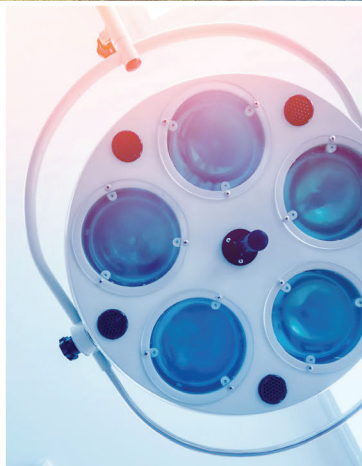




# TE CONNECTIVITY SENSORS

# TE CONNECTIVITY SENSORS

TE Connectivity (TE) is a global technology leader, providing connectivity and sensor solutions essential in today's increasingly connected world. As one of the largest sensor companies in the world, our sensors are vital to the next generation of data-driven technology. TE's portfolio of intelligent, efficient and high-performing sensor solutions are used for customers across several industries, including Automotive, Industrial, Medical, Appliance, Aerospace & Defense, and Industrial & Commercial Transportation. Our technologies enable measurement capabilities such as pressure, temperature, position, vibration, humidity and fluid property, to name a few. Our engineers help transform concepts into creations — redefining what's possible, using technologies capable of measuring most physical characteristics contributing to a safe, green and connected world, even in harsh conditions.



## MARKETS SERVED



AEROSPACE & DEFENSE



INDUSTRIAL & COMMERCIAL TRANSPORTATION



APPLIANCES



INTELLIGENT BUILDINGS



AUTOMATION & CONTROL



MEDICAL



AUTOMOTIVE



OIL & GAS



DATA & DEVICES



RAIL



INDUSTRIAL



TEST & MEASUREMENT



# SENSOR TECHNOLOGIES



## DIGITAL COMPONENT SENSOR DEVELOPMENT TOOLS

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## FLOW SENSORS

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## FORCE SENSORS

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## HUMIDITY SENSORS

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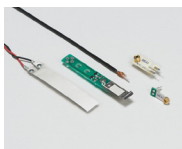
## LIQUID LEVEL SENSORS

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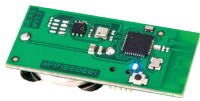
## WATER LEVEL SENSORS

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# DIGITAL COMPONENT SENSOR DEVELOPMENT TOOLS



## WIRELESS DEMO AND DEVELOPMENT KITS



### Environmental Sensor Tag

Type	Humidity, Temperature, Pressure
Specifications	<ul style="list-style-type: none"> <li>• 0 - 100% RH</li> <li>• 300 to 1,200 mbar</li> </ul>
Communication Interface	Standard 2.4 GHz wireless communication
Application	iOS 7.0+ Android™ 4.3+
Operating Temp.	20°C to 85°C



### M5600

Type	Pressure
Specifications	<ul style="list-style-type: none"> <li>• 50 - 15K psi</li> <li>• Type G/S/C</li> </ul>
Communication Interface	Standard 2.4 GHz wireless communication
Application	iOS 7.0+ Android™ 4.3+
Operating Temp.	-20°C to 85°C

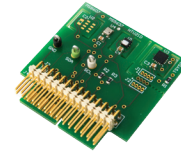
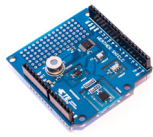


### U5600

Type	Pressure
Specifications	<ul style="list-style-type: none"> <li>• 2 - 10K psi</li> <li>• Type G/S/C/A</li> </ul>
Communication Interface	Standard 2.4 GHz wireless communication
Application	iOS 7.0+ Android™ 4.3+
Operating Temp.	-20°C to 85°C



## SHIELDS AND HATS



	<b>Arduino Weather Shield</b>	<b>Raspberry Pi™ Sensors Weather Hat</b>	<b>PicTail Plus</b>
<b>Type</b>	Humidity, Temperature, Pressure	Humidity, Temperature, Pressure	Humidity, Temperature, Pressure
<b>Sensors</b>	HTU21D, MS5637, MS8607, TSYS01*, TSD305	HTU21D, MS5637, TSYS01*, TSD305	HTU21DF, MS5637, TSYS01*, MS8607
<b>Specifications</b>	<ul style="list-style-type: none"> <li>• 0 - 100% RH</li> <li>• 20°C to 85°C</li> <li>• 300 to 1,200 mbar</li> </ul>	<ul style="list-style-type: none"> <li>• 0 - 100% RH</li> <li>• 20°C to 85°C</li> <li>• 300 to 1,200 mbar</li> </ul>	<ul style="list-style-type: none"> <li>• 0 - 100% RH</li> <li>• -20°C to 85°C</li> <li>• 300 to 1,200 mbar</li> </ul>
<b>Communication Interface</b>	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C
<b>Partner Board</b>	Arduino / Genuino	Raspberry Pi™	Microchip Explorer 16

## WING BOARDS



	<b>HTU21D</b>	<b>MS5637</b>	<b>MS8607</b>	<b>TSYS01*</b>	<b>TSYS02D*</b>	<b>KMA36(A)</b>
<b>Type</b>	Humidity	Pressure	Pressure, Temperature, Humidity	Temperature	Temperature	Angular Position
<b>Specifications</b>	<ul style="list-style-type: none"> <li>• 0 to 100% RH</li> <li>• -40°C to 125°C</li> <li>• 3.3 to 5.5 V</li> </ul>	<ul style="list-style-type: none"> <li>• 10 to 2,000 mbar</li> <li>• -40°C to 85°C</li> <li>• 1.5 to 3.6 V</li> </ul>	<ul style="list-style-type: none"> <li>• 10 to 2,000 mbar</li> <li>• -40°C to 85°C</li> <li>• 0 to 100% RH</li> <li>• 1.5 to 3.6 V</li> </ul>	<ul style="list-style-type: none"> <li>• -40°C to 125°C</li> <li>• 2.2 to 3.6 V</li> </ul>	<ul style="list-style-type: none"> <li>• -40°C to 125°C</li> <li>• 1.5 to 3.6 V</li> </ul>	<ul style="list-style-type: none"> <li>• 0 to 360°</li> <li>• -25°C to 85°C</li> <li>• 2.9 to 6.0 V</li> </ul>
<b>Accuracy</b>	±3% RH	±2 mbar	±3% RH, ±2 mbar, ±1.0°C	±0.1°C	±0.2°C	±0.1°
<b>Communication Interface</b>	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C
<b>Compatibility</b>	Configured to operate with the Xplained Pro development platform	Configured to operate with the Xplained Pro development platform	Configured to operate with the Xplained Pro development platform	Configured to operate with the Xplained Pro development platform	Configured to operate with the Xplained Pro development platform	Configured to operate with the Xplained Pro development platform

\*Temperature System Sensor (TSYS)

## PERIPHERAL MODULES

Digilent Pmod™



### HTU21D

Type	Humidity
Specifications	<ul style="list-style-type: none"> <li>• 0 to 100% RH</li> <li>• -40°C to 125°C</li> <li>• 3.3 to 5.5 V</li> </ul>
Accuracy	±3% RH
Communication Interface	I <sup>2</sup> C
Compatibility	Development systems compatible with Digilent Pmod™ connections



### MS5637

Type	Pressure
Specifications	<ul style="list-style-type: none"> <li>• 10 to 2,000 mbar</li> <li>• -40°C to 85°C</li> <li>• 1.5 to 3.6 V</li> </ul>
Accuracy	±2 mbar
Communication Interface	I <sup>2</sup> C
Compatibility	Development systems compatible with Digilent Pmod™ connections



### MS8607

Type	Pressure, Temperature, Humidity
Specifications	<ul style="list-style-type: none"> <li>• 10 to 2,000 mbar</li> <li>• -40°C to 85°C</li> <li>• 0 to 100% RH</li> <li>• 1.5 to 3.6 V</li> </ul>
Accuracy	±3% RH, ±2 mbar, ±1.0°C
Communication Interface	I <sup>2</sup> C
Compatibility	Development systems compatible with Digilent Pmod™ connections



### TSYS01\*

Type	Temperature
Specifications	<ul style="list-style-type: none"> <li>• -40°C to 125°C</li> <li>• 2.2 to 3.6 V</li> </ul>
Accuracy	±0.1°C
Communication Interface	I <sup>2</sup> C
Compatibility	Development systems compatible with Digilent Pmod™ connections



### TSYS02D\*

Type	Temperature
Specifications	<ul style="list-style-type: none"> <li>• -40°C to 125°C</li> <li>• 1.5 to 3.6 V</li> </ul>
Accuracy	±0.2°C
Communication Interface	I <sup>2</sup> C
Compatibility	Development systems compatible with Digilent Pmod™ connections



### KMA36(A)

Type	Angular Position
Specifications	<ul style="list-style-type: none"> <li>• 0° to 360°</li> <li>• -25°C to 85°C</li> <li>• 2.9 to 6.0 V</li> </ul>
Accuracy	±0.1°
Communication Interface	I <sup>2</sup> C
Compatibility	Development systems compatible with Digilent Pmod™ connections



### MS5611

Type	Pressure
Specifications	<ul style="list-style-type: none"> <li>• 10 to 1,200 mbar</li> <li>• -40°C to 85°C</li> <li>• 1.5 to 3.6 V</li> </ul>
Accuracy	±2 mbar
Communication Interface	I <sup>2</sup> C
Compatibility	Development systems compatible with Digilent Pmod™ connections



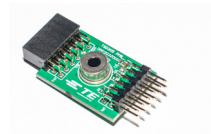
### MS5837

Type	Pressure
Specifications	<ul style="list-style-type: none"> <li>• 10 to 2,000 mbar</li> <li>• -40°C to 85°C</li> <li>• 1.5 to 3.6 V</li> </ul>
Accuracy	±2 mbar
Communication Interface	I <sup>2</sup> C
Compatibility	Development systems compatible with Digilent Pmod™ connections



### MS5805

Type	Pressure
Specifications	<ul style="list-style-type: none"> <li>• 10 to 2,000 mbar</li> <li>• -40°C to 85°C</li> <li>• 1.8 to 3.6 V</li> </ul>
Accuracy	±2 mbar
Communication Interface	I <sup>2</sup> C
Compatibility	Development systems compatible with Digilent Pmod™ connections



### TSD305

Type	Temperature
Specifications	<ul style="list-style-type: none"> <li>• -10°C to +85°C</li> <li>• 1.68 to 3.6 V</li> </ul>
Accuracy	±1°C
Communication Interface	I <sup>2</sup> C
Compatibility	Development systems compatible with Digilent Pmod™ connections

## GROVE SYSTEM



**KMA36**  
 Angular Position  
 Specifications  
 • 0 to 360°  
 • -25°C to 85°C  
 • 5.0 V  
 Accuracy  
 ±0.1°  
 Comm. Interface  
 I<sup>2</sup>C  
 Compatibility  
 Development platform compatible with grove systems



**TSYS01\***  
 Temperature  
 Specifications  
 • -40°C to 125°C  
 • 5.0 V  
 Accuracy  
 ±0.1°C  
 Comm. Interface  
 I<sup>2</sup>C  
 Compatibility  
 Development platform compatible with grove systems



**TSYS02\***  
 Temperature  
 Specifications  
 • -40°C to 125°C  
 • 5.0 V  
 Accuracy  
 ±0.2°C  
 Comm. Interface  
 I<sup>2</sup>C  
 Compatibility  
 Development platform compatible with grove systems



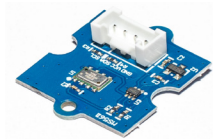
**MS5637**  
 Pressure  
 Specifications  
 • 10 to 2,000 mbar  
 • -40°C to 85°C  
 • 5.0 V  
 Accuracy  
 ±2 mbar  
 Comm. Interface  
 I<sup>2</sup>C  
 Compatibility  
 Development platform compatible with grove systems



**MS8607**  
 Pressure, Temperature, Humidity  
 Specifications  
 • 10 to 2,000 mbar  
 • -40°C to 85°C  
 • 0 to 100% RH  
 • 5.0 V  
 Accuracy  
 ±3% RH, ±2 mbar, ±1.0°C  
 Comm. Interface  
 I<sup>2</sup>C  
 Compatibility  
 Development platform compatible with grove systems



**HTU21D**  
 Humidity  
 Specifications  
 • 0 to 100% RH  
 • -40°C to 125°C  
 • 5.0 V  
 Accuracy  
 ±3% RH  
 Communication Interface  
 I<sup>2</sup>C  
 Compatibility  
 Development platform compatible with grove systems



**MS5611**  
 Pressure  
 Specifications  
 • 10 to 1,200 mbar  
 • -40°C to 85°C  
 • 5.0 V  
 Accuracy  
 ±2 mbar  
 Comm. Interface  
 I<sup>2</sup>C  
 Compatibility  
 Development platform compatible with grove systems



**MS5837**  
 Pressure  
 Specifications  
 • 10 to 2,000 mbar  
 • -40°C to 85°C  
 • 5.0 V  
 Accuracy  
 ±2 mbar  
 Comm. Interface  
 I<sup>2</sup>C  
 Compatibility  
 Development platform compatible with grove systems



**MS5805**  
 Pressure  
 Specifications  
 • 10 to 2,000 mbar  
 • -40°C to 85°C  
 • 5.0 V  
 Accuracy  
 ±2 mbar  
 Comm. Interface  
 I<sup>2</sup>C  
 Compatibility  
 Development platform compatible with grove systems

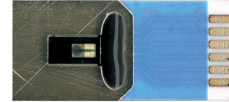
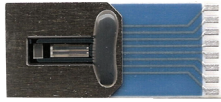


**TSD305**  
 Temperature  
 Specifications  
 • -10°C to +85°C  
 • 5.0 V  
 Accuracy  
 ±1°C  
 Comm. Interface  
 I<sup>2</sup>C  
 Compatibility  
 Development platform compatible with grove systems

# FLOW SENSORS



## MASS AIR FLOW SENSORS



### LMM-H03

<b>Package</b>	Hybrid
<b>Type</b>	<ul style="list-style-type: none"> <li>• Hot film anemometer component</li> <li>• Bidirectional</li> </ul>
<b>Operating Temp.</b>	-40°C to 125°C
<b>Unique Features</b>	High sensitivity at low heater temperatures, fast response time, true air temperature sensor
<b>Calibration/Accuracy</b>	Dependent on electronics
<b>Dimensions (mm)</b>	23 x 10.15 x 1.1
<b>Typical Applications</b>	Air intake of combustion engine, spirometer, industrial gas flow

### LMM-H04

<b>Package</b>	Hybrid
<b>Type</b>	<ul style="list-style-type: none"> <li>• Hot film anemometer component</li> <li>• Unidirectional</li> </ul>
<b>Operating Temp.</b>	-40°C to 125°C
<b>Unique Features</b>	High sensitivity at low heater temperatures, fast response time, true air temperature sensor
<b>Calibration/Accuracy</b>	Dependent on electronics
<b>Dimensions (mm)</b>	24 x 10.15 x 1.1
<b>Typical Applications</b>	Air intake of combustion engine, spirometer, industrial gas flow

## FLOW SWITCHES



### FS-01

<b>Package</b>	Noryl®
<b>Type</b>	Flow switch for direction of liquid and gas flow
<b>Max. Pressure</b>	10 bar at 20°C
<b>Operating Temp.</b>	-30°C to 85°C
<b>Unique Features</b>	Triac, normally open, close on flow
<b>Dimensions (mm)</b>	106 x 32 x 32
<b>Typical Applications</b>	Mains water control, power shower, central heating systems, circulation pump protection, cooling systems

### FS-02

<b>Package</b>	Noryl®
<b>Type</b>	Flow switch for direction of liquid and gas flow
<b>Max. Pressure</b>	10 bar at 20°C
<b>Operating Temp.</b>	-30°C to 85°C
<b>Unique Features</b>	SPST reed switch, normally open, close on flow
<b>Dimensions (mm)</b>	106 x 32 x 32
<b>Typical Applications</b>	Mains water control, power shower, central heating systems, circulation pump protection, cooling systems

### FS-05

<b>Package</b>	Brass
<b>Type</b>	Flow switch for direction of liquid and gas flow
<b>Max. Pressure</b>	10 bar at 20°C
<b>Operating Temp.</b>	-30°C to 100°C
<b>Unique Features</b>	Triac, normally open, close on flow
<b>Dimensions (mm)</b>	113 x 53 x 36
<b>Typical Applications</b>	Mains water control, power shower, central heating systems, circulation pump protection, cooling systems

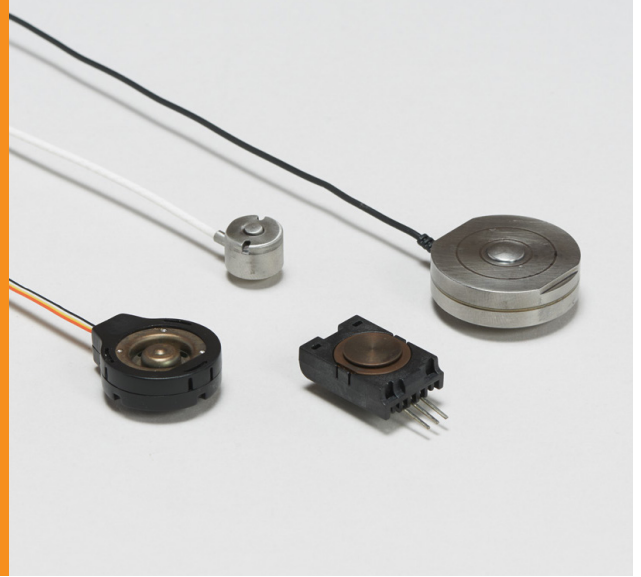
### FS-06

<b>Package</b>	Brass
<b>Type</b>	Flow switch for direction of liquid and gas flow
<b>Max. Pressure</b>	10 bar at 20°C
<b>Operating Temp.</b>	-30°C to 100°C
<b>Unique Features</b>	SPST reed switch, normally open, close on flow
<b>Dimensions (mm)</b>	113 x 53 x 36
<b>Typical Applications</b>	Mains water control, power shower, central heating systems, circulation pump protection, cooling systems

### FS-90/1

<b>Package</b>	Copper
<b>Type</b>	Flow switch for direction of liquid and gas flow
<b>Max. Pressure</b>	10 bar at 20°C
<b>Operating Temp.</b>	-30°C to 85°C
<b>Unique Features</b>	SPST reed switch, normally open, close on flow
<b>Dimensions (mm)</b>	153 x 25 x 15
<b>Typical Applications</b>	Leak detection, flow sensing, mains water control, cooling systems, circulation pump protection

# FORCE SENSORS



## LOAD CELLS

Low Cost OEM



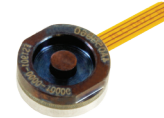
### FX19

<b>Package</b>	Low profile "coin cell" design
<b>Operating Mode</b>	Compression
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low cost, low strain design</li> <li>• Essentially unlimited cycle life</li> </ul>
<b>FS Ranges</b>	10 to 200 lbf 50 to 100 Newton
<b>Max. Over-range</b>	2.5X FS
<b>Output/Span</b>	100 mV
<b>Combined Linearity &amp; Hysteresis</b>	±1.0% FSO
<b>Operating Temperature</b>	0°C to 50°C
<b>Dimensions (mm)</b>	Ø25.00 x 8.00
<b>Typical Applications</b>	Consumer OEM, exercise machines, physical therapy, vending machines, appliances, pumps, medical devices



### FX29

<b>Package</b>	Welded miniature compression load cell, Analog and Digital options
<b>Operating Mode</b>	Compression
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Best price to performance</li> <li>• Designed for unlimited cycles and high over-range</li> </ul>
<b>FS Ranges</b>	10 to 100 lbf 50 to 500 Newton
<b>Max. Over-range</b>	2.5X FS
<b>Output/Span</b>	100 mV, 0.5-4.5 VDC, Digital (I <sup>2</sup> C)
<b>Combined Linearity &amp; Hysteresis</b>	±1.0% FSO
<b>Operating Temperature</b>	0°C to 50°C
<b>Dimensions (mm)</b>	Ø19.70 x 4.95
<b>Typical Applications</b>	Consumer OEM, exercise machines, physical therapy, vending machines, appliances, pumps, medical devices



### FS19

<b>Package</b>	Stainless steel housing with flexible PCB
<b>Operating Mode</b>	Compression
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low cost</li> <li>• Small size and light weight</li> </ul>
<b>FS Ranges</b>	500 to 3,000 grams-force 5 to 30 Newton
<b>Max. Over-range</b>	2X FS
<b>Output/Span</b>	100 mV
<b>Combined Linearity &amp; Hysteresis</b>	±1.0% FSO
<b>Operating Temperature</b>	0°C to 40°C
<b>Dimensions (mm)</b>	Ø9.5 x 3.45
<b>Typical Applications</b>	Infusion pump, load sensing, contact sensing, weighing, household appliances



### FS20

<b>Package</b>	Miniature, drop in replacement for industry standard
<b>Operating Mode</b>	Compression
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Load cell design operates at very low strains</li> <li>• Not subject to lead die fatigue</li> </ul>
<b>FS Ranges</b>	500 to 5,000 grams-force 5 to 50 Newton
<b>Max. Over-range</b>	2.5X FS
<b>Output/Span</b>	0.5-4.5 VDC, 1.0-4.0 VDC
<b>Combined Linearity &amp; Hysteresis</b>	±1.0% FSO
<b>Operating Temperature</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	30.708 x 17.272 x 8.255
<b>Typical Applications</b>	Infusion pumps, contact sensing, medical devices, consumer appliances



### FC22

<b>Package</b>	Plastic housing, button, flange mounting
<b>Operating Mode</b>	Compression
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low cost button shape</li> <li>• Essentially unlimited cycle life</li> </ul>
<b>FS Ranges</b>	10 to 100 lbf 50 to 500 Newton
<b>Max. Over-range</b>	2.5X FS
<b>Output/Span</b>	100 mV, 0.5-4.5 VDC
<b>Combined Linearity &amp; Hysteresis</b>	±1.0% FSO
<b>Operating Temperature</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	Ø26.00 x 42.00 x 19.50
<b>Typical Applications</b>	Infusion pumps, robotics end-effectors, exercise machines, contact sensing, appliances



### FC23

<b>Package</b>	Stainless steel housing button shape for higher weight loads
<b>Operating Mode</b>	Compression
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Industry standard low profile all stainless steel design</li> <li>• Resistant to off-axis loads</li> </ul>
<b>FS Ranges</b>	50 to 2,000 lbf 250 to 1,000 Newton
<b>Max. Over-range</b>	2.5X FS
<b>Output/Span</b>	100 mV, 0.5-4.5 VDC
<b>Combined Linearity &amp; Hysteresis</b>	±1.0% FSO
<b>Operating Temperature</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	Ø31.75 x 10.20
<b>Typical Applications</b>	Batch weighing, robotics, assembly line force, printing presses, pumps, winch and hoist

## LOAD CELLS

### Standard



#### FMT

Package	Washer
Operating Mode	Compression
Unique Features	<ul style="list-style-type: none"> <li>• High stiffness</li> <li>• Clamping and bolt forces</li> <li>• High temperature option</li> </ul>
FS Ranges	4K to 64K lbf 20K to 320K Newton
Max. Over-range	1.5X FS
Output/Span	±20 mV
Combined Linearity & Hysteresis	±1.5% FS
Operating Temperature	-20°C to 80°C
Dimensions (mm)	Range dependent
Typical Applications	Robotics, process control, bolt clamping for bridges



#### FN1010

Package	Load pin design
Operating Mode	Tension and compression
Unique Features	<ul style="list-style-type: none"> <li>• Keyed anti-rotation slot</li> <li>• Bidirectional available</li> <li>• Optional watertight construction</li> </ul>
FS Ranges	2K to 400K lbf 10K to 2,000K Newton
Max. Over-range	1.5X FS
Output/Span	±20 mV, 0.5-4.5 VDC, 4-20 mA
Combined Linearity & Hysteresis	±1% FS
Operating Temperature	-20°C to 80°C
Dimensions (mm)	Range dependent
Typical Applications	Crane monitoring, offshore, load-limited devices



#### FN2420

Package	Very high capacity load button
Operating Mode	Compression
Unique Features	<ul style="list-style-type: none"> <li>• High stiffness</li> <li>• Optional load button</li> <li>• Optional high level output module</li> </ul>
FS Ranges	4K to 1000K lbf 20K to 5,000K Newton
Max. Over-range	1.5X FS
Output/Span	±20 mV, 0.5-4.5 VDC
Combined Linearity & Hysteresis	±0.25% FS
Operating Temperature	-40°C to 150°C
Dimensions (mm)	Range dependent
Typical Applications	Calibration presses, robotics and effectors, laboratory and research



#### FN3000, FN3050

Package	Pan-cake
Operating Mode	Tension and compression
Unique Features	<ul style="list-style-type: none"> <li>• High stability</li> <li>• All FN3050 have same housing</li> <li>• Optional high level output</li> </ul>
FS Ranges	20 to 200K lbf 100 to 1,000K Newton
Max. Over-range	1.5X FS (10X FS with stops)
Output/Span	±20 mV, 0.5-4.5 VDC
Combined Linearity & Hysteresis	±0.1% FS
Operating Temperature	-40°C to 150°C
Dimensions (mm)	Range dependent
Typical Applications	Static fatigue tests, laboratory and research, robotics



#### FN3002

Package	Very high capacity dual stud
Operating Mode	Tension and compression
Unique Features	<ul style="list-style-type: none"> <li>• Threaded male fitting</li> <li>• Integrated amplifier</li> <li>• Optional rod end</li> </ul>
FS Ranges	2K to 400K lbf 10K to 2,000K Newton
Max. Over-range	1.5X FS
Output/Span	±20 mV, 0.5-4.5 VDC
Combined Linearity & Hysteresis	±0.25% FS
Operating Temperature	-40°C to 150°C
Dimensions (mm)	Range dependent
Typical Applications	Assembly forces, tool force, offshore



#### FN3030

Package	S-beam
Operating Mode	Tension and compression
Unique Features	<ul style="list-style-type: none"> <li>• Optional rod ends</li> <li>• Optional high level output</li> <li>• Optional high compensation temperature</li> </ul>
FS Ranges	10 to 20K lbf 50 to 100K Newton
Max. Over-range	1.5X FS
Output/Span	±20 mV, 0.5-4.5 VDC
Combined Linearity & Hysteresis	±0.1% FS
Operating Temperature	-40°C to 150°C
Dimensions (mm)	Range dependent
Typical Applications	Laboratory and research, process control, customized options



#### FN3148

Package	S-beam with stops
Operating Mode	Tension and compression
Unique Features	<ul style="list-style-type: none"> <li>• Very high accuracy</li> <li>• High resolution</li> <li>• Mechanical stops</li> </ul>
FS Ranges	2 to 400 lbf 10 to 2,000 Newton
Max. Over-range	5X to 100X FS
Output/Span	±20 mV, 0.5-4.5 VDC
Combined Linearity & Hysteresis	±0.05% FS
Operating Temperature	-40°C to 120°C
Dimensions (mm)	Range dependent
Typical Applications	Product validation tests, medical instruments, weighing



#### FN9620

Package	S-beam
Operating Mode	Tension and compression
Unique Features	<ul style="list-style-type: none"> <li>• High accuracy</li> <li>• IP68</li> <li>• Entry level</li> </ul>
FS Ranges	100 to 2,000 lbf 500 to 10K Newton
Max. Over-range	1.5X FS
Output/Span	±10 mV to ±20 mV
Combined Linearity & Hysteresis	±0.05% FS
Operating Temperature	-40°C to 90°C
Dimensions (mm)	56 x 20 x 60
Typical Applications	Test bed, dynamic fatigue testing, robotics and effectors



#### FN9630, FN9635

Package	Very high accuracy pan-cake
Operating Mode	Tension and compression
Unique Features	<ul style="list-style-type: none"> <li>• High stability &amp; accuracy</li> <li>• Connection flange supplied for model FN9635</li> <li>• Minimal cross effect</li> </ul>
FS Ranges	2K to 40K lbf 10K to 200K Newton
Max. Over-range	3X FS
Output/Span	±20 mV
Combined Linearity & Hysteresis	±0.08% FS
Operating Temperature	-40°C to 90°C
Dimensions (mm)	Range dependent
Typical Applications	Static fatigue tests, weighing calibration, robotics

