IP67 | IP50 |
| Enclosure | Aluminum | Aluminum and polycarbonate | Polycarbonate with stainless steel bracket | Polycarbonate with stainless steel bracket | Aluminum |
| Accuracy | ±0.4% to ±1% | ±0.25% to ±1.1% | ±0.25% to ±1% | ±0.35% to ±0.5% | ±0.15% to ±0.25% |
| Unique Features | <ul style="list-style-type: none"> –M150, world's smallest stringpot –Designed for space-critical and testing applications | <ul style="list-style-type: none"> –designed for test applications –Dual-axis measuring cable alignment –Tracks high-acceleration linear position up to 136g's –High-frequency response –GAM EG 13 certification | <ul style="list-style-type: none"> –In stock –Compact design –Low cost, high value stringpot –Versatile stainless steel mounting bracket –Free-release tolerant –Custom configurations available for OEM customers | <ul style="list-style-type: none"> –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 | <ul style="list-style-type: none"> –Customer specific for OEM applications –Short design time –Fast turnaround –Cost effective –Contact factory for more information |
| Operating Temp | -40°C to 85°C (M150) -55°C to 100°C (MTA) | -55°C to 125°C | -18°C to 70°C | -40°C to 85°C | Design specific |
| Dimensions (mm) | 19 x 19 x 10 (M150) | 55 x 45 x 55 | 43 x 45 x 68 | 100 x 120 x 200 | Design specific |
| Typical Apps | Aerospace, automotive instrumentation, crash testing, auto and motorcycle racing | Automotive crash testing, aerospace and flight testing | Factory automation, light industrial, seismic testing, racing instrumentation, medical imaging systems, fume hood position | Outdoor mobile construction equipment, outrigger positioning, hydraulic lifts, water and power controls | Vehicle lift systems, medical imaging systems including x-ray, mammography, CT's and oncology devices, fume hood and HVACR controls |



PTX, PT101



PT1, PT5



PT8000



PT9000

| | | | | |
|------------------------|---|--|---|--|
| Range | 0 - 2 to 0 - 100 inches | 0 - 2 to 0 - 250 inches | 0 - 2 to 0 - 60 inches | 0 - 75 to 0 - 1700 inches |
| Output | Voltage divider, 0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA, incremental encoder, velocity output (DV301) | Voltage divider, 0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA, incremental encoder, CANbus, DeviceNet, RS-232 | Voltage divider, 0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA, incremental / absolute encoder, CANbus, DeviceNet, RS-232 | Voltage divider, 0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA, incremental / absolute encoder, CANbus, DeviceNet, RS-232 |
| IP Rating | IP50 | IP65, IP67 (PT5) | IP67, IP68 | IP67, IP68 |
| Enclosure | Aluminum | Aluminum and abs plastic (PT1) | Aluminum or stainless | Aluminum or stainless |
| Accuracy | ±0.04% to ±0.25% | ±0.04% to ±0.25% | ±0.04% to ±0.25% | ±0.04% to ±0.25% |
| Unique Features | <ul style="list-style-type: none"> –Original classic design –High precision –Proven track record | <ul style="list-style-type: none"> –Designed for most factory environments –Industry standard output signals –User serviceable –Compact design (PT1) | <ul style="list-style-type: none"> –Heavy duty, submersible –Designed for extreme industrial and marine environments –CSA, CENELEC certification for hazardous area applications –High accuracy, high acceleration –Free-release proof with VLS option –M12 and Deutsch connector options | <ul style="list-style-type: none"> –Heavy duty, submersible –Proven workhorse for long stroke applications –Designed for extreme industrial and marine environments –CSA, CENELEC certification for hazardous area applications –Free-release proof with VLS option –M12 and Deutsch connector options |
| Operating Temp | -40°C to 90°C | -40°C to 90°C | -40°C to 90°C | -40°C to 90°C |
| Dimensions (mm) | Model and range specific | 85 x 100 x 70 (PT1) 100 x 175 x 80 (PT5) | 90 x 140 x 135 | 200 x 135 x 125 |
| Typical Apps | Aerospace testing, architectural and structural testing, factory automation | Factory automation, industrial, die casting, injection molding | Steel mills, lumber and paper mills, factory automation, die-casting, injection molding, mobile construction and mining | Mobile hydraulic boom position, water resource management, mining and tunnel boring equipment, telescoping mechanism position, theatre stage control |

Linear Position Transducers, Inductive

Absolute






Linear absolute technologies include LVDT's for OEM and end-user applications and LCIT's for low-cost OEM requirements. All of these sensors feature friction-free, non-contact inductive magnetic coupling for extremely long cycle life and virtually infinite resolution. Various off-the-shelf and custom packaging options are available for the most demanding application requirements.

| |  |  |  |  |  |  |
|------------------------|---|--|--|---|---|---|
| Package | HR | M12 | HC | XS-C | DC-SE | XS-D |
| Linearity | AISI-400 Series Stainless steel | AISI-304 Series Stainless steel | AISI-400 Series Stainless steel | AISI-304 Series Stainless steel | AISI-400 Series Stainless steel | AISI-400 Series Stainless steel |
| Excitation | ±0.25% of range | ±0.25% of range | ±0.25% of range | ±0.25% of range | ±0.25% of range | ±2% of range |
| Output | AC operated | AC operated | AC and DC operated versions | AC operated | 8.5 to 28 VDC | AC operated |
| Range | AC voltage | AC voltage | AC or DC voltage, 4 - 20 mA loop or RS-485 | AC voltage | 0 - 5 VDC (4 wire) 1 - 6 VDC (3 wire) | AC voltage |
| Unique Features | ±0.05 to ±10 inches | ±10 to ±100 mm | ±0.05 to ±10 inches | ±0.25, ±0.5 & ±1 inch | 0 - 0.1 to 0 - 6 inches | ±1 to ±10 inches |
| Operating Temp | <ul style="list-style-type: none"> Large bore to core clearance Broad range of excitation frequencies Many options Mild radiation resistance option | <ul style="list-style-type: none"> Metric series High stroke to length ratio Constant sum of secondaries Excellent temperature coefficient | <ul style="list-style-type: none"> Hermetically sealed Welded connector Double shielding Intrinsically safe version CE mark for DC versions | <ul style="list-style-type: none"> High pressure Bulkhead mounting Hermetically sealed welded assembly | <ul style="list-style-type: none"> CE mark Low current consumption (6 mA typical) Synchronous demodulation Shielded cable | <ul style="list-style-type: none"> Very high stroke to body length ratio |
| Diameter (mm) | -55°C to 150°C (220°C optional) | -55°C to 150°C (220°C optional) | -55°C to 150°C (AC); 0°C to 70°C (DC) | -55°C to 150°C | -25°C to 85°C | -55°C to 150°C |
| Typical Apps | 20.6 | 12 | 19 | 19 | 19 | 20.6 |
| | General industrial | Hydraulic spool valve position feedback, flight simulators, aircraft flight control feedback | Harsh environments, submersible applications, process controls, valve position feedback | Hydraulic actuators, other pressurized vessels | Positioning sensing feedback, battery operated systems, test labs, ram guide, platen position | Where sensor installation length is restricted, ideal replacement for linear potentiometers |

Other models available, please consult MEAS web site library.

Dimensional Gauging Products

Gage heads are spring loaded or air actuated position sensors (LVDTs) with contact tips. Our precision gage heads are classified into several categories based on size, repeatability, accuracy and input/output.

| |  |  |  |  |  |
|------------------------|--|--|---|---|---|
| Linearity | LBB, spring-extend | LBB air-extend | PCA 375 | GC | Ultimate-Precision Digital LBB NEW |
| Excitation | ±0.2% of range | ±0.2% of range | ±0.5% of range | ±0.25% (Voltage) to ±0.5% (4 - 20 mA) of range | Accuracy ±0.2% |
| Output | AC operated | AC operated | AC operated | AC or DC voltage | 5 VDC USB (bus or external) |
| Range | AC voltage | AC voltage | AC voltage | AC or DC voltage, RS-485, or 4 - 20 mA loop | RS485; USB |
| Unique Features | ±0.02 to ±0.20 inches | ±0.04 & ±0.1 inches | ±0.02 to ±1 inches | ±0.05 to ±2 inches | 1, 2, 5 and 10 mm |
| Operating Temp | <ul style="list-style-type: none"> 0.000004 inch (0.1 µm) repeatability Removable tungsten carbide contact tip Double shielded LVDT Repairable | <ul style="list-style-type: none"> 0.000004 inch (0.1 µm) repeatability Removable tungsten carbide contact tip Double shielded LVDT Repairable | <ul style="list-style-type: none"> Longer strokes IP65 cable exit Accepts industry standard contact tips Heavy duty return spring | <ul style="list-style-type: none"> Hermetically sealed Welded MS connector (MIL-C-5015) CE mark for DC Versions Special tips available Air extend spring retract available | <ul style="list-style-type: none"> Plug-and-play 14-bit resolution COM libraries provided CE mark USB adapter and power supply available |
| Diameter (mm) | -40°C to 70°C | -40°C to 70°C | -20°C to 70°C | -55°C to 150°C (AC); 0°C to 70°C (DC) | 0°C to 60°C |
| Typical Apps | 8 or 9.5 | 8 or 9.5 | 9.5 | 19 mm body, 1/2 - 20 threads | Stackable gage system |
| | Process standards, manufacturing on-line inspection, robotics, replaces dial indicators in manual measurement systems | Process standards, manufacturing on-line inspection, robotics, replaces dial indicators in manual measurement systems | High density gaging fixtures, resistance weld verification, pressing applications, X-Y stage position feedback, rough casting inspection | Harsh environments, environments requiring hermetic seal, high temperatures (150°C for AC units) | Multi-channel electronic dimensional gauging, precision dimensional measurement, optics inspection systems, SPC data collection, hand tools |

Other models available, please consult MEAS web site library.

Linear Position Encoders

Incremental

Linear incremental encoders provide rugged low cost, non-contacting position feedback for demanding applications. This technology is not affected by dirt, oil, dust or other contaminants. It is also not affected by changes in ambient lighting conditions.



