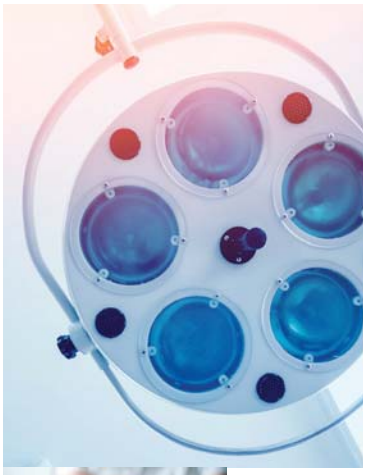
SENSOR SOLUTIONS

SENSOR SOLUTIONS

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

WIRELESS DEMO AND DEVELOPMENT KITS

	Environmental Sensor Tag	M5600	U5600
Type	Humidity, Temperature, Pressure	Pressure	Pressure
Specifications	• 0 - 100% RH • 300 to 1,200 mbar	• 50 - 15K psi • Type G/S/C	• 2 - 10K psi • Type G/S/C/A
Communication Interface	Standard 2.4 GHz wireless communication	Standard 2.4 GHz wireless communication	Standard 2.4 GHz wireless communication
Application	iOS 7.0+ Android™ 4.3+	iOS 7.0+ Android™ 4.3+	iOS 7.0+ Android™ 4.3+
Operating Temp.	20°C to 85°C	-20°C to 85 °C	-20°C to 85°C

SHIELDS AND HATS

	Arduino Weather Shield	Raspberry Pi™ Sensors Weather Hat	PicTail Plus
Type	Humidity, Temperature, Pressure	Humidity, Temperature, Pressure	Humidity, Temperature, Pressure
Sensors	HTU21D, MS5637, MS8607, TSYS01*, TSD305	HTU21D, MS5637, TSYS01*, TSD305	HTU21DF, MS5637, TSYS01*, MS8607
Specifications	• 0 - 100% RH • 20°C to 85°C • 300 to 1,200 mbar	• 0 - 100% RH • 20°C to 85°C • 300 to 1,200 mbar	• 0 - 100% RH • -20°C to 85°C • 300 to 1,200 mbar
Communication Interface	I²C	I²C	I²C
Partner Board	Arduino / Genuino	Raspberry Pi™	Microchip Explorer 16

WING BOARDS

	HTU21D	MS5637	MS8607	TSYS01*	TSYS02D*	KMA36(A)
Type	Humidity	Pressure	Pressure, Temperature, Humidity	Temperature	Temperature	Angular Position
Specifications	• 0 to 100% RH • -40°C to 125°C • 3.3 to 5.5 V	• 10 to 2,000 mbar • -40°C to 85°C • 1.5 to 3.6 V	• 10 to 2,000 mbar • -40°C to 85°C • 0 to 100% RH • 1.5 to 3.6 V	• -40°C to 125°C • 2.2 to 3.6 V	• -40°C to 125°C • 1.5 to 3.6 V	• 0 to 360° • -25°C to 85°C • 2.9 to 6.0 V
Accuracy	±3% RH	±2 mbar	±3% RH, ±2 mbar, ±1.0°C	±0.1°C	±0.2°C	±0.1°
Communication Interface	I²C	I²C	I²C	I²C	I²C	I²C
Compatibility	Configured to operate with the Xplained Pro development platform	Configured to operate with the Xplained Pro development platform	Configured to operate with the Xplained Pro development platform	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	MS5637	MS8607	TSYS01*	TSYS02D*	KMA36(A)
Type	Humidity	Pressure	Pressure, Temperature, Humidity	Temperature	Temperature	Angular Position
Specifications	• 0 to 100% RH • -40°C to 125°C • 3.3 to 5.5 V	• 10 to 2,000 mbar • -40°C to 85°C • 1.5 to 3.6 V	• 10 to 2,000 mbar • -40°C to 85°C • 0 to 100% RH • 1.5 to 3.6 V	• -40°C to 125°C • 2.2 to 3.6 V	• -40°C to 125°C • 1.5 to 3.6 V	• 0° to 360° • -25°C to 85°C • 2.9 to 6.0 V
Accuracy	±3% RH	±2 mbar	±3% RH, ±2 mbar, ±1.0°C	±0.1°C	±0.2°C	±0.1°
Communication Interface	I²C	I²C	I²C	I²C	I²C	I²C
Compatibility	Development systems compatible with Digilent Pmod™ connections	Development systems compatible with Digilent Pmod™ connections	Development systems compatible with Digilent Pmod™ connections	Development systems compatible with Digilent Pmod™ connections	Development systems compatible with Digilent Pmod™ connections	Development systems compatible with Digilent Pmod™ connections




	MS5611	MS5837	MS5805	TSD305
Type	Pressure	Pressure	Pressure	Temperature
Specifications	• 10 to 1,200 mbar • -40°C to 85°C • 1.5 to 3.6 V	• 10 to 2,000 mbar • -40°C to 85°C • 1.5 to 3.6 V	• 10 to 2,000 mbar • -40°C to 85°C • 1.8 to 3.6 V	• -10°C to +85°C • 1.68 to 3.6 V
Accuracy	±2 mbar	±2 mbar	±2 mbar	±1°C
Communication Interface	I²C	I²C	I²C	I²C
Compatibility	Development systems compatible with Digilent Pmod™ connections	Development systems compatible with Digilent Pmod™ connections	Development systems compatible with Digilent Pmod™ connections	Development systems compatible with Digilent Pmod™ connections

GROVE SYSTEM

	KMA36
Type	Angular Position
Specifications	• 0 to 360° • -25°C to 85°C • 5.0 V
Accuracy	±0.1°
Comm. Interface	I²C
Compatibility	Development platform compatible with grove systems

	TSYS01*
Type	Temperature
Specifications	• -40°C to 125°C • 5.0 V
Accuracy	±0.1°C
Comm. Interface	I²C
Compatibility	Development platform compatible with grove systems

	TSYS02*
Type	Temperature
Specifications	• -40°C to 125°C • 5.0 V
Accuracy	±0.2°C
Comm. Interface	I²C
Compatibility	Development platform compatible with grove systems

	MS5637
Type	Pressure
Specifications	• 10 to 2,000 mbar • -40°C to 85°C • 5.0 V
Accuracy	±2 mbar
Comm. Interface	I²C
Compatibility	Development platform compatible with grove systems

	MS8607
Type	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	I²C
Compatibility	Development platform compatible with grove systems

	HTU21D
Type	Humidity
Specifications	• 0 to 100% RH • -40°C to 125°C • 5.0 V
Accuracy	±3% RH
Communication Interface	I²C
Compatibility	Development platform compatible with grove systems

	MS5611
Type	Pressure
Specifications	• 10 to 1,200 mbar • -40°C to 85°C • 5.0 V
Accuracy	±2 mbar
Communication Interface	I²C
Compatibility	Development platform compatible with grove systems

	MS5837
Type	Pressure
Specifications	• 10 to 2,000 mbar • -40°C to 85°C • 5.0 V
Accuracy	±2 mbar
Communication Interface	I²C
Compatibility	Development platform compatible with grove systems

	MS5805
Type	Pressure
Specifications	• 10 to 2,000 mbar • -40°C to 85°C • 5.0 V
Accuracy	±2 mbar
Communication Interface	I²C
Compatibility	Development platform compatible with grove systems

	TSD305
Type	Temperature
Specifications	• -10°C to +85°C • 5.0 V
Accuracy	±1°C
Communication Interface	I²C
Compatibility	Development platform compatible with grove systems

FLOW SENSORS

MASS AIR FLOW SENSORS

	LMM-H03	LMM-H04
Package	Hybrid	Hybrid
Type	• Hot film anemometer component • Bidirectional	• Hot film anemometer component • Unidirectional
Operating Temp.	-40°C to 125°C	-40°C to 125°C
Unique Features	High sensitivity at low heater temperatures, fast response time, true air temperature sensor	High sensitivity at low heater temperatures, fast response time, true air temperature sensor
Calibration/Accuracy	Dependent on electronics	Dependent on electronics
Dimensions (mm)	23 x 10.15 x 1.1	24 x 10.15 x 1.1
Typical Applications	Air intake of combustion engine, spirometer, industrial gas flow	Air intake of combustion engine, spirometer, industrial gas flow

FLOW SWITCHES

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

FORCE SENSORS

LOAD CELLS

Low Cost OEM

	FX19	FX29	FS19
Package	Low profile “coin cell” design	Welded miniature compression load cell, Analog and Digital options	Stainless steel housing with flexible PCB
Operating Mode	Compression	Compression	Compression
Unique Features	• Low cost, low strain design • Essentially unlimited cycle life	• Best price to performance • Designed for unlimited cycles and high over-range	• Low cost • Small size and light weight
FS Ranges	10 to 200 lbf 50 to 100 Newton	10 to 100 lbf 50 to 500 Newton	500 to 3,000 grams-force 5 to 30 Newton
Max. Over-range	2.5X FS	2.5X FS	2X FS
Output/Span	100 mV	100 mV, 0.5-4.5 VDC, Digital (I^2C)	100 mV
Combined Linearity & Hysteresis	±1.0% FSO	±1.0% FSO	±1.0% FSO
Operating Temperature	0°C to 50°C	0°C to 50°C	0°C to 40°C
Dimensions (mm)	Ø25.00 x 8.00	Ø19.70 x 4.95	Ø9.5 x 3.45
Typical Applications	Consumer OEM, exercise machines, physical therapy, vending machines, appliances, pumps, medical devices	Consumer OEM, exercise machines, physical therapy, vending machines, appliances, pumps, medical devices	Infusion pump, load sensing, contact sensing, weighing, household appliances

	FS20	FC22	FC23
Package	Miniature, drop in replacement for industry standard	Plastic housing, button, flange mounting	Stainless steel housing button shape for higher weight loads
Operating Mode	Compression	Compression	Compression
Unique Features	• Load cell design operates at very low strains • Not subject to lead die fatigue	• Low cost button shape • Essentially unlimited cycle life	• Industry standard low profile all stainless steel design • Resistant to off-axis loads
FS Ranges	500 to 5,000 grams-force 5 to 50 Newton	10 to 100 lbf 50 to 500 Newton	50 to 2,000 lbf 250 to 1,000 Newton
Max. Over-range	2.5X FS	2.5X FS	2.5X FS
Output/Span	0.5-4.5 VDC, 1.0-4.0 VDC	100 mV, 0.5-4.5 VDC	100 mV, 0.5-4.5 VDC
Combined Linearity & Hysteresis	±1.0% FSO	±1.0% FSO	±1.0% FSO
Operating Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	30.708 x 17.272 x 8.255	Ø26.00 x 42.00 x 19.50	Ø31.75 x 10.20
Typical Applications	Infusion pumps, contact sensing, medical devices, consumer appliances	Infusion pumps, robotics end-effectors, exercise machines, contact sensing, appliances	Batch weighing, robotics, assembly line force, printing presses, pumps, winch and hoist