## FORCE LOAD CELLS

### Miniature Load Cells



	<b>ELAF</b>	<b>XFC200R</b>	<b>XFL212R</b>	<b>XFTC300</b>	<b>XFU400</b>
<b>Package</b>	Button, dual stud	Small diameter load button	Low profile load button	Low/high capacity dual stud	Miniature rod end
<b>Operating Mode</b>	Tension and compression	Compression	Compression	Tension and compression	Tension and compression
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low cost, small profile</li> <li>• Microfuse technology</li> <li>• Low off-axis response</li> </ul>	<ul style="list-style-type: none"> <li>• High stiffness</li> <li>• High overload capacity</li> <li>• Static and dynamic</li> </ul>	<ul style="list-style-type: none"> <li>• Extremely flat</li> <li>• Integrated load button</li> <li>• Small diameter</li> </ul>	<ul style="list-style-type: none"> <li>• High stiffness</li> <li>• High overload capacity</li> <li>• Threaded male/female fitting</li> </ul>	<ul style="list-style-type: none"> <li>• High stiffness</li> <li>• High accuracy</li> <li>• High temperature</li> </ul>
<b>FS Ranges</b>	10 to 2,000 lbf 50 to 10K Newton	0.4 to 2,000 lbf 2 to 10K Newton	1 to 100 lbf 5 to 500 Newton	0.4 to 400 lbf 2 to 2,000 Newton	100 to 1,000 lbf 500 to 5,000 Newton
<b>Max. Over-range</b>	2.5X FS	2X FS	2X FS	2X FS	1.5X FS
<b>Output/Span</b>	±100 mV, 0.5-4.5 VDC	±100 mV	±100 mV	±100 mV, 0.5-4.5 VDC	±100 mV
<b>Combined Linearity &amp; Hysteresis</b>	±0.25% FS	±0.5% FS	±1% FS	±0.5% FS	±0.3% FS
<b>Operating Temperature</b>	-40°C to 120°C	-40°C to 120°C	-40°C to 120°C	-40°C to 150°C	-20°C to 120°C
<b>Dimensions (mm)</b>	Range dependent	Ø10 to Ø16	Ø12.5 x 3.5	Range dependent	Range dependent
<b>Typical Applications</b>	Theatrical rigging loads, assembly forces, weighing, thrust measurements, product validation testing	Material test, measuring tools, robotics and effectors	Dental and biomechanical, surface mount assembly system, production validation test	Material test, tool forces, robotics end effectors	Spherical rod end bearings, engine & suspension testing, machinery equipment

## FORCE LOAD CELLS

### Multiaxial Load Cells



	<b>FN7110</b>	<b>FN7325</b>
<b>Package</b>	Dual S-beam range	Custom design and ranges available upon request
<b>Operating Mode</b>	Tension and compression	Multiaxial force and torque
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• High resolution</li> <li>• Optional high level output</li> <li>• Double range</li> </ul>	<ul style="list-style-type: none"> <li>• Measures load and torque in 3 directions, 6DOF total</li> <li>• Fatigue rated</li> <li>• Minimal cross effects</li> </ul>
<b>FS Ranges</b>	2 to 2,000 lbf 10 to 10K Newton	1K to 50K lbf 5K to 250K Newton
<b>Max. Over-range</b>	1.2X FS	1.2X FS
<b>Output/Span</b>	±20 mV, 0.5-4.5 VDC	±150 mV, 0.5-4.5 VDC
<b>Combined Linearity &amp; Hysteresis</b>	±0.1% FS	±1% FS
<b>Operating Temperature</b>	-20°C to 80°C	-20°C to 80°C
<b>Dimensions (mm)</b>	60 x 30 x 100	Range dependent
<b>Typical Applications</b>	Process control, assembly forces, weighing, thrust measurements, product validation testing	Structure testing, crash testing, industrial test benches, robotic joints

## FORCE LOAD CELLS

### Automotive Load Cells



#### FN2114

Package	Brake pedal
Operating Mode	Compression
Unique Features	<ul style="list-style-type: none"> <li>• High accuracy</li> <li>• Extra flat</li> <li>• Compact</li> </ul>
FS Ranges	40 to 500 lbf 200 to 2,500 Newton
Max. Over-range	1.5X FS
Output/Span	±20 mV, 0.5-4.5 VDC
Combined Linearity & Hysteresis	±1% FS
Operating Temperature	-20°C to 80°C
Dimensions (mm)	Range dependent
Typical Applications	Brake pedal, clutch pedal, test bed



#### FN2317

Package	Hand brake
Operating Mode	Compression
Unique Features	<ul style="list-style-type: none"> <li>• Easily installed</li> <li>• Ergonomic design</li> <li>• Fits most vehicles</li> </ul>
FS Ranges	100 to 200 lbf 500 to 1,000 Newton
Max. Over-range	1.5X FS
Output/Span	±20 mV, 0.5-4.5 VDC
Combined Linearity & Hysteresis	±0.5% FS
Operating Temperature	-20°C to 80°C
Dimensions (mm)	100 x 20 x 15
Typical Applications	Hand brake, test bed



#### FN2570

Package	Brake pedal
Operating Mode	Compression
Unique Features	<ul style="list-style-type: none"> <li>• High accuracy</li> <li>• Compact and extra flat</li> <li>• Rugged, stainless steel design</li> </ul>
FS Ranges	40 to 500 lbf 200 to 2,500 Newton
Max. Over-range	1.5X FS
Output/Span	±20 mV
Combined Linearity & Hysteresis	±2.5% FS
Operating Temperature	-20°C to 80°C
Dimensions (mm)	59 x 59 x 12.5
Typical Applications	Brake pedal, clutch pedal, test bed



#### FN4055

Package	Seat belt sensor
Operating Mode	Tension
Unique Features	<ul style="list-style-type: none"> <li>• Low operating ranges</li> <li>• Protected against overload</li> <li>• Compatible with most seat belts</li> </ul>
FS Ranges	20 to 60 lbf 100 to 300 Newton
Max. Over-range	10X FS
Output/Span	±20 mV
Combined Linearity & Hysteresis	±0.25% FS
Operating Temperature	-20°C to 80°C
Dimensions (mm)	63.5 x 63.5 x 12.7
Typical Applications	Auto crash testing, tension at the belt receptacle



#### FN4070 & FN4080

Package	Seat belt buckle sensor
Operating Mode	Tension
Unique Features	<ul style="list-style-type: none"> <li>• High operating ranges</li> <li>• Detachable tongue and cable</li> <li>• Compatible with most seat belts</li> </ul>
FS Ranges	200 to 8,000 lbf 1K to 40K Newton
Max. Over-range	1.5X FS
Output/Span	±20 mV
Combined Linearity & Hysteresis	±0.5% FS
Operating Temperature	-20°C to 80°C
Dimensions (mm)	Range dependent
Typical Applications	Auto crash testing, tension at the belt receptacle



#### FN7080

Package	Gear stick design
Operating Mode	Multi-axial
Unique Features	<ul style="list-style-type: none"> <li>• Measures force in three directions</li> <li>• Replaces gear knob</li> <li>• Ease of mounting</li> </ul>
FS Ranges	40 to 100 lbf 200 to 500 Newton
Max. Over-range	1.2X FS
Output/Span	±20 mV, 0.5-4.5 VDC
Combined Linearity & Hysteresis	< ±0.3% FS
Operating Temperature	-20°C to 80°C
Dimensions (mm)	Ø25 spherical
Typical Applications	Change gear force measurement, roughness of material



#### EL20-S458

Package	Special purpose seat belt load cell for automotive crash testing
Operating Mode	Seat belt tension
Unique Features	<ul style="list-style-type: none"> <li>• Mass optimized to minimize acceleration induced errors during SAE J2570 ATD and ISO 6487</li> <li>• Optional high level and linearized outputs</li> <li>• Smoothed design and slotted titanium axles eliminate drag errors and dummy damage</li> </ul>
FS Ranges	1,000 to 5,000 lbf 5K to 25K Newton
Max. Over-range	2X FS
Output/Span	±20 mV, 0.5-4.5 VDC
Combined Linearity & Hysteresis	±0.5% FS
Operating Temperature	-40°C to 120°C
Dimensions (mm)	66 x 35 x 16.5
Typical Applications	Seat belt forces, safety and restraint system crash test, parachute tether and riser forces

## FORCE LOAD CELLS

Digital Display Meters



### ARD154

<b>Package</b>	Din rail mountable
<b>Type</b>	Signal conditioning for wheatstone bridge sensors
<b>No. of Channels</b>	Four
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Suited for full bridge strain gage sensors</li> <li>• Test stands and process industries</li> <li>• 2 kHz or 20 kHz max. bandwidth</li> </ul>
<b>Output/Span</b>	±10 VDC or 4-20 mA current output
<b>Accuracy</b>	±0.01% FS
<b>Operating Temperature</b>	-10°C to 60°C
<b>Dimensions (mm)</b>	99 x 17.5 x 112
<b>Typical Applications</b>	Test stands, power plants, manufacturing systems, test and measurement, test bed regulation, automat interfaces



### CPA150

<b>Package</b>	Hand held indicator
<b>Type</b>	Portable display suited for strain gage type sensors
<b>No. of Channels</b>	Two
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Suited for 1 or 2 sensors</li> <li>• 45 hour life battery</li> <li>• Calibration pushbutton from 0.1 to 10 mV/V</li> </ul>
<b>Output/Span</b>	Display only
<b>Accuracy</b>	±0.005% FS
<b>Operating Temperature</b>	-10°C to 50°C
<b>Dimensions (mm)</b>	90 x 34 x 152
<b>Typical Applications</b>	Outdoor punctual measurements, test and measurement, portable calibration device



### M210

<b>Package</b>	Front panel or housed in case
<b>Type</b>	Signal conditioning and display meter
<b>No. of Channels</b>	One
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Red LED display: ±2,000 count</li> <li>• High bandwidth: 1,000 Hz at -3 dB</li> <li>• Low noise level</li> </ul>
<b>Output/Span</b>	±10 VDC
<b>Accuracy</b>	±0.05% FS
<b>Operating Temperature</b>	0°C to 50°C
<b>Dimensions (mm)</b>	96 x 48 x 155
<b>Typical Applications</b>	High bandwidth test bed display, monitoring, laboratory and research, process control equipment



### M905

<b>Package</b>	Front panel or housed in case
<b>Type</b>	Display suited for process or strain gage type sensors
<b>No. of Channels</b>	One
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Suited for process or strain gage type sensors</li> <li>• 5 digits: -19999 to 19999</li> <li>• Front panel programming</li> </ul>
<b>Output/Span</b>	±10 VDC or 4-20 mA current output
<b>Accuracy</b>	±15 bits, 20 sample/sec
<b>Operating Temperature</b>	-10°C to 60°C
<b>Dimensions (mm)</b>	96 x 48 x 60
<b>Typical Applications</b>	Display on test bed, monitoring, laboratory and research



### 121

<b>Package</b>	Bench top
<b>Type</b>	DC amplifier and signal conditioner
<b>No. of Channels</b>	Three
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• 0.001 to 9999</li> <li>• Low noise operation with auto-zero</li> <li>• For bridge type sensors</li> <li>• µP controlled, programmable</li> <li>• Low pass filter options</li> </ul>
<b>Output/Span</b>	±10 VDC
<b>Accuracy</b>	±0.1% FS
<b>Operating Temperature</b>	0°C to 50°C
<b>Dimensions (mm)</b>	301 x 258 x 102
<b>Typical Applications</b>	Instrumentation labs, test benches, R&D facilities



### 140A / 142A

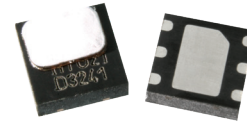
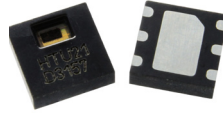
<b>Package</b>	Inline amplifier
<b>Type</b>	DC amplifier and auto-zero
<b>No. of Channels</b>	one
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• ±1.5 mV auto-zero</li> <li>• For bridge type sensor (140A)</li> <li>• For strain gage (142A)</li> <li>• x10, x25, x50, x100, x200 gain</li> <li>• 5 to 30 VDC excitation</li> </ul>
<b>Output/Span</b>	0.5-4.5 VDC, ref to 2.5 VDC
<b>Accuracy</b>	±0.5% FS
<b>Operating Temperature</b>	-10°C to 50°C
<b>Dimensions (mm)</b>	56.9 x 25.4 x 12.7
<b>Typical Applications</b>	Instrumentation labs, test benches, R&D facilities

# HUMIDITY SENSORS



## HUMIDITY AND TEMPERATURE (NTC) COMPONENTS

Analog Voltage and Digital Output



	<b>HS1101LF</b>	<b>HTU2X</b>	<b>HTU2XF</b>
<b>Package</b>	Through hole TO39 with side opening plastic cap	DFN type	DFN type
<b>Type</b>	Capacitive humidity	Digital RH and NTC temperature	Digital RH and NTC temperature
<b>Operating RH Range</b>	0 to 100% RH	0 to 100% RH	0 to 100% RH
<b>Operating Temp.</b>	-60°C to 140°C	-40°C to 125°C	-40°C to 125°C
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Robust and recognized component</li> <li>• Suitable for most humidity applications</li> <li>• Cost effective solution</li> </ul>	<ul style="list-style-type: none"> <li>• Low power consumption</li> <li>• Fast response time</li> <li>• Very low temperature coefficient</li> <li>• I<sup>2</sup>C interface or PWM interface or SDM interface</li> </ul>	<ul style="list-style-type: none"> <li>• Low power consumption</li> <li>• Fast response time</li> <li>• Very low temperature coefficient</li> <li>• I<sup>2</sup>C interface or PWM interface or SDM interface</li> <li>• Optimal filter</li> </ul>
<b>Accuracy</b>	180 pF, ±3 pF at 55% RH	±3% RH at 25°C (10 to 95% RH) ±0.3°C at 25°C	±3% RH at 25°C (10 to 95% RH) ±0.3°C at 25°C
<b>Dimensions (mm)</b>	10 x 10 x 19	3.0 x 3.0 x 1.0	3.0 x 3.0 x 1.0
<b>Typical Applications</b>	Applications requiring a robust humidity sensor in appliance, HVACR, consumer electronics, printing, meteorology	Humidity and temperature plug and play transducers for OEM demanding applications in appliance, printer, medical, HVACR	Humidity and temperature plug and play transducers for OEM demanding applications in appliance, printer, medical, HVACR

## HUMIDITY AND TEMPERATURE (NTC) MINI-MODULES

Analog Voltage and Digital Output



	<b>HTU3535PVBM/Wire</b>	<b>HTU383X/Wire</b>	<b>HTG351xCH</b>
<b>Package</b>	Cost effective, small size mini-module	Cost effective small size mini-module	Cost effective small size mini-module
<b>Type</b>	Analog voltage RH and NTC temperature	Digital RH and NTC temperature	Analog voltage RH and NTC temperature
<b>Operating RH Range</b>	0 to 100% RH	0 to 100% RH	0 to 100% RH
<b>Operating Temp.</b>	-40°C to 110°C	-40°C to 110°C	-40°C to 110°C
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• PTFE filter (Optional)</li> <li>• Electronics fully protected (5 V)</li> <li>• Multiple connector choices (JST, Samtec board to board through hole)</li> <li>• Based on HTU21</li> </ul>	<ul style="list-style-type: none"> <li>• PTFE filter (Optional)</li> <li>• Electronics fully protected (5 V)</li> <li>• Multiple connector choices (JST, Samtec board to board through hole)</li> <li>• Based on HTU21</li> </ul>	<ul style="list-style-type: none"> <li>• Electronics fully protected with potting material (3.3 V or 5 V)</li> <li>• Multiple connector choices (JST, Samtec board to board through hole)</li> </ul>
<b>Calibration</b>	±3% RH at 55% RH; ±0.25°C at 25°C	±3% RH at 55% RH; ±0.25°C at 25°C	±3% RH at 55% RH; ±0.25°C at 25°C
<b>Dimensions (mm)</b>	27 x 11.9 x YY (Depending on the connector, from 6 to 10.8 mm length)	27 x 11.9 x YY (Depending on the connector, from 6 to 10.8 mm length)	27 x 11.9 x 6.7
<b>Typical Applications</b>	Humidity and temperature plug and play transducers for OEM demanding applications in HVACR, home appliance, printer and medical	Humidity and temperature plug and play transducers for OEM demanding applications in HVACR, home appliance, printer and medical	Humidity and temperature plug and play transducers for OEM applications in HVACR, appliance, printer and medical

## HUMIDITY AND TEMPERATURE (NTC) PROBES

Analog Output



### HM1500LF

<b>Package</b>	Probe, RH only
<b>Type</b>	Cost effective analog voltage RH probe
<b>Operating RH Range</b>	0 to 100% RH
<b>Operating Temp.</b>	-40°C to 60°C
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Electronics fully protected with potting material</li> <li>• Optional wiring length and connectors</li> </ul>
<b>Calibration</b>	±3% RH at 55% RH
<b>Dimensions (mm)</b>	57 x 11 x 11 (Standard wire length of 200 mm)
<b>Typical Applications</b>	Medical, telecommunication cabinets, green houses, process control, industrial



### HM1520LF

<b>Package</b>	Probe, RH only
<b>Type</b>	Dedicated to low RH accurate measurement
<b>Operating RH Range</b>	0 to 100% RH
<b>Operating Temp.</b>	-40°C to 60°C
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Electronics fully protected with potting material</li> <li>• Optional wiring length and connectors</li> </ul>
<b>Calibration</b>	±3% RH at 10% RH
<b>Dimensions (mm)</b>	57 x 11.5 x 11.5 (Standard wire length of 200 mm)
<b>Typical Applications</b>	Medical, drying cabinets, low humidity, meteorology

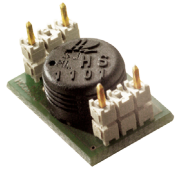


### HTM2500LF

<b>Package</b>	Probe, RH and temperature
<b>Type</b>	Cost effective analog voltage RH
<b>Operating RH Range</b>	0 to 100% RH
<b>Operating Temp.</b>	-40°C to 85°C
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Electronics fully protected with potting material</li> <li>• Optional wiring length and connectors</li> </ul>
<b>Calibration</b>	±3% RH at 55% RH; ±0.25°C at 25°C
<b>Dimensions (mm)</b>	86 x 11.5 x 11.5 (Standard wire length of 200 mm)
<b>Typical Applications</b>	Hygrostat, data loggers, cabinets

## HUMIDITY AND TEMPERATURE (NTC) SENSORS

Frequency Output Systems (Digital)



### HTF3000LF

<b>Package</b>	PCB for board to board
<b>Type</b>	Frequency output for RH, direct NTC for temperature
<b>Operating RH Range</b>	0 to 100% RH
<b>Operating Temp.</b>	-40°C to 85°C
<b>Unique Features</b>	<ul style="list-style-type: none"><li>• Voltage supply from 3 to 8 VDC</li><li>• Through hole or SMD</li><li>• T and R available</li></ul>
<b>Calibration</b>	±3% RH at 55% RH; ±0.25°C at 25°C
<b>Dimensions (mm)</b>	12.5 x 18.5 x 11.2
<b>Typical Applications</b>	HVACR, printer, cabin comfort, hygostat

# LIQUID LEVEL SENSORS



## LIQUID LEVEL SWITCHES

### Side Entry



	<b>LS304-31</b>	<b>LS509-51</b>	<b>LS809-31</b>	<b>LDS309-11N</b>	<b>LCS-03</b>	<b>RCS01-10</b>
<b>Package</b>	Glass filled nylon 6.6	Glass filled PPS	Glass filled polypropylene	Glass filled nylon 6.6	Acetal/Polypropylene	Polypropylene
<b>Type</b>	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor
<b>Unique Features</b>	1/2" NPT horizontal mount SPDT	M16 horizontal mount SPST	1/2" NPT horizontal mount SPST	M16 horizontal mount SPST	Push fit horizontal mount SPST	M16 Horiz mount SPST
<b>Max. Pressure</b>	4.7 bar	4.7 bar	2.0 bar	4.7 bar	0.34 bar	4.7 bar
<b>Operating Temp.</b>	-30°C to 130°C	-30°C to 110°C	-30°C to 105°C	-30°C to 130°C	-30°C to 60°C	-30°C to 70°C
<b>Dimensions (mm)</b>	103 x 29 x 29	88 x 27 x 27	103 x 29 x 29	100 x 27 x 27	100 x 36 x 36	67 x 30 x 30
<b>Typical Applications</b>	Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection	Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water	Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems	Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection	Water high or low, unpressurized central heating systems, fuel level, organic solvents	Waste water level, coolant, water

## LIQUID LEVEL SWITCHES

### Top & Bottom Entry



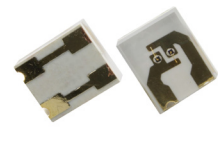
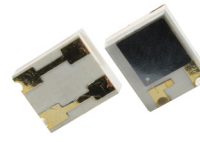
	<b>VS309-51N</b>	<b>VS804-21</b>	<b>VCS-04</b>	<b>VCS-06</b>	<b>EVS312-11N</b>	<b>EVS722-51</b>
<b>Package</b>	Glass filled nylon 6.6	Glass filled polypropylene	Polypropylene	Nylon 6.6	Nylon 6.6	Brass/ Polypropylene
<b>Type</b>	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor
<b>Unique Features</b>	M16 vertical mount SPST	M16 vertical mount SPDT	M8 vertical mount SPST	M8 vertical mount SPST	M16 vertical mount 2 X SPST	M16 vertical mount 16 X SPST
<b>Max. Pressure</b>	4.7 bar	4.7 bar	1.3 bar	1.3 bar	4.7 bar	4.7 bar
<b>Operating Temp.</b>	-30°C to 130°C	-30°C to 105°C	-30°C to 70°C	-30°C to 105°C	-30°C to 110°C	-30°C to 80°C
<b>Dimensions (mm)</b>	87 x 22 x 22	87 x 22 x 22	59 x 22 x 22	59 x 22 x 22	224 x 22 x 22	224 x 22 x 22
<b>Typical Applications</b>	Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection	Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems	Water high or low, condensate level, cooling systems	Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection	Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection	Coolant level indication, water high or low level, boiler heating element protection, sump level

# PHOTO OPTIC SENSORS



## PHOTO OPTIC SENSORS

### Photo Optic Components



	<b>ELM-4000</b>	<b>EPM-4001</b>	<b>ELM-5000</b>	<b>EPM-5000</b>
<b>Package</b>	Lead frame	Lead frame	Surface mount	Surface mount
<b>Type</b>	Emitter assembly	Detector assembly	Emitter assembly	Detector assembly
<b>Range</b>	660 nm / 880-940 nm	—	660 nm / 890-905 nm	—
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low cost</li> <li>• Dual drive</li> <li>• Clear epoxy lens</li> </ul>	<ul style="list-style-type: none"> <li>• Low cost</li> <li>• Fast response</li> <li>• High efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Reflow solderable</li> <li>• Dual drive</li> <li>• Clear epoxy lens</li> </ul>	<ul style="list-style-type: none"> <li>• Reflow solderable</li> <li>• Fast response</li> <li>• High efficiency</li> </ul>
<b>Accuracy</b>	Sensor dependent	Sensor dependent	Sensor dependent	Sensor dependent
<b>Operating Temp.</b>	-20°C to 80°C	-20°C to 80°C	-20°C to 80°C	-20°C to 80°C
<b>Dimensions (mm)</b>	4.4 x 5.1 x 1.9	4.4 x 5.1 x 1.8	4.0 x 4.8 x 1.3	4.0 x 4.8 x 1.3
<b>Typical Applications</b>	Pulse oximetry, finger and ear probes, disposable	Pulse oximetry, finger and ear probes, disposable	Pulse oximetry, finger and ear probes, disposable	Pulse oximetry, finger and ear probes, disposable

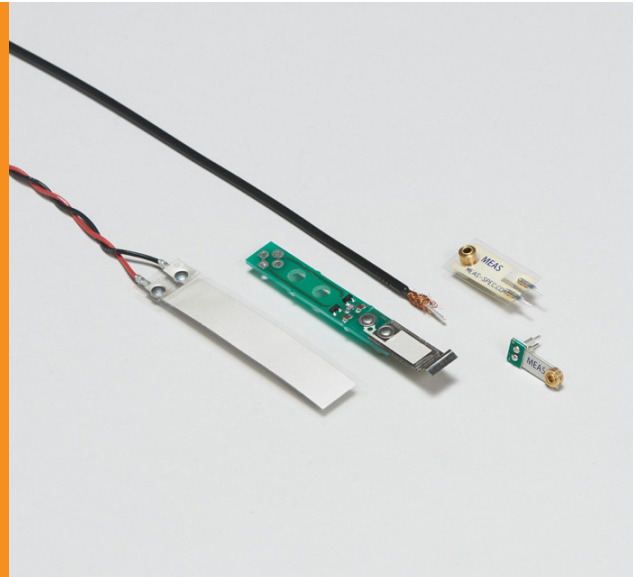
## PHOTO OPTIC SENSORS

### Pulse Oximetry (SpO<sub>2</sub>) Probe Platforms



	<b>Disposable Sensor</b>	<b>Finger Clip Sensor</b>	<b>Soft Sensor</b>
<b>Package</b>	Biocompatible	Biocompatible	Silicon boot
<b>Type</b>	Sensor platform	Sensor platform	Sensor platform
<b>Range</b>	Adult/neonatal	Adult	Adult/pediatric
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Latex free</li> <li>• Lightweight</li> <li>• Microfoam/cloth</li> </ul>	<ul style="list-style-type: none"> <li>• Soft pads</li> <li>• Lightweight</li> <li>• Easily cleaned</li> </ul>	<ul style="list-style-type: none"> <li>• Ease of use</li> <li>• Lightweight</li> <li>• Latex free</li> </ul>
<b>Accuracy</b>	Sensor dependent	Sensor dependent	Sensor dependent
<b>Operating Temp.</b>	-20°C to 80°C	-20°C to 80°C	-20°C to 80°C
<b>Typical Applications</b>	Pulse oximetry	Pulse oximetry	Pulse oximetry

# PIEZO FILM SENSORS



## PIEZO FILM



	<b>DT1, SDT1</b>	<b>Piezo Cable</b>	<b>CM-01</b>	<b>FLDT1</b>
<b>Package</b>	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
<b>Type</b>	Flexible film, adhesive mount	Polymer jacketing, armored jacketing	Contact microphone	Flexible film, adhesive mount
<b>Range</b>	15 mV/ $\mu\epsilon$ up to 1% strain	$\mu\text{Pa}$ sensitivity	40 V/mm; 8 Hz to 2.2 kHz	15 mV/ $\mu\epsilon$ , up to 1% strain
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>Thin, flexible, robust</li> <li>Withstands &gt;2% strain</li> <li>Ultra-low power (Self generating)</li> </ul>	<ul style="list-style-type: none"> <li>Continuous lengths of up to 1 km</li> <li>Shielded construction</li> </ul>	<ul style="list-style-type: none"> <li>Low noise</li> <li>Shielded construction</li> <li>High sensitivity</li> </ul>	<ul style="list-style-type: none"> <li>Thin, flexible</li> <li>Leads screen printed on film</li> <li>Connects to standard connector</li> </ul>
<b>Accuracy</b>	$\pm 20\%$ (Typical)	$\pm 20\%$ (Typical)	—	$\pm 20\%$ (Typical)
<b>Operating Temp.</b>	-40°C to 70°C (Higher available custom)	-40°C to 85°C	5°C to 60°C	-40°C to 70°C; (Higher available custom)
<b>Dimensions (mm)</b>	Application dependent	$\varnothing 3$ (Continuous lengths)	$\varnothing 18 \times 11$ high	12 x 30 active; (Custom available)
<b>Typical Applications</b>	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	Event timing, dynamic strain, motion detection

## PIEZO FILM



### Sleep Monitor Strip

<b>Package</b>	Unshielded element with crimps
<b>Type</b>	Flexible film, adhesive mount
<b>Range</b>	15 mV/ $\mu\epsilon$ up to 1% strain
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Thin, flexible, robust</li> <li>• Withstands &gt;2% strain</li> <li>• Ultra-low power (Self generating)</li> </ul>
<b>Accuracy</b>	$\pm 20\%$ (Typical)
<b>Operating Temp.</b>	-40°C to 70°C (Higher available custom)
<b>Dimensions (mm)</b>	28 $\mu\text{m}$ PVDF; 8mm x 800mm
<b>Typical Applications</b>	Respiration and heart beat monitoring for mattress or seat



### BL Traffic Sensor

<b>Center Core:</b>	16 gage copper wire
<b>Piezoelectric Material:</b>	Piezoelectric film cable
<b>Outer Sheath:</b>	0.016" thick brass
<b>Type</b>	Spiral wrapped PVDF piezo film cable
<b>Range</b>	15 mV/ $\mu\epsilon$ up to 1% strain
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Flexible, durable, available in many lengths</li> <li>• Withstands &gt;2% strain</li> <li>• Ultra-low power (Self generating)</li> </ul>
<b>Accuracy</b>	$\pm 20\%$ (Typical)
<b>Operating Temp.</b>	-40°C to 70°C (Higher available custom)
<b>Dimensions (mm)</b>	0.260" wide x 0.063" thick; 0.005"
<b>Typical Applications</b>	Traffic counting, classifying, toll booths, speed detection, red light cameras



### Laboratory Amplifier

<b>Package</b>	Bench top
<b>Type</b>	Piezo film lab amp
<b>Range</b>	0.1 Hz to 100 kHz
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Voltage or charge mode settings</li> <li>• Multi-pole high-pass and low-pass filters</li> <li>• Adjustable gain</li> </ul>
<b>Accuracy</b>	Application dependent
<b>Operating Temp.</b>	0°C to 40°C
<b>Dimensions (mm)</b>	150 x 100 x 100
<b>Typical Applications</b>	Low frequency dynamic strain, pyroelectric signals, machine vibration, piezo cable and traffic sensor interface



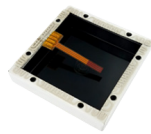
### 80 KHz Transducers

<b>Package</b>	Pin mounted
<b>Type</b>	Air ultrasound transducer
<b>Range</b>	80 kHz
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Small size</li> <li>• Low mechanical Q</li> <li>• Shielded package</li> </ul>
<b>Accuracy</b>	Application dependent
<b>Operating Temp.</b>	-20°C to 80°C
<b>Dimensions (mm)</b>	$\varnothing 6 \times 9$
<b>Typical Applications</b>	Air ranging, ultrasonic mouse, digitizers