ED32i

NEW

| | |
|------------------------|---|
| Package | IP67 aluminum |
| Range | Magnetic scale, 5mm pole pitch, typically up to 100 m absolute version up to 100 mm range on request |
| Excitation | 5 VDC |
| Output | 5 V TTL ABZ differential quadrature; RS-485 |
| Resolution | ≥ 10 µm; field programmable |
| Maximum Speed | 4 m/s |
| Unique Features | <ul style="list-style-type: none"> –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 |
| Operating Temp | -25°C to 85°C |
| Dimensions (mm) | 60 x 20 x 10 |
| Typical Apps | Linear displacement measurement in industrial and medical applications |

Potentiometers

Linear Position Sensors

NEW



MLP, CLP

| | |
|------------------------|---|
| Package | Aluminum body, steel rod, IP65 / 67 |
| Range | 0 - 0.5 to 0 - 11.5 inches |
| Excitation | Up to 40 VDC max. |
| Output | Voltage divider |
| Resolution | ±0.1% to 0.5% |
| Maximum Speed | 10 m/s |
| Unique Features | <ul style="list-style-type: none"> –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: Ø 9.5 mm (MLP), 15 mm x 15 mm (CLP) |
| Typical Apps | Vehicle testing, autosport instrumentation, structural and architectural testing and robotics. |



5903 / 5905 Series Linear Motion

| | |
|--------------------------|--|
| Package | –7.94 mm - 12.7 mm / .312 in - .500 in housing diameter –1.98 mm - 3.18 mm / .078 in - .125 in shaft diameter |
| Resistance | 1K / 5K / 10K |
| Range | 5903 series - up to 50.8 mm / 2 in stroke 5905 series - up to 101.6 mm / 4 in stroke |
| Linearity | ±1% |
| Output Smoothness | <0.1% |
| Resolution | Infinite |
| Operating Temp. | -65°C to 125°C |
| Rotational Life | 50 million cycles min |
| Typical Apps | Critical position feedback apps in commercial, industrial, medical, aircraft and military markets |

Potentiometers

Angular Position Sensors

NEW



6000 Series Servo Mount

| | |
|--------------------------|---|
| Package | –12.7 mm - 50.8 mm / .500 in -2.00 in housing diameter –3.170mm - 6.34mm / .1248 in - .2498 in shaft diameter –12.7mm - 1.74mm / .500 in -.680 in housing length –11.11mm - 47.62mm / .438 in - 1.875 in mounting pilot diameter |
| Resistance | 1K - 20KΩ |
| Range | up to 355 degrees |
| Linearity | ± 0.5% |
| Output Smoothness | <0.1% |
| Resolution | Infinite |
| Operating Temp. | –65°C to 125°C |
| Rotational Life | 50 million cycles min |
| Typical Apps | Critical position feedback apps in commercial, industrial, medical, aircraft and military markets |



6200 Series Bushing Mount

| | |
|--------------------------|--|
| Package | –12.7 mm - 50.8 mm / .500 in -2.00 in housing diameter –3.170mm - 6.34mm / .1248 in - .2498 in shaft diameter –12.7mm - 1.74mm / .500 in -.680 in housing length –3/8 32 NEF thread / 10.31mm / .4062 in pilot diameter |
| Resistance | 1K - 20KΩ |
| Range | up to 355 degrees |
| Linearity | ± 0.5% |
| Output Smoothness | <0.1% |
| Resolution | Infinite |
| Operating Temp. | –65°C to 125°C |
| Rotational Life | 50 million cycles min |
| Typical Apps | Critical position feedback apps in commercial, industrial, medical, aircraft and military markets |



6900 Series Element/Wiper/Insul

| | |
|--------------------------|--|
| Package | –17.81 mm - 45.85mm / .702 in -1.805 in element outside diameter –4.724 mm - 11.05mm / .186 in - .435 in element inside diameter –3.175 mm -6.35 mm / .125 in - .250 shaft insulator inside diameter –4.064 mm - 7.80mm / .160 in - .307 in mating wiper inside diameter –5.08 mm / .200 in assembled package height |
| Resistance | 1K / 5K / 10KΩ |
| Range | up to 350 degrees |
| Linearity | ± 0.5% |
| Output Smoothness | < 0.1% |
| Resolution | Infinite |
| Operating Temp. | –65°C to 125°C |
| Rotational Life | 50 million cycles min |
| Typical Apps | Critical position feedback apps in commercial, industrial, medical, aircraft and military markets |



6100 Series Hollow Shaft

| | |
|--------------------------|--|
| Package | –27.94 mm - 66.5 mm / 1.100 in - 2.62 in housing diameter –3.175 mm - 19 mm / .125 in - .752 in hollow shaft diameter |
| Resistance | 1K - 20KΩ |
| Range | up to 355 degrees |
| Linearity | ± 0.5% |
| Output Smoothness | < 0.1% |
| Resolution | Infinite |
| Operating Temp. | –65°C to 125°C |
| Rotational Life | 50 million cycles min. |
| Typical Apps | Critical position feedback apps in commercial, industrial, medical, aircraft and military markets |



RT8, RT9

NEW

| | |
|------------------------|--|
| Package | Aluminum or stainless IP67, IP68 |
| Resolution | ±0.15% to ±1.25% |
| MAX Speed | — |
| Excitation | — |
| Unique Features | –Absolute rotary –Designed for heavy industrial applications –CSA, CENELEC certification for hazardous area applications |
| Output | Voltage divider, 0 - 5V, 0 - 10V, 4 - 20 mA, incremental encoder, CANbus, DeviceNet™ |
| Range | 0 - 0.125 to 0 - 200 turns |
| Operating Temp | –40°C to 90°C |
| Dimensions (mm) | Ø 65 x 100 (RT8) Ø 115 x 60 (RT9) |
| Typical Apps | Valve control, airport passenger loading bridge, water management, factory automation |

LVDT / RVDT Instrumentation

Our OEM and end-user oriented LVDT/RVDT instrumentation signal conditioners and read-out devices are specifically designed to be compatible with all our Linear and Angular AC inductive sensors. These instruments provide everything needed to interface with our AC devices to control or data acquisition systems.



LVM-110 LiM-420



LDM-1000



ATA-2001



PML 1000



MP 2000

| | | | | | |
|------------------------|--|---|---|--|--|
| 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 | <ul style="list-style-type: none"> –Master / slave for multi-up applications –Dip switch selectable excitation frequencies –Plug-in PCB or wire termination –Small form factor | <ul style="list-style-type: none"> –Operates with 4, 5 & 6 wire LVDT / RVDTs –Adjustable zero, span and phase –Status LEDs –CE mark | <ul style="list-style-type: none"> –Push button programmable –Splash proof front panel –LED status lights –Mounting hardware included –CE mark | <ul style="list-style-type: none"> –5 digit LED display –Auto-calibration –Programmable –Splash proof front panel –Mounting hardware included –CE mark | <ul style="list-style-type: none"> –Programmable set point controller –Dual channel with math functions –Digital I/O –Large LCD display –Splash proof front panel |
| Dimensions (mm) | 63 x 56 x 21 | 115 x 99 x 23 | 267 x 99 x 49 | 173 x 97 x 49 | 178 x 92 x 92 |
| Typical Apps | OEM applications | Automotive test track instrumentation, gas and steam turbine controls, factory automation | Precision metrology labs, power generation valve position monitoring | Remote monitoring stations, measurement test stands, process monitoring | LVDT based weighing systems, pass / fail parts sorting, quality inspection |

liquid level

solutions by sensor type

Measurement Specialties' range of liquid level products addresses the sensing requirements of the construction, off-road, automotive industries. Our solutions include level sensors for power steering, coolant, windscreen wash, fuel and oil. We pride ourselves on our experience in serving the heavy duty vehicle markets: Truck and Bus, Emergency, Military, Recreational, Luxury and Coach.

We also offer level sensors for use in demanding applications such as storage and collection tanks, vending machines, showers for the disabled, heat exchangers, washing machines, central heating systems and boilers.

To meet the requirements of the food and beverage industry, MEAS offers a range of standard products which provide cost-effective solutions. We also provide thousands of sensors annually to marine engine manufacturers.

For complex OEM applications, we work closely with customers to ensure the appropriate sensing solution is delivered.



Liquid Level Sensors

High or Low Level Sensing

NEW



LS304-31

| | |
|------------------------|------------------------|
| Package | Glass filled nylon 6.6 |
| Type | Level sensor |
| Unique Features | SPDT reed switch |
| Max. Pressure | 2.0 bar |
| Operating Temp | -30°C to 130°C |
| Dimensions (mm) | 103 x 29 x 29 |

Typical Apps Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection



LS304-51N

| | |
|------------------------|------------------------|
| Package | Glass filled nylon 6.6 |
| Type | Level sensor |
| Unique Features | SPDT reed switch |
| Max. Pressure | 4.7 bar |
| Operating Temp | -30°C to 130°C |
| Dimensions (mm) | 88 x 27 x 27 |

Typical Apps Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection



LS309-31

| | |
|------------------------|------------------------|
| Package | Glass filled nylon 6.6 |
| Type | Level sensor |
| Unique Features | SPST reed switch |
| Max. Pressure | 2.0 bar |
| Operating Temp | -30°C to 130°C |
| Dimensions (mm) | 103 x 29 x 29 |

Typical Apps Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection



LS309-51N

| | |
|------------------------|------------------------|
| Package | Glass filled nylon 6.6 |
| Type | Level sensor |
| Unique Features | SPST reed switch |
| Max. Pressure | 4.7 bar |
| Operating Temp | -30°C to 130°C |
| Dimensions (mm) | 88 x 27 x 27 |

Typical Apps Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection



LS504-31

| | |
|------------------------|------------------|
| Package | Glass filled PPS |
| Type | Level sensor |
| Unique Features | SPDT reed switch |
| Max. Pressure | 2.0 bar |
| Operating Temp | -30°C to 110°C |
| Dimensions (mm) | 103 x 29 x 29 |

Typical Apps Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water



LS504-51

| | |
|------------------------|------------------|
| Package | Glass filled PPS |
| Type | Level sensor |
| Unique Features | SPDT reed switch |
| Max. Pressure | 4.7 bar |
| Operating Temp | -30°C to 110°C |
| Dimensions (mm) | 88 x 27 x 27 |

Typical Apps Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water



LS509-31

| | |
|------------------------|------------------|
| Package | Glass filled PPS |
| Type | Level sensor |
| Unique Features | SPST reed switch |
| Max. Pressure | 2.0 bar |
| Operating Temp | -30°C to 110°C |
| Dimensions (mm) | 103 x 29 x 29 |

Typical Apps Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water



LS509-51

| | |
|------------------------|------------------|
| Package | Glass filled PPS |
| Type | Level sensor |
| Unique Features | SPST reed switch |
| Max. Pressure | 4.7 bar |
| Operating Temp | -30°C to 110°C |
| Dimensions (mm) | 88 x 27 x 27 |

Typical Apps Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water



LS804-31

| | |
|------------------------|----------------------------|
| Package | Glass filled polypropylene |
| Type | Level sensor |
| Unique Features | SPDT reed switch |
| Max. Pressure | 2.0 bar |
| Operating Temp | -30°C to 105°C |
| Dimensions (mm) | 103 x 29 x 29 |

Typical Apps Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems



LS804-51

| | |
|------------------------|----------------------------|
| Package | Glass filled polypropylene |
| Type | Level sensor |
| Unique Features | SPDT reed switch |
| Max. Pressure | 4.7 bar |
| Operating Temp | -30°C to 105°C |
| Dimensions (mm) | 88 x 27 x 27 |

Typical Apps Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems



LS809-31

| | |
|------------------------|----------------------------|
| Package | Glass filled polypropylene |
| Type | Level sensor |
| Unique Features | SPST reed switch |
| Max. Pressure | 2.0 bar |
| Operating Temp | -30°C to 105°C |
| Dimensions (mm) | 103 x 29 x 29 |

Typical Apps Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems



LS809-51

| | |
|------------------------|----------------------------|
| Package | Glass filled polypropylene |
| Type | Level sensor |
| Unique Features | SPST reed switch |
| Max. Pressure | 4.7 bar |
| Operating Temp | -30°C to 105°C |
| Dimensions (mm) | 88 x 27 x 27 |

Typical Apps Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems

ultrasonic (air bubble, point level, continuous level monitoring)

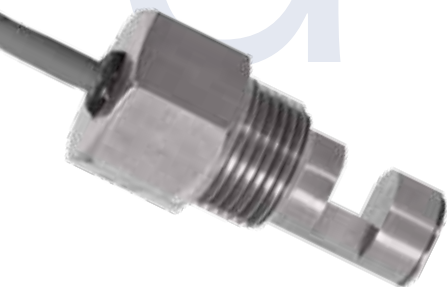
solutions by sensor type

Measurement Specialties' range of level sensors is now expanded to include sensors using Ultrasonic Technology.