LOAD CELLS

Standard

	FMT	FN1010	FN2420	FN3000, FN3050	FN3002
Package	Washer	Load pin design	Very high capacity load button	Pan-cake	Very high capacity dual stud
Operating Mode	Compression	Tension and compression	Compression	Tension and compression	Tension and compression
Unique Features	• High stiffness • Clamping and bolt forces • High temperature option	• Keyed anti-rotation slot • Bidirectional available • Optional watertight construction	• High stiffness • Optional load button • Optional high level output module	• High stability • All FN3050 have same housing • Optional high level output	• Threaded male fitting • Integrated amplifier • Optional rod end
FS Ranges	4K to 64K lbf 20K to 320K Newton	2K to 400K lbf 10K to 2,000K Newton	4K to 1000K lbf 20K to 5,000K Newton	20 to 200K lbf 100 to 1,000K Newton	2K to 400K lbf 10K to 2,000K Newton
Max. Over-range	1.5X FS	1.5X FS	1.5X FS	1.5X FS (10X FS with stops)	1.5X FS
Output/Span	±20 mV	±20 mV, 0.5-4.5 VDC, 4-20 mA	±20 mV, 0.5-4.5 VDC	±20 mV, 0.5-4.5 VDC	±20 mV, 0.5-4.5 VDC
Combined Linearity & Hysteresis	±1.5% FS	±1% FS	±0.25% FS	±0.1% FS	±0.25% FS
Operating Temperature	-20°C to 80°C	-20°C to 80°C	-40°C to 150°C	-40°C to 150°C	-40°C to 150°C
Dimensions (mm)	Range dependent	Range dependent	Range dependent	Range dependent	Range dependent
Typical Applications	Robotics, process control, bolt clamping for bridges	Crane monitoring, offshore, load-limited devices	Calibration presses, robotics and effectors, laboratory and research	Static fatigue tests, laboratory and research, robotics	Assembly forces, tool force, offshore

	FN3030	FN3148	FN9620	FN9630, FN9635
Package	S-beam	S-beam with stops	S-beam	Very high accuracy pan-cake
Operating Mode	Tension and compression	Tension and compression	Tension and compression	Tension and compression
Unique Features	• Optional rod ends • Optional high level output • Optional high compensation temperature	• Very high accuracy • High resolution • Mechanical stops	• High accuracy • IP68 • Entry level	• High stability & accuracy • Connection flange supplied for model FN9635 • Minimal cross effect
FS Ranges	10 to 20K lbf 50 to 100K Newton	2 to 400 lbf 10 to 2,000 Newton	100 to 2,000 lbf 500 to 10K Newton	2K to 40K lbf 10K to 200K Newton
Max. Over-range	1.5X FS	5X to 100X FS	1.5X FS	3X FS
Output/Span	±20 mV, 0.5-4.5 VDC	±20 mV, 0.5-4.5 VDC	±10 mV to ±20 mV	±20 mV
Combined Linearity & Hysteresis	±0.1% FS	±0.05% FS	±0.05% FS	±0.08% FS
Operating Temperature	-40°C to 150°C	-40°C to 120°C	-40°C to 90°C	-40°C to 90°C
Dimensions (mm)	Range dependent	Range dependent	56 x 20 x 60	Range dependent
Typical Applications	Laboratory and research, process control, customized options	Product validation tests, medical instruments, weighing	Test bed, dynamic fatigue testing, robotics and effectors	Static fatigue tests, weighing calibration, robotics

FORCE LOAD CELLS

Miniature Load Cells





	ELAF	XFC200R	XFL212R	XFTC300	XFU400
Package	Button, dual stud	Small diameter load button	Low profile load button	Low/high capacity dual stud	Miniature rod end
Operating Mode	Tension and compression	Compression	Compression	Tension and compression	Tension and compression
Unique Features	• Low cost, small profile • Microfuse technology • Low off-axis response	• High stiffness • High overload capacity • Static and dynamic	• Extremely flat • Integrated load button • Small diameter	• High stiffness • High overload capacity • Threaded male/ female fitting	• High stiffness • High accuracy • High temperature
FS Ranges	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
Max. Over-range	2.5X FS	2X FS	2X FS	2X FS	1.5X FS
Output/Span	±100 mV, 0.5-4.5 VDC	±100 mV	±100 mV	±100 mV, 0.5-4.5 VDC	±100 mV
Combined Linearity & Hysteresis	±0.25% FS	±0.5% FS	±1% FS	±0.5% FS	±0.3% FS
Operating Temperature	-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
Dimensions (mm)	Range dependent	Ø10 to Ø16	Ø12.5 x 3.5	Range dependent	Range dependent
Typical Applications	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


	FN7110	FN7325
Package	Dual S-beam range	Custom design and ranges available upon request
Operating Mode	Tension and compression	Multiaxial force and torque
Unique Features	• High resolution • Optional high level output • Double range	• Measures load and torque in 3 directions, 6DOF total • Fatigue rated • Minimal cross effects
FS Ranges	2 to 2,000 lbf 10 to 10K Newton	1K to 50K lbf 5K to 250K Newton
Max. Over-range	1.2X FS	1.2X FS
Output/Span	±20 mV, 0.5-4.5 VDC	±150 mV, 0.5-4.5 VDC
Combined Linearity & Hysteresis	±0.1% FS	±1% FS
Operating Temperature	-20°C to 80°C	-20°C to 80°C
Dimensions (mm)	60 x 30 x 100	Range dependent
Typical Applications	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	FN2317	FN2570	FN4055
Package	Brake pedal	Hand brake	Brake pedal	Seat belt sensor
Operating Mode	Compression	Compression	Compression	Tension
Unique Features	• High accuracy • Extra flat • Compact	• Easily installed • Ergonomic design • Fits most vehicles	• High accuracy • Compact and extra flat • Rugged, stainless steel design	• Low operating ranges • Protected against overload • Compatible with most seat belts
FS Ranges	40 to 500 lbf 200 to 2,500 Newton	100 to 200 lbf 500 to 1,000 Newton	40 to 500 lbf 200 to 2,500 Newton	20 to 60 lbf 100 to 300 Newton
Max. Over-range	1.5X FS	1.5X FS	1.5X FS	10X FS
Output/Span	±20 mV, 0.5-4.5 VDC	±20 mV, 0.5-4.5 VDC	±20 mV	±20 mV
Combined Linearity & Hysteresis	±1% FS	±0.5% FS	±2.5% FS	±0.25% FS
Operating Temperature	-20°C to 80°C	-20°C to 80°C	-20°C to 80°C	-20°C to 80°C
Dimensions (mm)	Range dependent	100 x 20 x 15	59 x 59 x12.5	63.5 x 63.5 x 12.7
Typical Applications	Brake pedal, clutch pedal, test bed	Hand brake, test bed	Brake pedal, clutch pedal, test bed	Auto crash testing, tension at the belt receptacle

	FN4070 & FN4080	FN7080	EL20-S458
Package	Seat belt buckle sensor	Gear stick design	Special purpose seat belt load cell for automotive crash testing
Operating Mode	Tension	Multi-axial	Seat belt tension
Unique Features	• High operating ranges • Detachable tongue and cable • Compatible with most seat belts	• Measures force in three directions • Replaces gear knob • Ease of mounting	• Mass optimized to minimize acceleration induced errors during SAE J2570 ATD and ISO 6487 • Optional high level and linearized outputs • Smoothed design and slotted titanium axles eliminate drag errors and dummy damage
FS Ranges	200 to 8,000 lbf 1K to 40K Newton	40 to 100 lbf 200 to 500 Newton	1,000 to 5,000 lbf 5K to 25K Newton
Max. Over-range	1.5X FS	1.2X FS	2X FS
Output/Span	±20 mV	±20 mV, 0.5-4.5 VDC	±20 mV, 0.5-4.5 VDC
Combined Linearity & Hysteresis	±0.5% FS	< ±0.3% FS	±0.5% FS
Operating Temperature	-20°C to 80°C	-20°C to 80°C	-40°C to 120°C
Dimensions (mm)	Range dependent	Ø25 spherical	66 x 35 x 16.5
Typical Applications	Auto crash testing, tension at the belt receptacle	Change gear force measurement, roughness of material	Seat belt forces, safety and restraint system crash test, parachute tether and riser forces

FORCE LOAD CELLS

Digital Display Meters

	ARD154	CPA150	M210
Package	Din rail mountable	Hand held indicator	Front panel or housed in case
Type	Signal conditioning for wheatstone bridge sensors	Portable display suited for strain gage type sensors	Signal conditioning and display meter
No. of Channels	Four	Two	One
Unique Features	• Suited for full bridge strain gage sensors • Test stands and process industries • 2 kHz or 20 kHz max. bandwidth	• Suited for 1 or 2 sensors • 45 hour life battery • Calibration pushbutton from 0.1 to 10 mV/V	• Red LED display: ±2,000 count • High bandwidth: 1,000 Hz at -3 dB • Low noise level
Output/Span	±10 VDC or 4-20 mA current output	Display only	±10 VDC
Accuracy	±0.01% FS	±0.005% FS	±0.05% FS
Operating Temperature	-10°C to 60°C	-10°C to 50°C	0°C to 50°C
Dimensions (mm)	99 x 17.5 x 112	90 x 34 x 152	96 x 48 x 155
Typical Applications	Test stands, power plants, manufacturing systems, test and measurement, test bed regulation, automat interfaces	Outdoor punctual measurements, test and measurement, portable calibration device	High bandwidth test bed display, monitoring, laboratory and research, process control equipment