### NDT-1

<b>Package</b>	Adhesive mounted
<b>Type</b>	High frequency ultrasound transducer
<b>Range</b>	3 MHz
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Flexible</li> <li>• High bandwidth, low Q</li> <li>• Low impedance</li> </ul>
<b>Accuracy</b>	Application dependent
<b>Operating Temp.</b>	-20°C to 60°C
<b>Dimensions (mm)</b>	12 x 30
<b>Typical Applications</b>	Thickness measurement, speed of sound measurement, pulse/echo NDT



### Tamper Box

<b>Package</b>	Flat film or box mounted
<b>Type</b>	Tamper detection sensor
<b>Range</b>	Application dependent
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low power</li> <li>• Custom shapes and sizes</li> <li>• High security</li> </ul>
<b>Accuracy</b>	Application dependent
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	Application dependent
<b>Typical Applications</b>	Encryption modules, POS card readers, PIN entry devices



### ACH-01

<b>Package</b>	Ceramic base, plastic cover, shielded cable
<b>Type</b>	Adhesive mount
<b>Range</b>	$\pm 250$ g (Typical)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Extremely high bandwidth</li> <li>• Low cost</li> <li>• Ultra-low power</li> </ul>
<b>Accuracy</b>	$\pm 20\%$ (Typical)
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	18.80 x 13.21 x 6.10
<b>Typical Applications</b>	Vibration sensing, gear box and high speed monitoring, high speed bearings and centrifuges, speaker motional feedback



### LDTC Family

<b>Package</b>	Piezo film elements with or without mass
<b>Type</b>	Cantilever beam with vertical or horizontal pins
<b>Range</b>	$\pm 10$ g (Typical)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Very low cost</li> <li>• High sensitivity (1 V/g)</li> <li>• Ultra-low power (Self generating)</li> </ul>
<b>Accuracy</b>	$\pm 20\%$ (Typical)
<b>Operating Temp.</b>	-40°C to 70°C
<b>Dimensions (mm)</b>	19.05 x 6.35 x 6.35
<b>Typical Applications</b>	Wake-up switch, load imbalance, antitheft devices, impact sensing, vital signs monitoring

# POSITION SENSORS



## ANISOTROPIC MAGNETORESISTIVE (AMR) SENSOR COMPONENTS

Magnetoresistive (MR)



### KMY, KMZ

<b>Package</b>	SOT-223, E-line 4 pin
<b>Type</b>	Linear low field sensor
<b>Range</b>	-2 to 2 kA/m magnetic field
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• High sensitivity</li> <li>• Low hysteresis</li> <li>• Linear to uniaxial field strength</li> </ul>
<b>Output</b>	Ratiometric with output voltage range 20 mV/V
<b>Resolution</b>	Typ. 0.1% of range
<b>Accuracy</b>	Typ. 1.0% of range
<b>Operating Temp.</b>	-40°C to 150°C
<b>Dimensions (mm)</b>	SOT: 6.6 x 7.0 x 1.6 E-line: 16 x 4.2 x 2.4
<b>Typical Applications</b>	Non-destructive material testing, spray arm detection in dish washers, magnetic imaging, brake pedal position



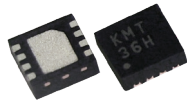
### MS32

<b>Package</b>	TDFN
<b>Type</b>	Low field switch sensor
<b>Range</b>	1 to 3 kA/m magnetic switching field
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Linearized ratiometric output</li> <li>• Temperature compensated switching point</li> </ul>
<b>Output</b>	Ratiometric with output voltage range 10 mV/V
<b>Resolution</b>	Typ. 0.1 kA/m
<b>Accuracy</b>	Typ. 0.1 kA/m
<b>Operating Temp.</b>	-25°C to 85°C
<b>Dimensions (mm)</b>	TDFN: 2.5 x 2.5 x 0.8
<b>Typical Applications</b>	Piston position switch, reed switch replacement



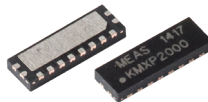
### KMT39 (Former 32B), KMT37

<b>Package</b>	TDFN
<b>Type</b>	Angle sensor
<b>Range</b>	180° angle
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• High accuracy</li> <li>• High resolution</li> </ul>
<b>Output</b>	Sine and cosine signals with output voltage range 20 mV/V
<b>Resolution</b>	Typ. 0.01° to 0.1°
<b>Accuracy</b>	Typ. 0.1° to 1.0°
<b>Operating Temp.</b>	-40°C to 150°C (175°C on request)
<b>Dimensions (mm)</b>	TDFN: 2.5 x 2.5 x 0.8 SO-8: 5 x 4 x 1.75
<b>Typical Applications</b>	Steering position, flow meters, rpm meters, rotary encoders



### KMT36H

<b>Package</b>	TDFN 2.5 x 2.5
<b>Type</b>	Angle sensor
<b>Range</b>	360° angle
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• High accuracy</li> <li>• High resolution</li> <li>• 360° full turn</li> </ul>
<b>Output</b>	Three 120° phase shifted output signals with output voltage range 20 mV/V
<b>Resolution</b>	Typ. 0.01° to 0.1°
<b>Accuracy</b>	Typ. 0.1° to 1°
<b>Operating Temp.</b>	-40°C to 150°C
<b>Dimensions (mm)</b>	TDFN: 2.5 x 2.5 x 0.8
<b>Typical Applications</b>	Steering position, gage readings, rotary encoders



### KMXP

<b>Package</b>	DFN 2 x 6
<b>Type</b>	Linear displacement sensor, 3 flat and 3 perpendicular versions
<b>Range</b>	Absolute within magnetic pole pitch, else incremental
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• For pole pitch</li> <li>• KMXP 1000: p= 1 mm</li> <li>• KMXP 2000: p= 2 mm</li> <li>• KMXP 5000: p= 5 mm</li> </ul>
<b>Output</b>	Sine and cosine signals with output voltage range 20 mV/V
<b>Resolution</b>	0.01% to 0.1% of pole pitch
<b>Accuracy</b>	0.1% to 1.0% of pole pitch
<b>Operating Temp.</b>	-40°C to 125°C
<b>Dimensions (mm)</b>	DFN: 2 x 6 x 0.8
<b>Typical Applications</b>	Roller conveyors, circular saws, bending machines



### KMA36

<b>Package</b>	TSSOP
<b>Type</b>	Angle sensor with digital output
<b>Range</b>	360° angle
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low cost MR encoder for rotational and incremental measurements</li> <li>• Digital output</li> </ul>
<b>Output</b>	Analog and I <sup>2</sup> C Digital
<b>Resolution</b>	Typ. 0.1°
<b>Accuracy</b>	Typ. 0.3°
<b>Operating Temp.</b>	-25°C to 85°C
<b>Dimensions (mm)</b>	TSSOP20: 6.5 x 6.4 x 1.2
<b>Typical Applications</b>	Knobs, small robotics, angular/linear position

ANGULAR POSITION TRANSDUCERS—INDUCTIVE

Absolute



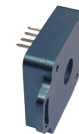
<b>Package</b>	PCB for OEM volumes
<b>Resolution</b>	Infinite
<b>Excitation</b>	DC voltage
<b>Output</b>	DC voltage, DC current, digital
<b>Range</b>	Up to $\pm 75^\circ$
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Absolute position</li> </ul>
<b>Operating Temp.</b>	-25°C to 85°C
<b>Dimensions (mm)</b>	Custom
<b>Typical Applications</b>	Viscometers, valve position, robotics, HVACR vane position, ATM's, joysticks

<b>R60D</b>
Servo mount with ball bearing
Infinite
DC symmetrical $\pm 15$ VDC
$\pm 7.5$ VDC
$\pm 60^\circ$
<ul style="list-style-type: none"> <li>• Absolute position</li> <li>• Low momentum of inertia</li> </ul>
-25°C to 85°C
Aluminum case size 11 ( $\varnothing 27$ mm)
Dancer arm position, rotary actuator position feedback, throttle lever position feedback, ball valve position, textile manufacturing equipment, printing presses

<b>R30A</b>
Servo mount with ball bearing
Infinite
AC operated
AC voltage
$\pm 30^\circ$ to $\pm 60^\circ$
<ul style="list-style-type: none"> <li>• Absolute position</li> </ul>
-55°C to 150°C
Aluminum case size 11 ( $\varnothing 27$ mm)
Machine tool equipment, rotary actuator feedback, valve positioning, power generation valve position

ANGULAR POSITION—ENCODERS

Absolute



<b>H005, H009</b>
<ul style="list-style-type: none"> <li>• 12.7 mm - 22.19 mm/.500 in - .875 in housing diameter</li> <li>• 3.170 mm/.1248 in shaft diameter</li> <li>• 16.9 mm - 17.4 mm/.670 in - .680 in housing length</li> </ul>
Up to 359°
Analog/PWM/Serial
12-bit analog/PWM 14-bit serial (SPI)
—
—
$\pm 0.2\%$
5 volts
-40°C to 150°C
> 100 million cycles (Bearing life)
Dimensions (mm)
Critical position feedback applications in commercial, industrial, medical, aircraft and military markets

<b>H009, 1200</b> Dual Output
<ul style="list-style-type: none"> <li>• 22.23 mm/.875 in housing diameter</li> <li>• 3.170 mm/.1248 in shaft diameter</li> <li>• 26.1 mm/1.03 in housing length</li> </ul>
Up to 359° (Dual output)
Analog/PWM/Serial
12-bit analog/PWM 14-bit serial (SPI)
—
—
$\pm 0.2\%$ (Dual output)
5 volts (Dual output)
-40°C to 150°C
> 100 million cycles (Bearing life)
Dimensions (mm)
Critical position feedback applications in commercial, industrial, medical, aircraft and military markets

<b>R36</b>
Heavy duty shaftless
180°
Voltage
Analog 1.4°
5 VDC
<ul style="list-style-type: none"> <li>• Rugged housing</li> <li>• Shaftless</li> <li>• No optical degradation</li> </ul>
—
—
-40°C to 85°C
—
37.36 x 25.4 x 7.62
Feedback sensor or human machine interface device, rudder control, servomotor position and speed control

## TILT SENSORS

Single Axis



### E-Series

<b>Package</b>	Ceramic housing
<b>Type</b>	Inclination sensor module
<b>Range</b>	±5°, ±15°
<b>Output</b>	Voltage
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Easy to handle</li> <li>• Minimal temperature drift</li> <li>• Good long term stability</li> </ul>
<b>Accuracy</b>	±0.2° to ±0.5°
<b>Operating Temp.</b>	-25°C to 85°C
<b>Dimensions (mm)</b>	29 x 17 x 16.5
<b>Typical Applications</b>	Road construction, building monitoring, weighing systems, mobile and stationary cranes, platform leveling



### AccuStar EA

<b>Package</b>	LCP housing
<b>Type</b>	Inclinometer sensor module
<b>Range</b>	±45° to ±60°
<b>Output</b>	Voltage
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Compact</li> <li>• Low power</li> <li>• Vertical and horizontal mount</li> </ul>
<b>Accuracy</b>	0° to 10° ±0.1% accuracy 10° to 60° ±0.75% reading
<b>Operating Temp.</b>	-30°C to 65°C
<b>Dimensions (mm)</b>	65.91 x 51.56 x 30.5
<b>Typical Applications</b>	Wheel alignment, construction, equipment, antenna positioning, robotics, crane/boom angle



### APS System

<b>Package</b>	Plastic housing
<b>Type</b>	Inclination system
<b>Range</b>	±45°, ±90°
<b>Output</b>	Analog/digital
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Stand alone system</li> <li>• Separate system and sensor</li> </ul>
<b>Accuracy</b>	0° to 10° ±0.1% accuracy 10° to 45° ±0.75% of reading
<b>Operating Temp.</b>	-25°C to 65°C
<b>Dimensions (mm)</b>	127.5 x 88 x 32.2
<b>Typical Applications</b>	Tower crane safety, RV and mobile trailer leveling, water and oil well drilling rigs, mining equipment

## TILT SENSORS

### Single Axis



	<b>G-Series</b>
<b>Package</b>	Aluminum housing IP67
<b>Type</b>	Inclinometer
<b>Range</b>	±10°
<b>Output</b>	Switch
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Programmable</li> <li>• EMC standard</li> <li>• High switch accuracy</li> </ul>
<b>Accuracy</b>	±0.25°
<b>Operating Temp.</b>	-25°C to 85°C
<b>Dimensions (mm)</b>	80 x 75 x 57.5
<b>Typical Applications</b>	Lift platforms, building device control, train inclination monitoring, position switch

	<b>IT9000</b>
<b>Package</b>	Aluminum or stainless
<b>Type</b>	Inclinometer
<b>Range</b>	±45° to ±240°
<b>Output</b>	Voltage divider, 4 - 20 mA
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Rugged industrial design, IP67/68</li> <li>• Submersible</li> <li>• Designed for brutal environments</li> <li>• CSA, CENELEC certification for hazardous area applications</li> </ul>
<b>Accuracy</b>	±1%
<b>Operating Temp.</b>	-34°C to 90°C
<b>Dimensions (mm)</b>	Ø130 x 100
<b>Typical Applications</b>	Waste water control, tainter gates, draw bridges, heavy industrial applications

	<b>AccuStar IP66</b>
<b>Package</b>	Aluminum housing IP66
<b>Type</b>	Inclinometer
<b>Range</b>	±3° to ±45°
<b>Output</b>	Current
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• EMI and RFI rated</li> <li>• CE pending</li> <li>• Water tight enclosure</li> </ul>
<b>Accuracy</b>	0° to 10° ±0.1% linearity 10° to 45° ±1% linearity
<b>Operating Temp.</b>	-25°C to 60°C
<b>Dimensions (mm)</b>	98.04 x 63 x 35.05
<b>Typical Applications</b>	Tower crane safety, RV and mobile trailer leveling, water and oil well drilling rigs, mining equipment

## TILT SENSORS

### Dual Axis



	<b>DPL, DPN</b>
<b>Package</b>	PCB board
<b>Type</b>	Inclination board module
<b>Range</b>	±2° to ±30°
<b>Output</b>	Voltage/RS 232/SPI
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• High resolution</li> <li>• Minimal temperature drift</li> <li>• User configurable</li> </ul>
<b>Accuracy</b>	±0.05° to ±0.8°
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	45 x 45 x 20
<b>Typical Applications</b>	Laser leveling, weighing systems, mobile and stationary cranes, hydraulic leveling, building monitoring, wind power

	<b>DOG2</b>
<b>Package</b>	Plastic PA 6.6 housing, IP67
<b>Type</b>	Inclinometer
<b>Range</b>	±25°, ±45°, ±90°
<b>Output</b>	Voltage/Current/J1939/CANopen®
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Plug and play</li> <li>• Wide measurement range</li> <li>• Cost-efficient</li> <li>• Cable with connector</li> <li>• Fast MEMS sensor</li> </ul>
<b>Accuracy</b>	± 0.5° (Full temp. range)
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	70.5 x 45 x 15
<b>Typical Applications</b>	Off road vehicle, fork lift, truck leveling, man lift, harvester, farm machine, tip over protection, solar panel control

	<b>DPG</b>
<b>Package</b>	Aluminum housing IP67
<b>Type</b>	Inclinometer
<b>Range</b>	±5° to ±30°
<b>Output</b>	RS232/Voltage
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• CE approved</li> <li>• Rugged housing</li> <li>• Easy to use</li> <li>• User configurable</li> </ul>
<b>Accuracy</b>	±0.05° to ±0.3°
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	84 x 70 x 34.2
<b>Typical Applications</b>	Platform leveling, road construction machines, tunnel drilling, mobile leveling

	<b>D-Series</b>
<b>Package</b>	Aluminum housing IP67
<b>Type</b>	Inclinometer
<b>Range</b>	±5° to ±30°
<b>Output</b>	RS232/Voltage/Current/Switch/PWM/CANopen®
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• High accuracy</li> <li>• Rugged housing</li> <li>• Programmable</li> <li>• CE approved</li> </ul>
<b>Accuracy</b>	±0.04° to ±0.8°
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	84 x 70 x 46
<b>Typical Applications</b>	Drilling machines, mobile and stationary cranes, wind power, antenna/radar leveling

## PROXIMITY SENSORS



**PS801**  
 Stainless steel  
 Type  
 • Proximity sensor  
 • Used with proximity magnet  
 Unique Features  
 SPST reed switch, normally open  
 Operating Temp.  
 -30°C to 120°C  
 Dimensions (mm)  
 Ø12 x 65  
 Typical Applications  
 Door interlocks, hook switches, security systems, safety interlocks, position indication



**PS811**  
 Nylon 6.6  
 Type  
 • Proximity sensor  
 • Used with proximity magnet  
 Unique Features  
 SPST reed switch, normally open  
 Operating Temp.  
 -30°C to 110°C  
 Dimensions (mm)  
 Ø10 x 38  
 Typical Applications  
 Door interlocks, hook switches, security systems, safety interlocks, position indication



**PS831**  
 Stainless steel  
 Type  
 • Proximity sensor  
 • Used with proximity magnet  
 Unique Features  
 SPST reed switch, normally open  
 Operating Temp.  
 -30°C to 130°C  
 Dimensions (mm)  
 Ø12 x 32  
 Typical Applications  
 Door interlocks, hook switches, security systems, safety interlocks, position indication



**PS2011AB**  
 Glass filled nylon 6.6  
 Type  
 • Proximity sensor  
 • Used with proximity magnet  
 Unique Features  
 SPST reed switch, normally open  
 Operating Temp.  
 -30°C to 105°C  
 Dimensions (mm)  
 29 x 7 x 20  
 Typical Applications  
 Door interlocks, hook switches, security systems, safety interlocks, position indication



**PS2021AB**  
 Glass filled nylon 6.6  
 Type  
 • Proximity sensor  
 • Used with proximity magnet  
 Unique Features  
 SPST reed switch, normally closed  
 Operating Temp.  
 -30°C to 105°C  
 Dimensions (mm)  
 29 x 7 x 20  
 Typical Applications  
 Door interlocks, hook switches, security systems, safety interlocks, position indication



**PS2031AB**  
 Glass filled nylon 6.6  
 Type  
 • Proximity sensor  
 • Used with proximity magnet  
 Unique Features  
 SPDT reed switch  
 Operating Temp.  
 -30°C to 105°C  
 Dimensions (mm)  
 29 x 7 x 20  
 Typical Applications  
 Door interlocks, hook switches, security systems, safety interlocks, position indication



**PS501**  
 Glass filled nylon 6.6  
 Type  
 • Proximity sensor  
 • Used with proximity magnet  
 Unique Features  
 SPST reed switch, normally open  
 Operating Temp.  
 -30°C to 130°C  
 Dimensions (mm)  
 Ø6 x 32  
 Typical Applications  
 Door interlocks, hook switches, security systems, safety interlocks, position indication

PROXIMITY MAGNET



**PM101**

**Package** Glass filled nylon 6.6

**Type**

- Proximity magnet
- Used with proximity sensor

**Unique Features** Housed magnet

**Operating Temp.** -30°C to 105°C

**Dimensions (mm)** 29 x 7 x 20

**Typical Applications** Door interlocks, hook switches, security systems, safety interlocks, position indication



**PM50**

**Package** Glass filled nylon 6.6

**Type**

- Proximity magnet
- Used with proximity sensor

**Unique Features** Housed magnet

**Operating Temp.** -30°C to 70°C

**Dimensions (mm)** Ø6 x 32

**Typical Applications** Door interlocks, hook switches, security systems, safety interlocks, position indication



**PM81**

**Package** Nylon 6.6

**Type**

- Proximity magnet
- Used with proximity sensor

**Unique Features** Housed magnet

**Operating Temp.** -30°C to 120°C

**Dimensions (mm)** Ø10 x 38

**Typical Applications** Door interlocks, hook switches, security systems, safety interlocks, position indication



**PM83**

**Package** Stainless steel

**Type**

- Proximity magnet
- Used with proximity sensor

**Unique Features** Housed magnet

**Operating Temp.** -30°C to 120°C

**Dimensions (mm)** Ø12 x 32

**Typical Applications** Door interlocks, hook switches, security systems, safety interlocks, position indication

LINEAR POSITION TRANSDUCERS

Cable Extension Transducers



**PT1, PT5**

**Range** 0 - 2 to 0 - 250 inches

**Output** Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental encoder, CANbus, DeviceNet™, RS-232

**IP Rating** IP65, IP67 (PT5)

**Enclosure** Aluminum and abs plastic (PT1)

**Accuracy** ±0.04% to ±0.25%

**Unique Features**

- Designed for most factory environments
- Industry standard output signals
- User serviceable
- Compact design (PT1)

**Operating Temp.** -40°C to 90°C

**Dimensions (mm)** 85 x 100 x 70 (PT1) 100 x 175 x 80 (PT5)

**Typical Applications** Factory automation, industrial, die casting, injection molding



**PT8000**

**Range** 0 - 2 to 0 - 60 inches

**Output** Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental/absolute encoder, CANbus, DeviceNet™, RS-232

**IP Rating** IP67, IP68

**Enclosure** Aluminum or stainless

**Accuracy** ±0.04% to ±0.25%

**Unique Features**

- 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

**Operating Temp.** -40°C to 90°C

**Dimensions (mm)** 90 x 140 x 135

**Typical Applications** Steel mills, lumber and paper mills, factory automation, die-casting, injection molding, mobile construction and mining



**PT9000**

**Range** 0 - 75 to 0 - 1700 inches

**Output** Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental/absolute encoder, CANbus, DeviceNet™, RS-232

**IP Rating** IP67, IP68

**Enclosure** Aluminum or stainless

**Accuracy** ±0.04% to ±0.25%

**Unique Features**

- 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

**Dimensions (mm)** 200 x 135 x 125

**Typical Applications** Mobile hydraulic boom position, water resource management, mining and tunnel boring equipment, telescoping mechanism position, theater stage control

## LINEAR POSITION TRANSDUCERS

### Cable Extension Transducers



	<b>M150, MTA</b>
<b>Range</b>	0 - 1.5 to 0 - 5 inches
<b>Output</b>	Voltage divider
<b>Environment/ IP Rating</b>	IP50
<b>Enclosure</b>	Aluminum
<b>Accuracy</b>	±0.4% to ±1%
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• M150: one of the world's smallest string potentiometer</li> <li>• Designed for space-critical and testing applications</li> </ul>
<b>Operating Temp.</b>	-40°C to 85°C (M150) -55°C to 100°C (MTA)
<b>Dimensions (mm)</b>	19 x 19 x 10 (M150)
<b>Typical Applications</b>	Aerospace, automotive instrumentation, automotive crash testing, automotive and motorcycle racing



	<b>MT2, MT3</b>
<b>Range</b>	0 - 3 to 0 - 30 inches
<b>Output</b>	Voltage divider, incremental encoder
<b>Environment/ IP Rating</b>	IP50, IP67 (MT3A)
<b>Enclosure</b>	Aluminum and polycarbonate
<b>Accuracy</b>	±0.25% to ±1.1%
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Designed for test applications</li> <li>• Dual-axis measuring cable alignment</li> <li>• Tracks high-acceleration linear position up to 136g's</li> <li>• High-frequency response</li> <li>• GAM EG 13 certification</li> </ul>
<b>Operating Temp.</b>	-55°C to 125°C
<b>Dimensions (mm)</b>	55 x 45 x 55
<b>Typical Applications</b>	Automotive crash testing, aerospace and flight testing



	<b>SM, SP</b>
<b>Range</b>	0 - 2.5 to 0 - 50 inches
<b>Output</b>	Voltage divider, 0 - 10 VDC, 4 - 20 mA
<b>Environment/ IP Rating</b>	IP50, IP67 (SP)
<b>Enclosure</b>	Polycarbonate with stainless steel bracket
<b>Accuracy</b>	±0.25% to ±1%
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Compact design</li> <li>• M12 connection</li> <li>• Adjustable mounting bracket</li> <li>• Free-release tolerant</li> <li>• Custom configurations for OEMs</li> </ul>
<b>Operating Temp.</b>	-18°C to 70°C (SM) -40°C to 85°C (SP)
<b>Dimensions (mm)</b>	120 x 140 x 140
<b>Typical Applications</b>	Factory automation, light industrial, seismic testing, racing instrumentation, medical imaging systems, fume hood position



	<b>SG, SR</b>
<b>Range</b>	0 - 80 to 0 - 175 inches
<b>Output</b>	Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental encoder, CANbus
<b>Environment/ IP Rating</b>	IP67
<b>Enclosure</b>	Polycarbonate with stainless steel bracket
<b>Accuracy</b>	±0.35% to ±0.5%
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low cost, high value string potentiometer</li> <li>• Versatile stainless steel mounting bracket</li> <li>• Simple one-button user scalable stroke range (SR)</li> <li>• Custom configurations available for OEM customers</li> </ul>
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	100 x 120 x 200
<b>Typical Applications</b>	Outdoor mobile construction equipment, outrigger positioning, hydraulic lifts, water and power controls



	<b>SK</b>
<b>Range</b>	0 - 250 and 0 - 400 inches
<b>Output</b>	4 - 20 mA, 0 - 10 V, voltage divider, CAN J1939, CANopen®, Encoder drive
<b>Environment/ IP Rating</b>	IP67
<b>Enclosure</b>	Polycarbonate with stainless steel bracket
<b>Accuracy</b>	±.25% FS
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Compact design</li> <li>• M12 connectivity</li> <li>• Adjustable mounting bracket</li> </ul>
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	120 x 140 x 140
<b>Typical Applications</b>	Mobile construction equipment, factory automation



	<b>PTX, PT101</b>
<b>Range</b>	0 - 2 to 0 - 100 inches
<b>Output</b>	Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental encoder, velocity output (DV301)
<b>Environment/ IP Rating</b>	IP50
<b>Enclosure</b>	Aluminum
<b>Accuracy</b>	±0.04% to ±0.25%
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Original classic design</li> <li>• High precision</li> <li>• Proven track record</li> </ul>
<b>Operating Temp.</b>	-40°C to 90°C
<b>Dimensions (mm)</b>	Model and range specific
<b>Typical Applications</b>	Aerospace testing, architectural and structural testing, factory automation

## LINEAR POSITION TRANSDUCERS—INDUCTIVE

Absolute



	<b>HR</b>	<b>M12</b>	<b>HC</b>
<b>Package</b>	AISI-400 series stainless steel	AISI-304 series stainless steel	AISI-400 series stainless steel
<b>Linearity</b>	±0.25% of range	±0.25% of range	±0.25% of range
<b>Excitation</b>	AC operated	AC operated	AC and DC operated versions
<b>Output</b>	AC voltage	AC voltage	AC or DC voltage, 4 - 20 mA loop or RS-485
<b>Range</b>	±0.05 to ±10 inches	±10 to ±100 mm	±0.05 to ±10 inches
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Large bore to core clearance</li> <li>• Broad range of excitation frequencies</li> <li>• Variety of options</li> <li>• Mild radiation resistance option</li> </ul>	<ul style="list-style-type: none"> <li>• Metric series</li> <li>• High stroke to length ratio</li> <li>• Constant sum of secondaries</li> <li>• Excellent temperature coefficient</li> </ul>	<ul style="list-style-type: none"> <li>• Hermetically sealed</li> <li>• Welded connector</li> <li>• Double shielding</li> <li>• Intrinsically safe version</li> <li>• CE mark for DC versions</li> </ul>
<b>Operating Temp.</b>	-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)
<b>Diameter (mm)</b>	20.6	12	19
<b>Typical Applications</b>	General industrial	Hydraulic spool valve position feedback, flight simulators, aircraft flight control feedback	Harsh environments, submersible applications, process controls, valve position feedback



	<b>XS-C</b>	<b>DC-SE</b>	<b>XS-D</b>
<b>Package</b>	AISI-304 series stainless steel	AISI-400 series stainless steel	AISI-400 series stainless steel
<b>Linearity</b>	±0.25% of range	±0.25% of range	±2% of range
<b>Excitation</b>	AC operated	8.5 to 28 VDC	AC operated
<b>Output</b>	AC voltage	0 - 5 VDC (4 wire), 1 - 6 VDC (3 wire)	AC voltage
<b>Range</b>	±0.25, ±0.5 and ±1 inches	0 - 0.1 to 0 - 6 inches	±1 to ±10 inches
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• High pressure</li> <li>• Bulkhead mounting</li> <li>• Hermetically sealed welded assembly</li> </ul>	<ul style="list-style-type: none"> <li>• CE mark</li> <li>• Low current consumption (6 mA typical)</li> <li>• Synchronous demodulation</li> <li>• Shielded cable</li> </ul>	<ul style="list-style-type: none"> <li>• Very high stroke to body length ratio</li> </ul>
<b>Operating Temp.</b>	-55°C to 150°C	-25°C to 85°C	-55°C to 150°C
<b>Diameter (mm)</b>	19	19	20.6
<b>Typical Applications</b>	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 TE.com.