Using ultrasonic technology opens a wider variety of applications where liquid level needs to be measured despite transparency, viscosity, color or dielectric. Our ultrasonic sensors are deployed in numerous applications including, air bubble detection in as small as 1mm tube, contact and non-contact and high accuracy for container fill verification through air and liquid, 316L stainless steel sensor material construction for pump protection and non-invasive solutions for pipeline fluid/type detection.

To meet the requirements of our customers level applications, MEAS offers a range of standard products which provide a system with no moving parts, no adjustments, no maintenance, robust and cost-effective reliable level sensing solution. With ranges in temperature from -240°C to 288°C, pressures to 1000 psi, various input/output configurations and multiple sensing points, MEAS also provides sensors annually for custom complex OEM applications and works closely with customers to ensure the appropriate sensing solution is delivered.

Visit our website or call us for the special point level and custom sensors.



Ultrasonic Sensors

Standard Contact Point Level

NEW



LL-01

| | |
|---------------------------|--|
| Type | Gap |
| Unique Features | <ul style="list-style-type: none"> -All 316L SS -Integral electronics -Miniature threads -Single machined -No adjustment for viscosity, density |
| Input | 6 - 24VDC |
| Output | 1/2A contact |
| Pressure | 250 psi |
| Temperature | 100°C |
| Actuation point | 0.25" |
| Process Connection | 1/4"NPT & 1/2"NPT |
| Cable | 12" |
| Approvals | CE |
| Typical Apps | Medical waste tanks, histology processors, compressors, chillers, coolant reservoirs |



LL-10

| | |
|---------------------------|--|
| Type | Tip |
| Unique Features | <ul style="list-style-type: none"> -All 316L SS -Integral electronics -No adjustment for viscosity, density |
| Input | 9 - 24VDC |
| Output | 1A SPDT |
| Pressure | 1000 psi |
| Temperature | 100°C |
| Actuation point | 2.25" standard |
| Process Connection | 3/4"NPT |
| Cable | 12" |
| Approvals | CE |
| Typical Apps | Hydraulic reservoirs, storage tanks, pipe lines, sewage systems |



LL-100

| | |
|---------------------------|--|
| Type | Tip |
| Unique Features | <ul style="list-style-type: none"> -All 316L SS -Integral electronics -No adjustment for viscosity, density |
| Input | DC and AC options |
| Output | 10A DPDT or analog |
| Pressure | 1000 psi |
| Temperature | 150°C |
| Actuation point | Custom |
| Process Connection | 3/4"NPT |
| Cable | Terminal block |
| Approvals | CE |
| Typical Apps | Industrial tanks, pump protection, hydraulic supply lines, storage tanks |



LL-101

| | |
|---------------------------|--|
| Type | Gap |
| Unique Features | <ul style="list-style-type: none"> -High / normal fail-safe -Integral electronics -Plastic for chemical compatibility -No adjustment for viscosity, density -Demand self-test |
| Input | DC and AC options |
| Output | 10A DPDT |
| Pressure | 1000 psi |
| Temperature | 150°C |
| Actuation point | Custom |
| Process Connection | 3/4"NPT |
| Cable | Terminal block |
| Approvals | CE |
| Typical Apps | Food processing tank, chemical tanks, oil & fuel level, liquid pharmaceuticals |

Ultrasonic Sensors

Air-Bubble and Non-Invasive Point Level

NEW



AD-101

| | |
|---------------------------|--|
| Type | Non-invasive |
| Unique Features | <ul style="list-style-type: none"> –Bubble detection from 1mm tube –Temperature option –Occlusion option –Fluid differentiation –3.3 & 5 V input option |
| Input | 6 - 24 VDC standard |
| Output | Open collector |
| Pressure | — |
| Temperature | — |
| Actuation point | — |
| Process Connection | — |
| Cable | 12" |
| Approvals | CE |
| Typical Apps | Infusion pumps, dialysis machines, apheresis, auto-transfusion |



SL-630

| | |
|---------------------------|---|
| Type | Non-invasive |
| Unique Features | <ul style="list-style-type: none"> –Stick on dry contact –Point level detection |
| Input | 6 - 24 VDC |
| Output | Open collector |
| Pressure | — |
| Temperature | 70°C |
| Actuation point | Variable |
| Process Connection | Reusable sensor Disposable tape |
| Cable | 12" |
| Approvals | CE |
| Typical Apps | Chromatography, chemical analyzer, hemodialysis, reagent vessels |

Contact Multi-Point Level



SL-900

| | |
|---------------------------|--|
| Type | Contact |
| Unique Features | <ul style="list-style-type: none"> –Miniature –10 URA electro-polished finish –316 LSS body |
| Input | Variable |
| Output | Dual LED 1/2 A.N.O. Contact |
| Pressure | 250 PSIG |
| Temperature | -20°F to 200°F (Sensor) |
| Actuation point | Variable |
| Process Connection | 3/4 " VCR 1/2" Standard |
| Cable | Shielded with strain relief and 9 pin connector |
| Approvals | NEMA 1 housing |
| Typical Apps | Pharmaceutical and semiconductor industries, high pressure vessels |

Continuous Level



2 Wire

| | |
|---------------------------|--|
| Type | Continuous transmitter through air |
| Unique Features | <ul style="list-style-type: none"> –Non-contact –Integral electronics –Explosionproof –316 SS or ETFE sensor material –BCD switch program |
| Input | 18 - 30 VDC |
| Output | Loop power, 4 - 20 mA |
| Pressure | 100 psi |
| Temperature | 82°C |
| Sensing Range | 6" to 120" - 3/4"NPT 12" to 300" - 2" NPT 3/4"NPT, 2"NPT |
| Process Connection | — |
| Accuracy | 0.25% of full scale |
| Elect Connection | Terminal block |
| Approvals | CE |
| Typical Apps | Liquid level monitoring, unstable chemicals, fuel storage tanks, flammable liquids |



4 Wire

| | |
|---------------------------|---|
| Type | Continuous transmitter through air |
| Unique Features | <ul style="list-style-type: none"> –Non-contact –Integral electronics –Explosion proof –316 SS or ETFE sensor material –BCD switch program |
| Input | 24 VDC |
| Output | 4 - 20 mA isolated |
| Pressure | 100 psi |
| Temperature | 82°C |
| Sensing Range | 6" to 120" - 3/4"NPT 12" to 300" - 2" NPT 3/4"NPT, 2"NPT |
| Process Connection | — |
| Accuracy | 0.25% of full scale |
| Elect Connection | Terminal block |
| Approvals | CE |
| Typical Apps | Food processing, pharmaceutical tanks, high purity fluid tanks, chemical storage |



LL-1101

| | |
|---------------------------|--|
| Type | Continuous transmitter through air |
| Unique Features | <ul style="list-style-type: none"> –Non-contact –Remotely mounted –316 SS or ETFE sensor material –Push button program |
| Input | DC and AC options |
| Output | Analog, display, relay setpoints |
| Pressure | 100 psi |
| Temperature | 82°C |
| Sensing Range | 6" to 120" - 3/4"NPT 12" to 360" - 2" NPT 3/4"NPT, 2"NPT |
| Process Connection | — |
| Accuracy | 0.25% of full scale |
| Elect Connection | Terminal block |
| Approvals | CE |
| Typical Apps | Large storage tanks, factory automation, process control tanks, power plants |



SL-700

| | |
|---------------------------|--|
| Type | Continuous transmitter through liquid |
| Unique Features | <ul style="list-style-type: none"> –Contact –Remotely mounted –316 SS sensor –RS-232 program |
| Input | 24 VDC |
| Output | RS-232, analog, relay setpoints |
| Pressure | 250 psi |
| Temperature | 100°C |
| Sensing Range | Range up to 36" |
| Process Connection | — |
| Accuracy | ± 0.005" |
| Elect Connection | Terminal block |
| Approvals | — |
| Typical Apps | Semiconductor tanks, ampoules & bubblers, high purity fluids, level in vacuum |



ML Series

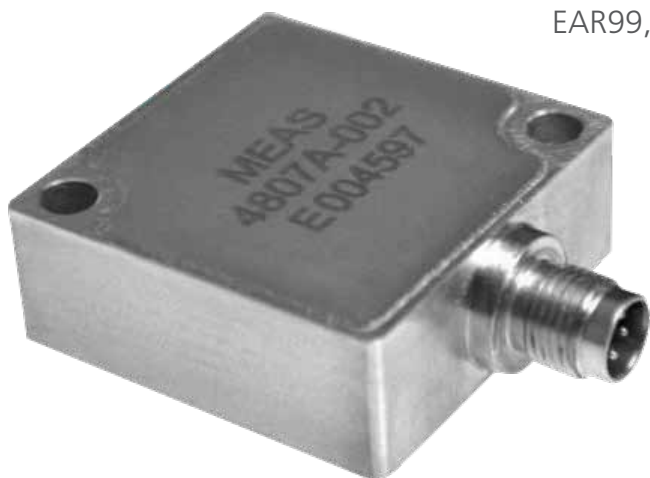
| | |
|---------------------------|--|
| Type | Continuous transmitter through air |
| Unique Features | <ul style="list-style-type: none"> –Non-contact –Remotely mounted –316 SS or Epoxy sensor material –RS-232 program |
| Input | 24 VDC |
| Output | RS-232, analog, relay setpoints |
| Pressure | Atmosphere |
| Temperature | 40°C |
| Sensing Range | Range up to 6" |
| Process Connection | — |
| Accuracy | ± 0.0075" |
| Elect Connection | Terminal block |
| Approvals | — |
| Typical Apps | Microplate well level, test tubes & vials, bottle fill level, surface flaw detection |

vibration

solutions by sensor type

Measurement Specialties brings more than twenty years of experience in the design and manufacture of accelerometers and gyros based on our proprietary Micro-ElectroMechanical 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 its wide bandwidth. We offer voltage mode accelerometers in the traditional 3-wire or 2-wire (IEPE) configurations. Charge mode piezoelectric accelerometers are designed for measuring 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 its users unmatched dynamic range scalability. To measure motion (velocity, displacement) accurately, an accelerometer or gyro sensor with DC response is required. Incorporating state-of-the-art MEMS technologies and the latest analog and digital ASICs, Measurement Specialties' DC accelerometers and gyros offer the best-in-class performance and exceptional value. All products are EAR99, RoHS compliant and meet CE standards.