	M905	121	140A / 142A
Package	Front panel or housed in case	Bench top	Inline amplifier
Type	Display suited for process or strain gage type sensors	DC amplifier and signal conditioner	DC amplifier and auto-zero
No. of Channels	One	Three	one
Unique Features	• Suited for process or strain gage type sensors • 5 digits: -19999 to 19999 • Front panel programming	• 0.001 to 9999 • Low noise operation with auto-zero • For bridge type sensors • µP controlled, programmable • Low pass filter options	• ±1.5 mV auto-zero • For bridge type sensor (140A) • For strain gage (142A) • x10, x25, x50, x100, x200 gain • 5 to 30 VDC excitation
Output/Span	±10 VDC or 4-20 mA current output	±10 VDC	0.5-4.5 VDC, ref to 2.5 VDC
Accuracy	±15 bits, 20 sample/sec	±0.1% FS	±0.5% FS
Operating Temperature	-10°C to 60°C	0°C to 50°C	-10°C to 50°C
Dimensions (mm)	96 x 48 x 60	301 x 258 x 102	56.9 x 25.4 x 12.7
Typical Applications	Display on test bed, monitoring, laboratory and research	Instrumentation labs, test benches, R&D facilities	Instrumentation labs, test benches, R&D facilities

HUMIDITY SENSORS

HUMIDITY AND TEMPERATURE (NTC) COMPONENTS

Analog Voltage and Digital Output

	HS1101LF	HTU2X	HTU2XF
Package	Through hole TO39 with side opening plastic cap	DFN type	DFN type
Type	Capacitive humidity	Digital RH and NTC temperature	Digital RH and NTC temperature
Operating RH Range	0 to 100% RH	0 to 100% RH	0 to 100% RH
Operating Temp.	-60°C to 140°C	-40°C to 125°C	-40°C to 125°C
Unique Features	• Robust and recognized component • Suitable for most humidity applications • Cost effective solution	• Low power consumption • Fast response time • Very low temperature coefficient • I^2C interface or PWM interface or SDM interface	• Low power consumption • Fast response time • Very low temperature coefficient • I^2C interface or PWM interface or SDM interface • Optimal filter
Accuracy	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
Dimensions (mm)	10 x 10 x 19	3.0 x 3.0 x 1.0	3.0 x 3.0 x 1.0
Typical Applications	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 appliance, printer, medical, HVACR

HUMIDITY AND TEMPERATURE (NTC) MINI-MODULES

Analog Voltage and Digital Output

	HTU3535PVBM/Wire	HTU383X/Wire	HTG351xCH
Package	Cost effective, small size mini-module	Cost effective small size mini-module	Cost effective small size mini-module
Type	Analog voltage RH and NTC temperature	Digital RH and NTC temperature	Analog voltage RH and NTC temperature
Operating RH Range	0 to 100% RH	0 to 100% RH	0 to 100% RH
Operating Temp.	-40°C to 110°C	-40°C to 110°C	-40°C to 110°C
Unique Features	• PTFE filter (Optional) • Electronics fully protected (5 V) • Multiple connector choices (JST, Samtec board to board through hole) • Based on HTU21	• PTFE filter (Optional) • Electronics fully protected (5 V) • Multiple connector choices (JST, Samtec board to board through hole) • Based on HTU21	• Electronics fully protected with potting material (3.3 V or 5 V) • Multiple connector choices (JST, Samtec board to board through hole)
Calibration	±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
Dimensions (mm)	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
Typical Applications	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	HM1520LF	HTM2500LF
Package	Probe, RH only	Probe, RH only	Probe, RH and temperature
Type	Cost effective analog voltage RH probe	Dedicated to low RH accurate measurement	Cost effective analog voltage RH
Operating RH Range	0 to 100% RH	0 to 100% RH	0 to 100% RH
Operating Temp.	-40°C to 60°C	-40°C to 60°C	-40°C to 85°C
Unique Features	• Electronics fully protected with potting material • Optional wiring length and connectors	• Electronics fully protected with potting material • Optional wiring length and connectors	• Electronics fully protected with potting material • Optional wiring length and connectors
Calibration	±3% RH at 55% RH	±3% RH at 10% RH	±3% RH at 55% RH; ±0.25°C at 25°C
Dimensions (mm)	57 x 11 x 11 (Standard wire length of 200 mm)	57 x 11.5 x 11.5 (Standard wire length of 200 mm)	86 x 11.5 x 11.5 (Standard wire length of 200 mm)
Typical Applications	Medical, telecommunication cabinets, green houses, process control, industrial	Medical, drying cabinets, low humidity, meteorology	Hygrostat, data loggers, cabinets

HUMIDITY AND TEMPERATURE (NTC) SENSORS

Frequency Output Systems (Digital)

	HTF3000LF
Package	PCB for board to board
Type	Frequency output for RH, direct NTC for temperature
Operating RH Range	0 to 100% RH
Operating Temp.	-40°C to 85°C
Unique Features	• Voltage supply from 3 to 8 VDC • Through hole or SMD • T and R available
Calibration	±3% RH at 55% RH; ±0.25°C at 25°C
Dimensions (mm)	12.5 x 18.5 x 11.2
Typical Applications	HVACR, printer, cabin comfort, hygrostat

LIQUID LEVEL SENSORS

LIQUID LEVEL SWITCHES
Side Entry






	LS304-31	LS509-51	LS809-31	LDS309-11N	LCS-03	RCS01-10
Package	Glass filled nylon 6.6	Glass filled PPS	Glass filled polypropylene	Glass filled nylon 6.6	Acetal/Polypropylene	Polypropylene
Type	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor
Unique Features	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
Max. Pressure	4.7 bar	4.7 bar	2.0 bar	4.7 bar	0.34 bar	4.7 bar
Operating Temp.	-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
Dimensions (mm)	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
Typical Applications	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






	VS309-51N	VS804-21	VCS-04	VCS-06	EVS312-11N	EVS722-51
Package	Glass filled nylon 6.6	Glass filled polypropylene	Polypropylene	Nylon 6.6	Nylon 6.6	Brass/ Polypropylene
Type	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor
Unique Features	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
Max. Pressure	4.7 bar	4.7 bar	1.3 bar	1.3 bar	4.7 bar	4.7 bar
Operating Temp.	-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
Dimensions (mm)	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
Typical Applications	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 sytems	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

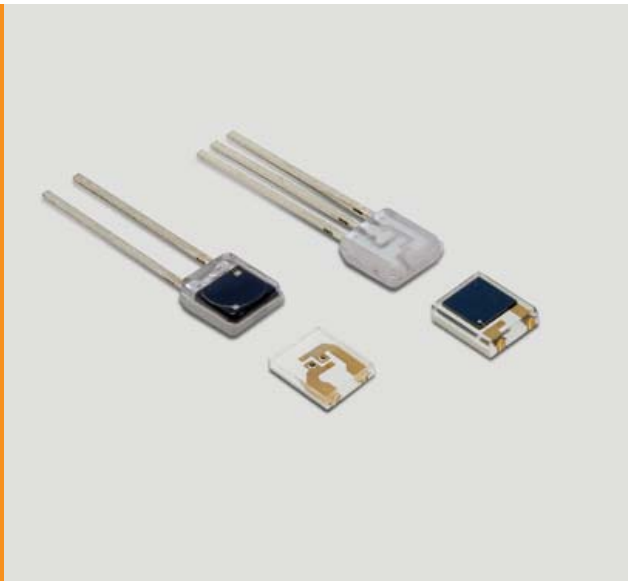
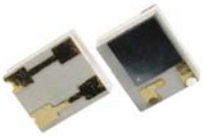
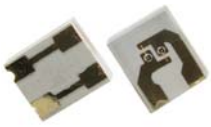


PHOTO OPTIC SENSORS

Photo Optic Components



	ELM-4000	EPM-4001	ELM-5000	EPM-5000
Package	Lead frame	Lead frame	Surface mount	Surface mount
Type	Emitter assembly	Detector assembly	Emitter assembly	Detector assembly
Range	660 nm / 880-940 nm	—	660 nm / 890-905 nm	—
Unique Features	• Low cost • Dual drive • Clear epoxy lens	• Low cost • Fast response • High efficiency	• Reflow solderable • Dual drive • Clear epoxy lens	• Reflow solderable • Fast response • High efficiency
Accuracy	Sensor dependent	Sensor dependent	Sensor dependent	Sensor dependent
Operating Temp.	-20°C to 80°C	-20°C to 80°C	-20°C to 80°C	-20°C to 80°C
Dimensions (mm)	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
Typical Applications	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

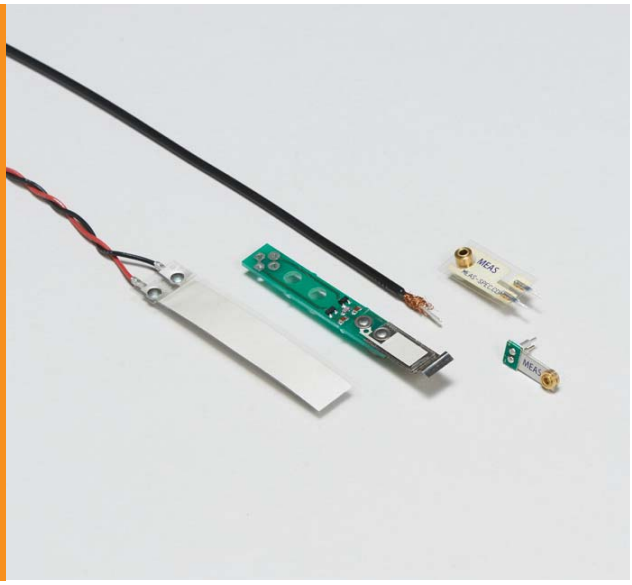
PHOTO OPTIC SENSORS

Pulse Oximetry (SpO_2) Probe Platforms



	Disposable Sensor	Finger Clip Sensor	Soft Sensor
Package	Biocompatible	Biocompatible	Silicon boot
Type	Sensor platform	Sensor platform	Sensor platform
Range	Adult/neonatal	Adult	Adult/pediatric
Unique Features	• Latex free • Lightweight • Microfoam/cloth	• Soft pads • Lightweight • Easily cleaned	• Ease of use • Lightweight • Latex free
Accuracy	Sensor dependent	Sensor dependent	Sensor dependent
Operating Temp.	-20°C to 80°C	-20°C to 80°C	-20°C to 80°C
Typical Applications	Pulse oximetry	Pulse oximetry	Pulse oximetry