## LINEAR POSITION TRANSDUCERS—INDUCTIVE

Absolute



### MACRO HSTA/R

<b>Package</b>	AISI-410 stainless steel
<b>Linearity</b>	±0.25% of range
<b>Excitation</b>	AC operated
<b>Output</b>	AC voltage
<b>Range</b>	±0.050 to ±10.0 inches
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• IP68 rating, hermetically sealed</li> <li>• Mild radiation resistant (30 Mrad) optional</li> <li>• Axial or radial connector with thru-bore construction</li> </ul>
<b>Operating Temp.</b>	-55°C to 200°C standard (Contact factory for higher temperature)
<b>Diameter (mm)</b>	19
<b>Typical Applications</b>	High temperature steam and gas valves, nuclear power plants, harsh and corrosive environments, environments with heavy dust, dirt, and humidity



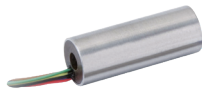
### MACRO SSI/R

<b>Package</b>	Alloy 625
<b>Linearity</b>	±0.10% of range
<b>Excitation</b>	AC or DC operated
<b>Output</b>	AC or 4-20 mA loop digital CANbus available
<b>Range</b>	±1.0 to ±10.0 inches
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Operating pressure to 5,000 psi (7,500 psi proof)</li> <li>• Seawater submersible IP68</li> <li>• Standard Seacon connector</li> <li>• Axial or radial connection</li> </ul>
<b>Operating Temp.</b>	-40°C to 80°C
<b>Diameter (mm)</b>	23.9
<b>Typical Applications</b>	Off-shore drilling platforms, pipeline monitoring, choke valves, mooring cables, extensometers, pulp and paper mills



### MACRO HPGS 750

<b>Package</b>	AISI-410 stainless steel
<b>Linearity</b>	±0.25% of range
<b>Excitation</b>	AC operated
<b>Output</b>	AC voltage
<b>Range</b>	±0.050 to ±10.0 inches
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Radial screw-on 38999 connector</li> <li>• IP68 rating, hermetically sealed</li> <li>• Designed for high vibration applications</li> </ul>
<b>Operating Temp.</b>	-55°C to 200°C
<b>Diameter (mm)</b>	19
<b>Typical Applications</b>	Nuclear power generation equipment, hydraulic cylinder position, steam valve positioning, power generation equipment, corrosive environments, high-vibration environments



### MACRO CD375

<b>Package</b>	AISI-410 stainless steel
<b>Linearity</b>	±0.25% of range
<b>Excitation</b>	AC operated
<b>Output</b>	AC voltage
<b>Range</b>	± 0.025 to ±1 inches
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Compact design</li> <li>• Operating pressure to 20,000 psi+</li> </ul>
<b>Operating Temp.</b>	-55°C to 200°C
<b>Diameter (mm)</b>	9.5
<b>Typical Applications</b>	Machine tools, robotic grippers, medical equipment, valve position sensing, hydraulic cylinder, down-hole equipment



### MACRO GHSE/R

<b>Package</b>	AISI-410 stainless steel
<b>Linearity</b>	±0.1% of range
<b>Excitation</b>	DC operated
<b>Output</b>	0 - 10 VDC
<b>Range</b>	0.100 to 4 inches
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Spring loaded design</li> <li>• IP68 rating, hermetically sealed</li> <li>• Axial and radial connection</li> <li>• Low pressure air-extend/spring-retract version available (GHSER 750-A)</li> </ul>
<b>Operating Temp.</b>	-20°C to 70°C
<b>Diameter (mm)</b>	19
<b>Typical Applications</b>	Industrial gaging systems, replaces dial indicators, fabricated metal products gaging

LINEAR POSITION TRANSDUCERS—INDUCTIVE

Dimensional Gaging Products



	LBB Spring-Extend	LBB Air-Extend	PCA 375	GC	Ultimate-Precision Digital LBB
Linearity	±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%
Excitation	AC operated	AC operated	AC operated	AC or DC voltage	5 VDC USB (Bus or external)
Output	AC voltage	AC voltage	AC voltage	AC or DC voltage, RS-485, or 4 - 20 mA loop	RS485; USB
Range	±0.02 to ±0.20 inches	±0.04 and ±0.1 inches	±0.02 to ±1 inches	±0.05 to ±2 inches	1, 2, 5 and 10 mm
Unique Features	<ul style="list-style-type: none"> <li>• 0.000004 inch (0.1 μm) repeatability</li> <li>• Removable tungsten carbide contact tip</li> <li>• Double shielded LVDT</li> <li>• Repairable</li> </ul>	<ul style="list-style-type: none"> <li>• 0.000004 inch (0.1 μm) repeatability</li> <li>• Removable tungsten carbide contact tip</li> <li>• Double shielded LVDT</li> <li>• Repairable</li> </ul>	<ul style="list-style-type: none"> <li>• Longer strokes</li> <li>• IP65 cable exit</li> <li>• Accepts industry standard contact tips</li> <li>• Heavy duty return spring</li> </ul>	<ul style="list-style-type: none"> <li>• Hermetically sealed</li> <li>• Welded MS connector (MIL-C-5015) "</li> <li>• CE mark for DC versions</li> <li>• Special tips available</li> <li>• Air extend spring retract available</li> </ul>	<ul style="list-style-type: none"> <li>• Plug-and-play</li> <li>• 14-bit resolution</li> <li>• COM libraries provided</li> <li>• CE mark</li> <li>• USB adapter and power supply available</li> </ul>
Operating Temp.	-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
Diameter (mm)	8 or 9.5	8 or 9.5	9.5	19 mm body, 1/2 - 20 threads	Stackable gage system
Typical Applications	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 gaging, precision dimensional measurement, optics inspection systems, SPC data collection, hand tools

LINEAR POSITION ENCODERS

Incremental



	ED32i
Package	IP67 aluminum
Range	Magnetic scale, 5 mm 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
Max. Speed	4 m/s
Unique Features	<ul style="list-style-type: none"> <li>• Contactless incremental measurement</li> <li>• Very high accuracy, programmable resolution</li> <li>• High speed up to 4 m/s</li> <li>• Error detection, missing scale function</li> <li>• Adapter plate for easy mounting</li> </ul>
Operating Temp.	-25°C to 85°C
Dimensions (mm)	60 x 20 x 10
Typical Applications	Linear displacement measurement in industrial and medical applications

## LVDT/RVDT INSTRUMENTATION



### LVM-110, LiM-420

<b>Package</b>	Open circuit board
<b>Supply</b>	DC voltage
<b>Output</b>	DC voltage or current
<b>Operating Temp.</b>	0°C to 55°C
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Master/slave for multi-up applications</li> <li>• Dip switch selectable excitation frequencies</li> <li>• Plug-in PCB or wire termination</li> <li>• Small form factor</li> </ul>
<b>Dimensions (mm)</b>	63 x 56 x 21
<b>Typical Applications</b>	OEM applications



### LDM-1000

<b>Package</b>	DIN rail mount
<b>Supply</b>	10 to 30 VDC
<b>Output</b>	DC voltage and current
<b>Operating Temp.</b>	-25°C to 85°C
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Operates with 4, 5 &amp; 6 wire LVDT/RVDTs</li> <li>• Adjustable zero, span and phase</li> <li>• Status LEDs</li> <li>• CE mark</li> </ul>
<b>Dimensions (mm)</b>	115 x 99 x 23
<b>Typical Applications</b>	Automotive test track instrumentation, gas and steam turbine controls, factory automation



### ATA-2001

<b>Package</b>	1/8 DIN panel mount
<b>Supply</b>	115 and 220 VAC, 50 - 400 Hz
<b>Output</b>	DC voltage and current
<b>Operating Temp.</b>	-40°C to 85°C
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Push button programmable</li> <li>• Splash proof front panel</li> <li>• LED status lights</li> <li>• Mounting hardware included</li> <li>• CE mark</li> </ul>
<b>Dimensions (mm)</b>	267 x 99 x 49
<b>Typical Applications</b>	Precision metrology labs, power generation valve position monitoring



### PML 1000

<b>Package</b>	1/8 DIN panel mount
<b>Supply</b>	90 to 265 VAC, 50 - 60 Hz or 24 VDC
<b>Output</b>	DC voltage and current (RS-485 optional)
<b>Operating Temp.</b>	10°C to 55°C
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• 5 digit LED display</li> <li>• Auto-calibration</li> <li>• Programmable</li> <li>• Splash proof front panel</li> <li>• Mounting hardware included</li> <li>• CE mark</li> </ul>
<b>Dimensions (mm)</b>	173 x 97 x 49
<b>Typical Applications</b>	Remote monitoring stations, measurement test stands, process monitoring



### MP 2000

<b>Package</b>	1/4 DIN panel mount
<b>Supply</b>	100 to 240 VAC, 47 - 63 Hz
<b>Output</b>	DC voltage and RS-232
<b>Operating Temp.</b>	0°C to 55°C
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Programmable set point controller</li> <li>• Dual channel with math functions</li> <li>• Digital I/O</li> <li>• Large LCD display</li> <li>• Splash proof front panel</li> </ul>
<b>Dimensions (mm)</b>	178 x 92 x 92
<b>Typical Applications</b>	LVDT based weighing systems, pass/fail parts sorting, quality inspection



### MMX Mini Module

<b>Package</b>	DIN rail mount
<b>Supply</b>	15 to 30 VDC
<b>Output</b>	DC voltage or 4-20 mA
<b>Operating Temp.</b>	0°C to 70 °C
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Push-button calibration</li> <li>• Flame retardant mini-module housing</li> <li>• Master/slave excitation synchronization (Up to 10 channels)</li> <li>• LED status lights</li> <li>• Supports all standard AC LVDTs, RVDTs, and VR half-bridge sensors</li> </ul>
<b>Dimensions (mm)</b>	85.1 x 70.4 x 17.8
<b>Typical Applications</b>	Automotive test instrumentation, factory automation

LINEAR POSITION—POTENTIOMETERS



**MLP, CLP**

<b>Package</b>	Aluminum body, steel rod, IP65, IP67
<b>Range</b>	0 - 0.5 to 0 - 6" (MLP) 0 - 1 to 0 - 10" (CLP)
<b>Linearity</b>	±0.5 to ±1% (MLP) ±0.1 to ±0.2% (CLP)
<b>Excitation</b>	Up to 40 VDC max.
<b>Output</b>	Voltage divider
<b>Resolution</b>	Essentially infinite
<b>Max. Speed</b>	10 m/s
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Extended temperature range, miniature design</li> <li>• First choice for auto racing applications</li> <li>• Perfect for high cycle applications</li> </ul>
<b>Operating Temp.</b>	-40°C to 90°C
<b>Dimensions (mm)</b>	Diameter/cross section: Ø9.5 mm (MLP) 15 mm x 15 mm (CLP)
<b>Typical Applications</b>	Vehicle testing, autosport instrumentation, structural and architectural testing and robotics.

LINEAR POSITION—POTENTIOMETERS



**5903, 5905**  
Linear Motion

<b>Package</b>	<ul style="list-style-type: none"> <li>• 7.94 mm - 12.7 mm/0.312" - 0.500" housing diameter</li> <li>• 1.98 mm - 3.18 mm/0.078" - 0.125" shaft diameter</li> </ul>
<b>Resistance</b>	1K/5K/10K
<b>Range</b>	5903 series - up to 50.8 mm/2" stroke 5905 series - up to 101.6 mm/4" stroke
<b>Linearity</b>	±1%
<b>Output Smoothness</b>	<0.1%
<b>Resolution</b>	Infinite
<b>Operating Temp.</b>	-65°C to 125°C
<b>Stroke Life</b>	50 million cycles min
<b>Typical Applications</b>	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets

## ANGULAR POSITION—POTENTIOMETERS



	<b>6000</b> Servo Mount	<b>6200</b> Bushing Mount	<b>6900</b> Element/Wiper/Insulator	<b>6100</b> Hollow Shaft
<b>Package</b>	<ul style="list-style-type: none"> <li>• 12.7 mm - 50.8 mm/0.500" - 2.00" housing diameter</li> <li>• 3.170 mm - 6.34 mm/0.1248" - 0.2498" shaft diameter</li> <li>• 12.7 mm - 1.74 mm/0.500" - 0.680" housing length</li> <li>• 11.11 mm - 47.62 mm/0.438" - 1.875" mounting pilot diameter</li> </ul>	<ul style="list-style-type: none"> <li>• 12.7 mm - 50.8 mm/0.500" - 2.00" housing diameter</li> <li>• 3.170 mm - 6.34 mm/0.1248" - .2498" shaft diameter</li> <li>• 12.7 mm - 1.74 mm/0.500" - 0.680" housing length</li> <li>• 3/8 32 NEF thread/10.31 mm/0.4062" pilot diameter</li> </ul>	<ul style="list-style-type: none"> <li>• 17.81 mm - 45.85 mm/0.702" - 1.805 in element outside diameter</li> <li>• 4.724 mm - 11.05 mm/0.186" - 0.435" element inside diameter</li> <li>• 3.175 mm - 6.35 mm/0.125" - 0.250 shaft insulator inside diameter</li> <li>• 4.064 mm - 7.80 mm/0.160" - 0.307" mating wiper inside diameter</li> <li>• 5.08 mm/0.200" assembled package height</li> </ul>	<ul style="list-style-type: none"> <li>• 27.94 mm - 66.5 mm/1.100" - 2.62" housing diameter</li> <li>• 3.175 mm - 19 mm/0.125" - 0.752" hollow shaft diameter</li> </ul>
<b>Resistance</b>	1K - 20KΩ	1K - 20KΩ	1K/5K/10KΩ	1K - 20KΩ
<b>Range</b>	Up to 355°	Up to 355°	Up to 350°	Up to 355°
<b>Linearity</b>	± 0.5%	± 0.5%	± 0.5%	± 0.5%
<b>Output Smoothness</b>	<0.1%	<0.1%	< 0.1%	< 0.1%
<b>Resolution</b>	Infinite	Infinite	Infinite	Infinite
<b>Operating Temp.</b>	-65°C to 125°C	-65°C to 125°C	-65°C to 125°C	-65°C to 125°C
<b>Rotational Life</b>	50 million cycles/minute	50 million cycles/minute	50 million cycles/minute	50 million cycles/minute.
<b>Typical Applications</b>	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets

## ANGULAR POSITION—POTENTIOMETERS



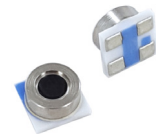
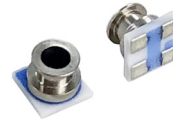
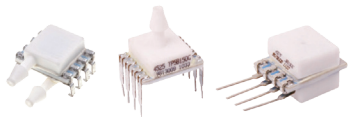
	<b>RT8, RT9</b>
<b>Package</b>	Aluminum or stainless IP67, IP68
<b>Resolution</b>	±0.15% to ±1.25%
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Absolute rotary</li> <li>• Designed for heavy industrial applications</li> <li>• CSA, CENELEC certification for hazardous area applications</li> </ul>
<b>Output</b>	Voltage divider, 0 - 5 V, 0 - 10 V, 4 - 20 mA, incremental encoder, CANbus, DeviceNet™
<b>Range</b>	0 - 0.125 to 0 - 200 turns
<b>Operating Temp.</b>	-40°C to 90°C
<b>Dimensions (mm)</b>	Ø65 x 100 (RT8) Ø115 x 60 (RT9)
<b>Typical Applications</b>	Valve control, airport passenger loading bridge, water management, factory automation

# PRESSURE SENSORS



## BOARD LEVEL PRESSURE SENSORS

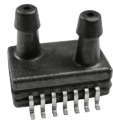
Digital Output and Altimeter



	<b>MS4515DO, MS4525DO</b>	<b>MS5803</b>	<b>MS5837</b>	<b>MS5840</b>
<b>Package</b>	8 pin DIL	Surface mountable	Surface mountable	Surface mountable
<b>Type</b>	Gage, compound (MS4515DO) Gage, absolute, differential, compound (MS4525DO)	Absolute	Absolute	Absolute
<b>Pressure Range</b>	0 - 2 to 30" H <sub>2</sub> O (MS4515DO) 0 - 1 to 150 psi (MS4525DO)	0 - 1 to 30 bar	0 - 2 bar 0 - 30 bar	0 - 2 bar Operating range: 300 to 1200 mbar
<b>Output/Span</b>	14-bit ADC SPI or I <sup>2</sup> C	24-bit ADC I <sup>2</sup> C and SPI (Mode 0, 3)	24-bit ADC I <sup>2</sup> C	24-bit ADC I <sup>2</sup> C
<b>Resolution</b>	—	12 µbar (MS5803-01BA) 0.5 mbar (MS5803-30BA)	0.016 mbar (2 bar) 0.2 mbar (30 bar)	13 cm of air
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Optional gel coat, low power</li> <li>• Pressure and temperature measurement</li> <li>• Single supply of 3.3 or 5.0 VDC</li> <li>• Top, side barbed or manifold o-ring port</li> <li>• J lead or thru hole pins</li> </ul>	<ul style="list-style-type: none"> <li>• 24-bit digital sensor, software calibration and temperature compensation (I<sup>2</sup>C and SPI), no external components</li> <li>• Supply voltage 1.8 to 3.6 V</li> </ul>	<ul style="list-style-type: none"> <li>• Supply voltage: 1.5 to 3.6 V</li> <li>• Pressure and temperature measurement</li> <li>• Excellent long term stability</li> <li>• Hermetically sealable for outdoor devices</li> <li>• Sealing designed for 1.8 x 0.88 mm o-ring</li> </ul>	<ul style="list-style-type: none"> <li>• Supply voltage: 1.5 to 3.6 V</li> <li>• Pressure and temperature measurement</li> <li>• Low power, 0.6 µA (standby ≤ 0.1 µA at 25°C)</li> <li>• Protected against direct sunlight</li> </ul>
<b>Linearity/Absolute Accuracy</b>	0.25%/1% TEB	±1.5 mbar at 25°C (MS5803-01BA) ±250 mbar at 0°C to 40°C (MS5803-30BA)	±.5 mbar (2 bar) ±400 mbar (30 bar)	±0.5mbar at 20°C ±4mbar from -20°C to 85°C
<b>Overpressure</b>	300 psi	10 bar (1, 2 bar) 30 bar (5, 7, 14 bar) 50 bar (30 bar)	10 bar (2 bar) 50 bar (30 bar)	—
<b>Operating Temp.</b>	-10°C to 85°C (MS4515DO) -25°C to 105°C (MS4525DO)	-40°C to 85°C	-20°C to 85 °C	-20°C to 85 °C
<b>Dimensions (mm)</b>	12.5 x 9.9	6.4 x 6.2 x 2.9	3.3 x 3.3 x 2.75	3.3 x 3.3 x 1.7mm
<b>Typical Applications</b>	Medical instruments, air flow measurements, process control, leak detection	Precision altimeter, diving and multi-mode watches, in-building navigation, variometers/flight instruments	Mobile water depth measurement systems, diving computers, adventure or multi-mode watches, data loggers	Altimeter and barometer applications, adventure or multi-mode watches, drones, bike computers

## BOARD LEVEL PRESSURE SENSORS

Digital Output and Altimeter



### MS5525DSO

<b>Package</b>	SOIC-14
<b>Type</b>	Gage, absolute, differential, compound
<b>Pressure Range</b>	0 - 1 to 30 psi
<b>Output/Span</b>	24-bit ADC SPI or I <sup>2</sup> C protocol
<b>Resolution</b>	—
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• 24-bit digital small outline sensor</li> <li>• Pressure and temperature measurement</li> <li>• Single supply of 1.8 or 3.6 VDC</li> <li>• Barb, tube and hole package style options</li> </ul>
<b>Linearity/Absolute Accuracy</b>	0.25%/2.5% TEB
<b>Overpressure</b>	3X range
<b>Operating Temp.</b>	-40°C to 125°C
<b>Dimensions (mm)</b>	12.5 x 7.9
<b>Typical Applications</b>	Medical respirators, ventilators, factory automation, altitude and airspeed measurements, leak detection, home appliances



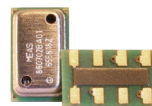
### MS5607, MS5611, MS5637

<b>Package</b>	Surface mountable
<b>Type</b>	Absolute
<b>Pressure Range</b>	10 - 2K mbar
<b>Output/Span</b>	24-bit ADC I <sup>2</sup> C
<b>Resolution</b>	0.016 mbar
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• 24-bit digital sensor</li> <li>• 13 cm resolution (MS5607, MS5637)</li> <li>• 10 cm resolution (MS5611)</li> <li>• Supply voltage: 1.5 to 3.6 V (MS5637) Supply voltage: 1.8 to 3.6 V (MS5607, MS5611)</li> <li>• Low power, 0.6 μA (Standby ≤ 0.1 μA at 25°C)</li> </ul>
<b>Linearity/Absolute Accuracy</b>	±2.0 mbar at 25°C
<b>Overpressure</b>	6 bar
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	3 x 3 x 0.9 (MS5637) 5 x 3 x 1 (MS5607, MS5611)
<b>Typical Applications</b>	Smart phones, tablets, personal navigation devices, tire pressure monitoring, compressors



### MS5805

<b>Package</b>	Surface mountable
<b>Type</b>	Absolute
<b>Pressure Range</b>	10 - 2K mbar
<b>Output/Span</b>	24-bit ADC I <sup>2</sup> C
<b>Resolution</b>	0.02 mbar
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• 24-bit digital sensor</li> <li>• 20 cm resolution</li> <li>• Supply voltage: 1.8 to 3.6 V</li> <li>• Sealing designed for 2.5 x 1 mm o-ring</li> <li>• Silicone gel protection</li> <li>• Waterproof</li> </ul>
<b>Linearity/Absolute Accuracy</b>	±2.0 mbar at 25°C
<b>Overpressure</b>	5 bar
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	4.5 x 4.5 x 3.5
<b>Typical Applications</b>	Mobile altimeter and barometer systems, bike computers, adventure or multi-mode watches, variometers, data loggers

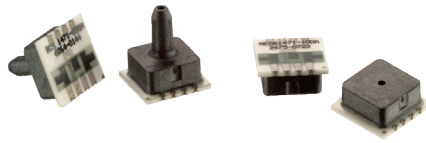


### MS8607

<b>Package</b>	Surface mountable
<b>Type</b>	Absolute
<b>Pressure Range</b>	10 - 2K mbar
<b>Output/Span</b>	24-bit ADC I <sup>2</sup> C
<b>Resolution</b>	0.016 mbar
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Integrated pressure, humidity and temperature</li> <li>• Supply voltage: 1.5 to 3.6 V</li> <li>• Fully factory calibrated sensor</li> </ul>
<b>Linearity/Absolute Accuracy</b>	±4 mbar
<b>Overpressure</b>	6 bar
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	5 x 3 x 1
<b>Typical Applications</b>	Mobile water depth measurement systems, diving computers, adventure or multi-mode watches, data loggers

## BOARD LEVEL PRESSURE SENSORS

mV Output



### MS1451, MS1471

<b>Package</b>	Surface mountable
<b>Type</b>	Gage, absolute
<b>Pressure Range</b>	0 - 5 to 500 psi
<b>Output/Span</b>	60 mV typical
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low cost</li> <li>• Coarse calibrated at room temp. (MS1471)</li> <li>• With gel to protect against moisture</li> <li>• Tube or hole</li> </ul>
<b>Accuracy</b>	±0.25% non-linearity
<b>Operating Temp.</b>	-40°C to 125°C
<b>Dimensions (mm)</b>	7.6 x 7.6, application dependent
<b>Typical Applications</b>	Altitude measurement, barometric pressure, medical instrumentation, consumer appliances, tire pressure

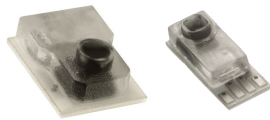


### MS52xx, MS54xx

<b>Package</b>	Surface mountable
<b>Type</b>	Gage, absolute
<b>Pressure Range</b>	0 - 1 to 12 bar
<b>Output/Span</b>	150 mV, 240 mV
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Small size (MS54xx)</li> <li>• High linearity or high sensitivity options</li> <li>• Plastic tube or metal ring options</li> <li>• With gel to protect against moisture</li> <li>• High endurance (Option HM)</li> </ul>
<b>Accuracy</b>	±0.05%, ±0.15% FS non-linearity (MS52xx) ±0.05%, ±0.2% FS non-linearity (MS54xx)
<b>Operating Temp.</b>	-40°C to 125°C
<b>Dimensions (mm)</b>	7.6 x 7.6, application dependent (MS52xx) 6.4 x 6.2 (MS54xx)
<b>Typical Applications</b>	Absolute pressure sensor systems, engine controls, high resolution altimeters, variometers, waterproof watches, diver computers, barometers, tire pressure monitoring systems (TPMS), medical instrumentation, pneumatic controls

## DISPOSABLE MEDICAL PRESSURE SENSORS

mV Output



### 1620, 1630

<b>Package</b>	Hybrid assembly
<b>Type</b>	Gage
<b>Pressure Range</b>	-30 to 300 mmHg
<b>Output/Span</b>	5 µV/V/mmHg
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low cost, disposable design</li> <li>• Supplied in tape and reel</li> <li>• Compliant to AAMI spec</li> <li>• ISO13485 certified</li> </ul>
<b>Operating Temp.</b>	10°C to 40°C
<b>Dimensions (mm)</b>	1620: 11.43 x 8.13 x 4.20 1630: 12.7 x 5.08 x 3.94
<b>Typical Applications</b>	Disposable blood pressure, surgical procedures, ICU, kidney dialysis machines, medical instrumentation



### Fully Assembled 1620 (Customized per customer specifications)

<b>Package</b>	Plastic housing
<b>Type</b>	Gage
<b>Pressure Range</b>	-30 to 300 mmHg
<b>Output/Span</b>	5 µV/V/mmHg
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low cost, disposable design</li> <li>• Compliant to AAMI spec</li> <li>• Custom designs available</li> </ul>
<b>Operating Temp.</b>	10°C to 40°C
<b>Dimensions (mm)</b>	42.8 x 30.3 x 19.0
<b>Typical Applications</b>	Disposable blood pressure, kidney dialysis machines, surgical procedures and intensive care units. Ready to use, fully assembled disposable sensor units with cable, connector, stop cock, flush device in a plastic housing.