MEMS DC Accelerometers

Embedded

Uses patented piezoresistive silicon die technology with high over-range protection and broad frequency response.

| |  |  |  |  |  |
|------------------------|--|--|---|---|--|
| 3022/3028 | | 3052A/3058A | 3038 | EGHS-M | 3255A |
| Package | Pins or pads | Pins or pads | SMD | SMD | SMD |
| Type | Board level | Board level | Board level | Board level | Board level |
| F.S. Range (g) | ±2, 5, 10, 20, 50, 100, 200 | ±2, 5, 10, 20, 50, 100 | ±50, 100, 200, 500, 2000, 6000 | ±20K | ±25, 50, 100, 250, 500 |
| Unique Features | <ul style="list-style-type: none"> –mV output –Gas damping –Pin or pad option | <ul style="list-style-type: none"> –Temperature compensated –Gas damping –Pin or pad option | <ul style="list-style-type: none"> –Hermetically sealed –High over-range protection –Gas damping | <ul style="list-style-type: none"> –Low power –Hermetically sealed –>100 kHz resonant frequency | <ul style="list-style-type: none"> –Self test enabled –Gas damping –Bi-directional mounting |
| Accuracy | ±0.5% Non-linearity | ±0.5% Non-linearity | ±0.5% Non-linearity | ±2.0% Non-linearity | ±1.0% Non-linearity |
| Operating Temp | -40°C to 125°C | -40°C to 125°C | -54°C to 125°C | -55°C to 125°C | -40°C to 125°C |
| Dimensions (mm) | 22.86 x 15.24 x 5.33 | 22.86 x 15.24 x 5.33 | 7.62 x 7.62 x 3.3 | 7.62 x 7.62 x 3.3 | 13.46 x 7.62 x 3.81 |
| Typical Apps | Vibration / shock monitoring, tilt applications, motion control, impact testing | Vibration / shock monitoring, tilt applications, motion control, impact testing | Vibration / shock monitoring, embedded systems, shock testing, safe and arm | Impact and shock testing, fuzing, safe and arm | Vibration / shock monitoring, aerospace testing, impact testing, transportation |

Piezoelectric Accelerometers

Embedded Single Axis

Uses piezo-electric technology with broad frequency response for harsh applications.







Embedded Triaxial

| |  |  |  |  |  |  |
|------------------------|---|--|---|--|---|---|
| 805/805M1 | | 808/808M1 <small>NEW</small> | 810M1 <small>NEW</small> | LDT Family | 832/832M1 | 834/834M1 |
| Package | TO - 5 | TO - 8 | Board level | Piezo Film elements with or without mass and pins | SMD | SMD |
| Type | Adhesive (Stud mount option) | Adhesive (Stud mount option) | SMD | Cantilever beam with vertical or horizontal pins | Board mount | Board mount |
| F.S. Range (g) | ±50, 500 / ±20, 200 | ±10, 50 / ±4, 20 | ±25, 100 | ±10 (typical) | ±25, 50, 100, 200, 500 | ±2000, 6000 |
| Unique Features | <ul style="list-style-type: none"> –Hermetically sealed –Case grounded design –Bandwidth to 12 kHz | <ul style="list-style-type: none"> –Hermetically sealed –Case grounded design –Bandwidth to 8 kHz | <ul style="list-style-type: none"> –Small size, low cost –Dynamic response –6kHz bandwidth | <ul style="list-style-type: none"> –Very low cost –High sensitivity (1V/g) –Ultra-low power (self generating) | <ul style="list-style-type: none"> –Low cost –Hermetically sealed –Piezo-ceramic | <ul style="list-style-type: none"> –Low cost –Hermetically sealed –Piezo-ceramic |
| Accuracy | ±1.0% Non-linearity | ±1.0% Non-linearity | ±2.0% Non-linearity | ±20.0% (typical) | ±2.0% Non-linearity | ±2.0% Non-linearity |
| Operating Temp | -50°C to 100°C | -50°C to 100°C | -40°C to 125°C | -40°C to 70°C | -20°C to 80°C / -40°C to 125°C | -20°C to 80°C / -40°C to 125°C |
| Dimensions (mm) | Ø 8.9 x 10.16 | Ø 15.2 x 16.6 | 12.70 x 15.24 | 19.05 x 6.35 x 6.35 | 18.8 x 14.22 x 4.32 | 18.8 x 14.22 x 4.32 |
| Typical Apps | Machine monitoring, data loggers, permanent structures | Machine monitoring, data loggers, embedded applications | Data logging, impact detection | Wake-up switch, load imbalance, antitheft devices, impact sensing, vital signs monitoring | Data logging, asset monitoring, impact monitoring | Data logging, asset monitoring, impact monitoring |

DC Accelerometers

Plug and Play, Unamplified

Uses piezoresistive MEMS technology with high over-range protection and application-specific packaging.

| |  |  |  |  |  |  |
|------------------------|--|--|--|--|---|---|
| | 40A/40B NEW | 52F | 52/52M30 | 64B/64C | 58 NEW | 1201/1201F |
| Package | Anodized aluminum | Anodized aluminum | Plastic / anodized aluminum | Anodized aluminum | Anodized Aluminum | Anodized aluminum |
| Type | Screw mount | Screw mount | Adhesive mount | Screw mount | Adhesive mount | Adhesive / screw mount |
| F.S. Range (g) | ±25, 100, 250, 500, 1000, 2000 | ±50, 200, 500, 2000 | ±50, 200, 500, 2000 | ±50, 100, 200, 500, 2000, 6000 | ±50, 100, 200, 500, 2000 | ±50, 100, 200, 500, 1000 |
| Unique Features | <ul style="list-style-type: none"> –Critically damped –SAE J211 / 2570 compliant –Compact | <ul style="list-style-type: none"> –Low cost –Gas damping –Over-range stops | <ul style="list-style-type: none"> –Low cost –Gas damping –Over-range stops | <ul style="list-style-type: none"> –SAE J211 / 2570 compliant –Flexible, rugged cable –Over-range stops | <ul style="list-style-type: none"> –Low noise cable –Small package –Light weight | <ul style="list-style-type: none"> –Small size –Flexible, rugged cable –Over-range stops |
| Accuracy | ±1.0% Non-linearity | ±1.0% Non-linearity | ±1.0% Non-linearity | ±1.0 % Non-linearity | ±1.0% non-linearity | ±1.0 % Non-linearity |
| Operating Temp | -20°C to 80°C | -40°C to 90°C | -40°C to 90°C | -40°C to 121°C | -20°C to 85°C | -20°C to 85°C |
| Dimensions (mm) | 16.7 x 10.0 x 5.0 | 11.2 x 10.2 x 3.8 | 9.65 x 4.83 x 3.3 | 12.19 x 4.83 x 4.83 | 14.0 x 6.35 x 6.35 | 8.89 x 8.89 x 9.4 |
| Typical Apps | In-dummy and pedestrian crash testing | Vibration / shock monitoring, shock testing, safety impact testing, side-impact testing | Vibration / shock monitoring, shock testing, safety impact testing, side-impact testing | In-dummy crash and impact testing | Crash testing, impact testing, off-road testing | On-vehicle crash and impact testing, vibration and shock monitoring |

DC Accelerometers

Plug and Play, Unamplified

Uses piezoresistive MEMS technology with high over-range protection and application-specific packaging.

| |  |  |  |  |  |
|------------------------|--|---|---|--|--|
| | 3801A | 3700 | EGAXT | EGCS-D0 EGCS-D1S | EGCS-S425 |
| Package | Stainless steel | Stainless steel | Stainless steel | Stainless steel | Anodized aluminum |
| Type | Stud mount | Screw mount | Adhesive / screw mount | Screw / stud mount | Screw mount |
| F.S. Range (g) | ±2, 10, 20, 50, 100, 200, 500, 2000 | ±50, 200, 500, 2000, 6000 | ±5 through 2500 | ±5 through 10,000 | ±50, 100, 250, 500, 1000, 2000 |
| Unique Features | <ul style="list-style-type: none"> –Hermetically sealed sensor –Gas damping –10,000 g over-range protection | <ul style="list-style-type: none"> –No zero shift –mV output –20,000 g over-range protection | <ul style="list-style-type: none"> –Sub-miniature –Lightweight –10,000 g over-range protection | <ul style="list-style-type: none"> –Rugged housing –Critically damped –10,000 g over-range protection | <ul style="list-style-type: none"> –Critically damped –Compact- Mechanical stops |
| Accuracy | ±0.5% Non-linearity | ±2.0% Non-linearity | ±1.0 % Non-linearity | ±1.0 % Non-linearity | ±1.0 % Non-linearity |
| Operating Temp | -54°C to 121°C | -54°C to 121°C | -40°C to 120°C | -40°C to 120°C | -20°C to 80°C |
| Dimensions (mm) | 15.88 x 15.24 | 14.22 x 8.13 x 3.81 | 7.2 x 4.6 x 4.6 | D0: 19.05 x 19.05 x 7.62 D1S: 12.7 x 12.7 x 15.24 | 14.73 x 9.9 x 4.83 |
| Typical Apps | Impact testing, structural testing, test and instrumentation, environmental testing | Impact and shock testing, structural testing, drop testing, aerospace testing | Flight test and control, launch, crash, impact testing, robotics | General purpose, machine control, destructive testing, engine testing | Auto safety testing for side impact, on-vehicle, sled and in-dummy |

DC Accelerometers

Plug and Play, Amplified

Uses silicon MEMS technology with digital temperature compensation.

| |  |  |  |  |  |  |
|---------------------------|--|--|---|--|---|--|
| | 201 | 4000A/4001A | 4602/4604HT | 4610/4610A | 4801A | 4807A NEW |
| Package | Anodized aluminum | Anodized aluminum | Anodized aluminum | Anodized aluminum | Stainless steel | Stainless steel |
| Type | Screw mount | Screw mount | Screw mount | Screw mount | Stud mount | Screw mount |
| F.S. Range (g) | ±2, 5, 10, 20, 30, 50, 100 | ±2, 5, 10, 20, 50, 100, 200 | ±2, 10, 30, 50, 100, 200, 500 | ±2, 10, 30, 50, 100, 200, 500 | ±2, 10, 20, 50, 100, 200, 500, 2000 | ±2, 5, 10, 20, 30, 50, 100, 200, 500 |
| Unique Features | <ul style="list-style-type: none"> –Low noise –Low current consumption –2 pole electronic filtering | <ul style="list-style-type: none"> –Integral connector option –Gas damping –Low power | <ul style="list-style-type: none"> –Exceptional temp compensation –HT version to 170°C –High overrange –Hermetically sealed | <ul style="list-style-type: none"> –New low noise ranges –Temperature compensated –High overrange –Hermetically sealed | <ul style="list-style-type: none"> –Hermetically sealed sensor –Integral connector –Signal conditioned | <ul style="list-style-type: none"> –Ultra low noise –Micro-g resolution –Hermetically sealed –Detachable cable |
| Accuracy | ±1.0% Non-linearity | ±1.0% Non-linearity | ±1.0% Non-linearity | ±1.0% Non-linearity | ±1.0% Non-linearity | ±1.0% Non-linearity |
| Excitation Voltage | 5 - 30 Vdc | 8 - 32 Vdc | 8 - 36 Vdc / 8 - 18 Vdc (HT) | 8 - 36 Vdc | 8 - 36 Vdc | 8 - 18 Vdc |
| Operating Temp | -40°C to 125°C | -20°C to 85°C | -54°C to 170°C (HT) | -40°C to 115°C | -55°C to 125°C | -55°C to 125°C |
| Dimensions (mm) | 25.4 x 21.59 x 9.65 | 18.54 x 18.54 x 8.64 | 21.08 x 21.59 x 7.62 | 21.59 x 25.4 x 7.62 | 13.33 x 20.83 | 18.54 x 18.54 x 8.64 |
| Typical Apps | Motorsports, seismic, wind turbine, structural monitoring | Low frequency monitoring, transportation, vibration monitoring, motion control | Flight testing on engines, flutter test, weapons development | Rail motion control, modal analysis, flight test, structural test | Impact testing, structural testing, test and instrumentation, environmental testing | Seismic, structural monitoring, flight testing, trains, machine control, road test |