PIEZO FILM SENSORS

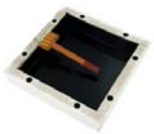


PIEZO FILM

	DT1, SDT1	Piezo Cable	CM-01	FLDT1
Package	Unshielded element with twisted pair or shielded element with shielded cable	Shielded coaxial 20 gage piezo cable	Metallized plastic housing	Unshielded film element with screen printed leads
Type	Flexible film, adhesive mount	Polymer jacketing, armored jacketing	Contact microphone	Flexible film, adhesive mount
Range	15 mV/με up to 1% strain	μPa sensitivity	40 V/mm; 8 Hz to 2.2 kHz	15 mV/με, up to 1% strain
Unique Features	• Thin, flexible, robust • Withstands >2% strain • Ultra-low power (Self generating)	• Continuous lengths of up to 1 km • Shielded construction	• Low noise • Shielded construction • High sensitivity	• Thin, flexible • Leads screen printed on film • Connects to standard connector
Accuracy	±20% (Typical)	±20% (Typical)	—	±20% (Typical)
Operating Temp.	-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)
Dimensions (mm)	Application dependent	Ø3 (Continuous lengths)	Ø18 x 11 high	12 x 30 active; (Custom available)
Typical Applications	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	BL Traffic Sensor	Laboratory Amplifier	80 KHz Transducers
Package	Unshielded element with crimps	Center Core: 16 gage copper wire Piezoelectric Material: Piezoelectric film cable Outer Sheath: 0.016" thick brass	Bench top	Pin mounted
Type	Flexible film, adhesive mount	Spiral wrapped PVDF piezo film cable	Piezo film lab amp	Air ultrasound transducer
Range	15 mV/με up to 1% strain	15 mV/με up to 1% strain	0.1 Hz to 100 kHz	80 kHz
Unique Features	• Thin, flexible, robust • Withstands >2% strain • Ultra-low power (Self generating)	• Flexible, durable, available in many lengths • Withstands >2% strain • Ultra-low power (Self generating)	• Voltage or charge mode settings • Multi-pole high-pass and low-pass filters • Adjustable gain	• Small size • Low mechanical Q • Shielded package
Accuracy	±20% (Typical)	±20% (Typical)	Application dependent	Application dependent
Operating Temp.	-40°C to 70°C (Higher available custom)	-40°C to 70°C (Higher available custom)	0°C to 40°C	-20°C to 80°C
Dimensions (mm)	28 um PVDF; 8mm x 800mm	0.260" wide x 0.063" thick; 0.005"	150 x 100 x 100	Ø6 x 9
Typical Applications	Respiration and heart beat monitoring for mattress or seat	Traffic counting, classifying, toll booths, speed detection, red light cameras	Low frequency dynamic strain, pyroelectric signals, machine vibration, piezo cable and traffic sensor interface	Air ranging, ultrasonic mouse, digitizers



	NDT-1	Tamper Box	ACH-01	LDTC Family
Package	Adhesive mounted	Flat film or box mounted	Ceramic base, plastic cover, shielded cable	Piezo film elements with or without mass
Type	High frequency ultrasound transducer	Tamper detection sensor	Adhesive mount	Cantilever beam with vertical or horizontal pins
Range	3 MHz	Application dependent	±250 g (Typical)	±10 g (Typical)
Unique Features	• Flexible • High bandwidth, low Q • Low impedance	• Low power • Custom shapes and sizes • High security	• Extremely high bandwidth • Low cost • Ultra-low power	• Very low cost • High sensitivity (1 V/g) • Ultra-low power (Self generating)
Accuracy	Application dependent	Application dependent	±20% (Typical)	±20% (Typical)
Operating Temp.	-20°C to 60°C	-40°C to 85°C	-40°C to 85°C	-40°C to 70°C
Dimensions (mm)	12 x 30	Application dependent	18.80 x 13.21 x 6.10	19.05 x 6.35 x 6.35
Typical Applications	Thickness measurement, speed of sound measurement, pulse/echo NDT	Encryption modules, POS card readers, PIN entry devices	Vibration sensing, gear box and high speed monitoring, high speed bearings and centrifuges, speaker motional feedback	Wake-up switch, load imbalance, antitheft devices, impact sensing, vital signs monitoring

POSITION SENSORS

ANISOTROPIC MAGNETORESISTIVE (AMR) SENSOR COMPONENTS

Magnetoresistive (MR)

	KMY, KMZ	MS32	KMT39 (Former 32B), KMT37
Package	SOT-223, E-line 4 pin	TDFN	TDFN
Type	Linear low field sensor	Low field switch sensor	Angle sensor
Range	-2 to 2 kA/m magnetic field	1 to 3 kA/m magnetic switching field	180° angle
Unique Features	• High sensitivity • Low hysteresis • Linear to uniaxial field strength	• Linearized ratiometric output • Temperature compensated switching point	• High accuracy • High resolution
Output	Ratiometric with output voltage range 20 mV/V	Ratiometric with output voltage range 10 mV/V	Sine and cosine signals with output voltage range 20 mV/V
Resolution	Typ. 0.1% of range	Typ. 0.1 kA/m	Typ. 0.01° to 0.1°
Accuracy	Typ. 1.0% of range	Typ. 0.1 kA/m	Typ. 0.1° to 1.0°
Operating Temp.	-40°C to 150°C	-25°C to 85°C	-40°C to 150°C (175°C on request)
Dimensions (mm)	SOT: 6.6 x 7.0 x 1.6 E-line: 16 x 4.2 x 2.4	TDFN: 2.5 x 2.5 x 0.8	TDFN: 2.5 x 2.5 x 0.8 SO-8: 5 x 4 x 1.75
Typical Applications	Non-destructive material testing, spray arm detection in dish washers, magnetic imaging, brake pedal position	Piston position switch, reed switch replacement	Steering position, flow meters, rpm meters, rotary encoders

	KMT36H	KMXP	KMA36
Package	TDFN 2.5 x 2.5	DFN 2 x 6	TSSOP
Type	Angle sensor	Linear displacement sensor, 3 flat and 3 perpendicular versions	Angle sensor with digital output
Range	360° angle	Absolute within magnetic pole pitch, else incremental	360° angle
Unique Features	• High accuracy • High resolution • 360° full turn	• For pole pitch • KMXP 1000: p= 1 mm • KMXP 2000: p= 2 mm • KMXP 5000: p= 5 mm	• Low cost MR encoder for rotational and incremental measurements • Digital output
Output	Three 120° phase shifted output signals with output voltage range 20 mV/V	Sine and cosine signals with output voltage range 20 mV/V	Analog and I²C Digital
Resolution	Typ. 0.01° to 0.1°	0.01% to 0.1% of pole pitch	Typ. 0.1°
Accuracy	Typ. 0.1° to 1°	0.1% to 1.0% of pole pitch	Typ. 0.3°
Operating Temp.	-40°C to 150°C	-40°C to 125°C	-25°C to 85°C
Dimensions (mm)	TDFN: 2.5 x 2.5 x 0.8	DFN: 2 x 6 x 0.8	TSSOP20: 6.5 x 6.4 x 1.2
Typical Applications	Steering position, gage readings, rotary encoders	Roller conveyors, circular saws, bending machines	Knobs, small robotics, angular/linear position

ANGULAR POSITION TRANSDUCERS—INDUCTIVE

Absolute

	RVIT-Z	R60D	R30A
Package	PCB for OEM volumes	Servo mount with ball bearing	Servo mount with ball bearing
Resolution	Infinite	Infinite	Infinite
Excitation	DC voltage	DC symmetrical ±15 VDC	AC operated
Output	DC voltage, DC current, digital	±7.5 VDC	AC voltage
Range	Up to ±75°	±60°	±30° to ±60°
Unique Features	• Absolute position	• Absolute position • Low momentum of inertia	• Absolute position
Operating Temp.	-25°C to 85°C	-25°C to 85°C	-55°C to 150°C
Dimensions (mm)	Custom	Aluminum case size 11 (Ø27 mm)	Aluminum case size 11 (Ø27 mm)
Typical Applications	Viscometers, valve position, robotics, HVACR vane position, ATM's, joysticks	Dancer arm position, rotary actuator position feedback, throttle lever position feedback, ball valve position, textile manufacturing equipment, printing presses	Machine tool equipment, rotary actuator feedback, valve positioning, power generation valve position

ANGULAR POSITION—ENCODERS

Absolute

	H005, H009	H009, 1200 Dual Output	R36
Package	• 12.7 mm - 22.19 mm/500 in - .875 in housing diameter • 3.170 mm/.1248 in shaft diameter • 16.9 mm - 17.4 mm/.670 in - .680 in housing length	• 22.23 mm/.875 in housing diameter • 3.170 mm/.1248 in shaft diameter • 26.1 mm/1.03 in housing length	Heavy duty shaftless
Range	Up to 359°	Up to 359° (Dual output)	180°
Output Options	Analog/PWM/Serial	Analog/PWM/Serial	Voltage
Resolution	12-bit analog/PWM 14-bit serial (SPI)	12-bit analog/PWM 14-bit serial (SPI)	Analog 1.4°
Excitation	—	—	5 VDC
Unique Features	—	—	• Rugged housing • Shaftless • No optical degradation
Absolute Linearity	±0.2%	± 0.2% (Dual output)	—
Nominal Supply	5 volts	5 volts (Dual output)	—
Operating Temp.	-40°C to 150°C	-40°C to 150°C	-40°C to 85°C
Rotational Life	> 100 million cycles (Bearing life)	> 100 million cycles (Bearing life)	—
Dimensions (mm)			37.36 x 25.4 x 7.62
Typical Applications	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets	Feedback sensor or human machine interface device, rudder control, servomotor position and speed control

TILT SENSORS

Single Axis

	E-Series	AccuStar EA	APS System
Package	Ceramic housing	LCP housing	Plastic housing
Type	Inclination sensor module	Inclinometer sensor module	Inclination system
Range	±5°, ±15°	±45° to ±60°	±45°, ±90°
Output	Voltage	Voltage	Analog/digital
Unique Features	• Easy to handle • Minimal temperature drift • Good long term stability	• Compact • Low power • Vertical and horizontal mount	• Stand alone system • Separate system and sensor
Accuracy	±0.2° to ±0.5°	0° to 10° ±0.1% accuracy 10° to 60° ±0.75% reading	0° to 10° ±0.1% accuracy 10° to 45° ±0.75% of reading
Operating Temp.	-25°C to 85°C	-30°C to 65°C	-25°C to 65°C
Dimensions (mm)	29 x 17 x 16.5	65.91 x 51.56 x 30.5	127.5 x 88 x 32.2
Typical Applications	Road construction, building monitoring, weighing systems, mobile and stationary cranes, platform leveling	Wheel alignment, construction, equipment, antenna positioning, robotics, crane/boom angle	Tower crane safety, RV and mobile trailer leveling, water and oil well drilling rigs, mining equipment