## MEDIA ISOLATED PRESSURE SENSOR MODULES

Digital Output



### 85BSD

<b>Package</b>	<ul style="list-style-type: none"> <li>• 13 mm diaphragm diameter</li> <li>• Weldable or threaded process fittings</li> </ul>
<b>Type</b>	Gage, absolute
<b>Pressure Range</b>	0 - 0.35 to 20 bar / 0 - 5 to 300 psi
<b>Output/Span</b>	14-bit ADC I <sup>2</sup> C or SPI
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Pressure and temperature read-out</li> <li>• Cable and connector options</li> <li>• Low power option</li> </ul>
<b>Accuracy</b>	±0.25% span
<b>Total Error Band</b>	±1.0% FSO
<b>Overpressure</b>	2X
<b>Operating Temp.</b>	-40°C to 125°C
<b>Dimensions (mm)</b>	Ø15.85 x 7.9
<b>Typical Applications</b>	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, submersible depth monitoring



### 86BSD

<b>Package</b>	<ul style="list-style-type: none"> <li>• 16 mm diaphragm diameter</li> <li>• O-ring mount</li> </ul>
<b>Type</b>	Gage, absolute
<b>Pressure Range</b>	0 - 0.07 to 20 bar / 0 - 1 to 300 psi
<b>Output/Span</b>	14-bit ADC I <sup>2</sup> C or SPI
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Pressure and temperature read-out</li> <li>• Cable and connector options</li> <li>• Low power option</li> </ul>
<b>Accuracy</b>	±0.25% span
<b>Total Error Band</b>	±1.0% FSO
<b>Overpressure</b>	2X
<b>Operating Temp.</b>	-40°C to 125°C
<b>Dimensions (mm)</b>	Ø15.82 x 9.3
<b>Typical Applications</b>	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, submersible depth monitoring



### 89BSD

<b>Package</b>	<ul style="list-style-type: none"> <li>• 9 mm diaphragm diameter</li> <li>• Threaded or weldable</li> </ul>
<b>Type</b>	Absolute, sealed gage
<b>Pressure Range</b>	0 - 6 to 30 bar
<b>Output/Span</b>	24-bit ADC I <sup>2</sup> C
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Pressure and temperature read-out</li> <li>• Low power: 1 µA (Standby &lt; 0.15 µA)</li> </ul>
<b>Accuracy</b>	±0.3% span
<b>Total Error Band</b>	±3.0% FSO max.
<b>Overpressure</b>	2X
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	Ø9.04 x 7.5
<b>Typical Applications</b>	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, dive computers



### 154BSD

<b>Package</b>	<ul style="list-style-type: none"> <li>• 19 mm diaphragm diameter</li> <li>• O-ring mount</li> </ul>
<b>Type</b>	Gage, absolute
<b>Pressure Range</b>	0 - 1 to 300 psi
<b>Output/Span</b>	14-bit ADC I <sup>2</sup> C or SPI
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Pressure and temperature read-out</li> <li>• Cable and connector options</li> <li>• Low power option</li> </ul>
<b>Accuracy</b>	±0.25% span
<b>Total Error Band</b>	±1.0% FSO
<b>Overpressure</b>	2X
<b>Operating Temp.</b>	-40°C to 125°C
<b>Dimensions (mm)</b>	Ø19 x 13.8
<b>Typical Applications</b>	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, submersible depth monitoring

## TRANSDUCERS AND TRANSMITTERS

Industrial Wireless



### M5600, U5600

<b>Type</b>	Gage, sealed, absolute, compound
<b>Pressure Range</b>	0 - 50 to 15K psi (M5600), 0 - 5 to 10K psi (U5600)
<b>Output/Span</b>	24-bit ADC I <sup>2</sup> C
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Pressure and temperature</li> <li>• 2.3 - 3.6 V supply voltage</li> <li>• Compact and battery-powered</li> <li>• Weather resistant (IP66 and IP67)</li> <li>• Stainless steel and polycarbonate enclosure</li> </ul>
<b>Accuracy</b>	±0.25% FS (M5600) Down to ±0.1% FS (U5600)
<b>Operating Temp.</b>	-20°C to 85°C
<b>Dimensions (mm)</b>	24 x 24 x 69
<b>Typical Applications</b>	Industrial process control and monitoring, advanced HVACR systems, refrigeration systems, automotive test stands, off-road vehicles, pumps and compressors, hydraulic and pneumatic systems, agriculture equipment, energy generation and management
<b>Agency Approvals</b>	CE, FCC



### MSP100

<b>Type</b>	Gage
<b>Pressure Range</b>	0 - 100 to 500 psi
<b>Output/Span</b>	100 mV typical
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Microfused</li> <li>• Low cost stainless steel isolated transducer</li> <li>• No threads needed for pressure connect</li> <li>• Highly customized for OEM application</li> <li>• Small size</li> <li>• Solid state reliability</li> </ul>
<b>Accuracy</b>	±0.5% FSO
<b>Operating Temp.</b>	0°C to 55°C
<b>Dimensions (mm)</b>	12.7 x 24.38 x 20.32
<b>Typical Applications</b>	Beverage dispensing systems, automation, HVACR controls, energy and water management, pumps, compressors, pneumatic equipment
<b>Agency Approvals</b>	—



### MSP300, MSP340

<b>Type</b>	Gage
<b>Pressure Range</b>	0 - 100 to 10K psi (MSP300) 0 - 50 to 10K psi (MSP340)
<b>Output/Span</b>	0 - 100 mV, 0.5 - 4.5 VDC, 1 - 5 VDC, 4 - 20 mA
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Microfused</li> <li>• Highly customized for OEM applications</li> <li>• Small size</li> <li>• Solid state reliability</li> </ul>
<b>Accuracy</b>	±1% FSO
<b>Operating Temp.</b>	-20°C to 85°C
<b>Dimensions (mm)</b>	MSP300: 22.23 x 22.23 x 55.88 MSP340: 15.88 x 15.88 x 75.44
<b>Typical Applications</b>	Paint sprayers, braking systems, HVACR controls, energy and water management, pumps, compressors, pneumatic equipment, off road heavy equipment, agriculture equipment
<b>Agency Approvals</b>	UL 508 (MSP300)

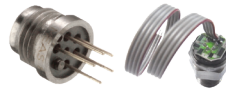
## MEDIA ISOLATED PRESSURE SENSOR MODULES

Analog Output



**82, 85 with Fittings**

Package	Weldable (85) or process fitting
Type	Gage, absolute, vacuum gage
Pressure Range	0 - 5 to 500 psi (85), 0 - 1 to 500 psi (82)
Output/Span	100 mV typical
Unique Features	<ul style="list-style-type: none"> <li>• Modular design</li> </ul>
Non-linearity	±0.3% FSO (1 psi) ±0.2% FSO (5 psi) ±0.1% FSO (≥15 psi)
Operating Temp.	-40°C to 125°C
Dimensions (mm)	Fittings: application dependent
Typical Applications	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 - 1K to 10K psi
Output/Span	100 mV typical
Unique Features	<ul style="list-style-type: none"> <li>• High pressure</li> <li>• Modular design</li> </ul>
Non-linearity	±0.25% FSO
Operating Temp.	-40°C to 125°C
Dimensions (mm)	89 Button: Ø9.04 x 13.2 89 with Fittings: application dependent
Typical Applications	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 - 1 to 150 psi
Output/Span	0.5 - 4.5 VDC
Unique Features	<ul style="list-style-type: none"> <li>• Small diameter, amplified output</li> <li>• Bar ranges available</li> </ul>
Non-linearity	±1.0% FSO
Operating Temp.	-20°C to 85°C
Dimensions (mm)	Ø15.82 x 9.3
Typical Applications	Level measurement, OEM transmitters and transducers, process control

## MEDIA ISOLATED PRESSURE SENSOR MODULES

Analog Output



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

Package	<ul style="list-style-type: none"> <li>• 3/4" (19 mm) diameter o-ring mount (82, 154N)</li> <li>• 5/8" (16 mm) diameter o-ring mount (86)</li> <li>• 1/2" (13 mm) diameter o-ring flush mount (85F)</li> <li>• 1/2" (13 mm) diameter o-ring mount (85)</li> </ul>
Type	Gage, absolute, vacuum gage (82, 85, 86, 154N) Gage, absolute (85F)
Pressure Range	0 - 1 to 500 psi (Absolute, gage: 82, 154N) 0 - 5 to 500 psi (Absolute, gage: 85, 86) 0 - 15 to 500 psi (85F, vacuum gage: 82, 85, 86, 154N)
Output/Span	100 mV typical
Unique Features	<ul style="list-style-type: none"> <li>• High performance</li> <li>• High stability for OEM applications</li> <li>• Minimizes trapped volume (85F)</li> </ul>
Non-linearity	±0.3% FSO (1 psi), ±0.2% FSO (5 psi) ±0.1% FSO (≥15 psi), ±0.1% FSO (85F)
Operating Temp.	-40°C to 125°C (82 / 85 / 86 / 154N), -20°C to 125°C (85F)
Dimensions (mm)	82: Ø19 x 6.48      86: Ø15.82 x 11.4 154N: Ø18.97 x 13.8      85F: Ø17.2 x 11.33 85: Ø15.85 x 9.3
Typical Applications	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" (16 mm) diameter o-ring mount or threaded process fittings
Type	Differential
Pressure Range	0 - 1 to 500 psi
Output/Span	100 mV typical/sensitivity dependent
Unique Features	<ul style="list-style-type: none"> <li>• Wet/wet differential pressure</li> <li>• Line pressure max. 1,000 psi</li> </ul>
Non-linearity	±0.3% FSO (1 psi) ±0.2% FSO (5 psi) ±0.1% FSO (≥15 psi)
Operating Temp.	-40°C to 125°C
Dimensions (mm)	O-ring: Ø15.82 x 17.5 Fittings: Application dependent
Typical Applications	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 - 5 to 13 bar/0 - 50 to 200 psi
Output/Span	0.5 - 4.5 VDC (Ratiometric output)
Unique Features	• Amplified
Non-linearity	±0.5% FSO
Operating Temp.	-7°C to 105°C
Dimensions (mm)	Ø15.82 x 13.6 Socket spacing: 31.75
Typical Applications	Urea level, urea pressure, air brakes, corrosive fluid measurement for engine & vehicle applications

## TRANSDUCERS AND TRANSMITTERS

Industrial



	<b>US300</b>	<b>AST20HA, AST20PT, AST20SW</b>	<b>AST4000, AST4100, AST4200</b>
<b>Type</b>	Gage, absolute	Gage, sealed gage, absolute	Gage, sealed gage, compound
<b>Pressure Range</b>	0 - 15 to 5K psi	0 - 1 to 60K psi	0 - 25 to 10K psi
<b>Output/Span</b>	0 - 10 mV/V, 0.5 - 4.5 V, 1 - 5 V, 4 - 20 mA	0.5 - 4.5 V (Ratiometric) 1 - 5 V 4 - 20 mA, 0 - 5 V, 0 - 10 V, switch (AST20SW)	0.5 - 4.5 V (Ratiometric), 1 - 5 V, 1 - 10 V, 4 - 20 mA, 0.5 - 2.5 V
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• UltraStable technology</li> <li>• Highly customized for OEM applications</li> <li>• Small size</li> <li>• Solid state reliability</li> </ul>	<ul style="list-style-type: none"> <li>• Excellent performance over temperature</li> <li>• Semi-custom designs available</li> <li>• Fault mode condition settings</li> <li>• Four standard sensor material options</li> <li>• Additional temperature output (AST20PT)</li> </ul>	<ul style="list-style-type: none"> <li>• Four standard sensor material options</li> <li>• Rugged construction</li> <li>• 100 V/m EMI/RFI protection</li> <li>• Semi-custom designs available</li> </ul>
<b>Accuracy</b>	±0.15% FSO (15 - 1K psi), ±0.25% FSO (>1K psi)	±0.1% FSO	±0.5% FSO
<b>Operating Temp.</b>	-40°C to 105°C	-40°C to 85°C	-40°C to 85°C
<b>Dimensions (mm)</b>	15.88 x 15.88 x 98.00	Application dependent	Application dependent
<b>Typical Applications</b>	Paint sprayers, braking systems, HVACR controls, energy and water management, pumps, compressors, pneumatic equipment, off road heavy equipment, agriculture equipment	Test and measurement, industrial controls	Water, hydraulic equipment, HVACR, industrial controls
<b>Agency Approvals</b>	—	ABS, CE	UL/cUL508, ABS, CE



	<b>M3200</b>	<b>M5200</b>	<b>U5200, U5300</b>	<b>D5100</b>
<b>Type</b>	Gage, Compound	Gage, sealed, compound	Gage, sealed, absolute, compound	Differential wet/wet
<b>Pressure Range</b>	0-7bar to 500 bar / 0-100 to 7,500 Psi	0 - 3.5 to 1K bar/0 - 50 to 15K psi	0 - 0.14 to 700 bar/0 - 2 to 10K psi	0 - 0.07 to 35 bar/0 - 1 to 500 psi
<b>Output/Span</b>	100mV, 0.5 - 4.5 V, 1 - 5 V, 0 - 5 V, 0 - 10 V, 4 - 20 mA and I <sup>2</sup> C Digital Output	0.5 - 4.5 V, 1 - 5 V, 0 - 5 V, 0 - 10 V, 4 - 20 mA, 1 - 6 V	0.5 - 4.5 V, 1 - 5 V, 0 - 5 V, 0 - 10 V, 4 - 20 mA, 1 - 6 V	80 mV / 100 mV, 0.5 - 4.5 VDC, 1 - 5 VDC, 4 - 20 mA
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Microfused technology</li> <li>• High performance at a low cost</li> <li>• Solid state reliability</li> <li>• ±1.5% FSO TEB (-20°C to 85°C)</li> <li>• Weatherproof - IP67 with cable</li> <li>• 14bit digital output for Pressure</li> </ul>	<ul style="list-style-type: none"> <li>• Microfused technology</li> <li>• High performance at a low cost</li> <li>• Solid state reliability</li> <li>• ±1% FSO TEB (-20°C to 85°C)</li> <li>• Weatherproof</li> <li>• 17 - 4 PH or 316L SS</li> </ul>	<ul style="list-style-type: none"> <li>• UltraStable technology</li> <li>• High performance at a low cost</li> <li>• ±0.75% FSO TEB (-20°C to 85°C, &gt;5 psi and ≤5000 psi) (U5200)</li> <li>• ±0.5% FSO TEB (-20°C to 85°C) (U5300)</li> <li>• Weatherproof</li> <li>• High accuracy (U5300)</li> </ul>	<ul style="list-style-type: none"> <li>• UltraStable technology</li> <li>• High performance at a low cost</li> <li>• Solid state reliability</li> <li>• ±1% FSO TEB (-20°C to 85°C)</li> <li>• Line pressure max. 1000 psi</li> </ul>
<b>Accuracy</b>	±0.25% FSO	±0.25% FSO	±0.1% FSO (>5 and ≤500 psi)	±0.3% FSO (<5 psi), ±0.25% FSO (5 psi), ±0.1 % FSO (≥15 psi)
<b>Operating Temp.</b>	-40°C to 125°C	-40°C to 125°C	-40°C to 125°C	-40°C to 125°C
<b>Dimensions (mm)</b>	22.2 on Hex x 58 max	24 X 24 X 82 max.	24 X 24 X 82 max.	25.4 x 58.4 x 72.0
<b>Typical Applications</b>	Suitable for measurement of liquid or gas pressure, even for difficult media such as contaminated water, steam, and mildly corrosive fluids.	Industrial process control and monitoring, advanced HVACR systems, refrigeration systems, automotive test stands, off road vehicles, pumps and compressors, hydraulic and pneumatic systems, agriculture equipment, energy generation and management	Industrial process control and monitoring, advanced HVACR systems, refrigeration systems, automotive test stands, off road vehicles, pumps and compressors, hydraulic and pneumatic systems, agriculture equipment, energy generation and management, military and aerospace test stands, calibration equipment, high accuracy applications, stationary motor fuel control, high end industry machinery	Process controls, tank level measurement, filter performance monitoring, corrosive fluids and gas measurement systems, flow measurement
<b>Agency Approvals</b>	CE (EMC)	CE (EMC)	CE (EMC), UL 508	CE (EMC)

## TRANSDUCERS AND TRANSMITTERS

Heavy Industrial



	<b>M7100, U7100</b>	<b>P900, P981, P1200, P700, P9000</b>	<b>P101, P105, P125</b>
<b>Type</b>	Gage, no vent gage (M7100) Gage, sealed gage, absolute (U7100)	Gage, absolute	Gage
<b>Pressure Range</b>	0 - 10 to 700 bar/0 - 150 to 10K psi (M7100) 0 - 1 to 10 bar/0 - 15 to 150 psi (U7100)	0 - 5 bar to 700 bar/0 - 75 to 10K psi	0 - 10 to 7K bar/0 - 150 to 100K psi
<b>Output/Span</b>	0.5 - 4.5 VDC [Ratiometric output] 1 - 5 VDC [Regulated] (M7100) 0.5 - 4.5 VDC [Ratiometric output] (U7100)	0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA	7.5 to 20 mV (4 V; 5 V optional)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• ±1% FSO TEB (-20°C to 85°C)</li> <li>• Solid state reliability</li> <li>• Survives high vibration and immersion</li> <li>• Microfused technology (M7100)</li> <li>• UltraStable technology (U7100)</li> <li>• Copper tube for HVACR (M7100)</li> </ul>	<ul style="list-style-type: none"> <li>• High overpressure (10X over pressure)</li> <li>• Shock and vibration resistant</li> <li>• Heavy industrial grade transducer (P9000)</li> <li>• Advanced digital compensation / calibration</li> <li>• Mechanical over pressure stops</li> <li>• High temperature operation</li> </ul>	<ul style="list-style-type: none"> <li>• Stainless steel diaphragm</li> <li>• Female pressure connectors: M16 x 1.5, M20 x 1.5, 1/4 NPT</li> <li>• Metal to metal seal</li> </ul>
<b>Accuracy</b>	0.25% FSO	0.1% to 0.2% FSO	±0.3% FSO
<b>Operating Temp.</b>	-40°C to 125°C	-54°C to 120°C	-20°C to 80°C
<b>Dimensions (mm)</b>	26.7 x 26.7 x 50.0	Application dependent	Ø29 x 85 max.
<b>Typical Applications</b>	HVACR refrigeration controls, off road vehicles engine control, compressors, hydraulic, energy and water management	Steel mills, hydraulic controls, power generation equipment, torpedo depth, military and aerospace, vehicle braking systems	Harsh environments, aggressive liquids
<b>Agency Approvals</b>	CE (EMC), UL 508	CE, CENELEC (Intrinsically Safe)	—

## TRANSDUCERS AND TRANSMITTERS

Miniature



	<b>XP</b>	<b>XPC10</b>
<b>Type</b>	Gage, sealed, absolute	Gage, sealed, absolute
<b>Pressure Range</b>	0 - 1 to 350 bar/0 - 15 to 5K psi (XP5, XPM10) 0 - 5 to 200 bar/0 - 75 to 3K psi (XPM4) 0 - 100 to 1K bar/0 - 1.5K to 15K psi (XPM6)	0 - 10 to 500 bar/0 - 150 to 7.5K psi
<b>Output/Span</b>	20 - 100 mV, 4 V FSO (Amplified)	12 mV FSO, 4 V FSO (Amplified)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Titanium construction (XP5, XPM4)</li> <li>• Stainless steel housing (XPM6, XPM10)</li> <li>• Amplified output options (XP5, XPM6, XPM10)</li> <li>• Cable and connector options</li> <li>• For static and dynamic applications</li> </ul>	<ul style="list-style-type: none"> <li>• Amplified output available</li> <li>• For static and dynamic applications</li> <li>• Optional IP67 ingress protection</li> <li>• High temperature operation</li> </ul>
<b>Accuracy</b>	Down to ±0.25% FSO (XP5, XPM6, XPM10), down to ±0.35% FSO (XPM4)	Down to ±0.25% FSO
<b>Operating Temp.</b>	-40°C to 120°C	-40°C to 220°C
<b>Dimensions (mm)</b>	XPM4: M4 x 0.7 thread; Hex 8 XP5: M5 x 0.8 or 10-32 UNF thread; Hex 10 XPM6: M6 x 1 thread; Hex 12 XPM10: M10 x 1 thread; Hex 15	M10 x 1 or 3/8-24 UNF thread; Hex 15
<b>Typical Applications</b>	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	Aerospace, test benches, oven monitoring equipment, cooling regulation systems

## TRANSDUCERS AND TRANSMITTERS

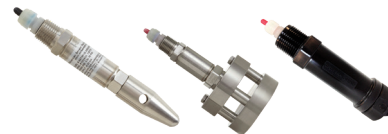
### Miniature



	<b>EB, EPRB</b>	<b>EPIH</b>	<b>EPB, EPB-PW, EPL</b>
<b>Type</b>	Gage, sealed, absolute	Gage, sealed, absolute	Gage, sealed, absolute
<b>Pressure Range</b>	0 - 0.35 to 700 bar/0 - 5 to 10K psi	0 - 0.35 to 20 bar/0 - 5 to 300 psi	0 - 0.35 to 350 bar/0 - 5 to 5K psi
<b>Output/Span</b>	0.5 to 4.5 VDC	12 mV to 75 mV	10 mV to 125 mV
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• High accuracy</li> <li>• Miniature design</li> <li>• UltraStable technology</li> <li>• EMI protected</li> <li>• Combined pressure and temperature</li> </ul>	<ul style="list-style-type: none"> <li>• Diffused silicon diaphragm with a large variety of sizes and shapes available as small as 0.05" outside diameter</li> <li>• High frequency response (To 1.7 MHz)</li> <li>• Ultra-miniature design</li> </ul>	<ul style="list-style-type: none"> <li>• Miniature flush mountable</li> <li>• Flush stainless steel diaphragm, flanged or non-flanged</li> <li>• Bonded silicon gage, high frequency response (To 400 KHz)</li> <li>• IP68 ingress protection in Titanium construction (EPB-PW)</li> </ul>
<b>Accuracy</b>	±0.25% FSO	±1.0% FSO	±0.5 to ±1% FSO
<b>Operating Temp.</b>	-40°C to 125°C (Available option up to 150°C)	-40°C to 120°C	-40°C to 120°C
<b>Dimensions (mm)</b>	11 body diameter	Application dependent	3.2 to 7 outside diameter
<b>Typical Applications</b>	Motor sport, hydraulic/pneumatic systems, automotive test stands, military and aerospace test stands	Aerospace testing, wind tunnels, biomedical testing, aircraft body and wing dynamics, high frequency measurements	Air flow testing, hydraulic pressure systems, air pressure systems, bearing studies, ballistics, water hammer, miniature scale model testing, centrifuge pore water pressure measurements
<b>Agency Approvals</b>	CE (EMC)	—	—

## TRANSDUCERS AND TRANSMITTERS

### Liquid Level



	<b>U5700</b>	<b>AST45xx</b>
<b>Type</b>	Gage, sealed, absolute, compound	Gage, absolute
<b>Pressure Range</b>	0 - 2 to 10K psi	0 - 1 to 100 psi (AST4500, AST4510, AST4520)
<b>Output/Span</b>	0.5 - 4.5 V, 1 - 5 V, 0 - 5 V, 0 - 10 V, 4 - 20 mA, 1 - 6 V	0.5 - 4.5 V [Ratiometric], 1 - 5 V, 4 - 20 mA, 0.5 - 2.5 V
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• UltraStable technology</li> <li>• High accuracy</li> <li>• IP68 rated connection and submersible</li> <li>• Polyurethane jacketed cable</li> <li>• Optional Polyoxymethylene cap</li> </ul>	<ul style="list-style-type: none"> <li>• Intrinsically safe ratings</li> <li>• Material options including: 316L, alloy C276, and PVDF</li> <li>• Low power options</li> <li>• High quality cable options</li> </ul>
<b>Accuracy</b>	0.1% FSO	±0.25% FSO
<b>Operating Temp.</b>	-10°C to 60°C	-40°C to 85°C
<b>Dimensions (mm)</b>	22.23 x 22.23 x 98.04	Application dependent
<b>Typical Applications</b>	Industrial process control and monitoring, advanced HVACR systems, refrigeration systems, automotive test stands, off road vehicles, pumps and compressors, hydraulic/pneumatic systems, agriculture equipment, energy generation and management, liquid level applications	Diesel tanks, chemical tanks, water tanks
<b>Agency Approvals</b>	CE (EMC)	UL/CSA Class I Div I, ATEX/IECEx Exia, ABS, CE

## TRANSDUCERS AND TRANSMITTERS

### Hazardous Location



#### AST43xx, AST44xx

<b>Type</b>	Gage, sealed gage, compound, absolute
<b>Pressure Range</b>	0 - 1 to 15 psi (AST43LP, AST44LP) 0 - 25 to 20K psi (AST4300, AST4400, AST4401)
<b>Output/Span</b>	0.5 - 4.5 V [Ratiometric], 1 - 5 V, 4 - 20 mA, 0.5 - 2.5 V
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Available with 316L, Hastalloy C276, or Inconel 718 materials</li> <li>• Low current consumption options</li> <li>• Low power options</li> <li>• High proof and burst pressure</li> </ul>
<b>Accuracy</b>	±0.25% FSO
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	Application dependent
<b>Typical Applications</b>	Compressors, well sites, ships, factory automation, SCADA equipment, offshore equipment
<b>Agency Approvals</b>	UL/CSA Class I Div I and II, ATEX/IECEX Exia/Exn, CCOE, CNEx, ABS, CE



#### AST46xx

<b>Type</b>	Gage, sealed gage, compound, absolute
<b>Pressure Range</b>	0 - 1 to 20K psi
<b>Output/Span</b>	0.5 - 4.5 V [Ratiometric], 1 - 5 V, 4 - 20 mA, 0.5 - 2.5 V, switch (AST46SW)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Available with 316L, Hastalloy C276, or Inconel 718 materials</li> <li>• Low current consumption options</li> <li>• Low power options</li> <li>• Local display (AST46DS)</li> <li>• Additional temperature output</li> </ul>
<b>Accuracy</b>	±0.25% FSO (AST4600, AST46DS), ±0.1% FSO (AST46HA, AST46PT)
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	Application dependent
<b>Typical Applications</b>	SCADA/RTU, well sites, offshore equipment, hydraulic controls
<b>Agency Approvals</b>	CSA Class I/II Div I, ATEX/IECEX Exd, ABS, CE



#### AST5100, AST5300, AST5400

<b>Type</b>	Differential
<b>Pressure Range</b>	0 - 5 H <sub>2</sub> O to 5K psi
<b>Output/Span</b>	0.5 - 4.5 V [Ratiometric], 0 - 5 V, 1 - 5 V, 4 - 20 mA
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Wide range of pressures available</li> <li>• Full line pressure on either side without zero shifts</li> <li>• Hazardous location approvals (AST5300, AST5400)</li> </ul>
<b>Accuracy</b>	±0.25% FSO (AST5100, AST5300), 1% TEB (AST5400)
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	Application dependent
<b>Typical Applications</b>	Filter monitoring, flow measurement, tank level measurement
<b>Agency Approvals</b>	CSA Class I/II Div I and II, ATEX/IECEX Exd/Exn, ABS, CE



#### AST2000H2

<b>Type</b>	Gage, sealed gage
<b>Pressure Range</b>	0-10 PSI to 10000 PSI
<b>Output/Span</b>	0.5 - 4.5 V [Ratiometric] 1 - 5 V, 4 - 20 mA
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• 20 bar, 448 bar, 900 bar</li> <li>• High pressure H<sub>2</sub> Storage</li> <li>• CE EN61326</li> </ul>
<b>Accuracy</b>	±0.25% BFSL
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	Application dependent
<b>Typical Applications</b>	PEM fuel cells, hydrogen storage, hydrogen filling stations, backup power
<b>Agency Approvals</b>	EC-79 e24*79/2009*406/2010*0006*02 CE EN61326

# RATE AND INERTIAL SENSORS



## RATE SENSORS AND GYROS



	11206AC	11207AC	31206B/31207B	610	603
<b>Package</b>	Electroless nickel plated Aluminum	Electroless nickel plated Aluminum	Electroless nickel plated Aluminum	Anodized aluminum	Anodized aluminum
<b>FS Ranges</b>	±50, ±180°/sec	±300°/sec	±50, ±180, ±1,000°/sec	±500 to ±50K°/sec	±100 to ±24K°/sec
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• IdentiCal™ interchangeable sensor</li> <li>• ±0.5% accuracy from -40°C to +85°C</li> <li>• Silicon MEMS gyro</li> <li>• EN61000-6-2/-4 certified for industrial environment</li> </ul>	<ul style="list-style-type: none"> <li>• IdentiCal™ interchangeable sensor</li> <li>• High stability</li> <li>• Low noise</li> <li>• Vibration-rejecting</li> </ul>	<ul style="list-style-type: none"> <li>• Triaxial angular rate sensor</li> <li>• Stable performance over temperature</li> <li>• Power supply regulation</li> <li>• Temperature calibration data</li> </ul>	<ul style="list-style-type: none"> <li>• Small, lightweight package</li> <li>• SAE-J211, ISO-6487, NHTSA approved</li> <li>• Crash testing certified</li> <li>• Insensitive to shock</li> </ul>	<ul style="list-style-type: none"> <li>• MEMS triaxial rate sensor</li> <li>• SAEJ211 compliant</li> <li>• Shock resistant housing</li> <li>• Rugged compact package</li> </ul>
<b>Accuracy</b>	±0.1% non-linearity	±0.01% non-linearity	±0.1% non-linearity	±0.5% non-linearity	±0.5% non-linearity
<b>Excitation Voltage</b>	8.5 - 36 VDC	10 - 36 VDC	8.5 - 36 VDC	5 - 16 VDC	5 - 16 VDC
<b>Operating Temp.</b>	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 105°C	-40°C to 105°C
<b>Dimensions (mm)</b>	24 x 24 x 27.30	24 x 24 x 27.30	24 x 24 x 28.30	14.6 x 10.2 x 7.6	20.8 x 20.8 x 14.5
<b>Typical Applications</b>	Wind turbine, weapons testing, test and measurement	Wind turbine, weapons testing, test and measurement	Weapons testing, boat stabilization, test and measurement	Automotive safety crash testing, roll-over testing, motor sports, biomechanics, weapons testing	Automotive safety crash testing, pedestrian impact, biomechanics, robotics

## 6 DEGREES OF FREEDOM SENSORS



### 633

<b>Package</b>	Stainless steel
<b>FS Ranges</b>	±500 to ±50K°/sec ±50g to ±6,000g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Complete six degree-of-freedom (6DoF) analog sensor</li> <li>• Shock resistant rugged housing</li> <li>• Silicon MEMS gyros</li> <li>• PR MEMS high-g shock sensors</li> </ul>
<b>Accuracy</b>	±0.5% non-linearity
<b>Excitation Voltage</b>	5 - 16 VDC
<b>Operating Temp.</b>	-40°C to 105°C
<b>Dimensions (mm)</b>	21.3 x 21.3 x 15.2
<b>Typical Applications</b>	Aerospace testing, weapons testing, biomechanics, shock and impact testing



### 634

<b>Package</b>	Anodized aluminum
<b>FS Ranges</b>	±100 to ±18K°/sec ±2g to ±100g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• 6DoF analog sensor</li> <li>• Signal conditioned output</li> <li>• Silicon MEMS gyros</li> <li>• UltraStable VC MEMS low-g sensors</li> </ul>
<b>Accuracy</b>	±0.1% non-linearity
<b>Excitation Voltage</b>	5 - 16 VDC
<b>Operating Temp.</b>	-40°C to 105°C
<b>Dimensions (mm)</b>	30.5 x 30.5 x 24.6
<b>Typical Applications</b>	Automotive testing, motion measurements, biomechanics

## INERTIAL SENSORS



### 65210E

<b>Package</b>	Electroless nickel plated Aluminum
<b>FS Ranges</b>	±1K to ±20K°/sec, ±10g to ±100g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• 6DoF and telemetry kit</li> <li>• User configurable, IRIG encoder</li> <li>• Parabolic and radome ring mounting adaptor options</li> <li>• Up to 4hr battery options</li> </ul>
<b>Accuracy</b>	±0.2% non-linearity error
<b>Excitation Voltage</b>	Li-Ion battery included
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	Ø69.85 x 197.3 length
<b>Typical Applications</b>	Weapons separation testing, captive carry testing, GTV and JTV test vehicles



### 65210ES

<b>Package</b>	Electroless nickel plated Aluminum
<b>FS Ranges</b>	±1K to ±20K°/sec, ±10g to ±100g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• 6DoF and telemetry kit</li> <li>• Parabolic and radome ring mounting adaptor options</li> <li>• AES encryption option</li> <li>• Wide range of signal conditioning modules</li> </ul>
<b>Accuracy</b>	±0.2% non-linearity error
<b>Excitation Voltage</b>	Li-Ion battery included
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	Ø69.85 x 161.3 length
<b>Typical Applications</b>	Weapons separation testing, captive carry testing, GTV and JTV test vehicles