DC Accelerometers

Plug and Play, Triaxial

Uses silicon MEMS technology.

| |  |  |  |  |  |  |
|------------------------|---|---|--|--|---|--|
| | EGAXT3 | 53/53A | 63/68CM1 | 4630/4630A | 4020/4030 NEW | 606M1 |
| Package | Stainless steel | Anodized aluminum | Stainless steel | Anodized aluminum | Molded plastic | Nitrile rubber pad |
| Type | Stud mount | Adhesive mount | Screw mount | Screw mount | Screw mount | Removable |
| F.S. Range (g) | ±5 through 2500 | ±50, 200, 500, 2000 | ±500, 1000, 2000 | ±2, 5, 10, 30, 50, 100, 200, 500 | ±2 | ±25 |
| Unique Features | <ul style="list-style-type: none"> –Sub-miniature –Lightweight –10,000 g over-range protection | <ul style="list-style-type: none"> –Low cost –Gas damping –Low power | <ul style="list-style-type: none"> –World SID (68CM1) –Gas damping –Low power | <ul style="list-style-type: none"> –New low noise ranges –Temperature compensated –High overrange –Hermetically sealed | <ul style="list-style-type: none"> –Low cost –Biaxial, with triaxial option –DC response –Rugged construction | <ul style="list-style-type: none"> –0.7 damping ratio –Triaxial, hermetic –Seat pad accelerometer –606M2 IEPE option |
| Accuracy | ±1.0% Non-linearity | ±1.0% Non-linearity | ±1.0% Non-linearity | ±1.0% Non-linearity | ±1.0% Non-linearity | ±1.0% Non-linearity |
| Operating Temp | -40°C to 120°C | -20°C to 85°C | -20°C to 85°C | -40°C to 115°C | -40°C to 85°C | -20°C to 85°C |
| Dimensions (mm) | 12.7 x 12.7 x 12.7 | 18.29 x 13.21 x 7.11 | 12.7 x 12.7 x 12.7 | 26.16 x 26.16 x 23.37 | 71.2 x 40.0 x 15.2 | 199 x 4 |
| Typical Apps | Flight test, crash, shock monitoring | Auto safety, passenger comfort, transportation, NVH analysis | Auto safety, in-dummy crash, on-vehicle crash | Road testing, motion control, structural testing | Structural monitoring, seismic array, bridge testing | Off-road equipment, amusement rides, commercial aircraft |

DC Accelerometers

Plug and Play

NEW



| | XL403A | XL403D | 13203CC | 3420XA | 3520XA |
|---------------------------|---|---|---|---|---|
| Package | Anodized aluminum | Anodized aluminum | Anodized aluminum | Anodized aluminum | Anodized aluminum |
| FS Range (g) | any from ± 1 to 15 | any from ± 1 to 15 | ± 1 to 15 | ± 1 to 500 | ± 1 to 500 |
| Number of Axes | 1, 2, or 3 | 1, 2, or 3 | 1 | Triaxial | 1, 2, or 3 |
| Unique Features | <ul style="list-style-type: none"> –Quick ship –Configurable g range and bandwidth –Performance over temperature | <ul style="list-style-type: none"> –Quick ship –Digital output –Built-in analyses –User configurable settings | <ul style="list-style-type: none"> –IdentiCal™ interchangeable sensor –Best performance over temperature –Expanded environmental tests | <ul style="list-style-type: none"> –Analog output –Precision aligned –Performance over temperature | <ul style="list-style-type: none"> –Digital output –Direct to PC –User configurable settings |
| Accuracy | $\pm 0.1\%$ Non-linearity | $\pm 0.1\%$ Non-linearity | $\pm 0.06\%$ Non-linearity | $\pm 0.2\%$ Non-linearity | $\pm 0.2\%$ Non-linearity |
| Excitation Voltage | 8.5 to 36 VDC | 8.5 to 36 VDC | 8.5 to 36 VDC | 8.5 to 36 VDC | 8.5 to 36 VDC |
| Operating Temp | -40°C to 85°C | -40°C to 85°C | -40°C to 85°C | -40°C to 85°C | -40°C to 85°C |
| Dimensions (mm) | 36.50 x 25.40 x 17.50 | 36.50 x 25.40 x 17.50 | 24 x 24 x 27.30 | 24 x 24 x 28.30 | 52 x 36.50 x 17.50 |
| Typical Apps | Flight test, wind turbine, flight simulator | Non-navigation heading, system monitor, test and measurement | Aircraft warning system, railway mechanism, test and measurement | Safety system, research & development, test and measurement | Device production systems, impact detection, test and measurement |

Charge Mode, Piezoelectric Accelerometers

Plug and Play

Uses piezoelectric technology with broad frequency response for harsh applications.

| | 7500A | 7501A | 7502A | 7508A | 7514A NEW | 7530A |
|---------------------------|---|--|--|---|--|--|
| Package | Stainless steel | Titanium | Titanium | Stainless steel | Stainless steel | Hard anodized aluminum |
| Type | Through hole mount | Through hole mount | Adhesive mounting | Adhesive mounting | Stud mounting | Screw mounting |
| Sensitivity (pC/g) | 20, 13, 7 | 5.6 | 1.8 | 5.6 | 100, 50, 30, 20, 13 | 5.6 |
| Unique Features | <ul style="list-style-type: none"> –Single axis, shear mode –Hermetically sealed –Isolated mounting surface –Wide bandwidth | <ul style="list-style-type: none"> –Single axis, shear mode –Hermetically sealed –Bandwidth to >15 kHz | <ul style="list-style-type: none"> –Single axis, shear mode –Hermetically sealed –<1 gram –Wide bandwidth | <ul style="list-style-type: none"> –Single axis, shear mode –Hermetically sealed –Bandwidth to 8 kHz | <ul style="list-style-type: none"> –Single axis, shear mode –>12 kHz bandwidth –High sensitivity | <ul style="list-style-type: none"> –Triaxial, shear mode –Hermetically sealed –Isolated mounting surface –Wide bandwidth |
| Operating Temp | -73°C to 260°C | -73°C to 260°C | -73°C to 260°C | -73°C to 260°C | -73°C to 260°C | -73°C to 200°C |
| Dimensions (mm) | 8.38 x 22.35 | 5.84 x 14.48 | 4.40 x 11.94 | 9.53 x 10.16 | 14.99 x 14.99 | 18.72 x 18.72 x 11.68 |
| Typical Apps | Gearbox vibration monitoring, flight test, high temp applications | Gearbox vibration monitoring, flight test, high temp applications | Small structures monitoring, minimal mass loading, high temp applications | Small structures monitoring, general purpose, high temp applications | Low frequency vibration, general purpose, high temp applications | Vibration monitoring, drop testing, high temp applications |

Voltage Mode, Piezoelectric (IEPE) Accelerometers

Plug and Play

Uses piezo-electric technology with broad frequency response for harsh applications.

| | | | | | | |
|---------------------------|---|--|--|---|--|---|
| |  |  |  |  |  |  |
| | 7100A/7101A | 7109A/B <small>NEW</small> | 7108A | 7104A/7105A <small>NEW</small> | 7131A/7132A <small>NEW</small> | 7120A/7122A |
| Package | Stainless steel / titanium | Stainless steel | Stainless steel | Stainless steel | Titanium | Titanium |
| Type | Through hole mounting | Stud mount | Adhesive mounting | Stud mounting | Adhesive/stud mounting | Adhesive mounting |
| Sensitivity (mV/g) | 100, 10, 5 | 50, 1.0, 0.5, 0.25 | 100, 10 | 100, 50, 10, 5 | 100, 50, 10, 5, 2.5 | 1000, 100, 10 |
| Unique Features | <ul style="list-style-type: none"> –Single axis, shear mode –Isolated mounting surface –Hermetically sealed –Wide bandwidth, >10 kHz | <ul style="list-style-type: none"> –Single axis, shear mode –High g shock –Integral cable –Rugged construction | <ul style="list-style-type: none"> –Single axis, shear mode –Wide bandwidth –Welded construction –Small size | <ul style="list-style-type: none"> –Single axis, shear mode –Wide bandwidth –Top and side connector option | <ul style="list-style-type: none"> –Triaxial, shear mode –>12 kHz bandwidth –4-pin connector –Hermetically sealed | <ul style="list-style-type: none"> –Single axis, shear mode –Miniature cube –10-32 connector –Hermetically sealed |
| Operating Temp | 7100A: -55°C to 150°C 7101A: -55°C to 125°C | -55°C to 125°C | -55°C to 125°C | -55°C to 125°C | -55°C to 125°C | -55°C to 125°C |
| Dimensions (mm) | 7100A: 9.9 x 22.35 7101A: 5.84 x 14.48 | 15.1 x 10.0 | 9.53 x 10.16 | 7104A: 11.11 x 14.10 7105A: 11.11 x 19.05 | 7131A: 11 x 11 x 11 7132A: 15.24 x 20.32 x 13.46 | 10.16 x 10.16 x 19.16 |
| Typical Apps | Flight testing, general purpose, vibration monitoring | Shock testing, impact monitoring, drop testing | Vibration monitoring, modal testing, general purpose | General purpose IEPE accel, vibration monitoring, lab testing | General purpose, modal testing, vibration monitoring | Modal testing, vibration monitoring, small structures monitoring |

Voltage Mode, Piezoelectric Accelerometers

Plug and Play

Uses piezoelectric technology with broad frequency response for harsh applications.