TILT SENSORS
Single Axis



	G-Series	IT9000	AccuStar IP66
Package	Aluminum housing IP67	Aluminum or stainless	Aluminum housing IP66
Type	Inclinometer	Inclinometer	Inclinometer
Range	±10°	±45° to ±240°	±3° to ±45°
Output	Switch	Voltage divider, 4 - 20 mA	Current
Unique Features	• Programmable • EMC standard • High switch accuracy	• Rugged industrial design, IP67/68 • Submersible • Designed for brutal environments • CSA, CENELEC certification for hazardous area applications	• EMI and RFI rated • CE pending • Water tight enclosure
Accuracy	±0.25°	±1%	0° to 10° ±0.1% linearity 10° to 45° ±1% linearity
Operating Temp.	-25°C to 85°C	-34°C to 90°C	-25°C to 60°C
Dimensions (mm)	80 x 75 x 57.5	Ø130 x 100	98.04 x 63 x 35.05
Typical Applications	Lift platforms, building device control, train inclination monitoring, position switch	Waste water control, tainter gates, draw bridges, heavy industrial applications	Tower crane safety, RV and mobile trailer leveling, water and oil well drilling rigs, mining equipment

TILT SENSORS
Dual Axis



	DPL, DPN	DOG2	DPG	D-Series
Package	PCB board	Plastic PA 6.6 housing, IP67	Aluminum housing IP67	Aluminum housing IP67
Type	Inclination board module	Inclinometer	Inclinometer	Inclinometer
Range	±2° to ±30°	±25°, ±45°, ±90°	±5° to ±30°	±5° to ±30°
Output	Voltage/RS 232/SPI	Voltage/Current/ J1939/CANopen®	RS232/Voltage	RS232/Voltage/Current/ Switch/PWM/CANopen®
Unique Features	• High resolution • Minimal temperature drift • User configurable	• Plug and play • Wide measurement range • Cost-efficient • Cable with connector • Fast MEMS sensor	• CE approved • Rugged housing • Easy to use • User configurable	• High accuracy • Rugged housing • Programmable • CE approved
Accuracy	±0.05° to ±0.8°	± 0.5° (Full temp. range)	±0.05° to ±0.3°	±0.04° to ±0.8°
Operating Temp.	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	45 x 45 x 20	70.5 x 45 x 15	84 x 70 x 34.2	84 x 70 x 46
Typical Applications	Laser leveling, weighing systems, mobile and stationary cranes, hydraulic leveling, building monitoring, wind power	Off road vehicle, fork lift, truck leveling, man lift, harvester, farm machine, tip over protection, solar panel control	Platform leveling, road construction machines, tunnel drilling, mobile leveling	Drilling machines, mobile and stationary cranes, wind power, antenna/radar leveling

PROXIMITY SENSORS

	PS801
Package	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
Package	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
Package	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
Package	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
Package	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
Package	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
Package	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	PM50	PM81	PM83
Package	Glass filled nylon 6.6	Glass filled nylon 6.6	Nylon 6.6	Stainless steel
Type	• Proximity magnet • Used with proximity sensor	• Proximity magnet • Used with proximity sensor	• Proximity magnet • Used with proximity sensor	• Proximity magnet • Used with proximity sensor
Unique Features	Housed magnet	Housed magnet	Housed magnet	Housed magnet
Operating Temp.	-30°C to 105°C	-30°C to 70°C	-30°C to 120°C	-30°C to 120°C
Dimensions (mm)	29 x 7 x 20	Ø6 x 32	Ø10 x 38	Ø12 x 32
Typical Applications	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication

LINEAR POSITION TRANSDUCERS

Cable Extension Transducers



	PT1, PT5	PT8000	PT9000
Range	0 - 2 to 0 - 250 inches	0 - 2 to 0 - 60 inches	0 - 75 to 0 - 1700 inches
Output	Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental encoder, CANbus, DeviceNet™, RS-232	Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental/absolute encoder, CANbus, DeviceNet™, RS-232	Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental/absolute encoder, CANbus, DeviceNet™, RS-232
IP Rating	IP65, IP67 (PT5)	IP67, IP68	IP67, IP68
Enclosure	Aluminum and abs plastic (PT1)	Aluminum or stainless	Aluminum or stainless
Accuracy	±0.04% to ±0.25%	±0.04% to ±0.25%	±0.04% to ±0.25%
Unique Features	• Designed for most factory environments • Industry standard output signals • User serviceable • Compact design (PT1)	• 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	• Heavy duty, submersible • Proven workhorse for long stroke applications • Designed for extreme industrial and marine environments • CSA, CENELEC certification for hazardous area applications • Free-release proof with VLS option • M12 and DEUTSCH connector options
Operating Temp.	-40°C to 90°C	-40°C to 90°C	-40°C to 90°C
Dimensions (mm)	85 x 100 x 70 (PT1) 100 x 175 x 80 (PT5)	90 x 140 x 135	200 x 135 x 125
Typical Applications	Factory automation, industrial, die casting, injection molding	Steel mills, lumber and paper mills, factory automation, die-casting, injection molding, mobile construction and mining	Mobile hydraulic boom position, water resource management, mining and tunnel boring equipment, telescoping mechanism position, theater stage control

LINEAR POSITION TRANSDUCERS

Cable Extension Transducers

	M150, MTA	MT2, MT3	SM, SP
Range	0 - 1.5 to 0 - 5 inches	0 - 3 to 0 - 30 inches	0 - 2.5 to 0 - 50 inches
Output	Voltage divider	Voltage divider, incremental encoder	Voltage divider, 0 - 10 VDC, 4 - 20 mA
Environment/ IP Rating	IP50	IP50, IP67 (MT3A)	IP50, IP67 (SP)
Enclosure	Aluminum	Aluminum and polycarbonate	Polycarbonate with stainless steel bracket
Accuracy	±0.4% to ±1%	±0.25% to ±1.1%	±0.25% to ±1%
Unique Features	• M150: one of the world's smallest string potentiometer • Designed for space-critical and testing applications	• Designed for test applications • Dual-axis measuring cable alignment • Tracks high-acceleration linear position up to 136g's • High-frequency response • GAM EG 13 certification	• Compact design • M12 connection • Adjustable mounting bracket • Free-release tolerant • Custom configurations for OEMS
Operating Temp.	-40°C to 85°C (M150) -55°C to 100°C (MTA)	-55°C to 125°C	-18°C to 70°C (SM) -40°C to 85°C (SP)
Dimensions (mm)	19 x 19 x 10 (M150)	55 x 45 x 55	120 x 140 x 140
Typical Applications	Aerospace, automotive instrumentation, automotive crash testing, automotive and motorcycle racing	Automotive crash testing, aerospace and flight testing	Factory automation, light industrial, seismic testing, racing instrumentation, medical imaging systems, fume hood position

	SG, SR	SK	PTX, PT101
Range	0 - 80 to 0 - 175 inches	0 - 250 and 0 - 400 inches	0 - 2 to 0 - 100 inches
Output	Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental encoder, CANbus	4 - 20 mA, 0 - 10 V, voltage divider, CAN J1939, CANopen®, Encoder drive	Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental encoder, velocity output (DV301)
Environment/ IP Rating	IP67	IP67	IP50
Enclosure	Polycarbonate with stainless steel bracket	Polycarbonate with stainless steel bracket	Aluminum
Accuracy	±0.35% to ±0.5%	±.25% FS	±0.04% to ±0.25%
Unique Features	• Low cost, high value string potentiometer • Versatile stainless steel mounting bracket • Simple one-button user scalable stroke range (SR) • Custom configurations available for OEM customers	• Compact design • M12 connectivity • Adjustable mounting bracket	• Original classic design • High precision • Proven track record
Operating Temp.	-40°C to 85°C	-40°C to 85°C	-40°C to 90°C
Dimensions (mm)	100 x 120 x 200	120 x 140 x 140	Model and range specific
Typical Applications	Outdoor mobile construction equipment, outrigger positioning, hydraulic lifts, water and power controls	Mobile construction equipment, factory automation	Aerospace testing, architectural and structural testing, factory automation

LINEAR POSITION TRANSDUCERS—INDUCTIVE

Absolute

	HR	M12	HC
Package	AISI-400 series stainless steel	AISI-304 series stainless steel	AISI-400 series stainless steel
Linearity	±0.25% of range	±0.25% of range	±0.25% of range
Excitation	AC operated	AC operated	AC and DC operated versions
Output	AC voltage	AC voltage	AC or DC voltage, 4 - 20 mA loop or RS-485
Range	±0.05 to ±10 inches	±10 to ±100 mm	±0.05 to ±10 inches
Unique Features	• Large bore to core clearance • Broad range of excitation frequencies • Variety of options • Mild radiation resistance option	• Metric series • High stroke to length ratio • Constant sum of secondaries • Excellent temperature coefficient	• Hermetically sealed • Welded connector • Double shielding • Intrinsically safe version • CE mark for DC versions
Operating Temp.	-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)
Diameter (mm)	20.6	12	19
Typical Applications	General industrial	Hydraulic spool valve position feedback, flight simulators, aircraft flight control feedback	Harsh environments, submersible applications, process controls, valve position feedback

	XS-C	DC-SE	XS-D
Package	AISI-304 series stainless steel	AISI-400 series stainless steel	AISI-400 series stainless steel
Linearity	±0.25% of range	±0.25% of range	±2% of range
Excitation	AC operated	8.5 to 28 VDC	AC operated
Output	AC voltage	0 - 5 VDC (4 wire), 1 - 6 VDC (3 wire)	AC voltage
Range	±0.25, ±0.5 and ±1 inches	0 - 0.1 to 0 - 6 inches	±1 to ±10 inches
Unique Features	• High pressure • Bulkhead mounting • Hermetically sealed welded assembly	• CE mark • Low current consumption (6 mA typical) • Synchronous demodulation • Shielded cable	• Very high stroke to body length ratio
Operating Temp.	-55°C to 150°C	-25°C to 85°C	-55°C to 150°C
Diameter (mm)	19	19	20.6
Typical Applications	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	MACRO SSI/R	MACRO HPGS 750
Package	AISI-410 stainless steel	Alloy 625	AISI-410 stainless steel
Linearity	±0.25% of range	±0.10% of range	±0.25% of range
Excitation	AC operated	AC or DC operated	AC operated
Output	AC voltage	AC or 4-20 mA loop digital CANbus available	AC voltage
Range	±0.050 to ±10.0 inches	±1.0 to ±10.0 inches	±0.050 to ±10.0 inches
Unique Features	• IP68 rating, hermetically sealed • Mild radiation resistant (30 Mrad) optional • Axial or radial connector with thru-bore construction	• Operating pressure to 5,000 psi • (7,500 psi proof) • Seawater submersible IP68 • Standard Seacon connector • Axial or radial connection	• Radial screw-on 38999 connector • IP68 rating, hermetically sealed • Designed for high vibration applications
Operating Temp.	-55°C to 200°C standard (Contact factory for higher temperature)	-40°C to 80°C	-55°C to 200°C
Diameter (mm)	19	23.9	19
Typical Applications	High temperature steam and gas valves, nuclear power plants, harsh and corrosive environments, environments with heavy dust, dirt, and humidity	Off-shore drilling platforms, pipeline monitoring, choke valves, mooring cables, extensometers, pulp and paper mills	Nuclear power generation equipment, hydraulic cylinder position, steam valve positioning, power generation equipment, corrosive environments, high-vibration environments