# SCANNERS AND SYSTEMS



## PRESSURE AND TEMPERATURE SCANNERS

NetScanners



**NetScanner 9216**

Measurement Type	Pressure
Media	Dry
Accuracy	±0.05% FS
# of Channels	16
EU Throughput Rate	500 Hz/chan/sec
Operating Temp.	-30°C to 80°C
Enclosure	IP66/30 g vibration
Typical Applications	Engine testing, portable data acquisition, wind tunnel research, process monitoring



**NetScanner 9146-R**

Measurement Type	Temperature
Media	RTD/TC/Volt
Accuracy	±0.25°C
# of Channels	16/32
EU Throughput Rate	33 Hz/chan/sec
Operating Temp.	-30°C to 70°C
Enclosure	IP66/30 g vibration
Typical Applications	Engine testing, portable data acquisition, wind tunnel research, process monitoring



**NetScanner 9146-T**

Measurement Type	Temperature
Media	TC
Accuracy	±0.25°C
# of Channels	16
EU Throughput Rate	33 Hz/chan/sec
Operating Temp.	-30°C to 70°C
Enclosure	IP54/30 g vibration
Typical Applications	Engine testing, portable data acquisition, wind tunnel research, process monitoring



**NetScanner 9022**

Measurement Type	Pressure
Media	Liquid
Accuracy	±0.05% FS
# of Channels	12
EU Throughput Rate	100 Hz/chan/sec
Operating Temp.	-30°C to 70°C
Enclosure	IP64/30 g vibration
Typical Applications	Engine testing, third party transducers, close coupled requirements, high pressure

## PRESSURE SCANNERS & TRANSDUCERS

NetScanners, Transducers, and Accompanying Equipment



**NetScanner 9032, 9033**

Measurement Type	Barometer, Differential Standard
Media	Dry
Accuracy	±0.01% FS
# of Channels	1
EU Throughput Rate	10 Hz
Operating Temp.	-10°C to 60°C
Enclosure	Laboratory grade
Typical Applications	Barometric monitor, precision reference



**NetScanner 9034, 9038**

Measurement Type	Calibrator
Media	Dry
Accuracy	±0.01% FS
# of Channels	1
EU Throughput Rate	10 Hz
Operating Temp.	-10°C to 60°C
Enclosure	Laboratory grade
Typical Applications	Calibration, transfer standard, verification testing



**NetScanner 9916, 98RK-1 Rack**

Measurement Type	Pressure
Media	Dry
Accuracy	±0.05% FS
# of Channels	128
EU Throughput Rate	100 Hz/chan/sec
Operating Temp.	0°C to 50°C
Enclosure	19" rackmount/4U
Typical Applications	Turbine engine test, control room location



**NetScanner 9400 Transducer**

Measurement Type	Pressure
Media	All-media
Accuracy	±0.05%
# of Channels	1
EU Throughput Rate	Analog Output
Operating Temp.	-30°C to 100°C
Enclosure	IP66
Typical Applications	Turbine Engine Test, liquids, hydraulics

## ELECTRONIC & MINIATURE PRESSURE SCANNERS

ESP & MicroScanner



**ESP 64HD DTC**

Type	Pressure
Media	Dry
Accuracy	±0.03% FS
# of Channels	64
Thermal Comp.	Active (DTC)
Operating Temp.	-25°C to 80°C
Multiplex Scan Rate	70 KHz
Port Sizes (Inches)	0.040
Typical Applications	Wind tunnel research, flight test, on vehicle research



**ESP 32HD DTC**

Type	Pressure
Media	Dry
Accuracy	±0.03% FS
# of Channels	32
Thermal Comp.	Active (DTC)
Operating Temp.	-25°C to 80°C
Multiplex Scan Rate	70 KHz
Port Sizes (Inches)	0.040 or 0.063
Typical Applications	Wind tunnel research, flight test, on vehicle research



**ESP 64HD, 32HD, 16HD**

Type	Pressure
Media	Dry
Accuracy	±0.05% FS
# of Channels	64, 32 or 16
Thermal Comp.	Passive
Operating Temp.	-25°C to 80°C
Multiplex Scan Rate	20 KHz
Port Sizes (Inches)	0.040 or 0.63
Typical Applications	Wind tunnel research, flight test, on vehicle research



**MicroScanner 16MS**

Type	Pressure
Media	Dry
Accuracy	±0.05%
# of Channels	16
Thermal Comp.	Active
Operating Temp.	-20°C to 100°C
Multiplex Scan Rate	100 KHz
Port Sizes (Inches)	Direct mount
Typical Applications	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	2000 Hz
Operating Temp.	0°C to 50°C
Enclosure	Laboratory grade
Typical Applications	Aerospace development



**Initium**

Type	Pressure scanning
Media	Dry
Accuracy	±0.05% FS
# of Channels	512
EU Throughput Rate	1200 Hz
Operating Temp.	0°C to 70°C
Enclosure	Laboratory grade
Typical Applications	Wind engineering



**mSDI Interface**

Type	A/D conversion
Media	Dry
Accuracy	±0.05% FS
# of Channels	512
EU Throughput Rate	2000 Hz
Operating Temp.	-25°C to 80°C
Enclosure	Miniature
Typical Applications	In-model placement, Optimus System interface



**Pneumatics**

Type	Quick disconnect
Media	Dry
Accuracy	—
# of Channels	19, 31, 36, 55
EU Throughput Rate	—
Operating Temp.	-40°C to 80°C
Enclosure	Miniature
Typical Applications	Pressure connections for confined spaces

# SPEED SENSORS



## 3 & 4 CHANNELS HALL EFFECT SPEED SENSORS



### Jaquet DSD 25

<b>Technology</b>	Differential Hall Effect three and four channels
<b>Package</b>	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length 29 mm</li> <li>• Shaft diameter 24.5 mm</li> </ul>
<b>Frequency Range</b>	0 - 20 kHz
<b>Nominal Supply Voltage</b>	Nominal 15VDC (9 VDC to 30 VDC)
<b>Output Signal</b>	3 & 4 channels push-pull
<b>Operating Temp.</b>	-40°C to 125°C
<b>Typical Applications</b>	Railway

## DUAL CHANNEL HALL EFFECT SPEED SENSOR



### Jaquet DSD 70

<b>Technology</b>	Differential Hall Effect two channels
<b>Package</b>	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length 29 mm</li> <li>• Shaft diameter 16 mm</li> </ul>
<b>Frequency Range</b>	0 - 20 kHz
<b>Nominal Supply Voltage</b>	Nominal 15VDC (9 VDC to 30 VDC)
<b>Output Signal</b>	2 channels push-pull
<b>Operating Temp.</b>	-40°C to 125°C
<b>Typical Applications</b>	Railway

## EDDY CURRENT SPEED SENSORS



### Jaquet DSH

<b>Technology</b>	Eddy Current single channel
<b>Package</b>	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length 42 mm</li> <li>• Shaft diameter 18 mm</li> </ul>
<b>Frequency Range</b>	up to 20 kHz
<b>Nominal Supply Voltage</b>	10 - 30VDC
<b>Output Signal</b>	Square Wave
<b>Operating Temp.</b>	-40°C to 125°C
<b>Typical Applications</b>	Industrial (Power Generation, Hydraulic, Engines, Industry)



### Jaquet DSH 16

<b>Technology</b>	Eddy Current two channels
<b>Package</b>	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length 29 mm</li> <li>• Shaft diameter 16 mm</li> </ul>
<b>Frequency Range</b>	up to 20 kHz
<b>Nominal Supply Voltage</b>	Nominal 15 VDC (8 VDC to 30 VDC)
<b>Output Signal</b>	2 channels push-pull
<b>Operating Temp.</b>	120°C
<b>Typical Applications</b>	Railway

## HALL EFFECT SPEED SENSORS



### Jaquet Green Line D

Technology	Differential Hall Effect single channel
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length 26 mm, 64 mm</li> <li>• Shaft diameter 12 mm</li> </ul>
Frequency Range	5-20 kHz
Nominal Supply Voltage	8-32 VDC
Output Signal	Square Wave, single channel
Operating Temp.	-40°C to 125°C
Typical Applications	Industrial, non demanding, low cost applications



### Jaquet Green Line Y12AD

Technology	Hall Speed Sensor single channel + direction signal
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length 36 mm</li> <li>• Shaft diameter 12 mm</li> </ul>
Frequency Range	0-15 kHz
Nominal Supply Voltage	8-32 VDC
Output Signal	Square Wave, single channel + direction signal
Operating Temp.	-40°C to 125°C
Typical Applications	Industrial, non demanding, low cost applications



### Jaquet Green Line F

Technology	Hall Effect quasi static
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length various</li> <li>• Shaft diameter various</li> </ul>
Frequency Range	0.05-15 kHz
Nominal Supply Voltage	8-25 VDC
Output Signal	Square Wave, single channel
Operating Temp.	-40°C to 125°C
Typical Applications	Industrial, non demanding, low cost applications



### Jaquet DSD

Technology	Differential Hall Effect single channel
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Various shaft lengths M12, M14, M16, M18, M22</li> <li>• Various shaft diameter</li> </ul>
Frequency Range	up to 20 kHz
Nominal Supply Voltage	8-30 VDC
Output Signal	Square Wave, single channel
Operating Temp.	-40°C to 125°C
Typical Applications	Industrial (Power Generation, Hydraulic, Engines, Industry)



### Jaquet DSF extended power supply

Technology	Hall Effect
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Various shaft lengths</li> <li>• Various shaft diameter</li> </ul>
Frequency Range	up to 20 kHz
Nominal Supply Voltage	8-28 VDC 10-30 VDC
Output Signal	Square Wave, single channel
Operating Temp.	-40°C to 125°C
Typical Applications	Industrial (Power Generation, Hydraulic, Engines, Industry)



### Jaquet DSF EX-ATEX

Technology	Hall Effect
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Various shaft lengths</li> <li>• Various shaft diameter</li> </ul>
Frequency Range	up to 15 kHz
Nominal Supply Voltage	9-18 VDC
Output Signal	2-wire
Operating Temp.	-40°C to 125°C
Typical Applications	Industrial (Power Generation, Hydraulic, Engines, Industry), explosion protected, classified areas



### Jaquet DSF

Technology	Hall Effect
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length various</li> <li>• Various shaft diameter</li> </ul>
Frequency Range	up to 15 kHz
Nominal Supply Voltage	9-18 VDC
Output Signal	One channel
Operating Temp.	-40°C to 125°C
Typical Applications	Industrial, non demanding, low cost applications



### Jaquet DSL

Technology	Hall Effect
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length various</li> <li>• Various shaft diameter</li> </ul>
Frequency Range	up to 15 kHz
Nominal Supply Voltage	10-25 VDC
Output Signal	Square Wave
Operating Temp.	-40°C to 125°C
Typical Applications	Industrial, non demanding, low cost applications



### Jaquet DSS

Technology	Hall Effect zero speed
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length various</li> <li>• Shaft diameter various</li> </ul>
Frequency Range	up to 15 kHz
Nominal Supply Voltage	8-30 VDC
Output Signal	Square Wave
Operating Temp.	-40°C to 125°C
Typical Applications	Industrial, non demanding, low cost applications

## HALL EFFECT SPEED SENSORS



### Jaquet DSY

Technology	Hall Effect chopped
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length various</li> <li>• Various shaft diameter</li> </ul>
Frequency Range	0 - 15 kHz
Nominal Supply Voltage	4.5 - 16 VDC 8 - 32 VDC
Output Signal	Square Wave
Operating Temp.	-40°C to 125°C
Typical Applications	Industrial (Power Generation, Hydraulic, Engines, Industry)



### Jaquet DSD 17

Technology	Differential Hall Effect single channel, 3 wires, voltage output
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length various</li> <li>• Various shaft diameter</li> </ul>
Frequency Range	Up to 20 kHz
Nominal Supply Voltage	Nominal 15 VDC (9 VDC to 30 VDC)
Output Signal	1 channel push-pull, voltage output
Operating Temp.	-40°C to 125°C
Typical Applications	Railway



### Jaquet DSD 40

Technology	Differential Hall Effect single channel, 2 wires, current output
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length various</li> <li>• Various shaft diameter</li> </ul>
Frequency Range	0 - 20 kHz
Nominal Supply Voltage	Nominal 15 VDC (12 VDC to 30 VDC)
Output Signal	1 channel push-pull, current output
Operating Temp.	-40°C to 125°C
Typical Applications	Railway

## VARIABLE RELUCTANCE SPEED SENSORS



### Jaquet Green Line EV

Technology	Variable Reluctance (VR) square wave output
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length various</li> <li>• Various shaft diameter</li> </ul>
Frequency Range	25 Hz - 20 kHz
Nominal Supply Voltage	5-32 VDC
Output Signal	Square Wave
Operating Temp.	-40°C to 125°C
Typical Applications	Industrial, non demanding, low cost applications



### Jaquet Green Line EX

Technology	Variable Reluctance (VR) Classified Areas (explosion proof)
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length 48, 89, 129 mm</li> <li>• Shaft diameter 5/8" and 3/4"</li> </ul>
Frequency Range	25 Hz - 20 kHz
Nominal Supply Voltage	Passive
Output Signal	Sine Wave
Operating Temp.	-40°C to 125°C
Typical Applications	Industrial, non demanding, low cost applications



### Jaquet Green Line E

Technology	Variable Reluctance (VR)
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft length various</li> <li>• Shaft diameter various</li> </ul>
Frequency Range	25 Hz - 20 kHz
Nominal Supply Voltage	Passive
Output Signal	Sine Wave
Operating Temp.	-40°C to 125°C
Typical Applications	Industrial, non demanding, low cost applications



### Jaquet SIL-3

Technology	Variable Reluctance (VR)
Package	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Shaft lengths 35 mm up to 101 mm</li> <li>• Shaft diameter M16 and 5/8"</li> </ul>
Frequency Range	up to 30 kHz
Nominal Supply Voltage	Passive
Output Signal	Sine Wave
Operating Temp.	-40°C to 150°C
Typical Applications	SIL-3 and SIL-4 applications

POLE WHEEL



**FTP520 One piece pole wheel without boss**

**Material** 1.1191 CK45 Ferromagnetic steel, electrogalvanized, whit/blue passivated 8...12µm

**Module** 1 to 4

**Typical Applications** Railway traction motors, turbines, diesel engines, motors/generators and large compressors in industrial machinery



**FTP530 One piece pole wheel with boss**

**Material** 1.1191 CK45 Ferromagnetic steel, electrogalvanized, whit/blue passivated 8...12µm

**Module** 1 to 3

**Typical Applications** Measuring chain/signal output optimized



**FTP540 & FTP560 Two piece pole wheels**

**Material** 1.1191 CK45 Ferromagnetic steel, electrogalvanized, whit/blue passivated 8...12µm

**Module** 1 to 3

**Typical Applications** Existing or new designed machine with difficult mounting process of the pole wheel



**FTP551 Pole Band**

**Material** Ferromagnetic Steel St 12.03, surface Zinc-plated DIN/EN/ISO 9227, passivated blue/white 8-12µm

**Module** ≥ 3.0

**Typical Applications** Typically used for shafts with small diameters (diameter <500mm) and sensors which are sensitive to high magnetic gradients



**FTP552 Pole Band**

**Material** Ferromagnetic Steel St 12.03, surface Zinc-plated DIN/EN/ISO 9227, passivated blue/white 8-12µm

**Module** ≥ 3.0

**Typical Applications** Typically used for shafts with large diameters (diameter >500mm) and sensors which are sensitive to high magnetic gradients



**FTP553 Pole Band**

**Material** Ferromagnetic Steel St 12.03, surface Zinc-plated DIN/EN/ISO 9227, passivated blue/white 8-12µm

**Module** ≥ 3.0

**Typical Applications** Typically used for shafts with large diameters (diameter >500mm), large axial movements of the shaft and large number of poles



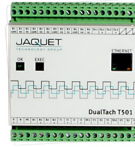
**FTP554 Pole Band**

**Material** Ferromagnetic Steel St 12.03, surface Zinc-plated DIN/EN/ISO 9227, passivated blue/white 8-12µm

**Module** ≥ 3.0

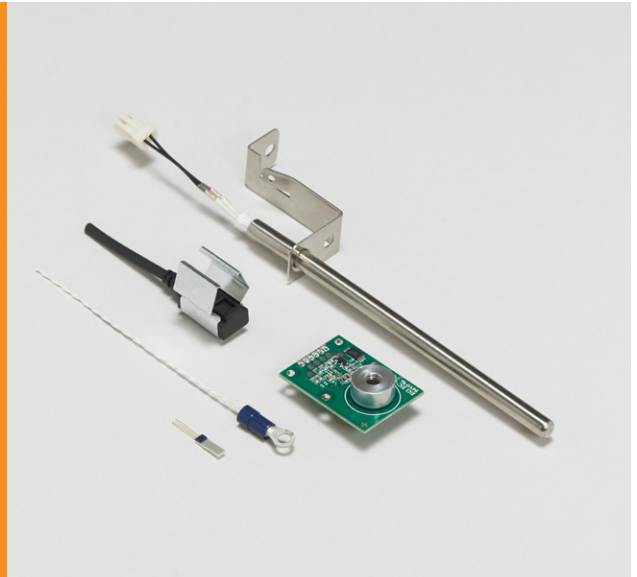
**Typical Applications** Typically used for shafts with large diameters (diameter >500mm), large axial and radial movements of the shaft

## TACHOMETERS



	<b>T400 Tachometer</b>	<b>T500 dual channel Tachometer</b>	<b>T600 Multitasker</b>
Analog Inputs	0	0	1
Binary Inputs	1	2	2
Analog Oupputs	1	2	2
Relays	1	4	4
Communication Interface	RS232	LAN (TCP/IP)	LAN/CAN
Nominal Supply Voltage	10 to 36VDC	AC version: 90 to 264VAC DC Version: 18 to 36VDC	AC version: 90 to 264VAC/120 to 370VDC DC Version: 18 to 36VDC
Ambient Temperature	-40°C to 85°C	-25°C to 50°C for AC version -40°C to 70°C for DC version	-25°C to 50°C for AC version -40°C to 70°C for DC version

# TEMPERATURE SENSORS



## SENSING ELEMENTS—NTC

Analog Output



### Thermistor Chips

<b>Package</b>	Leadless chips, SMD 0402, 0603, 0805
<b>Type</b>	Gold or silver electrodes, surface mounted
<b>Resistance Range</b>	Chip: 100 to 1M $\Omega$ / SMD: 2K to 200K $\Omega$
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Wire bonding compatible</li> <li>• End band SMD</li> </ul>
<b>Accuracy</b>	$\pm 1\%$ to 10%
<b>Operating Temp.</b>	-40°C to 125°C
<b>Dimensions (mm)</b>	Chip: 0.34 - 1 square SMD 0402: 1 x 0.5 x 0.7 SMD 0603: 1.6 x 0.8 x 1 SMD 0805: 2 x 1.25 x 1.2
<b>Typical Applications</b>	Temperature compensation, communication (DWDM), infrared sensing systems, PCB mounting temperature measurement

### Radial Led Thermistors

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

### Axial Led Thermistors

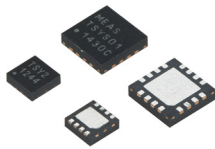
<b>Package</b>	DO-35
<b>Type</b>	Glass coated
<b>Resistance Range</b>	5K $\Omega$ to 100K $\Omega$
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Tight tolerance (<math>\pm 1\%</math>)</li> <li>• Max. stability using high density (HD) chip</li> <li>• Hermetically sealed</li> <li>• Tinned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

### Space Qualified (Hi-Rel)

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

## SENSING ELEMENTS—DIGITAL

Digital Output

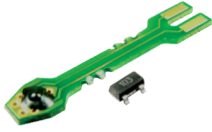


### Temperature System Sensor (TSYS)

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

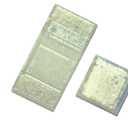
## SENSING ELEMENTS—RTD

Analog Output



### Nickel RTD

<b>Package</b>	SOT 23 Bare die on request
<b>Type</b>	<ul style="list-style-type: none"> <li>Thin film nickel structure on silicon substrate, protected with a passivation layer</li> <li>SOT 23 package for SMT</li> <li>Bare die for COB assembly</li> </ul>
<b>Resistance Range</b>	1,000Ω
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>Harsh environment compatible</li> <li>Automotive qualified</li> <li>Very small dimensions</li> <li>Very short response time</li> <li>Good linearity</li> <li>High temperature coefficient</li> <li>Low power consumption</li> <li>Good thermal connection of sensing element through leadframe-pin</li> </ul>
<b>Accuracy</b>	Class B, according to former DIN 43760 standard
<b>Operating Temp.</b>	-55°C to 160°C
<b>Dimensions (mm)</b>	2.1 x 2.5 x 2.1 (SOT 23), 0.7 x 0.7 x 0.4 (Bare die)
<b>Typical Applications</b>	Automotive, industrial, OEM, thermal compensation, thermal management



### Platinum Thin Film Chips

<b>Package</b>	Leadless chips, SMD 1206
<b>Type</b>	<ul style="list-style-type: none"> <li>Thin film platinum deposited on ceramic substrate</li> <li>Contact pads on top and bottom side for NTC chip like assembly</li> <li>Contact pads on both ends for SMT</li> </ul>
<b>Resistance Range</b>	100Ω, 1,000Ω (Other values on request)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>Long term stability</li> <li>Interchangeability</li> <li>Assembly like NTC chips</li> <li>Very small dimensions</li> <li>Short response time</li> </ul>
<b>Accuracy</b>	According to DIN EN 60751
<b>Operating Temp.</b>	-50°C to 400 °C
<b>Dimensions (mm)</b>	1.5 x 1.5 (Top/bottom pads), 1.2 x 3.6 (SMT)
<b>Typical Applications</b>	White goods, automotive, industrial, aerospace, medical, test and measurement



### Platinum Thin Film Sensors

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



### Glass Wire Wound Sensors

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



### Ceramic Wire Wound Sensors

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

## SENSOR ASSEMBLIES



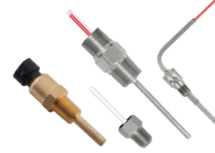
### Ring Sensors

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



### Push-in Sensors

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



### Screw-in Sensors

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



### Refrigeration Molded Probes

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



### Pipe Mount Sensors

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



### Outdoor Air Sensors

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



### Pool and Spa Sensors

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



### Boiler Sensors

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

## SENSOR ASSEMBLIES



	Oven Sensors	Urea Temperature Sensors	Exhaust Gas Temperature Probes
<b>Package</b>	Stainless steel housing	Plastic housing with screw hole mountings	EGT thermocouple probe
<b>Type</b>	<ul style="list-style-type: none"> <li>Pt element encapsulated into ceramic tube, with rigid stainless steel housing</li> <li>High temperature cable</li> </ul>	<ul style="list-style-type: none"> <li>Overmolded plastic housing with integrated 2 pin connector</li> </ul>	<ul style="list-style-type: none"> <li>Mineral insulated alloy sheath, screwed mechanical interface, cable extension and automotive connector</li> <li>Option: CANbus interface (From 1 to 4 thermocouples, fully configurable)</li> </ul>
<b>Sensor Range</b>	Pt100, Pt500, Pt1000 sensor	NTC	Thermocouple: Type K, N
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>High temperature</li> <li>Easy integration/installation</li> <li>Higher dielectric strength according to type</li> </ul>	<ul style="list-style-type: none"> <li>Temperature measurement of urea liquid used in Selective Catalytic Reduction (SCR) systems</li> <li>Suitable for high pressure applications</li> </ul>	<ul style="list-style-type: none"> <li>High temperature, robust design</li> <li>Vibration and corrosion resistant</li> <li>Fast response time</li> </ul>
<b>Accuracy</b>	Class B, C according to IEC60751	<ul style="list-style-type: none"> <li>NTC: custom tolerances available</li> <li>±2%, 3% and 5%</li> <li>Beta 25/85: 3976</li> </ul>	Class 1 according to IEC584
<b>Operating Temp.</b>	-20°C to 750°C (According to version)	-40°C to 125°C	-40°C to 900°C
<b>Dimensions (mm)</b>	<ul style="list-style-type: none"> <li>OD Ø4 mm to Ø6 mm</li> <li>Immersion length 35 mm to 100 mm</li> <li>Custom mechanical interface and cable length</li> </ul>	Sensor tip 8 mm diameter	<ul style="list-style-type: none"> <li>OD Ø4 to OD Ø8</li> <li>Custom immersion length and cable length</li> </ul>
<b>Typical Applications</b>	Drying oven, domestic oven	Temperature measurement of urea liquid used in SCR systems	Automotive, truck, mining, power unit, racing



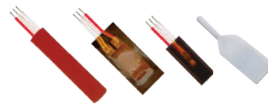
	Micro-Thermocouples	Patient Monitoring Probes	TLH Reference Probe	USB Temperature Probe
<b>Package</b>	Fine gage thermocouples	Sensor with cable and connector	TLH100/TLH600	Push-in probe with handle
<b>Type</b>	<ul style="list-style-type: none"> <li>Micro sized thermocouple: 44 AWG, 40 AWG, 38 AWG, 36 AWG</li> <li>Polymer encapsulated or bare junction</li> </ul>	<ul style="list-style-type: none"> <li>Reusable: Skin; 10FR and 12FR GP</li> <li>Disposable: Skin; 9FR and 12FR GP; 12FR, 18FR, 24FR Esoph/Stethoscope; 14FR, 16FR, 18FR Foley catheter</li> </ul>	<ul style="list-style-type: none"> <li>Rigid protective external stainless steel sheath and stainless steel handle, unique internal design to insure stability</li> </ul>	<ul style="list-style-type: none"> <li>Versatile push-in probe with stainless steel sheath and plastic or stainless steel handle</li> <li>High precision sensing element combined with integrated electronics for signal processing, calibration and USB interface</li> </ul>
<b>Sensor Range</b>	Thermocouple type: T, K	400 series, 700 series (Reusable only)	Pt100 sensor	Not applicable due to direct digital output
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>Welded or soldered junction</li> <li>Low profile, fast response</li> <li>Polyesterimide wire insulation</li> </ul>	<ul style="list-style-type: none"> <li>Autoclavable reusables</li> <li>Sterile disposables</li> </ul>	<ul style="list-style-type: none"> <li>Stability</li> <li>Provided with calibration report or option of calibration certificate by national committee for accreditation (COFRAC)</li> </ul>	<ul style="list-style-type: none"> <li>USB conformal interface</li> <li>Calibrated digital output, recalibration possible on request</li> <li>Robust design for general purpose applications</li> <li>Long term stability</li> </ul>
<b>Accuracy</b>	Varies by type: standard, special and custom limits of error available	±0.1°C at 25°C to 45°C ISO-80601-2-56: ±0.2°C at 35°C to 42°C	Class B (TLH600), A (LTH100) according to IEC60751	±0.1°C for temperature range -5°C to 55°C ±0.2°C for temperature range -40°C to 160°C (Other accuracies on request)
<b>Operating Temp.</b>	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)
<b>Dimensions (mm)</b>	Varies by thermocouple gage	Reusable: 3 m cable with sensor Disposable: Sensor <1 m; 3 m reusable adaptor cable	OD Ø5 x 500 + handle Ø15 x 100 (Typical cable length = 2 m)	OD Ø6 x 200 + handle Ø19 x 100 (Typical cable length = 2,000)
<b>Typical Applications</b>	Medical, catheters	Patient monitoring, laboratory	Laboratory, temperature sensors calibration by comparison	Laboratory, mobile research, test and measurement

## SENSOR ASSEMBLIES



### Stator Sensors

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



### Surface Sensors

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



### Bearing Sensors

<b>Package</b>	Copper alloy tip Stainless steel, isolated stainless steel or epoxy glass case
<b>Type</b>	<ul style="list-style-type: none"> <li>Rigid sheath</li> <li>Tip sensitive</li> <li>Cable/leadwire options</li> </ul>
<b>Sensor Range</b>	<ul style="list-style-type: none"> <li>RTD: Pt, Ni, Cu</li> <li>Thermocouple: Type J, K, T, E</li> </ul>
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>Cut-to-length</li> <li>Copper tip for fast time response</li> <li>Assemblies with fluid seal and spring loading</li> <li>Single or dual elements</li> </ul>
<b>Accuracy</b>	RTD: Class A, B, C according to IEC60751
<b>Operating Temp.</b>	Sheath specific, up to 250°C
<b>Dimensions (mm)</b>	Custom lengths Standard sheath diameters: Ø4.78, Ø5.46, Ø6.35
<b>Typical Applications</b>	Bearing monitoring, electric motors, generators