| | | | | | | |
|---------------------------|--|---|---|---|--|---|
| |  |  |  |  |  |  |
| | 7202A/7204A | 8042 <small>NEW</small> | 8011/8021-01 <small>NEW</small> | 8032-01 <small>NEW</small> | 8011/8021-AR/AP <small>NEW</small> | 8011/8021-VR/VP <small>NEW</small> |
| Package | Stainless steel | Titanium | Stainless steel | Stainless steel | Stainless steel | Stainless steel |
| Type | Through hole mount | Stud mount | Stud / through hole mount | Stud mount | Stud / through hole mount | Stud / through hole mount |
| Sensitivity (mV/g) | 100, 10 | 500, 100, 10 | 500, 100, 10 | 100, 10 | 4 - 20 mA RMS or peak | 4 - 20 mA RMS or peak |
| Unique Features | <ul style="list-style-type: none"> –Annular shear mode –Integral strain relief –Case isolated, internally shielded –3-pin connector –150°C option | <ul style="list-style-type: none"> –Industrial applications –Submersible –IP68, >100 meters –16kHz bandwidth | <ul style="list-style-type: none"> –Industrial accelerometer –Case isolated, internal shielding –Reverse wiring protection –±1.0% Non-linearity | <ul style="list-style-type: none"> –Industrial accelerometer –Case isolated, internal shielding –Low cost –Molded strain relief | <ul style="list-style-type: none"> –Industrial accelerometer –Case isolated, internal shielding –50, 20, 10, 5 g ranges | <ul style="list-style-type: none"> –Velocity transmitter –Case isolated, internal shielding –0.5 to 5.0 in/sec |
| Operating Temp | -55°C to 130°C | -20°C to 80°C | -55°C to 125°C | -55°C to 100°C | -40°C to 85°C | -40°C to 85°C |
| Dimensions (mm) | 13.34 x 19.05 | 22.23 x 48.26 | 22.23 x 48.26 | 14.3 x 45.3 | 22.23 x 48.26 | 22.23 x 48.26 |
| Typical Apps | HUMS applications, machinery monitoring, harsh environments | Submersed pump monitoring, underwater research, gearbox monitoring | Industrial applications, machine monitoring, intrinsic safety | Industrial applications, machine monitoring | Industrial applications, machine monitoring, intrinsic safety | Industrial applications, machine monitoring, intrinsic safety |

Gyros, Angular Rate Sensors

Plug and Play

NEW



GY407D



11206AC



11207AC



3120XB



65210E

| | | | | | |
|---------------------------|--|--|---|---|--|
| Package | Anodized aluminum | Anodized aluminum | Anodized aluminum | Anodized aluminum | Anodized aluminum |
| FS Range (°/s) | ±300 | ±50, 180, 300, 600 | ±250, 300, 450 | ±50, 150, 300, 600, 1000, 1200 | up to ±20K on roll axis |
| Number of Axes | 1, 2, or 3 | Single axis | Single axis | Triaxial | Six |
| Unique Features | <ul style="list-style-type: none"> –Digital output –Built-in analyses –Dynamic interface –Performance over temperature | <ul style="list-style-type: none"> –IdentiCal™ interchangeable sensor –Best performance over temperature –Gain and offset compensation –Expanded environmental tests | <ul style="list-style-type: none"> –IdentiCal™ interchangeable sensor –High stability –Low noise –Vibration-rejecting | <ul style="list-style-type: none"> –Performance over temperature –Rugged packaging –Power supply regulation –Temperature calibration data | <ul style="list-style-type: none"> –Complete 6DoF and TM kit –External inputs –User configurable –Self-powered |
| Accuracy | ±1.0% Non-linearity | ±0.1% Non-linearity | ±0.01% Non-linearity | ±0.1% Non-linearity | up to ±0.1% Non-linearity |
| Excitation Voltage | 8.5 to 36 VDC | 8.5 to 36 VDC | 10 to 36 VDC | 8.5 to 36 VDC | 8.5 to 36 VDC |
| Operating Temp | -40°C to 85°C | -40°C to 85°C | -40°C to 85°C | -40°C to 85°C | -40°C to 85°C |
| Dimensions (mm) | 36.50 x 25.40 x 17.50 | 24 x 24 x 27.30 | 24 x 24 x 27.30 | 24 x 24 x 28.30 | 69.85 dia x 201.42 length |
| Typical Apps | Non-navigation heading, vehicle dynamics, test and measurement | Wind turbine, weapons testing, test and measurement | Wind turbine, weapons testing, test and measurement | Weapons testing, boat stabilization, test and measurement | Weapons separation testing, captive carry testing |

Electronics

Signal Conditioners

Easy-to-use instrumentation that ensures data integrity.



121

NEW



130

NEW



140/142

NEW



161

| | | | | |
|------------------------|--|--|---|--|
| Type | Bench top | Inline charge converter | Auto-zero inline amplifier | Bench top |
| # of Channels | 3 | 1 | 1 | 4 |
| Gain Range | 0.001 to 9999 | 0.1, 1, 10 | 10, 25, 50, 100, 200, 500 | 0.001 to 999.9 |
| Unique Features | <ul style="list-style-type: none"> –Universal DC amplifier –Low noise operation with auto-zero –For bridge type sensors –µP controlled, Programmable –Low-pass filter options | <ul style="list-style-type: none"> –Low noise –Small package –Wide bandwidth –BNC male or female | <ul style="list-style-type: none"> –±1.5mV auto-zero –For bridge type sensor (140) –For strain gage (142) –Lowest noise –5 to 30Vdc excitation | <ul style="list-style-type: none"> –Charge and IEPE conditioner –Sensitivity normalization –LCD display –Support IEEE 1451.4 TEDS –10 V peak linear output –Selectable LP filter |
| Dimensions (mm) | 301 x 258 x 102 | Ø13.8 x 52.2 | 56.9 x 25.4 x 12.7 | 310 x 180 x 115 |
| Typical Apps | Instrumentation labs, test benches, R&D facilities | Instrumentation labs, high temperature testing PE accelerometer | Instrumentation labs, test benches, R&D facilities | Instrumentation labs, PE/IEPE sensors |



The MEAS line of Photo Optic Sensors includes both photo optic components and complete sensor solutions. Our component series features dual LED, bi-wavelength emitters and spectrally paired photo detectors. MEAS optics are ideally suited for medical applications for which the selection of peak wavelength is a priority, such as pulse oximetry (SpO_2). We also package our optics into complete probe assemblies for pulse oximetry (SpO_2) monitoring applications. The MEAS OEM pulse oximetry (SpO_2) probe platform includes reusable finger clips, soft silicone boots, and a range of disposable sensors.

Photo Optic Sensors

Photo Optic Components and Pulse Oximetry Probe Platforms



ELM-4000

| | |
|------------------------|---|
| Package | Lead frame |
| Type | Emitter assembly |
| Range | 660 nm / 880-940 nm |
| Unique Features | <ul style="list-style-type: none"> –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 Apps | Pulse oximetry, finger/ear probes, disposable |



EPM-4000

| | |
|------------------------|---|
| Package | Lead frame |
| Type | Detector assembly |
| Range | |
| Unique Features | <ul style="list-style-type: none"> –Low cost –Fast response –High efficiency |
| Accuracy | Sensor dependent |
| Operating Temp | -55°C to 70°C |
| Dimensions (mm) | 4.4 x 5.1 x 1.8 |
| Typical Apps | Pulse oximetry, finger/ear probes, disposable |



Disposable Sensor

| | |
|------------------------|---|
| Package | Biocompatible |
| Type | Sensor platform |
| Range | Adult / neonatal |
| Unique Features | <ul style="list-style-type: none"> –Latex free –Lightweight –Microfoam / cloth |
| Accuracy | Sensor dependent |
| Operating Temp | -55°C to 70°C |
| Dimensions (mm) | |
| Typical Apps | Pulse oximetry |



Finger Clip Sensor

| | |
|------------------------|---|
| Package | Biocompatible |
| Type | Sensor platform |
| Range | Adult |
| Unique Features | <ul style="list-style-type: none"> –Soft pads –Lightweight –Easily cleaned |
| Accuracy | Sensor dependent |
| Operating Temp | -55°C to 70°C |
| Dimensions (mm) | |
| Typical Apps | Pulse oximetry |



Soft Sensor

| | |
|------------------------|---|
| Package | Silicon boot |
| Type | Sensor platform |
| Range | Adult / pediatric |
| Unique Features | <ul style="list-style-type: none"> –Ease of use –Lightweight –Latex free |
| Accuracy | Sensor dependent |
| Operating Temp | -55°C to 70°C |
| Dimensions (mm) | |
| Typical Apps | Pulse oximetry |

piezo

Piezoelectric fluoropolymer film produces voltage or charge proportional to strain. Exceptionally high strain sensitivity ($15 \text{ mV}/\mu\epsilon$), in-plane strain bandwidth from $<0.1 \text{ Hz}$ to $>100 \text{ kHz}$, ultrasound transmit and receive functionality to $>100 \text{ MHz}$, and dynamic range of 280 dB characterize the very unique capabilities of Piezo Film. A highly versatile, enabling sensor technology, Piezo Film has thin cross-section ($28 \mu\text{m}$ - $110 \mu\text{m}$ in thickness), is flexible, very robust, chemically inert and can withstand temperatures up to 85°C (125°C with special processing). Piezo Film is also pyroelectric, capable of generating $>8\text{V}/^\circ\text{C}$. Simple printing with conductive ink defines the active electrode areas. This may be easily customized to give either single elements or complex arrays.

Piezo Cable is a coaxial sensor utilizing piezo film as the sensing material. Available in continuous lengths of 1km or longer, Piezo Cable possesses many of the attributes of Piezo Film in an extremely rugged and shielded form factor that is easy to deploy.





| | DT1 & SDT1 | Piezo Cable | CM-01 | FLDT1 | LDTC Analog PCB |
|------------------------|--|--|--|---|---|
| Package | Unshielded element with twisted pair or shielded element with shielded cable | Shielded coaxial 20 gage piezo cable | Metallized plastic housing | Unshielded film element with screen printed leads | Evaluation PCB platform for vibration sensor |
| Type | Flexible film, adhesive mount | Polymer jacketing; armored jacketing | Contact microphone | Flexible film, adhesive mount | Amplified analog output |
| Range | 15 mV/με up to 1% strain | μPa sensitivity | 40 V/mm; 8 Hz to 2.2 kHz | 15 mV/με, up to 1% strain | 1 Hz to 117 Hz |
| Unique Features | <ul style="list-style-type: none"> –Thin, flexible, robust –Withstands up to 1% strain –Ultra-low power (self generating) | <ul style="list-style-type: none"> –Continuous lengths to 1km –Shielded construction | <ul style="list-style-type: none"> –Low noise –Vibration and impact sensing –High sensitivity | <ul style="list-style-type: none"> –Thin, flexible –Leads screen printed on film –Connects to standard connector | <ul style="list-style-type: none"> –Low power –High sensitivity –Analog and digital signal access points |
| Accuracy | ±20% (typical) | ±20% (typical) | N/A | ±20% typical | ±20% |
| Operating Temp | -40°C to 70°C (up to 125°C available) | -40°C to 85°C (up to 100°C available) | 5°C to 60°C | -40°C to 70°C; higher available custom | -20°C to 85°C |
| Dimensions (mm) | Application dependent | 3 mm diameter; continuous lengths | 18 dia x 11 high | 12 x 30 active; custom available | 33 x 46 |
| Typical Apps | Dynamic strain gage, contact microphone, acoustic pickup | Perimeter and fence security; geophone, impact sensors, intrusion detection, seat occupancy (e.g. airbag), patient bed vital signs monitor | Electronic stethoscope, contact microphone, vibration and impact sensing | Event timing, dynamic strain, motion detection | Vibration sensing, wake-up sensor, activity sensor |