	MACRO CD375	MACRO GHSE/R
Package	AISI-410 stainless steel	AISI-410 stainless steel
Linearity	±0.25% of range	±0.1% of range
Excitation	AC operated	DC operated
Output	AC voltage	0 - 10 VDC
Range	± 0.025 to ±1 inches	0.100 to 4 inches
Unique Features	• Compact design • Operating pressure to 20,000 psi+	• Spring loaded design • IP68 rating, hermetically sealed • Axial and radial connection • Low pressure air-extend/spring-retract version available (GHSER 750-A)
Operating Temp.	-55°C to 200°C	-20°C to 70°C
Diameter (mm)	9.5	19
Typical Applications	Machine tools, robotic grippers, medical equipment, valve position sensing, hydraulic cylinder, down-hole equipment	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	• 0.000004 inch (0.1 µm) repeatability • Removable tungsten carbide contact tip • Double shielded LVDT • Repairable	• 0.000004 inch (0.1 µm) repeatability • Removable tungsten carbide contact tip • Double shielded LVDT • Repairable	• Longer strokes • IP65 cable exit • Accepts industry standard contact tips • Heavy duty return spring	• Hermetically sealed • Welded MS connector (MIL-C-5015) " • CE mark for DC versions • Special tips available • Air extend spring retract available	• Plug-and-play • 14-bit resolution • COM libraries provided • CE mark • USB adapter and power supply available
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	• Contactless incremental measurement • Very high accuracy, programmable resolution • High speed up to 4 m/s • Error detection, missing scale function • Adapter plate for easy mounting
Operating Temp.	-25°C to 85°C
Dimensions (mm)	60 x 20 x 10
Typical Applications	Linear displacement measurement in industrial and medical applications

LVDT/RVDT INSTRUMENTATION

	LVM-110, LiM-420	LDM-1000	ATA-2001
Package	Open circuit board	DIN rail mount	1/8 DIN panel mount
Supply	DC voltage	10 to 30 VDC	115 and 220 VAC, 50 - 400 Hz
Output	DC voltage or current	DC voltage and current	DC voltage and current
Operating Temp.	0°C to 55°C	-25°C to 85°C	-40°C to 85°C
Unique Features	• Master/slave for multi-up applications • Dip switch selectable excitation frequencies • Plug-in PCB or wire termination • Small form factor	• Operates with 4, 5 & 6 wire LVDT/RVDTs • Adjustable zero, span and phase • Status LEDs • CE mark	• Push button programmable • Splash proof front panel • LED status lights • Mounting hardware included • CE mark
Dimensions (mm)	63 x 56 x 21	115 x 99 x 23	267 x 99 x 49
Typical Applications	OEM applications	Automotive test track instrumentation, gas and steam turbine controls, factory automation	Precision metrology labs, power generation valve position monitoring

	PML 1000	MP 2000	MMX Mini Module
Package	1/8 DIN panel mount	1/4 DIN panel mount	DIN rail mount
Supply	90 to 265 VAC, 50 - 60 Hz or 24 VDC	100 to 240 VAC, 47 - 63 Hz	15 to 30 VDC
Output	DC voltage and current (RS-485 optional)	DC voltage and RS-232	DC voltage or 4-20 mA
Operating Temp.	10°C to 55°C	0°C to 55°C	0°C to 70 °C
Unique Features	• 5 digit LED display • Auto-calibration • Programmable • Splash proof front panel • Mounting hardware included • CE mark	• Programmable set point controller • Dual channel with math functions • Digital I/O • Large LCD display • Splash proof front panel	• Push-button calibration • Flame retardant mini-module housing • Master/slave excitation synchronization (Up to 10 channels) • LED status lights • Supports all standard AC LVDTs, RVDTs, and VR half-bridge sensors
Dimensions (mm)	173 x 97 x 49	178 x 92 x 92	85.1 x 70.4 x 17.8
Typical Applications	Remote monitoring stations, measurement test stands, process monitoring	LVDT based weighing systems, pass/fail parts sorting, quality inspection	Automotive test instrumentation, factory automation

LINEAR POSITION—POTENTIOMETERS

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

LINEAR POSITION—POTENTIOMETERS

	5903, 5905 Linear Motion
Package	• 7.94 mm - 12.7 mm/0.312″ - 0.500″ housing diameter • 1.98 mm - 3.18 mm/0.078″ - 0.125″ shaft diameter
Resistance	1K/5K/10K
Range	5903 series - up to 50.8 mm/2″ stroke 5905 series - up to 101.6 mm/4″ stroke
Linearity	±1%
Output Smoothness	<0.1%
Resolution	Infinite
Operating Temp.	-65°C to 125°C
Stroke Life	50 million cycles min
Typical Applications	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets

ANGULAR POSITION—POTENTIOMETERS

	6000 Servo Mount	**6200** Bushing Mount	**6900** Element/Wiper/Insulator	**6100** Hollow Shaft
Package	• 12.7 mm - 50.8 mm/0.500" - 2.00" housing diameter • 3.170 mm - 6.34 mm/0.1248" - 0.2498" shaft diameter • 12.7 mm - 1.74 mm/0.500" - 0.680" housing length • 11.11 mm - 47.62 mm/0.438" - 1.875" mounting pilot diameter	• 12.7 mm - 50.8 mm/0.500" - 2.00" housing diameter • 3.170 mm - 6.34 mm/0.1248" - .2498" shaft diameter • 12.7 mm - 1.74 mm/0.500" - 0.680" housing length • 3/8 32 NEF thread/10.31 mm/0.4062" pilot diameter	• 17.81 mm - 45.85 mm/0.702" - 1.805 in element outside diameter • 4.724 mm - 11.05 mm/0.186" - 0.435" element inside diameter • 3.175 mm -6.35 mm/0.125" - 0.250 shaft insulator inside diameter • 4.064 mm - 7.80 mm/0.160" - 0.307" mating wiper inside diameter • 5.08 mm/0.200" assembled package height	• 27.94 mm - 66.5 mm/1.100" - 2.62" housing diameter • 3.175 mm - 19 mm/0.125" - 0.752" hollow shaft diameter
Resistance	1K - 20KΩ	1K - 20KΩ	1K/5K/10KΩ	1K - 20KΩ
Range	Up to 355°	Up to 355°	Up to 350°	Up to 355°
Linearity	± 0.5%	± 0.5%	± 0.5%	± 0.5%
Output Smoothness	<0.1%	<0.1%	< 0.1%	< 0.1%
Resolution	Infinite	Infinite	Infinite	Infinite
Operating Temp.	-65°C to 125°C	-65°C to 125°C	-65°C to 125°C	-65°C to 125°C
Rotational Life	50 million cycles/minute	50 million cycles/minute	50 million cycles/minute	50 million cycles/minute.
Typical Applications	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

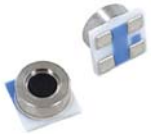
ANGULAR POSITION—POTENTIOMETERS

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

PRESSURE SENSORS

BOARD LEVEL PRESSURE SENSORS

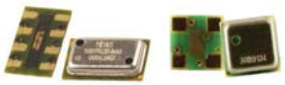
Digital Output and Altimeter



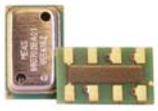
	MS4515DO, MS4525DO	MS5803	MS5837	MS5840
Package	8 pin DIL	Surface mountable	Surface mountable	Surface mountable
Type	Gage, compound (MS4515DO) Gage, absolute, differential, compound (MS4525DO)	Absolute	Absolute	Absolute
Pressure Range	0 - 2 to 30″ H_2O (MS4515DO) 0 - 1 to 150 psi (MS4525DO)	0 - 1 to 30 bar	0 - 2 bar 0 - 30 bar	0 - 2 bar Operating range: 300 to 1200 mbar
Output/Span	14-bit ADC SPI or I²C	24-bit ADC I²C and SPI (Mode 0, 3)	24-bit ADC I²C	24-bit ADC I²C
Resolution	—	12 µbar (MS5803-01BA) 0.5 mbar (MS5803-30BA)	0.016 mbar (2 bar) 0.2 mbar (30 bar)	13 cm of air
Unique Features	• Optional gel coat, low power • Pressure and temperature measurement • Single supply of 3.3 or 5.0 VDC • Top, side barbed or manifold o-ring port • J lead or thru hole pins	• 24-bit digital sensor, software calibration and temperature compensation (I²C and SPI), no external components • Supply voltage 1.8 to 3.6 V	• Supply voltage: 1.5 to 3.6 V • Pressure and temperature measurement • Excellent long term stability • Hermetically sealable for outdoor devices • Sealing designed for 1.8 x 0.88 mm o-ring	• Supply voltage: 1.5 to 3.6 V • Pressure and temperature measurement • Low power, 0.6 µA (standby ≤ 0.1 µA at 25°C) • Protected against direct sunlight
Linearity/Absolute Accuracy	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
Overpressure	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)	—
Operating Temp.	-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
Dimensions (mm)	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
Typical Applications	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	MS5607, MS5611, MS5637
Package	SOIC-14	Surface mountable
Type	Gage, absolute, differential, compound	Absolute
Pressure Range	0 - 1 to 30 psi	10 - 2K mbar
Output/Span	24-bit ADC SPI or I²C protocol	24-bit ADC I²C
Resolution	—	0.016 mbar
Unique Features	• 24-bit digital small outline sensor • Pressure and temperature measurement • Single supply of 1.8 or 3.6 VDC • Barb, tube and hole package style options	• 24-bit digital sensor • 13 cm resolution (MS5607, MS5637) • 10 cm resolution (MS5611) • Supply voltage: 1.5 to 3.6 V (MS5637) Supply voltage: 1.8 to 3.6 V (MS5607, MS5611) • Low power, 0.6 µA (Standby ≤ 0.1 µA at 25°C)
Linearity/Absolute Accuracy	0.25%/2.5% TEB	±2.0 mbar at 25°C
Overpressure	3X range	6 bar
Operating Temp.	-40°C to 125°C	-40°C to 85°C
Dimensions (mm)	12.5 x 7.9	3 x 3 x 0.9 (MS5637) 5 x 3 x 1 (MS5607, MS5611)
Typical Applications	Medical respirators, ventilators, factory automation, altitude and airspeed measurements, leak detection, home appliances	Smart phones, tablets, personal navigation devices, tire pressure monitoring, compressors