### Thermocouple

<b>Package</b>	Screw-in or push-in design with cable extension, connector, or connecting head
<b>Type</b>	<ul style="list-style-type: none"> <li>Collapsible Mineral Insulated (MI) with alloy sheath (Radius <math>\geq 5 \times OD</math>)</li> <li>Flexible cable with plastic or composite insulation</li> <li>Rigid protection sheath: ceramic, quartz or alloy sheath</li> </ul>
<b>Sensor Range</b>	Type T, J, K, N, R, S, B (According to TC type and insulation type)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>High temperature and high vibration level (For MI)</li> <li>Available in small diameters for fast respond time</li> <li>Grounded or ungrounded or apparent hot junction</li> <li>Single or multiple measuring points</li> </ul>
<b>Accuracy</b>	Class 1 according to IEC584
<b>Operating Temp.</b>	-40°C to 1,700°C (According to TC type and insulation type)
<b>Dimensions (mm)</b>	<ul style="list-style-type: none"> <li>OD Ø0.3 mm to Ø8 mm for MI</li> <li>Ø0.15 mm for smallest flexible cable</li> <li>Custom dimensions, fittings and cable lengths (From few centimeters to many meters)</li> </ul>
<b>Typical Applications</b>	Aeronautic, process industry, medical, semiconductor industry (spike, profile)



### Transmitter

<b>Package</b>	Brass, copper and stainless steel housing, flexible sheath with integrated connector.
<b>Type</b>	<ul style="list-style-type: none"> <li>Epoxy potted element</li> <li>Screw-in</li> </ul>
<b>Sensor Range</b>	4 - 20 mA output
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>Compact, welded design</li> <li>Highly sensitive and stable</li> <li>High vibration application</li> <li>Good waterproof properties</li> </ul>
<b>Accuracy</b>	0.5 or 1% FS
<b>Operating Temp.</b>	-20°C to 120°C
<b>Dimensions (mm)</b>	<ul style="list-style-type: none"> <li>Customer sheath length, thread type</li> <li>Probe diameter: Ø4.75 mm; Ø5 mm; Ø6 mm; Ø6.35 mm; Ø8 mm</li> </ul>
<b>Typical Applications</b>	Heavy industry, general industrial monitoring

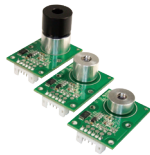
## THERMOPILES



	<p><b>TS</b> TS318-3B0814, TS318-5C50, TS305-10C50</p>
<b>Package</b>	TO-18, TO-5
<b>Type</b>	Thermopile sensor components
<b>Temp. Range</b>	Depends on applied electronics and calibration, filter types optimal for object temperature range -40°C to 300°C (Extended range: -60°C to 1,000°C)
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• High signal output</li> <li>• Accurate reference sensors</li> </ul>
<b>Accuracy</b>	Depends on applied electronics and calibration
<b>Operating Temp.</b>	Ambient temperature range: -20°C to 85°C
<b>Dimensions (mm)</b>	Ø9.15 x 4.4 (Body)
<b>Typical Applications</b>	Medical thermometer (ear, forehead), pyrometer

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

## THERMOPILES



**TSEV**  
Single Pixel Series

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



**TSEV**  
Multi Pixel Series

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



**TPT**  
TPT300V

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

# TORQUE SENSORS



## STATIC TORQUE SENSORS



**CS1060**

Package	Square male coupling
Operating Mode	Reaction
Unique Features	<ul style="list-style-type: none"> <li>• Optional high level output</li> <li>• Keyed shaft connection</li> <li>• Static measurements</li> </ul>
FS Ranges	±5 to ±7,000 Nm ±4 to ±5,600 lbf-ft
Max. Over-range	1.5X FS
Output/Span	±20 mV , 0.5-4.5V
Combined Non-linearity & Hysteresis	< ±0.25% FS
Operating Temp.	-20°C to 100°C
Dimensions (mm)	Application dependent
Typical Applications	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"> <li>• Optional high level output</li> <li>• Static torque measurement</li> <li>• Excellent temperature stability</li> </ul>
FS Ranges	±5 to ±2,500 Nm ±4 to ±2,000 lbf-ft
Max. Over-range	1.5X FS
Output/Span	±20 mV , 0.5-4.5V
Combined Non-linearity & Hysteresis	< ±0.25% FS
Operating Temp.	-20°C to 100°C
Dimensions (mm)	Application dependent
Typical Applications	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"> <li>• High stiffness</li> <li>• Low transverse sensitivity</li> <li>• Optional high temp option</li> </ul>
FS Ranges	±160 to ±10,000 Nm ±128 to ±8,000 lbf-ft
Max. Over-range	1.5X FS
Output/Span	±20 mV , 0.5-4.5V
Combined Non-linearity & Hysteresis	< ±0.25% FS
Operating Temp.	-40°C to 150°C
Dimensions (mm)	Application dependent
Typical Applications	Non-rotating parts torque measurement, robotics and effectors, laboratory and research

## DYNAMIC TORQUE SENSORS



### CD1050

Package	Square male couplings
Operating Mode	Dynamic rotary
Unique Features	<ul style="list-style-type: none"> <li>• Optional high level output</li> <li>• Rugged</li> <li>• Slip ring measurement interface</li> </ul>
FS Ranges	$\pm 5$ to $\pm 7,000$ Nm $\pm 4$ to $\pm 5,600$ lbf-ft
Max. Over-range	1.5X FS
Output/Span	$\pm 20$ mV, 0.5-4.5V
Combined Non-linearity & Hysteresis	$< \pm 0.25\%$ FS
Operating Temp.	-20°C to 80°C
Dimensions (mm)	Application dependent
Typical Applications	Engine efficiency, robotics and effectors, laboratory and research



### CD1095

Package	Keyed shaft couplings
Operating Mode	Dynamic rotary
Unique Features	<ul style="list-style-type: none"> <li>• High accuracy</li> <li>• Built-in amplifier</li> <li>• Bi-directional measurement</li> </ul>
FS Ranges	$\pm 5$ to $\pm 2,500$ Nm $\pm 4$ to $\pm 2,000$ lbf-ft
Max. Over-range	1.5X FS
Output/Span	$\pm 20$ mV, 0.5-4.5V
Combined Non-linearity & Hysteresis	$< \pm 0.25\%$ FS
Operating Temp.	-20°C to 80°C
Dimensions (mm)	Application dependent
Typical Applications	Process control equipment, robotics and effectors, test and measurement



### CD1110

Package	Keyed shaft couplings
Operating Mode	Dynamic rotary
Unique Features	<ul style="list-style-type: none"> <li>• Low range measurements</li> <li>• Bi-directional measurement</li> <li>• Mechanical over-range stops</li> </ul>
FS Ranges	$\pm 0.05$ to $\pm 2$ Nm $\pm 0.04$ to $\pm 1.6$ lbf-ft
Max. Over-range	10X FS
Output/Span	$\pm 20$ mV, 0.5-4.5V
Combined Non-linearity & Hysteresis	$< \pm 0.25\%$ FS
Operating Temp.	-20°C to 80°C
Dimensions (mm)	Application dependent
Typical Applications	Process control equipment, robotics and effectors, test and measurement

## CONTACTLESS TORQUE SENSORS



### CD1140

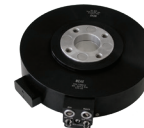
Package	Keyed shaft couplings
Operating Mode	Contactless
Unique Features	<ul style="list-style-type: none"> <li>• High accuracy</li> <li>• Built-in amplifier</li> <li>• Speed and angle detection</li> </ul>
FS Ranges	$\pm 0.05$ to $\pm 20,000$ Nm $\pm 0.04$ to $\pm 16,000$ lbf-ft
Max. Over-range	2X FS
Output/Span	$\pm 10$ V (60 pulses/rev)
Combined Non-linearity & Hysteresis	$\pm 0.1\%$ FS
Operating Temp.	0°C to 60°C
Dimensions (mm)	Application dependent
Typical Applications	Process control equipment, robotics and effectors, test and measurement



### CD9515

Package	Keyed shaft couplings
Operating Mode	Contactless
Unique Features	<ul style="list-style-type: none"> <li>• Economical</li> <li>• Small form factor</li> <li>• Speed and angle detection</li> </ul>
FS Ranges	$\pm 5$ to $\pm 1,000$ Nm $\pm 4$ to $\pm 738$ lbf-ft
Max. Over-range	2X FS
Output/Span	$\pm 5$ V (60 pulses/rev)
Combined Non-linearity & Hysteresis	$\pm 0.3\%$ FS
Operating Temp.	0°C to 60°C
Dimensions (mm)	Application dependent
Typical Applications	Industrial applications, process control equipment, PLC compatible

## AUTOMOTIVE TEST TORQUE SENSORS



### FCA7300

Package	Steering wheel adaptable
Operating Mode	Multi-sensing
Unique Features	<ul style="list-style-type: none"> <li>• Dual torque/angle range</li> <li>• Steering velocity measurement</li> <li>• Fits all road vehicles</li> </ul>
FS Ranges	10 to 200 Nm (7 lbf-ft to 150 lbf-ft)
Max. Over-range	10X FS
Output/Span	$\pm 10$ V
Combined Non-linearity & Hysteresis	$\pm 0.1\%$ FS
Operating Temp.	-20°C to 80°C
Dimensions (mm)	Ø195 x 50
Typical Applications	On-car road test, truck and buses steering test, armored vehicles steering test



### CD1124T

Package	Engine shaft dynamic torque meter
Operating Mode	Contactless
Unique Features	<ul style="list-style-type: none"> <li>• Heavy duty vehicles</li> <li>• Telemetry based</li> <li>• Gearbox to engine shaft measurement</li> </ul>
FS Ranges	20,000 Nm (16,000 lbf-ft)
Max. Over-range	1.5X FS
Output/Span	$\pm 10$ V
Combined Non-linearity & Hysteresis	$\pm 1\%$ FS
Operating Temp.	-20°C to 80°C
Dimensions (mm)	Ø195 x 35
Typical Applications	Automotive test benches for engine shaft torque measurement



# ULTRASONIC SENSORS

(air bubble, point level, continuous level monitoring)



## STANDARD CONTACT POINT LEVEL



### LL-01

Type	Gap
Unique Features	<ul style="list-style-type: none"> <li>• All 316L SS</li> <li>• Integral electronics</li> <li>• Miniature threads</li> <li>• No adjustment for viscosity, density</li> </ul>
Input	5 - 30 VDC
Output	<ul style="list-style-type: none"> <li>• 30 V, 3 W relay</li> <li>• Analog 4 - 20 mA power loop</li> </ul>
Pressure Range	250 psi
Operating Temp.	-30°C to 80°C
Actuation point	0.25 inches
Process Connection	1/4"NPT and 1/2"NPT
Cable	1, 4, 10, 20 feet
Approvals	CE
Typical Applications	Medical waste tanks, histology processors, compressors, chillers, coolant reservoirs



### LL-10

Type	Tip
Unique Features	<ul style="list-style-type: none"> <li>• All 316L SS</li> <li>• Integral electronics</li> <li>• No adjustment for viscosity, density</li> </ul>
Input	5 - 30 VDC
Output	<ul style="list-style-type: none"> <li>• 1 A SPDT</li> <li>• Analog 4 - 20 mA power loop</li> </ul>
Pressure Range	1000 psi
Operating Temp.	-30°C to 80°C
Actuation point	Custom (2.25, 6, 12, 18, 24 inches)
Process Connection	3/4"NPT
Cable	1, 4, 10, 20 feet
Approvals	CE
Typical Applications	Hydraulic reservoirs, storage tanks, pipe lines, sewage systems

## AIR-BUBBLE AND NON-INVASIVE POINT LEVEL



### AD-101

<b>Type</b>	Non-invasive
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Detect minimum bubble size of 70% ID</li> <li>• Immune to EMI/RFI</li> <li>• Acoustic coupling agent not required</li> <li>• Continuous self testing</li> <li>• LED indicator</li> </ul>
<b>Input</b>	5 - 24 VDC standard
<b>Output</b>	TTL & Open collector
<b>Pressure Range</b>	Atmosphere
<b>Operating Temp.</b>	0°C to 40°C
<b>Actuation point</b>	—
<b>Process Connection</b>	—
<b>Cable (Inches)</b>	12
<b>Approvals</b>	-
<b>Typical Applications</b>	Infusion pumps, dialysis machines, semi-conductor equipment, 3D printing



### SL-630

<b>Type</b>	Non-invasive
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Stick on dry contact</li> <li>• Point level detection</li> </ul>
<b>Input</b>	5 - 24 VDC
<b>Output</b>	TTL (High), dry condition
<b>Pressure Range</b>	Atmosphere
<b>Operating Temp.</b>	-30°C to 70°C
<b>Actuation point</b>	Variable
<b>Process Connection</b>	Reusable sensor, disposable tape
<b>Cable (Inches)</b>	12
<b>Approvals</b>	CE
<b>Typical Applications</b>	Chromatography, chemical analyzer, hemodialysis, reagent vessels

## CONTACT MULTI-POINT LEVEL



### SL-900

<b>Type</b>	Contact
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Miniature</li> <li>• 10 μRA electropolished finish</li> <li>• 316 LSS body</li> <li>• Designed for high purity market</li> </ul>
<b>Input</b>	Variable
<b>Output</b>	Dual color LED and ½ A relay
<b>Pressure Range</b>	250 PSIG
<b>Operating Temp.</b>	-30°C to 93°C
<b>Actuation point</b>	Variable
<b>Process Connection</b>	1/2", 3/4" VCR, male/female
<b>Cable (Inches)</b>	Up to 24" shielded with strain relief, 9 pin connector
<b>Approvals</b>	NEMA 1 housing
<b>Typical Applications</b>	Pharmaceutical and semiconductor industries, high pressure vessels

## CONTINUOUS LEVEL



### ML

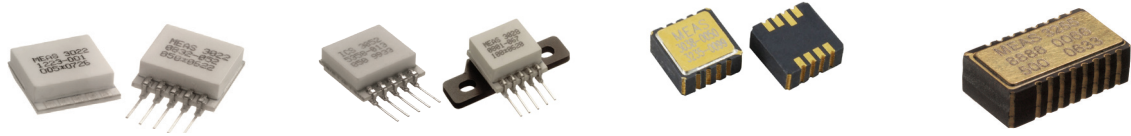
<b>Type</b>	Continuous transmitter through air
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Non-contact</li> <li>• Remotely mounted</li> <li>• 316 SS or epoxy sensor material</li> <li>• Configurable via RS-232</li> </ul>
<b>Input</b>	24 VDC
<b>Output</b>	RS-232, analog, relay setpoints
<b>Pressure Range</b>	Atmosphere
<b>Operating Temp.</b>	-30°C to 70°C
<b>Sensing Range</b>	0.5" to 5" inches
<b>Process Connection</b>	—
<b>Accuracy</b>	±0.0075"
<b>Elect Connection</b>	Terminal block
<b>Approvals</b>	NEMA 1 housing
<b>Typical Applications</b>	Microplate well level, test tubes and vials, bottle fill level, surface flaw detection

# VIBRATION SENSORS



## EMBEDDED ACCELEROMETERS

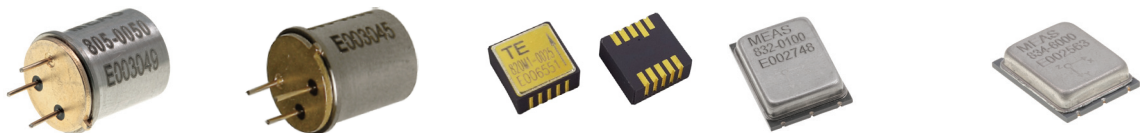
MEMS DC Accelerometer



	<b>3022, 3028</b>	<b>3052A, 3058A</b>	<b>3038</b>	<b>3255A</b>
<b>Package</b>	Pins or pads	Pins or pads	SMD	SMD
<b>Type</b>	Board level	Board level	Board level	Board level
<b>FS Range</b>	±2g to ±100g	±2g to ±100g	±50g to ±6,000g	±25g to ±100g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• mV output, critically gas damped</li> <li>• Board and screw mount options</li> <li>• Pin or solder pad option</li> </ul>	<ul style="list-style-type: none"> <li>• Temperature compensated</li> <li>• Board and screw mount options</li> <li>• Pin or solder pad option</li> </ul>	<ul style="list-style-type: none"> <li>• Hermetically sealed</li> <li>• High over-range protection</li> <li>• Gas damping</li> </ul>	<ul style="list-style-type: none"> <li>• Amplified, signal conditioned</li> <li>• Gas damping</li> <li>• Bidirectional mounting</li> </ul>
<b>Accuracy</b>	±1.0% non-linearity	±1.0% non-linearity	±1.0% non-linearity	±1.0% non-linearity
<b>Operating Temp.</b>	-40°C to 125°C	-40°C to 125°C	-54°C to 125°C	-40°C to 125°C
<b>Dimensions (mm)</b>	22.8 x 15.2 x 5.3	22.8 x 15.2 x 5.3	7.5 x 7.5 x 3.3	13.5 x 7.6 x 3.8
<b>Typical Applications</b>	Vibration and shock monitoring, tilt applications, motion control, impact testing	Vibration and shock monitoring, tilt applications, motion control, impact testing	Vibration and shock monitoring, embedded systems, shock testing, safe and arm	Vibration and shock monitoring, aerospace testing, impact testing, transportation

## EMBEDDED ACCELEROMETERS

Piezoelectric Accelerometer



	<b>805, 805M1</b>	<b>808, 808M1</b>	<b>820M1</b>	<b>832, 832M1</b>	<b>834, 834M1</b>
<b>Package</b>	TO-5	TO-8	Board level	SMD	SMD
<b>Type</b>	Adhesive (Stud mount option)	Adhesive (Stud mount option)	SMD	Board mount	Board mount
<b>FS Range</b>	±20g to ±500g	±4g to ±50g	±25g to ±500g	±25g to ±500g	±2,000g to ±6,000g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Hermetically sealed</li> <li>• Case grounded design</li> <li>• Bandwidth to 12 kHz</li> </ul>	<ul style="list-style-type: none"> <li>• Hermetically sealed</li> <li>• Case grounded design</li> <li>• Bandwidth to 8 kHz</li> </ul>	<ul style="list-style-type: none"> <li>• Small size, low cost</li> <li>• Dynamic response</li> <li>• Wide &gt;6000Hz bandwidth</li> </ul>	<ul style="list-style-type: none"> <li>• SMT mount, triaxial</li> <li>• Wide bandwidth &gt;6000Hz</li> <li>• Low power consumption</li> </ul>	<ul style="list-style-type: none"> <li>• SMT mount, triaxial</li> <li>• Wide bandwidth &gt;6,000Hz</li> <li>• Low power consumption</li> </ul>
<b>Accuracy</b>	±1.0% non-linearity	±1.0% non-linearity	±2.0% non-linearity	±2.0% non-linearity	±2.0% non-linearity
<b>Operating Temp.</b>	-50°C to 125°C	-50°C to 100°C	-40°C to 125°C	-20°C to 80°C (832) -40°C to 125°C (832M1)	-20°C to 80°C (834) -40°C to 125°C (834M1)
<b>Dimensions (mm)</b>	Ø8.9 x 10.2	Ø15.2 x 16.6	8.9 x 8.9 x 4.2	18.8 x 14.2 x 4.3	18.8 x 14.2 x 4.3
<b>Typical Applications</b>	Machine monitoring, data loggers, permanent structures	Machine monitoring, data loggers, embedded applications	Embedded predictive maintenance, condition monitoring, data loggers	Data logging, asset monitoring, impact monitoring	Data logging, asset monitoring, impact monitoring

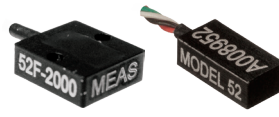
## PLUG AND PLAY ACCELEROMETERS

Uniaxial DC Response



### 40A, 40B

<b>Package</b>	Anodized aluminum
<b>Type</b>	Screw mount
<b>FS Range</b>	±25g to ±2,000g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Critically damped</li> <li>• Euro NCAP certified</li> <li>• Compact</li> </ul>
<b>Accuracy</b>	±1.0% non-linearity
<b>Operating Temp.</b>	-20°C to 80°C
<b>Dimensions (mm)</b>	16.7 x 10.0 x 5.0
<b>Typical Applications</b>	Pedestrian crash testing, Euro NCAP testing



### 52, 52M30, 52F

<b>Package</b>	Anodized aluminum
<b>Type</b>	Adhesive and Screw mount
<b>FS Range</b>	±50g to ±6,000g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• SAE-J211/2570 and ISO-6487 compliant</li> <li>• Gas damping, thin profile</li> <li>• Over-range stops</li> </ul>
<b>Accuracy</b>	±1.0% non-linearity
<b>Operating Temp.</b>	-40°C to 90°C
<b>Dimensions (mm)</b>	11.2 x 10.1 x 3.8
<b>Typical Applications</b>	Vibration and shock testing, safety impact testing, side-impact testing



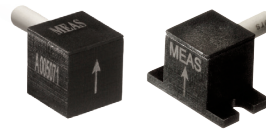
### 58

<b>Package</b>	Anodized Aluminum
<b>Type</b>	Adhesive mount
<b>FS Range</b>	±50g to ±6,000g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Most reliable crush zone accelerometer available</li> <li>• Rugged, water proof</li> <li>• Mounting on any sides of housing</li> </ul>
<b>Accuracy</b>	±1.0% non-linearity
<b>Operating Temp.</b>	-20°C to 85°C
<b>Dimensions (mm)</b>	14.0 x 6.3 x 6.3
<b>Typical Applications</b>	On-vehicle crash and impact testing, drop testing, harsh environment



### 64B, 64C, 64X

<b>Package</b>	Anodized aluminum
<b>Type</b>	Screw mount
<b>FS Range</b>	±50g to ±6,000g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• SAE-J211/2570 and ISO-6487 compliant</li> <li>• ATD dummy certified</li> <li>• Market performance leader</li> </ul>
<b>Accuracy</b>	±0.7% non-linearity
<b>Operating Temp.</b>	-40°C to 121°C
<b>Dimensions (mm)</b>	13.1 x 10.0 x 5.0
<b>Typical Applications</b>	In-dummy crash and impact testing, Euro NCAP testing



### 1201, 1201F

<b>Package</b>	Anodized aluminum
<b>Type</b>	Adhesive/screw mount
<b>FS Range</b>	±50g to ±2,000g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Cube form factor, low noise cable</li> <li>• Adhesive or screw mount</li> <li>• Over-range stops</li> </ul>
<b>Accuracy</b>	±1.0% non-linearity
<b>Operating Temp.</b>	-20°C to 85°C
<b>Dimensions (mm)</b>	8.9 x 8.9 x 9.4
<b>Typical Applications</b>	On-vehicle crash and impact testing, vibration and shock monitoring

## PLUG AND PLAY ACCELEROMETERS

Uniaxial DC Response



### 3801A, 4801A

Package	Stainless steel
Type	Stud mount
FS Range	4801A; $\pm 2g$ to $\pm 200g$ 3801A; $\pm 50g$ to $\pm 6,000g$
Unique Features	<ul style="list-style-type: none"> <li>• Hermetically sealed sensor</li> <li>• mV and amplified output options</li> <li>• Integral connector, detachable cable</li> </ul>
Accuracy	$\pm 0.1\%$ non-linearity on 4801A
Operating Temp.	$-54^{\circ}\text{C}$ to $121^{\circ}\text{C}$
Dimensions (mm)	15.9 x 15.2
Typical Applications	Impact testing, structural testing, test and instrumentation, environmental testing



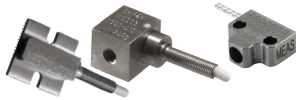
### 3700

Package	Stainless steel
Type	Screw mount
FS Range	$\pm 50g$ to $\pm 6,000g$
Unique Features	<ul style="list-style-type: none"> <li>• No zero shift</li> <li>• mV output</li> <li>• 20,000 g over-range protection</li> </ul>
Accuracy	$\pm 1.0\%$ non-linearity
Operating Temp.	$-54^{\circ}\text{C}$ to $121^{\circ}\text{C}$
Dimensions (mm)	14.2 x 8.1 x 3.8
Typical Applications	Impact and shock testing, structural testing, drop testing, aerospace testing



### EGAXT, EGAXT3

Package	Stainless steel
Type	Adhesive/screw mount
FS Range	$\pm 5g$ to $\pm 2,500g$
Unique Features	<ul style="list-style-type: none"> <li>• Sub-miniature, fluid damped</li> <li>• Miniature single and triaxial designs</li> <li>• 10,000 g over-range protection</li> </ul>
Accuracy	$\pm 1.0\%$ non-linearity
Operating Temp.	$-40^{\circ}\text{C}$ to $120^{\circ}\text{C}$
Dimensions (mm)	EGAXT; 7.2 x 4.6 x 4.6 EGAXT3; 12.7 x 12.7 x 12.7
Typical Applications	Flight test and control, launch, crash, impact testing, robotics



### EGCS-D0, EGCS-D1S, EGCS-D5

Package	Stainless steel
Type	Screw/stud mount
FS Range	$\pm 5g$ to $\pm 10,000g$
Unique Features	<ul style="list-style-type: none"> <li>• Rugged housing</li> <li>• Critically damped</li> <li>• 20,000 g over-range protection</li> </ul>
Accuracy	$\pm 1.0\%$ non-linearity
Operating Temp.	$-40^{\circ}\text{C}$ to $120^{\circ}\text{C}$
Dimensions (mm)	D0: 19.0 x 19.0 x 7.6 D1S: 12.7 x 12.7 x 15.2 D5: 14.2 x 12.7 x 5.6
Typical Applications	Impact and shock testing, destructive testing, engine testing



### 4602, 4604

Package	Anodized aluminum
Type	Screw mount
FS Range	$\pm 2g$ to $\pm 200g$
Unique Features	<ul style="list-style-type: none"> <li>• UltraStable MEMS</li> <li>• Low noise, signal conditioned</li> <li>• <math>&lt; 2\%</math> TEB (total error band)</li> </ul>
Accuracy	$\pm 0.1\%$ non-linearity
Operating Temp.	$-54^{\circ}\text{C}$ to $125^{\circ}\text{C}$
Dimensions (mm)	21.1 x 21.6 x 7.6
Typical Applications	Flight testing on engines, flutter test, road load and transportation testing



### 4610, 4810A

Package	Stainless steel
Type	Screw mount
FS Range	$\pm 2g$ to $\pm 200g$
Unique Features	<ul style="list-style-type: none"> <li>• UltraStable MEMS</li> <li>• Hermetically sealed</li> <li>• <math>&lt; 2\%</math> TEB (total error band)</li> </ul>
Accuracy	$\pm 0.1\%$ non-linearity
Operating Temp.	$-55^{\circ}\text{C}$ to $125^{\circ}\text{C}$
Dimensions (mm)	25.4 x 29.1 x 7.6
Typical Applications	Low frequency monitoring, road testing, motion analysis

## PLUG AND PLAY ACCELEROMETERS

Triaxial DC Response



### 53A, 53AF

<b>Package</b>	Anodized aluminum
<b>Type</b>	Adhesive mount
<b>FS Range</b>	±50 to ±2,000g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low cost</li> <li>• Gas damping</li> <li>• Low power</li> </ul>
<b>Accuracy</b>	±1.0% non-linearity
<b>Operating Temp.</b>	-20°C to 85°C
<b>Dimensions (mm)</b>	18.3 x 13.2 x 7.1
<b>Unique Features</b>	Auto safety, passenger comfort, transportation, NVH analysis



### 68CM1

<b>Package</b>	Stainless steel
<b>Type</b>	Screw mount
<b>FS Range</b>	±50 to ±2,000g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• World SID</li> <li>• Gas damping</li> <li>• Low power</li> </ul>
<b>Accuracy</b>	±1.0% non-linearity
<b>Operating Temp.</b>	-20°C to 85°C
<b>Dimensions (mm)</b>	12.7 x 12.7 x 12.7
<b>Unique Features</b>	Auto safety, in-dummy crash, on-vehicle crash



### 4630

<b>Package</b>	Anodized aluminum
<b>Type</b>	Screw mount
<b>FS Range</b>	±2g to ±200g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• UltraStable MEMS</li> <li>• Low noise, signal conditioned</li> <li>• &lt;2% TEB (total error band)</li> </ul>
<b>Accuracy</b>	±0.1% non-linearity
<b>Operating Temp.</b>	-40°C to 115°C
<b>Dimensions (mm)</b>	26.2 x 26.2 x 23.4
<b>Unique Features</b>	Road testing, motion control, structural testing



### 4020, 4030

<b>Package</b>	Molded plastic
<b>Type</b>	Screw mount
<b>FS Range</b>	±2g to ±6g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low cost</li> <li>• Biaxial, with triaxial option</li> <li>• DC response</li> </ul>
<b>Accuracy</b>	±1.0% non-linearity
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	71.2 x 40.0 x 15.2
<b>Unique Features</b>	Structural monitoring, seismic array, bridge testing



### 606M1

<b>Package</b>	Nitrile rubber pad
<b>Type</b>	Removable
<b>FS Range</b>	±25g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• 606M2 IEPE option</li> <li>• Triaxial, hermetic</li> <li>• Seat pad accelerometer</li> </ul>
<b>Accuracy</b>	±1.0% non-linearity
<b>Operating Temp.</b>	-20°C to 85°C
<b>Dimensions (mm)</b>	199 x 4
<b>Unique Features</b>	Off road equipment, amusement rides, commercial aircraft



### 4835A

<b>Package</b>	Titanium
<b>Type</b>	Screw mount
<b>FS Range</b>	±2g to ±200g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• UltraStable MEMS</li> <li>• Welded connector, hermetic</li> <li>• &lt;2% TEB (total error band)</li> </ul>
<b>Accuracy</b>	±0.1% non-linearity
<b>Operating Temp.</b>	-55°C to 125°C
<b>Dimensions (mm)</b>	22.9 x 22.9 x 17.1
<b>Typical Applications</b>	Road testing, motion control, flight testing