| | Laboratory Amplifier | 80 KHz Transducers | NDT-1 | Tamper Box | ACH01 | LDTC Family |
|------------------------|--|---|---|--|--|---|
| Package | Bench top | Pin mounted | Adhesive mounted | Flat film or box mounted | Ceramic base, plastic cover, shielded cable | Piezo film elements with or without mass and pins |
| Type | Piezo film lab amp | Air ultrasound transducer | High frequency ultrasound transducer | Tamper detection sensor | Adhesive mount | Cantilever beam with vertical or horizontal pins |
| Range | 0.1 Hz to 100 kHz | 80 kHz | 3 MHz | Application dependent | ±250 g (typical) | ±10 g (typical) |
| Unique Features | <ul style="list-style-type: none"> –Voltage or charge mode settings –Multi-pole high- and low-pass filters –Adjustable gain | <ul style="list-style-type: none"> –Small size –Low mechanical Q –Shielded package | <ul style="list-style-type: none"> –Flexible –High bandwidth, low Q –Low impedance | <ul style="list-style-type: none"> –Low power –Custom shapes and sizes –High security | <ul style="list-style-type: none"> –Extremely high bandwidth –Low cost –Ultra-low power | <ul style="list-style-type: none"> –Very low cost –High sensitivity (1 V/g) –Ultra-low power (self generating) |
| Accuracy | Application dependent | Application dependent | Application dependent | Application dependent | ±20% (typical) | ±20% (typical) |
| Operating Temp | 0°C to 40°C | -20°C to 80°C | -20°C to 60°C | -40°C to 85°C | -40°C to 85°C | -40°C to 70°C |
| Dimensions (mm) | 150 x 100 x 100 | 6 dia x 9 | 12 x 30 | Application dependent | 18.80 x 13.21 x 6.10 | 19.05 x 6.35 x 6.35 |
| Typical Apps | Low frequency dynamic strain, pyroelectric signals, machine vibration, piezo cable and traffic sensor interface | Air ranging, ultrasonic mouse, digitizers | Thickness measurement, speed of sound measurement, pulse/echo NDT | Encryption modules, POS card readers, PIN entry devices | Vibration sensing, gear box and high speed monitoring, high speed bearings and centrifuges, speaker motional feedback | Wake-up switch, load imbalance, antitheft devices, impact sensing, vital signs monitoring |

scanners

solutions by sensor type

The aerodynamic research group of measurement specialties provides data systems based on the electronic pressure and temperature scanners of legacy brand Pressure Systems. 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 RTD's. Software is included with each solution.



Pressure and Temperature

NetScanner™ Complete Data Acquisition Devices



9116



9146-R



9146-T



9022

| | | | | |
|--------------------|---|---|---|--|
| Measurement Type | Pressure | Temperature | Temperature | Pressure |
| Media | Dry | RTD / TC / Volt | TC | Liquid |
| Accuracy | ±0.05% FS | ±0.25°C | ±0.25°C | ±0.05% FS |
| # of Channels | 16 | 16 / 32 | 16 | 12 |
| EU Throughput Rate | 500 Hz | 33 Hz | 33 Hz | 100 Hz |
| Enclosure | IP66 / 30g vibration | IP66 / 30g vibration | IP54 / 30g vibration | IP64 / 30g vibration |
| Typical Apps | Engine testing, portable data acquisition, wind tunnel research, process monitoring | Engine testing, portable data acquisition, wind tunnel research, process monitoring | Engine testing, portable data acquisition, wind tunnel research, process monitoring | Engine testing, third party transducers, close coupled requirements, high pressure |

Pressure

NetScanner™ Complete Data Acquisition Devices



9032

| | |
|---------------------------|---|
| Measurement Type | Barometer |
| Media | Dry |
| Accuracy | ±0.01% FS |
| # of Channels | 1 |
| EU Throughput Rate | 10 Hz |
| Enclosure | Laboratory grade |
| Typical Apps | Barometric monitor, precision reference |



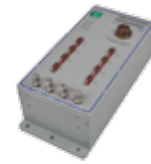
9034, 9038

| | |
|---------------------------|--|
| Measurement Type | Calibrator |
| Media | Dry |
| Accuracy | ±0.01% FS |
| # of Channels | 1 |
| EU Throughput Rate | 10 Hz |
| Enclosure | Laboratory grade |
| Typical Apps | Calibration, transfer standard, verification testing |



98RK-1, 9816

| | |
|---------------------------|--|
| Measurement Type | Pressure |
| Media | Dry |
| Accuracy | ±0.05% FS |
| # of Channels | 128 |
| EU Throughput Rate | 100 Hz |
| Enclosure | 19" rackmount / 4U |
| Typical Apps | Turbine engine test, control room location |



Flight Data System

NEW

| | |
|---------------------------|-----------------|
| Measurement Type | Pressure |
| Media | Dry |
| Accuracy | ±0.05% |
| # of Channels | 512 |
| EU Throughput Rate | 10 / 100 Base-T |
| Enclosure | Flight grade |
| Typical Apps | Flight testing |

Pressure Scanners

Miniature High Density Pressure Scanners



64HD DTC

| | |
|----------------------|--|
| Type | Pressure |
| Media | Dry |
| Accuracy | ±0.03% FS |
| # of Channels | 64 |
| Thermal Comp | Active (DTC) |
| Port Sizes | 0.040 in. |
| Typical Apps | Wind tunnel research, flight test, on vehicle research |



32HD DTC

| | |
|----------------------|--|
| Type | Pressure |
| Media | Dry |
| Accuracy | ±0.03% FS |
| # of Channels | 32 |
| Thermal Comp | Active (DTC) |
| Port Sizes | 0.040 or 0.063 in. |
| Typical Apps | Wind tunnel research, flight test, on vehicle research |



64HD, 32HD, 16HD

| | |
|----------------------|--|
| Type | Pressure |
| Media | Dry |
| Accuracy | ±0.05% FS |
| # of Channels | 64, 32 or 16 |
| Thermal Comp | Passive |
| Port Sizes | 0.040 or 0.63 in. |
| Typical Apps | Wind tunnel research, flight test, on vehicle research |



MicroScanner

NEW

| | |
|----------------------|--|
| Type | Pressure |
| Media | Dry |
| Accuracy | ±0.10% |
| # of Channels | 16 |
| Thermal Comp | Active |
| Port Sizes | Direct mount |
| Typical Apps | For confined space, wind tunnel, flight test |

Data Acquisition Systems

Multi-Scanner Data Acquisition Systems



Optimus

| | |
|---------------------------|-----------------------|
| Type | Pressure scanning |
| Media | Dry |
| Accuracy | ±0.03% FS |
| # of Channels | 2048 |
| EU Throughput Rate | 650 Hz |
| Enclosure | Laboratory grade |
| Typical Apps | Aerospace development |



Initium

| | |
|---------------------------|-------------------|
| Type | Pressure scanning |
| Media | Dry |
| Accuracy | ±0.05% FS |
| # of Channels | 512 |
| EU Throughput Rate | 1200 Hz |
| Enclosure | Laboratory grade |
| Typical Apps | Wind engineering |



Interface

NEW

| | |
|---------------------------|--|
| Type | A/D conversion |
| Media | Dry |
| Accuracy | ±0.05% FS |
| # of Channels | 512 |
| EU Throughput Rate | 650 Hz |
| Enclosure | Miniature |
| Typical Apps | In model placement, optimus system interface |



Pneumatics

NEW

| | |
|---------------------------|--|
| Type | Quick disconnect |
| Media | Dry |
| Accuracy | N/A |
| # of Channels | 19, 31, 36, 55 |
| EU Throughput Rate | N/A |
| Enclosure | Miniature |
| Typical Apps | Pressure connections for confined spaces |

fluid properties

solutions by sensor type

Measurement Specialties approaches the measurement of fluids using two distinct technologies. Its patented tuning fork technology is coupled with efficient software algorithms for accurate measurement of viscosity, density and dielectric constant. Highly reliable reed switch technology is combined with temperature measurement for level sensing. Dedicated applications include, among others, oils (engine, hydraulic, transmission), fuels and DEF/AdBlue®* fluid monitoring.

Robust design enables Fluid Property sensors to operate under diverse pressure, flow and temperature conditions to bring real time fluid monitoring to engines, fuel systems, SCR systems, compressors, transmissions, gear boxes and many other industrial applications.

Our new Water in Oil measurement sensor supplements the existing fluid quality range of products.



*AdBlue® is a registered trademark of the Verband der Automobilindustrie e.V (VDA)

Fluid Property Sensors

FPS

Directly and simultaneously measures the fluid properties and temperature.



FPS2810

Package Fully integrated, stand-alone module combines sensor and processing electronics for in-situ monitoring

Type Engine oil quality sensor

Operating Range Viscosity from 0.5 to 50 mPa-s
Density from 0.65 to 1.5 g/cc
Dielectric from 1.0 to 6.0

Operating Temp -40°C to 150°C

Unique Features –Rugged construction for high pressure and high flow environments
–CAN communication protocol (SAEJ1939 compliant)

Calibration Factory calibrated with NIST traceable standards

Dimensions (mm) 73.3 x 30 x 30

Typical Apps Engine quality monitoring for on and off highway vehicles: degradation, oxidation, fuel dilution, soot contamination



FPS2840

Fully integrated, stand-alone module combines sensor and processing electronics for in-situ monitoring

Hydraulic oil quality sensor

Viscosity from 0.5 to 50 mPa-s
Density from 0.65 to 1.5 g/cc
Dielectric from 1.0 to 6.0

-40°C to 150°C

–Rugged construction for high pressure and high flow environments
–CAN communication protocol (SAEJ1939 compliant)

Factory calibrated with NIST traceable standards

73.3 x 30 x 30

Hydraulic oil quality monitoring for on and off highway vehicles, HVACR, compressors, industrial equipments, turbines: degradation, oxidation, water content



FPS2860

Fully integrated, stand-alone module combines sensor and processing electronics for in-situ monitoring

Transmission oil quality sensor

Viscosity up to 20,000 mPa-s
Density from 0.65 to 1.5 g/cc
Dielectric from 1.0 to 6.0

-40°C to 150°C

–Rugged construction for high pressure and high flow environments

Factory calibrated with NIST traceable standards

73.3 x 30 x 30

Transmission oil quality monitoring in high viscosity conditions for on and off highway vehicles, HVACR, compressors, industrial equipments, turbines: degradation, oxidation



HTM2500B3C4 OIL NEW

Fully integrated, stand-alone module combines sensor and processing electronics for in-situ monitoring

Water content in oil and temperature sensor

0 to 1 aw
(aw, activity = water content / water content in saturated oil)

-40°C to 85°C

–Full interchangeability
–High reliability and demonstrated long term stability in oil
–Ratiometric to voltage supply
–Sensitive elements with unique mechanical and chemical robustness

Factory calibrated and tested

76.2 x 30 x 30

Water content in oil and temperature monitoring for automotive, truck, transformers, industrial applications



FPS2820 / FPS2830

Package Fully integrated sensor and processing electronics provide a single sensor solution for in-line or in-tank fuel monitoring

Type Fuel quality sensor

Operating Range Viscosity from 0.5 to 50 mPa-s
Density from 0.65 to 1.5 g/cc
Dielectric from 1.0 to 6.0