	MS5805	MS8607
Package	Surface mountable	Surface mountable
Type	Absolute	Absolute
Pressure Range	10 - 2K mbar	10 - 2K mbar
Output/Span	24-bit ADC I²C	24-bit ADC I²C
Resolution	0.02 mbar	0.016 mbar
Unique Features	• 24-bit digital sensor • 20 cm resolution • Supply voltage: 1.8 to 3.6 V • Sealing designed for 2.5 x 1 mm o-ring • Silicone gel protection • Waterproof	• Integrated pressure, humidity and temperature • Supply voltage: 1.5 to 3.6 V • Fully factory calibrated sensor
Linearity/Absolute Accuracy	±2.0 mbar at 25°C	±4 mbar
Overpressure	5 bar	6 bar
Operating Temp.	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	4.5 x 4.5 x 3.5	5 x 3 x 1
Typical Applications	Mobile altimeter and barometer systems, bike computers, adventure or multi-mode watches, variometers, data loggers	Mobile water depth measurement systems, diving computers, adventure or multi-mode watches, data loggers

BOARD LEVEL PRESSURE SENSORS

Amplified Output

	MS4515, MS4525	MS5525ASO
Package	8 pin DIL	SOIC-14
Type	Gage, differential (MS4515) Gage, absolute, differential, compound (MS4525)	Gage, absolute, differential, compound
Pressure Range	0 - 2 to 30" H_2O (MS4515) 0 - 1 to 150 psi (MS4525)	0 - 1 to 30 psi
Output/Span	10% to 90% or 5% to 95% of supply	10 - 90% VDC
Unique Features	• Ratiometric analog output sensor • Single supply of either 3.3 or 5.0 VDC • Top, side barbed or manifold o-ring port • J lead or thru-hole pins • Optional gel coat	• Temperature compensated • 2.75 to 5.5 VDC supply voltage • Amplified ratiometric analog output • Barb, tube and hole package style options
Accuracy	0.25% span/1% TEB	±0.5% span/2.5% TEB
Operating Temp.	-10°C to 85°C (MS4515), -25°C to 105°C (MS4525)	-25°C to 105°C
Dimensions (mm)	12.5 x 9.9	12.5 x 7.9
Typical Applications	Medical instruments, air flow measurements, process control, leak detection	Factory automation, altitude and airspeed measurements, medical instruments, leak detection

BOARD LEVEL PRESSURE SENSORS

mV Output

	1210, 1220, 1230, 1240	13, 23, 33, 43, 17, 27, 37, 47	MS4425, MS4426
Package	8 pin DIL	TO-8	6 pin DIL
Type	Gage, absolute, differential	Gage, absolute, differential	Gage, absolute, differential
Pressure Range	0 - 5 and 10" H_2O 0 - 1 to 100 psi	0 - 1 to 250 psi	0 - 1 to 300 psi
Output/Span	50 mV and 100 mV typical	100 mV typical	60 mV, 90 mV, 100 mV, and 150 mV typical
Unique Features	• Temperature compensated • High performance UltraStable die (1230, 1240) • Current excitation (1210, 1230) • Voltage excitation (1220, 1240)	• Temperature compensated • High performance • UltraStable die (17, 27, 37, 47) • Can gel fill for humid conditions	• Temperature compensated • High performance UltraStable die • Voltage excitation
Accuracy	±0.1% non-linearity	±0.1% non-linearity	±0.1% non-linearity
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-25°C to 85°C
Dimensions (mm)	15.2 x 14.7	Ø11.4, application dependent	15.2 x 13.7
Typical Applications	Medical instruments, air flow measurement, process control, factory automation, leak detection	Medical instruments, air flow measurement, HVACR, process control, factory automation, leak detection	Drop-in for 6 pin industrial sensor for PCB mounted medical

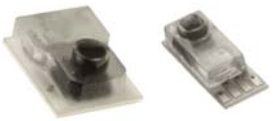
BOARD LEVEL PRESSURE SENSORS

mV Output

	MS1451, MS1471	MS52xx, MS54xx
Package	Surface mountable	Surface mountable
Type	Gage, absolute	Gage, absolute
Pressure Range	0 - 5 to 500 psi	0 - 1 to 12 bar
Output/Span	60 mV typical	150 mV, 240 mV
Unique Features	• Low cost • Coarse calibrated at room temp. (MS1471) • With gel to protect against moisture • Tube or hole	• Small size (MS54xx) • High linearity or high sensitivity options • Plastic tube or metal ring options • With gel to protect against moisture • High endurance (Option HM)
Accuracy	±0.25% non-linearity	±0.05%, ±0.15% FS non-linearity (MS52xx) ±0.05%, ±0.2% FS non-linearity (MS54xx)
Operating Temp.	-40°C to 125°C	-40°C to 125°C
Dimensions (mm)	7.6 x 7.6, application dependent	7.6 x 7.6, application dependent (MS52xx) 6.4 x 6.2 (MS54xx)
Typical Applications	Altitude measurement, barometric pressure, medical instrumentation, consumer appliances, tire pressure	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	Fully Assembled 1620 (Customized per customer specifications)
Package	Hybrid assembly	Plastic housing
Type	Gage	Gage
Pressure Range	-30 to 300 mmHg	-30 to 300 mmHg
Output/Span	5 µV/V/mmHg	5 µV/V/mmHg
Unique Features	• Low cost, disposable design • Supplied in tape and reel • Compliant to AAMI spec • ISO13485 certified	• Low cost, disposable design • Compliant to AAMI spec • Custom designs available
Operating Temp.	10°C to 40°C	10°C to 40°C
Dimensions (mm)	1620: 11.43 x 8.13 x 4.20 1630: 12.7 x 5.08 x 3.94	42.8 x 30.3 x 19.0
Typical Applications	Disposable blood pressure, surgical procedures, ICU, kidney dialysis machines, medical instrumentation	Disposable blood pressure, kidney dialysis machines, surgical procedures and intensive care units. Ready to use, fully assembled disposable sensor units with cable, connector, stop cock, flush device in a plastic housing.

MEDIA ISOLATED PRESSURE SENSOR MODULES

Digital Output




	85BSD	86BSD	89BSD	154BSD
Package	• 13 mm diaphragm diameter • Weldable or threaded process fittings	• 16 mm diaphragm diameter • O-ring mount	• 9 mm diaphragm diameter • Threaded or weldable	• 19 mm diaphragm diameter • O-ring mount
Type	Gage, absolute	Gage, absolute	Absolute, sealed gage	Gage, absolute
Pressure Range	0 - 0.35 to 20 bar / 0 - 5 to 300 psi	0 - 0.07 to 20 bar / 0 - 1 to 300 psi	0 - 6 to 30 bar	0 - 1 to 300 psi
Output/Span	14-bit ADC I²C or SPI	14-bit ADC I²C or SPI	24-bit ADC I²C	14-bit ADC I²C or SPI
Unique Features	• Pressure and temperature read-out • Cable and connector options • Low power option	• Pressure and temperature read-out • Cable and connector options • Low power option	• Pressure and temperature read-out • Low power: 1 µA (Standby < 0.15 µA)	• Pressure and temperature read-out • Cable and connector options • Low power option
Accuracy	±0.25% span	±0.25% span	±0.3% span	±0.25% span
Total Error Band	±1.0% FSO	±1.0% FSO	±3.0% FSO max.	±1.0% FSO
Overpressure	2X	2X	2X	2X
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-40°C to 85°C	-40°C to 125°C
Dimensions (mm)	Ø15.85 x 7.9	Ø15.82 x 9.3	Ø9.04 x 7.5	Ø19 x 13.8
Typical Applications	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, submersible depth monitoring	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, submersible depth monitoring	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, dive computers	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, submersible depth monitoring

TRANSDUCERS AND TRANSMITTERS

Industrial



	M5600, U5600	MSP100	MSP300, MSP340
Type	Gage, sealed, absolute, compound	Gage	Gage
Pressure Range	0 – 50 to 15K psi (M5600), 0 – 5 to 10K psi (U5600)	0 - 100 to 500 psi	0 - 100 to 10K psi (MSP300) 0 - 50 to 10K psi (MSP340)
Output/Span	24-bit ADC I²C	100 mV typical	0 - 100 mV, 0.5 - 4.5 VDC, 1 - 5 VDC, 4 - 20 mA
Unique Features	• Wireless connection • Pressure and temperature • 2.3 – 3.6 V supply voltage • Compact and battery-powered • Weather resistant (IP66 and IP67) • Stainless steel and polycarbonate enclosure	• Microfused • Low cost stainless steel isolated transducer • No threads needed for pressure connect • Highly customized for OEM application • Small size • Solid state reliability	• Microfused • Highly customized for OEM applications • Small size • Solid state reliability
Accuracy	±0.25% FS (M5600) Down to ±0.1% FS (U5600)	±0.5% FSO	±1% FSO
Operating Temp.	-20°C to 85°C	0°C to 55°C	-20°C to 85°C
Dimensions (mm)	24 x 24 x 69	12.7 x 24.38 x 20.32	MSP300: 22.23 x 22.23 x 55.88 MSP340: 15.88 x 15.88 x 75.44
Typical Applications	Industrial process control and monitoring, advanced HVACR systems, refrigeration systems, automotive test stands, off-road vehicles, pumps and compressors, hydraulic and pneumatic systems, agriculture equipment, energy generation and management	Beverage dispensing systems, automation, HVACR controls, energy and water management, pumps, compressors, pneumatic equipment	Paint sprayers, braking systems, HVACR controls, energy and water management, pumps, compressors, pneumatic equipment, off road heavy equipment, agriculture equipment
Agency Approvals	CE, FCC	—	UL 508 (MSP300)