### 4630M12, 4630M14

<b>Package</b>	Titanium
<b>Type</b>	Screw mount
<b>FS Range</b>	±2g to ±200g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• UltraStable MEMS</li> <li>• Compact, rugged and double shielded cable</li> <li>• &lt;2% TEB (total error band)</li> </ul>
<b>Accuracy</b>	±0.1% non-linearity
<b>Operating Temp.</b>	-55°C to 125°C
<b>Dimensions (mm)</b>	22.9 x 22.9 x 16.0
<b>Typical Applications</b>	Road load testing, transportation testing



### 4332M3

<b>Package</b>	Stainless steel
<b>Type</b>	Screw mount
<b>FS Range</b>	±2g to ±50g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Low noise ranges</li> <li>• Temperature compensated</li> <li>• High over-range</li> </ul>
<b>Accuracy</b>	±1.0% non-linearity
<b>Operating Temp.</b>	-40°C to 115°C
<b>Dimensions (mm)</b>	34.5 x 34.5 x 31.2
<b>Typical Applications</b>	Structural monitoring, bridge testing



### XL403D

<b>Package</b>	Nickel plated aluminum
<b>Type</b>	Screw mount
<b>FS Range</b>	±2g to ±15g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Digital triaxial accelerometer</li> <li>• Smart, onboard processing</li> <li>• Temperature output included</li> </ul>
<b>Accuracy</b>	±0.25% non-linearity
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	36.5 x 25.4 x 17.5
<b>Typical Applications</b>	Smart sensor function, vibration monitoring and alarm functions

## PLUG AND PLAY ACCELEROMETERS

IEPE AC Response



### 7100A, 7101A

Package	Stainless steel/titanium
Type	Center-hole mount
FS Range	±50g to ±2,000g
Unique Features	<ul style="list-style-type: none"> <li>• Single axis, shear mode</li> <li>• Isolated mounting surface</li> <li>• Wide bandwidth, &gt;10 kHz</li> </ul>
Operating Temp.	7100A: -55°C to 150°C 7101A: -55°C to 125°C
Dimensions (mm)	7100A: 9.9 x 22.3, 7101A: 5.8 x 14.5
Typical Applications	Flight testing, general purpose, vibration monitoring



### 7102A

Package	Titanium
Type	Adhesive mount
FS Range	±50g to ±2,000g
Unique Features	<ul style="list-style-type: none"> <li>• Single axis, shear mode</li> <li>• Wide bandwidth</li> </ul>
Operating Temp.	-55°C to +125°C
Dimensions (mm)	4.4 x 11.9
Typical Applications	Small structures monitoring, minimal mass loading, general purpose testing



### 7108A

Package	Stainless steel
Type	Adhesive mounting
FS Range	±50g to ±500g
Unique Features	<ul style="list-style-type: none"> <li>• Single axis, shear mode</li> <li>• Wide bandwidth</li> <li>• Small size</li> </ul>
Operating Temp.	-55°C to 125°C
Dimensions (mm)	9.5 x 10.2
Typical Applications	Vibration monitoring, modal testing, general purpose



### 7104A, 7105A

Package	Stainless steel
Type	Stud mounting
FS Range	±50g to ±2,000g
Unique Features	<ul style="list-style-type: none"> <li>• Single axis, shear mode</li> <li>• Wide bandwidth</li> </ul>
Operating Temp.	-55°C to 125°C
Dimensions (mm)	7104A: 11.11 x 14.10, 7105A: 11.11 x 19.05
Typical Applications	General purpose IEPE accel, vibration monitoring, lab testing



### 7131A, 7132A

Package	Titanium
Type	Adhesive/stud mounting
FS Range	±50g to ±2,000g
Unique Features	<ul style="list-style-type: none"> <li>• Triaxial, shear mode</li> <li>• &gt;12 kHz bandwidth</li> <li>• Hermetically sealed</li> </ul>
Operating Temp.	-55°C to 125°C
Dimensions (mm)	7131A: 11.0 x 11.0 x 11.0, 7132A: 15.2 x 15.2 x 14.5
Typical Applications	General purpose, modal testing, vibration monitoring



### 7135A

Package	Stainless steel
Type	Adhesive mounting
FS Range	±50g to ±500g
Unique Features	<ul style="list-style-type: none"> <li>• Triaxial, through hole mount</li> <li>• Case isolated, internally shielded</li> <li>• Hermetically sealed</li> </ul>
Operating Temp.	-55°C to 125°C
Dimensions (mm)	28.6 x 14.0
Typical Applications	AD&M monitoring, HUMS, structural applications



### 8711-01

Package	Stainless steel
Type	Stud mount
FS Range	±5g to ±500g
Unique Features	<ul style="list-style-type: none"> <li>• Industrial accelerometer</li> <li>• Case isolated, internal shielding</li> <li>• Low cost</li> </ul>
Operating Temp.	-55°C to +125°C
Dimensions (mm)	22.2 x 50.8
Typical Applications	Industrial applications, machine monitoring, wind turbines



### 8011-01, 8021-01

Package	Stainless steel
Type	Stud/center-hole mount
FS Range	±10g to ±100g
Unique Features	<ul style="list-style-type: none"> <li>• Industrial accelerometer</li> <li>• Case isolated, internal shielding</li> <li>• Reverse wiring protection</li> </ul>
Operating Temp.	-55°C to 125°C
Dimensions (mm)	22.2 x 48.3
Typical Applications	Industrial applications, machine monitoring, intrinsic safety



### 8032-01

Package	Stainless steel
Type	Stud mount
FS Range	±50g to ±500g
Unique Features	<ul style="list-style-type: none"> <li>• Industrial accelerometer</li> <li>• Case isolated, internal shielding</li> <li>• Low cost, molded strain relief</li> </ul>
Operating Temp.	-40°C to 100°C
Dimensions (mm)	14.3 x 45.3
Typical Applications	Industrial applications, machine monitoring



### 8811-01

Package	Stainless steel
Type	Stud mount
FS Range	±5g to ±500g
Unique Features	<ul style="list-style-type: none"> <li>• Certified for wind turbines</li> <li>• ±2,500VAC lightning protection</li> <li>• Case isolated, internal shielding</li> </ul>
Operating Temp.	-55°C to +125°C
Dimensions (mm)	22.2 x 50.8
Typical Applications	Industrial applications, machine monitoring, wind turbines

## PLUG AND PLAY ACCELEROMETERS

### 4-20mA AC Accelerometer



#### 8011, 8021-AR/AP

<b>Package</b>	Stainless steel
<b>Type</b>	Stud/center-hole mount
<b>FS Range</b>	5g to 50g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Industrial 4-20mA accelerometer</li> <li>• Case isolated, internal shielding</li> <li>• Top mount or side mount connector</li> </ul>
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	22.2 x 48.3
<b>Typical Applications</b>	Industrial applications, machine monitoring, intrinsic safety



#### 8011, 8021-VR/VP

<b>Package</b>	Stainless steel
<b>Type</b>	Stud/center-hole mount
<b>FS Range</b>	0.5in/sec to 5.0in/sec
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Industrial 4-20mA velocity transmitter</li> <li>• Case isolated, internal shielding</li> <li>• Top mount or side mount connector</li> </ul>
<b>Operating Temp.</b>	-40°C to 85°C
<b>Dimensions (mm)</b>	22.2 x 48.3
<b>Typical Applications</b>	Industrial applications, machine monitoring, intrinsic safety

## PLUG AND PLAY ACCELEROMETERS

### 3 Wire Voltage AC Accelerometer



#### 8102A

<b>Package</b>	Anodized aluminum
<b>Type</b>	Screw mount
<b>FS Range</b>	±25g to ±6,000g
<b>Unique Features</b>	<ul style="list-style-type: none"> <li>• Triaxial PE accel, low cost</li> <li>• Environmentally sealed, rugged</li> <li>• &lt;22µA current consumption</li> </ul>
<b>Operating Temp.</b>	-40°C to 125°C
<b>Dimensions (mm)</b>	25.4 x 21.6 x 10.8
<b>Typical Applications</b>	Impact and shock testing, R&D and lab applications

## PLUG AND PLAY ACCELEROMETERS

### PE Charge Accelerometer



#### 7500A

Package	Stainless steel
Type	Center-hole mount
Sensitivity	7pC/g to 20pC/g
Unique Features	<ul style="list-style-type: none"> <li>• Single axis, shear mode</li> <li>• Hermetically sealed</li> <li>• Isolated mounting surface</li> </ul>
Operating Temp.	-73°C to 260°C
Dimensions (mm)	8.4 x 22.3
Typical Applications	Gearbox vibration monitoring, flight test, high temp. applications



#### 7501A

Package	Titanium
Type	Center-hole mount
Sensitivity	5.6pC/g
Unique Features	<ul style="list-style-type: none"> <li>• Single axis, shear mode</li> <li>• Hermetically sealed</li> <li>• Bandwidth to &gt;15 kHz</li> </ul>
Operating Temp.	-73°C to 260°C
Dimensions (mm)	5.8 x 14.5
Typical Applications	Gearbox vibration monitoring, flight test, high temp. applications



#### 7502A

Package	Titanium
Type	Adhesive mounting
Sensitivity	1.8pC/g
Unique Features	<ul style="list-style-type: none"> <li>• Single axis, shear mode</li> <li>• Hermetically sealed</li> <li>• Miniature, &lt;1 gram</li> </ul>
Operating Temp.	-73°C to 260°C
Dimensions (mm)	4.4 x 11.9
Typical Applications	Small structures monitoring, minimal mass loading, high temp. applications



#### 7504A, 7505A

Package	Stainless steel
Type	Stud mount
Sensitivity	5.6pC/g
Unique Features	<ul style="list-style-type: none"> <li>• Single axis, shear mode</li> <li>• Top and side connector option</li> <li>• &gt;15 kHz Bandwidth</li> </ul>
Operating Temp.	-73°C to 260°C
Dimensions (mm)	7504A; 11.1 x 14.1, 7505A; 11.1 x 19.0
Typical Applications	Small structures monitoring, general purpose, high temp. applications



#### 7514A

Package	Stainless steel
Type	Stud mounting
Sensitivity	30pC/g to 100pC/g
Unique Features	<ul style="list-style-type: none"> <li>• Single axis, shear mode</li> <li>• &gt;12 kHz bandwidth</li> <li>• High sensitivity</li> </ul>
Operating Temp.	-73°C to 260°C
Dimensions (mm)	15.0 x 15.0
Typical Applications	Low frequency vibration, general purpose, high temp. applications



#### 7531A

Package	Titanium
Type	Adhesive mount
Sensitivity	1.8pC/g
Unique Features	<ul style="list-style-type: none"> <li>• Triaxial, shear mode</li> <li>• Miniature, light weight</li> <li>• &gt;10 kHz bandwidth</li> </ul>
Operating Temp.	-73°C to 260°C
Dimensions (mm)	11.0 x 13.6 x 11.0
Typical Applications	High temp. applications, flight testing, structural monitoring

## PLUG AND PLAY ACCELEROMETERS

### Amplifiers



#### 121

Type	Bench top
No. of Channels	3
Gain Range	x0.001 to 9999
Unique Features	<ul style="list-style-type: none"> <li>• Universal DC amplifier</li> <li>• Low noise operation with auto-zero</li> <li>• For bridge type sensors</li> </ul>
Dimensions (mm)	301 x 258 x 102
Typical Applications	Instrumentation labs, test benches, R&D facilities



#### 130

Type	In-line charge converter
No. of Channels	1
Gain Range	x0.1, 1, 10
Unique Features	<ul style="list-style-type: none"> <li>• Low noise, small package</li> <li>• BNC male or female</li> <li>• Wide bandwidth</li> </ul>
Dimensions (mm)	Ø13.8 x 52.2
Typical Applications	Instrumentation labs, high temperature testing PE accelerometer



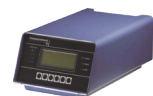
#### 140A & 142A

Type	Inline amplifier with auto-zero
No. of Channels	1
Gain Range	x10, 25, 50, 100, 200
Unique Features	<ul style="list-style-type: none"> <li>• ±1.5 mV auto-zero</li> <li>• 140A for bridge type sensor, 142A for strain gages</li> <li>• 5 to 30 VDC excitation</li> </ul>
Dimensions (mm)	57 x 25 x 13
Typical Applications	Instrumentation labs, test benches, R&D facilities



#### 160

Type	Bench top
No. of Channels	1
Gain Range	x1, 10
Unique Features	<ul style="list-style-type: none"> <li>• Economical IEPE power supply</li> <li>• Portable, compact</li> <li>• Rechargeable battery</li> </ul>
Dimensions (mm)	101 x 83 x 32
Typical Applications	Instrumentation



#### 161

Type	Bench top
No. of Channels	4
Gain Range	x0.001 to 999.9
Unique Features	<ul style="list-style-type: none"> <li>• Charge and IEPE conditioner</li> <li>• Sensitivity normalization</li> <li>• Support IEEE 1451.4 TEDS</li> </ul>
Dimensions (mm)	310 x 180 x 115
Typical Applications	Instrumentation labs, PE/IEPE sensors

# WATER LEVEL SENSORS



## WATER LEVEL DATA LOGGERS



### TruBlue Logger 555 Level, 575 Baro, 585 CTD

Accuracy	±0.05% FS TEB (TruBlue 555, 575, 585) 1% of reading or 20 µs/cm (TruBlue 585)
Range	0 - 692 ft (TruBlue 555, 585) 8 - 16 psia (TruBlue 575) 5 - 200,000µs/cm (TruBlue 585)
Max. Over-range	2X FS (TruBlue 555, 585) 32 psia (TruBlue 575)
Output	RS-485, SDI - 12
Data Logging Memory	8 MB
Operating Temp.	0°C to 50°C
Dimensions (mm)	Ø19.0 x 390.0
Typical Applications	Groundwater monitoring, surface water monitoring, oceanographic research, barometric pressure monitoring



### TruBlue Logger 255 Level

Accuracy	0.05% FS TEB
Range	0 - 658 ft H <sub>2</sub> O
Max. Over-range	3X FS
Output	RS 485, SDI - 12
Data Logging Memory	8 MB or 56 MB
Operating Temp.	0°C to 50°C
Dimensions (mm)	Ø19.0 x 222.0
Typical Applications	Flood and storm monitoring, wave studies and rapid sampling, stream and stage gaging, slug and pump test, aquifer characterization



### TruBlue Logger 275 Baro

Accuracy	0.05% FS TEB
Range	8 - 16 psia
Max. Over-range	3X FS
Output	RS 485, SDI-12
Data Logging Memory	8 MB or 56 MB
Operating Temp.	0°C to 50°C
Dimensions (mm)	Ø19.0 x 222.0
Typical Applications	Barometric pressure monitoring

## DIGITAL LEVEL SENSORS



### KPSI 500, 501

Accuracy	±0.05% FS TEB (KPSI 500) ±0.01 ft H <sub>2</sub> O (KPSI 501)
Range	10 - 230 ft (KPSI 500) 10 - 50 ft (KPSI 501)
Max. Over-range	2X FS
Output	SDI - 12, RS-485
Operating Temp.	-20°C to 60°C
Dimensions (mm)	Ø25.4 x 197.0
Typical Applications	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 <sub>2</sub> O (KPSI 351)
Range	10 - 230 ft (KPSI 353, 355) 10 - 50 ft (KPSI 351)
Max. Over-range	2X FS
Output	SDI - 12, RS-485
Operating Temp.	-20°C to 60°C
Dimensions (mm)	Ø19.0 x 243.0
Typical Applications	Groundwater monitoring, surface water monitoring, oceanographic research



### KPSI 600, 601 - Ceramic

Accuracy	±0.05% FS TEB (KPSI 600) ±0.01 ft H <sub>2</sub> O (KPSI 601)
Range	10 - 230 ft (KPSI 600) 10 - 50 ft (KPSI 601)
Max. Over-range	5X FS
Output	SDI - 12, RS-485
Operating Temp.	-20°C to 60°C
Dimensions (mm)	Ø25.4 x 197.0
Typical Applications	Dissolved gas monitoring, trailrace egress monitoring, ground water monitoring, oceanographic research

## DIGITAL TEMPERATURE SENSORS



	<b>KPSI 380</b>
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)	Ø19.0 x 127.0
Typical Applications	Groundwater monitoring, surface water monitoring, storm water, dam operations and stream gaging

## ANALOG LEVEL SENSORS

1" Bore



	<b>KPSI 700, 710, 720</b>	<b>KPSI 730, 735</b>
Accuracy	±1.00%, ±0.50%, ±0.25% FSO	±0.10%, ±0.05% FSO
Range	Custom ranges from: 2.3 - 700 ft H <sub>2</sub> O (Vented) 10 - 700 ft H <sub>2</sub> O (Sealed) 35 - 700 ft H <sub>2</sub> O (Absolute)	Custom ranges from: 5 - 700 ft H <sub>2</sub> O (Vented: KPSI 730) 0 - 5 ft H <sub>2</sub> O to 0 - 700 ft H <sub>2</sub> O (Sealed, Absolute: KPSI 730) 6 - 700 ft H <sub>2</sub> O (Vented KPSI 735)
Max. Over-range	2X FS	2X FS
Output	4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC	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	-20°C to 60°C
Dimensions (mm)	Ø25.4 x 86.6	Ø25.4 x 86.6
Typical Applications	Groundwater monitoring, surface water monitoring, oceanographic research, pump control, life stations, landfill leachate	Groundwater monitoring, surface water monitoring, oceanographic research, pump control, life stations, landfill leachate
Agency Approvals	CE, WEEE, RoHS, UL and FM (Intrinsically safe)	CE, WEEE, RoHS, UL and FM (Intrinsically safe)

## ANALOG LEVEL SENSORS

0.75" Bore



	<b>KPSI 320, 330, 335, 342</b>	<b>KPSI 300DS</b>
Accuracy	±0.10%, ±0.05% FSO (KPSI 330, 335) ±0.25% FSO (KPSI 320) ±0.25% FS TEB (KPSI 342)	±0.50% FSO
Range	Custom ranges from: 5 - 700 ft H <sub>2</sub> O (Vented: KPSI 320, 330, 335) 10 - 700 ft H <sub>2</sub> O (Vented KPSI 342) 0 - 5 ft H <sub>2</sub> O to 0-700 ft H <sub>2</sub> O (Sealed: KPSI 330, 342) 10 - 700 ft H <sub>2</sub> O (Sealed: KPSI 320) 35 - 700 ft H <sub>2</sub> O (Absolute: KPSI 320, 330, 342)	Custom ranges from: 700 - 6,921 ft H <sub>2</sub> O
Max. Over-range	2X FS	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 (KPSI 342)	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 (KPSI 320, 330, 335) -20°C to 85°C (KPSI 342)	-20°C to 60°C
Dimensions (mm)	Ø19.0 x 151.0	Ø19.0 x 215.0
Typical Applications	Groundwater monitoring, surface water monitoring, oceanographic research, pump control, lift stations, landfill leachate, tailrace and forebay monitoring	Down hole, level control, pump control
Agency Approvals	CE, WEEE, RoHS, UL and FM (Intrinsically safe) (KPSI 320, 330, 335) CE, WEEE, RoHS (KPSI 342)	CE, WEEE, RoHS

## LEVEL SENSORS

OEM Level Sensors



	<b>KPSI 705</b>	<b>KPSI 745, 750</b>	<b>LTA, LT</b>	<b>LTB, LTR</b>
<b>Accuracy</b>	±0.25% FSO	±0.25% FSO	±0.25% FSO	±0.25% FSO
<b>Options</b>	Optional ETFE	Optional standoff (KPSI 745)	Optional lightning protection	Optional lightning protection
<b>Range</b>	Custom ranges from 6 - 115 ft H <sub>2</sub> O	Custom ranges from 10 - 115 H <sub>2</sub> O	0 - 1 psi up to 0 - 300 psi Custom ranges available	0 - 11.5, 23.1, 34.6, 69.2, 115.4 ft H <sub>2</sub> O Custom ranges available
<b>Max. Over-range</b>	2X FS	2X FS	2X FS	2X FS
<b>Output</b>	4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC	4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC	4 - 20 mA	4 - 20 mA, 0 - 5 VDC, 0 - 10 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 1.5 - 7.5 VDC
<b>Operating Temp.</b>	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C
<b>Dimensions (mm)</b>	Ø25.4 x 86.6	KPSI 745: Ø88.9 x 279.4 (With standoff) Ø88.9 x 253.3 (Without standoff) KPSI 750: Ø104.1 x 279.4	LTA: Ø25.4 x 93.0 LT: Ø25.4 x 170.5 (Dependent on fitting)	LTB: Ø104.1 x 206.5 LTR: 287.1 with overmold conduit connection, 253.5 with gland seal conduit connection
<b>Typical Applications</b>	Wastewater, lift stations, pump control, slurry tank liquid level, tank level	Wastewater, lift stations, pump control, slurry tank liquid level, tank level	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	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
<b>Agency Approvals</b>	CE, WEEE, RoHS, UL and FM (Intrinsically safe)	CE, WEEE, RoHS, UL and FM (Intrinsically safe)	CE, WEEE, RoHS, with optional UL, CUL, and FM (Intrinsically safe)	CE, WEEE, RoHS, with optional UL, CUL, and FM (Intrinsically safe)

## NON-SUBMERSIBLE PRESSURE TRANSDUCERS

OEM Level Sensors



	<b>KPSI 27, 28</b>	<b>KPSI 30</b>
<b>Accuracy</b>	±0.5%, ±0.25%	±0.1%
<b>Options</b>	IP68 submersible option	IP68 submersible option
<b>Range</b>	1 - 300 psi (Vented) 5 - 2000 psi (Sealed) 15 - 2,000 psi (Absolute)	2 - 300 psi (Vented) 5 - 500 psi (Sealed, absolute)
<b>Max. Over-range</b>	2X FS	2X FS
<b>Output</b>	4-20 mA, 0-5 VDC, 0-2.5 VDC 0-4 VDC, 0-10 VDC, 1.5-7.5 VDC	4-20 mA, 0-5 VDC, 0-2.5 VDC 0-4 VDC, 0-10 VDC, 1.5-7.5 VDC
<b>Operating Temp.</b>	-20°C to 60°C	-20°C to 60°C
<b>Dimensions (mm)</b>	Ø25.4 x 86.6	Ø25.4 x 86.6
<b>Typical Applications</b>	Line pressure monitoring, pump and lift stations, pump control, tank level monitoring, underwater research	Line pressure monitoring, pump and lift stations, pump control, tank level monitoring, underwater research
<b>Agency Approvals</b>	CE, WEEE, RoHS, UL and FM (Intrinsically safe)	CE, WEEE, RoHS, UL and FM (Intrinsically safe)

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## 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

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

## Over-range Limit

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

## Plug and Play

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

## Root Mean Square

The square root of the arithmetical mean of a set of squared instantaneous values

## Sealing

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

## Sensitivity

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

## Thermal Sensitivity Shift (TSS)

The change in sensitivity of the sensor as a function of temperature. It is usually expressed as a percent reading change in sensitivity for a specified change in temperature such as  $\pm 0.01\%/^{\circ}\text{C}$  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  $\pm 0.01\%\text{FSO}/^{\circ}\text{C}$  or in voltage units such as  $\pm 0.2\text{ mV}/^{\circ}\text{C}$  and it is not a linear function.

## Total Error Band (TEB)

Typically expressed as a percentage, the TEB is the combination of possible errors for a sensing device within its measurement range and temperature of operation.



<b>ABS</b>	American Bureau of Shipping	<b>IP</b>	Ingress Protection	<b>PSIS</b>	Pounds Per Square Inch-Sealed Gage Reference
<b>AC</b>	Alternating Current	<b>ISO</b>	International Organization for Standardization	<b>PTFE</b>	Polytetrafluoroethylene
<b>ANSI</b>	American National Standards Institute	<b>ITAR</b>	International Traffic in Arms Regulations	<b>PUDF</b>	Public Use Data File
<b>ASIC</b>	Application-Specific Integrated Circuit	<b>KHZ</b>	Kilohertz	<b>PWM</b>	Pulse Width Modulation
<b>ATEX</b>	Appareils destinés à être utilisés en ATmosphères EXplosibles	<b>LED</b>	Light Emitting Diode	<b>R&amp;D</b>	Research and Development
<b>BOP</b>	Blow Out Prevention	<b>LIN</b>	Local Interconnect Network	<b>RDT&amp;E</b>	Research, Development, Test & Evaluation
<b>CAN</b>	Controller Area Network	<b>LVD</b>	Low Voltage Differential	<b>RFI</b>	Radio Frequency Interference
<b>CE</b>	Communauté Européenne	<b>LVDT</b>	Linear Variable Displacement Transducers	<b>RH</b>	Relative Humidity
<b>CENELEC</b>	European Committee for Electrotechnical Standardization	<b>mA</b>	Milliamp	<b>RMS</b>	Root Mean Square
<b>CSA</b>	Canadian Standards Association	<b>MAF</b>	Mass Air Flow	<b>ROHS</b>	Restriction of Hazardous Substances
<b>CT</b>	Computed Tomography	<b>mbar</b>	Millibar	<b>RPM</b>	Revolutions Per Minute
<b>cUL</b>	Tested to Canadian Standards by Underwriters' Laboratories	<b>MCR</b>	Main Control Room	<b>RTD</b>	Resistance Temperature Detector
<b>DC</b>	Direct Current	<b>MEMS</b>	Microelectromechanical Systems	<b>RTU</b>	Remote Terminal Unit
<b>DCS</b>	Distributed Control System	<b>mHZ</b>	Megahertz	<b>RVDT</b>	Rotary Variable Differential Transformer
<b>DEF</b>	Diesel Exhaust Fluid	<b>mm</b>	Millimeter	<b>SAE</b>	Society of Automotive Engineering
<b>DTC</b>	Digital Temperature Compensation	<b>MGS</b>	Military Qualification Standards	<b>SCADA</b>	Supervisory Control and Data Acquisition
<b>ECU</b>	Engine Control Unit	<b>MR</b>	Magnetostrictive	<b>SCR</b>	Selective Catalytic Reduction
<b>EGR</b>	Exhaust Gas Recirculation	<b>mV</b>	Millivolt	<b>SDI-12</b>	Serial Data Interface at 1200 Baud
<b>EMC</b>	Electromagnetic Compatibility	<b>NAV</b>	Navigation	<b>SMD</b>	Surface Mount Device
<b>EMI</b>	Electromagnetic Interference	<b>NASA</b>	National Aeronautics and Space Administration	<b>SpO<sub>2</sub></b>	Pulse Oximeter Oxygen Saturation
<b>ESA</b>	European Space Agency	<b>NEMA</b>	National Electrical Manufacturers Association	<b>SPDT</b>	Single Pole, Double Throw
<b>FLS</b>	Field Loadable Software	<b>NIST</b>	National Institute of Standards and Technology	<b>SPI</b>	Serial Peripheral Interface
<b>FM</b>	Factory Mutual	<b>NOx</b>	Nitrogen Oxide	<b>SPST</b>	Single Pole, Single Throw
<b>FPGA</b>	Field Programmable Gate Array	<b>NPT</b>	National Pipe Tapered	<b>T&amp;M</b>	Test & Measurement
<b>FS</b>	Full Scale	<b>NSF</b>	National Science Foundation	<b>TDFN</b>	Thin Dual Flats No Leads
<b>FSO</b>	Full Scale Output	<b>NTC</b>	Negative Temperature Coefficient	<b>TE</b>	TE Connectivity
<b>FT LBS</b>	Foot Pounds	<b>OEM</b>	Original Equipment Manufacturer	<b>TEB</b>	Total Error Band
<b>GPS</b>	Global Positioning System	<b>PCB</b>	Printed Circuit Board	<b>TESS</b>	TE Sensor Solutions
<b>HUMS</b>	Health Usage and Monitoring System	<b>PDF</b>	Portable Document Format	<b>THSA</b>	Trimmable Horizontal Stabilizer Actuators
<b>HVACR</b>	Heating, Ventilation, Air Conditioning, and Refrigeration	<b>PDM</b>	Pulse Density Modulation	<b>TPMS</b>	Tire Pressure Monitoring System
<b>HVD</b>	High-Voltage Differential	<b>PE</b>	Piezoelectric	<b>TSYS</b>	Temperature System Sensor
<b>HZ</b>	Hertz	<b>PLCD</b>	Permanent Magnet Linear Displacement Sensor	<b>UAV</b>	Unmanned Aerial Vehicle
<b>I<sup>2</sup>C</b>	Inter-Integrated Circuit	<b>PPS</b>	Polyphenylene Sulfide	<b>uC</b>	Microcontroller
<b>IEC</b>	International Electrical Commission	<b>PSI</b>	Pounds Per Square Inch	<b>UL</b>	Underwriters Laboratories
<b>IECEX</b>	International Electrotechnical Commission Explosive	<b>PSIA</b>	Pounds Per Square Inch-Absolute Reference	<b>USB</b>	Universal Serial Bus
<b>IEEE</b>	Institute of Electrical and Electronics Engineers	<b>PSID</b>	Pounds Per Square Inch-Differential Reference	<b>VAV</b>	Variable Air Volume
<b>IEPE</b>	Integral Electronic Piezoelectric	<b>PSIG</b>	Pounds Per Square Inch-Gage Reference	<b>VDC</b>	Volts Direct Current
				<b>WEEE</b>	Waste Electrical and Electronic Equipment

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