Operating Temp -40°C to 150°C

Unique Features –Rugged construction for high pressure and high flow environments

Calibration Factory calibrated with NIST traceable standards

Dimensions (mm) 73.3 x 30 x 30

Typical Apps Diesel, biodiesel, jet, gasoline and flexfuel monitoring, fuel type detection, biodiesel concentration measurement, fuel quality monitoring for engines, turbines, electric power generation, aviation, marine, etc



FPS5851HP NEW

Package Fully integrated sensor and processing electronics provide a solid state sensor for in-line urea quality monitoring

Type Urea quality sensor

Operating Range Urea concentration from 5 to 62.5% mass

Operating Temp -40°C to 125°C, urea concentration accuracy $\pm 1.0\%$

Unique Features –Rugged SST-based construction for demanding environment (vibration, side-load)
–Urea resistant DIN70070 / ISO22241 material
–High reliability and long term stability
–Integrated design to be installed directly on the pump output or on the dosing line
–Optimized for OEM specifications

Calibration Factory calibrated in compliance with DIN70070 / ISO 22241 standards

Dimensions (mm) 93 x 57 x 42 (+SAEJ2044 fluid connecting pipe)

Typical Apps Monitoring urea concentration and urea quality of diesel exhaust fluid (DEF) used in selective catalytic reduction systems (SCR). Detection of unauthorized fluids for SCR systems applications

*AdBlue® is a registered trademark of the Verband der Automobilindustrie e.V (VDA)




DEF/AdBlue®* SCR Sensors

DEF/AdBlue® Level Sensors

| | | | | |
|-----------------------|---|--|--|--|
| |  |  |  |  |
| | FLS RB Series | FLS RC Series NEW | FLS P Series | FLS PU Series |
| Package | Rubber header and stainless steel body | Rubber header and stainless steel body | Plastic header and stainless steel body | Plastic header and stainless steel body |
| Type | Combined level sensor, temperature sensor, filter, AdBlue® draw and return heater, collar header | Combined level sensor, temperature sensor, filter, AdBlue® draw and return heater, bayonet header | Combined level sensor, temperature sensor | Combined level sensor, temperature sensor, filter, AdBlue® draw and return heater, bayonet header |
| Operating Temp | -40°C to 85°C | -40°C to 85°C | -40°C to 85°C | -40°C to 85°C |
| Features | <ul style="list-style-type: none"> –Available in a range of sizes –High reliability –Reed switch technology –Using coolant system to thaw frozen –DEF / AdBlue® feed and return connections can be incorporated into the header –Various collar adapter options | <ul style="list-style-type: none"> –Available in a range of sizes –High reliability –Reed switch technology –Using coolant system to thaw frozen –DEF / AdBlue® feed and return connections can be incorporated into the header | <ul style="list-style-type: none"> –Available in a range of sizes –High reliability –Reed switch technology | <ul style="list-style-type: none"> –Available in a range of sizes –High reliability –Reed switch technology –Using coolant system to thaw frozen –DEF / AdBlue® feed and return connections can be incorporated into the header |

DEF/AdBlue® SCR Sensors with Quality Measurement

In-tank DEF/AdBlue® Level and Quality Sensors

| | | | |
|------------------------------------|---|--|---|
| |  |  |  |
| | QLS RB Series NEW | QLS RC Series NEW | QLS PL Series NEW |
| Package | Rubber header and stainless steel body | Rubber header and stainless steel body | Plastic header and stainless steel body |
| Type | Combined level sensor with quality measurement, temperature sensor, filter, AdBlue® draw and return heater, collar header | Combined level sensor with quality measurement, temperature sensor, filter, AdBlue® draw and return heater, bayonet header | Combined level sensor with quality measurement, temperature sensor, filter, AdBlue® draw and return heater, screwed header |
| Operating Temp | -40°C to 85°C | -40°C to 85°C | -40°C to 85°C |
| Operating Range | 0% to 62.5% mass urea | 0% to 62.5% mass urea | 0% to 62.5% mass urea |
| Urea Concentration Accuracy | ±2% | ±2% | ±2% |
| Features | <ul style="list-style-type: none"> –Available in a range of sizes –High reliability –Reed switch technology –Using coolant system to thaw frozen –DEF / AdBlue® feed and return connections can be incorporated into the header –Integrated quality sensor –Various collar adapter options | <ul style="list-style-type: none"> –Available in a range of sizes –High reliability –Reed switch technology –Using coolant system to thaw frozen –DEF / AdBlue® feed and return connections can be incorporated into the header –Integrated quality sensor | <ul style="list-style-type: none"> –Available in a range of sizes –Different types of foots (compact, normal and extended sizes) –High reliability –Reed switch technology –Using coolant system to thaw frozen –DEF / AdBlue® feed and return connections can be incorporated into the header –Integrated quality sensor –Bayonet adaptor option |

*AdBlue® is a registered trademark of the Verband der Automobilindustrie e.V (VDA)

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 $\pm\%$ 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 $\pm\%$ FSO.

Operating Temperature

Temperature at which a sensor will operate. Use of a sensor outside of its operating temperature range may result in sensor failure.

Operating Temperature Range

The temperature range in which the sensor functions without damage from thermal effects. Exposure to temperatures above or below the Operating Temperature Range may cause permanent damage to the sensor.

Overrange Limit

The Overrange 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 $\pm 0.01\%/^{\circ}\text{C}$ 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 $\pm 0.01\%$ FSO/ $^{\circ}\text{C}$ or in voltage units such as $\pm 0.2\text{mV}/^{\circ}\text{C}$ and it is not a linear function.

Total Error Band

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.

Common Abbreviations:

| | |
|----------------|--|
| AC | Alternating Current |
| ATM | Automatic Teller Machine |
| CAN | Controller Area Network |
| CE | Communauté Européenne |
| CENELEC | European Committee for Electrotechnical Standardization |
| CSA | Canadian Standards Association |
| CT | Computed Tomography |
| cUL | Tested to Canadian Standards by Underwriters' Laboratories |
| DEF | Diesel Exhaust Fluid |
| DTC | Digital Temperature Compensation |
| EMI | Electro-Magnetic Interference |
| ESA | European Space Agency |
| FM | Factory Mutual |
| FSO | Full Scale Output |
| HUMS | Health Usage and Monitoring System |
| HVD | High-Voltage Differential |
| IEC | International Electrical Commission |
| IEPE | Integral Electronic Piezoelectric |
| IP | Ingress Protection |
| ISO | International Organization for Standardization |
| kHz | Kilohertz |
| LIN | Local Interconnect Network |
| LVD | Low Voltage Differential |
| LVDT | Linear Variable Displacement Transducers |
| mA | Milliamp |
| mm | Millimeter |
| mV | Millivolt |
| NASA | National Aeronautics and Space Administration |
| NEMA | National Electrical Manufacturers Association |
| NIST | National Institute of Standards and Technology |
| NPN | Negative-Positive-Negative transistor |
| NPT | National Pipe Tapered |
| NTC | Negative Temperature Coefficient |
| OEM | Original Equipment Manufacturer |
| PCB | Printed Circuit Board |
| PDM | Pulse Density Modulation |
| PE | Piezoelectric |
| PWM | Pulse Width Modulation |
| PSI | Pounds Per Square Inch |
| RFI | Radio Frequency Interference |
| RH | Relative Humidity |
| RMS | Root Mean Square |
| RoHS | Restriction of Hazardous Substances |
| RPM | Revolutions Per Minute |
| RTD | Resistance Temperature Detector |
| SAE | Society of Automotive Engineering |
| SCR | Selective Catalytic Reduction |
| SDI-12 | Serial Data Interface at 1200 Baud |
| SMD | Surface Mount Device |
| SPI | Serial Peripheral Interface |
| SPST | Single Pole Single Throw |
| TDFN | Thin Dual Flats No Leads |
| TPMS | Tire Pressure Monitoring System |
| TEB | Total Error Band |
| UL | Underwriters Laboratories |
| USB | Universal Serial Bus |
| VDC | Volts Direct Current |
| WEEE | Waste Electrical and Electronic Equipment |

worldwide resources

Measurement Specialties is a unique sensor business that combines the strengths and experiences of several merged sensor companies to resolve challenging physical measurement problems. Our products have a proud lineage from the pioneering work of ICSensors in MEMS (micro electro-mechanical systems) technology and Schaevitz in inductive position sensing. During the last decade, we have significantly expanded our product offerings and enriched our technical capabilities through additional strategic acquisitions, including:

- **Spectrum Sensors.** Custom temperature probes, encoders and inertial sensors.
- **Cosense.** Ultrasonic sensors.
- **Gentech.** Liquid level, position, flow and optical sensors.
- **Celeco.** Rotary and linear position sensors.
- **Eureka Environmental Engineering.** Multiparameter instrumentation and software for water quality monitoring.
- **Pressure Systems, Inc.** Pressure scanners and water level measurement.
- **Intersema Sensoric.** Low power, MEMS pressure sensors, electronics and custom modules.
- **Humirel.** Capacitive humidity sensors and modules, as well as multi-parameter sensing assemblies.
- **HL Planartechnik.** Planar mass air flow elements, multi-layer magneto resistive sensors, thermopiles and various custom thin film MEMS structures.
- **ENTRAN / FGP.** Custom pressure, force, acceleration and torque sensors.
- **BetaTHERM / YSI / Atexis / RTD Company.** NTC, PTC, RTD, and thermocouple temperature sensors and custom probes.
- **Sensotherm.** A leader in the design and manufacture of platinum (Pt) thin film RTD temperature sensors.

Today, united under the MEAS brand, our multinational workforce of 3000+ is dedicated to the design and manufacturing of sensors for customers in more than 60 countries. We have design engineering and manufacturing locations strategically positioned around the globe in order to put resources close to our customers.





Toulouse, France
European Headquarters
Humidity Mfg/R&D
Fluid Property Mfg/R&D

Galway, Ireland
Temperature Mfg/R&D

Fontenay Tresigny, France
Temperature Mfg/R&D

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

Bevaix, Switzerland
Pressure Mfg/R&D

Dortmund, Germany
Position - Temperature Mfg/R&D
Foundry Services

Nuremberg, Germany
Temperature Mfg/R&D

Kormend, Hungary
Temperature Mfg/R&D

Shenzhen, China
Asian Headquarters
Various Sensors Mfg/R&D

Chengdu, China
Temperature Mfg/R&D

Tokyo, Japan
Nikkiso-Therm Co., Ltd
Joint Venture



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sensori & trasduttori

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WHAT CAN WE **SENSE** FOR YOU?

Measurement Specialties welcomes the opportunity to work with you to develop sensor solutions that meet or exceed your application requirements.

Visit the Contact Us section of our website (www.meas-spec.com) to find a location nearest you or email us directly for technical and product information.

Engine and Vehicle: e&vatmeas-spec.com

Medical: medicalatmeas-spec.com

General OEM / Industry: oematmeas-spec.com

Consumer Goods / Appliance:
consumeratmeas-spec.com

Test and Measurement: t&matmeas-spec.com

Military / Aerospace: mil-aeroatmeas-spec.com

HVACR / Building Equipment:
hvacratmeas-spec.com

Environmental Monitoring:
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