MEDIA ISOLATED PRESSURE SENSOR MODULES

Analog Output

	82, 85 with Fittings	89 Button, 89 with Fittings	86A Amplified
Package	Weldable (85) or process fitting	Weldable or process fitting	5/8" (16 mm) diameter o-ring mount
Type	Gage, absolute, vacuum gage	Sealed gage, absolute	Gage, absolute
Pressure Range	0 - 5 to 500 psi (85), 0 - 1 to 500 psi (82)	0 - 1K to 10K psi	0 - 1 to 150 psi
Output/Span	100 mV typical	100 mV typical	0.5 - 4.5 VDC
Unique Features	• Modular design	• High pressure • Modular design	• Small diameter, amplified output • Bar ranges available
Non-linearity	±0.3% FSO (1 psi) ±0.2% FSO (5 psi) ±0.1% FSO (≥15 psi)	±0.25% FSO	±1.0% FSO
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-20°C to 85°C
Dimensions (mm)	Fittings: application dependent	89 Button: Ø9.04 x 13.2 89 with Fittings: application dependent	Ø15.82 x 9.3
Typical Applications	Medical, process control, refrigeration compressor, oceanography, level systems	Air tank pressure, hydraulics, process control, robotics, refrigeration compressors, oceanography	Level measurement, OEM transmitters and transducers, process control

MEDIA ISOLATED PRESSURE SENSOR MODULES

Analog Output

	82, 85, 85F, 86, 154N	DP86 O-Ring Mount, with Fittings/Cable	U86B
Package	• 3/4" (19 mm) diameter o-ring mount (82, 154N) • 5/8" (16 mm) diameter o-ring mount (86) • 1/2" (13 mm) diameter o-ring flush mount (85F) • 1/2" (13 mm) diameter o-ring mount (85)	• 5/8" (16 mm) diameter o-ring mount or threaded process fittings	• Mountable with o-ring seal
Type	Gage, absolute, vacuum gage (82, 85, 86, 154N) Gage, absolute (85F)	Differential	Sealed gage, absolute
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)	0 - 1 to 500 psi	0 - 5 to 13 bar/0 - 50 to 200 psi
Output/Span	100 mV typical	100 mV typical/sensitivity dependent	0.5 - 4.5 VDC (Ratiometric output)
Unique Features	• High performance • High stability for OEM applications • Minimizes trapped volume (85F)	• Wet/wet differential pressure • Line pressure max. 1,000 psi	• Amplified
Non-linearity	±0.3% FSO (1 psi), ±0.2% FSO (5 psi) ±0.1% FSO (≥15 psi), ±0.1% FSO (85F)	±0.3% FSO (1 psi) ±0.2% FSO (5 psi) ±0.1% FSO (≥15 psi)	±0.5% FSO
Operating Temp.	-40°C to 125°C (82 / 85 / 86 / 154N), -20°C to 125°C (85F)	-40°C to 125°C	-7°C to 105°C
Dimensions (mm)	82: Ø19 x 6.48 154N: Ø18.97 x 13.8 85: Ø15.85 x 9.3 86: Ø15.82 x 11.4 85F: Ø17.2 x 11.33	O-ring: Ø15.82 x 17.5 Fittings: Application dependent	Ø15.82 x 13.6 Socket spacing: 31.75
Typical Applications	Hydraulic controls, process control, oceanography, refrigeration/compressors, pressure transmitters, level systems, dialysis machines, infusion pumps, medical systems	Level controls, tank level measurement, corrosive fluids and gas measurement systems, flow measurement	Urea level, urea pressure, air brakes, corrosive fluid measurement for engine & vehicle applications

TRANSDUCERS AND TRANSMITTERS

Industrial

	US300	AST20HA, AST20PT, AST20SW	AST4000, AST4100, AST4200
Type	Gage, absolute	Gage, sealed gage, absolute	Gage, sealed gage, compound
Pressure Range	0 - 15 to 5K psi	0 - 1 to 60K psi	0 - 25 to 10K psi
Output/Span	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
Unique Features	• UltraStable technology • Highly customized for OEM applications • Small size • Solid state reliability	• Excellent performance over temperature • Semi-custom designs available • Fault mode condition settings • Four standard sensor material options • Additional temperature output (AST20PT)	• Four standard sensor material options • Rugged construction • 100 V/m EMI/RFI protection • Semi-custom designs available
Accuracy	±0.15% FSO (15 - 1K psi), ±0.25% FSO (>1K psi)	±0.1% FSO	±0.5% FSO
Operating Temp.	-40°C to 105°C	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	15.88 x 15.88 x 98.00	Application dependent	Application dependent
Typical Applications	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
Agency Approvals	—	ABS, CE	UL/cUL508, ABS, CE

	M3200	M5200	U5200, U5300	D5100
Type	Gage, Compound	Gage, sealed, compound	Gage, sealed, absolute, compound	Differential wet/wet
Pressure Range	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
Output/Span	100mV, 0.5 - 4.5 V, 1 - 5 V, 0 - 5 V, 0 - 10 V, 4 - 20 mA and I²C 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
Unique Features	• Microfused technology • High performance at a low cost • Solid state reliability • ±1.5% FSO TEB (-20°C to 85°C) • Weatherproof - IP67 with cable • 14bit digital output for Pressure	• Microfused technology • High performance at a low cost • Solid state reliability • ±1% FSO TEB (-20°C to 85°C) • Weatherproof • 17 - 4 PH or 316L SS	• UltraStable technology • High performance at a low cost • ±0.75% FSO TEB (-20°C to 85°C, >5 psi and ≤5000 psi) (U5200) • ±0.5% FSO TEB (-20°C to 85°C) (U5300) • Weatherproof • High accuracy (U5300)	• UltraStable technology • High performance at a low cost • Solid state reliability • ±1% FSO TEB (-20°C to 85°C) • Line pressure max. 1000 psi
Accuracy	±0.25% 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)
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-40°C to 125°C	-40°C to 125°C
Dimensions (mm)	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
Typical Applications	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
Agency Approvals	CE (EMC)	CE (EMC)	CE (EMC), UL 508	CE (EMC)

TRANSDUCERS AND TRANSMITTERS
Heavy Industrial

	M7100, U7100	P900, P981, P1200, P700, P9000	P101, P105, P125
Type	Gage, no vent gage (M7100) Gage, sealed gage, absolute (U7100)	Gage, absolute	Gage
Pressure Range	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
Output/Span	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)
Unique Features	• ±1% FSO TEB (-20°C to 85°C) • Solid state reliability • Survives high vibration and immersion • Microfused technology (M7100) • UltraStable technology (U7100) • Copper tube for HVACR (M7100)	• High overpressure (10X over pressure) • Shock and vibration resistant • Heavy industrial grade transducer (P9000) • Advanced digital compensation / calibration • Mechanical over pressure stops • High temperature operation	• Stainless steel diaphragm • Female pressure connectors: M16 x 1.5, M20 x 1.5, 1/4 NPT • Metal to metal seal
Accuracy	0.25% FSO	0.1% to 0.2% FSO	±0.3% FSO
Operating Temp.	-40°C to 125°C	-54°C to 120°C	-20°C to 80°C
Dimensions (mm)	26.7 x 26.7 x 50.0	Application dependent	Ø29 x 85 max.
Typical Applications	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
Agency Approvals	CE (EMC), UL 508	CE, CENELEC (Intrinsically Safe)	—

TRANSDUCERS AND TRANSMITTERS
Miniature

	XP	XPC10
Type	Gage, sealed, absolute	Gage, sealed, absolute
Pressure Range	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
Output/Span	20 - 100 mV, 4 V FSO (Amplified)	12 mV FSO, 4 V FSO (Amplified)
Unique Features	• Titanium construction (XP5, XPM4) • Stainless steel housing (XPM6, XPM10) • Amplified output options (XP5, XPM6, XPM10) • Cable and connector options • For static and dynamic applications	• Amplified output available • For static and dynamic applications • Optional IP67 ingress protection • High temperature operation
Accuracy	Down to ±0.25% FSO (XP5, XPM6, XPM10), down to ±0.35% FSO (XPM4)	Down to ±0.25% FSO
Operating Temp.	-40°C to 120°C	-40°C to 220°C
Dimensions (mm)	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
Typical Applications	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

	EB, EPRB	EPIH	EPB, EPB-PW, EPL
Type	Gage, sealed, absolute	Gage, sealed, absolute	Gage, sealed, absolute
Pressure Range	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
Output/Span	0.5 to 4.5 VDC	12 mV to 75 mV	10 mV to 125 mV
Unique Features	• High accuracy • Miniature design • UltraStable technology • EMI protected • Combined pressure and temperature	• Diffused silicon diaphragm with a large variety of sizes and shapes available as small as 0.05" outside diameter • High frequency response (To 1.7 MHz) • Ultra-miniature design	• Miniature flush mountable • Flush stainless steel diaphragm, flanged or non-flanged • Bonded silicon gage, high frequency response (To 400 KHz) • IP68 ingress protection in Titanium construction (EPB-PW)
Accuracy	±0.25% FSO	±1.0% FSO	±0.5 to ±1% FSO
Operating Temp.	-40°C to 125°C (Available option up to 150°C)	-40°C to 120°C	-40°C to 120°C
Dimensions (mm)	11 body diameter	Application dependent	3.2 to 7 outside diameter
Typical Applications	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
Agency Approvals	CE (EMC)	—	—

TRANSDUCERS AND TRANSMITTERS

Liquid Level

	U5700	AST45xx
Type	Gage, sealed, absolute, compound	Gage, absolute
Pressure Range	0 - 2 to 10K psi	0 - 1 to 100 psi (AST4500, AST4510, AST4520)
Output/Span	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
Unique Features	• UltraStable technology • High accuracy • IP68 rated connection and submersible • Polyurethane jacketed cable • Optional Polyoxymethylene cap	• Intrinsically safe ratings • Material options including: 316L, alloy C276, and PVDF • Low power options • High quality cable options
Accuracy	0.1 % FSO	±0.25% FSO
Operating Temp.	-10°C to 60°C	-40°C to 85°C
Dimensions (mm)	22.23 x 22.23 x 98.04	Application dependent
Typical Applications	Industrial process control and monitoring, advanced HVACR systems, refrigeration systems, automotive test stands, off road vehicles, pumps and compressors, hydraulic/ pneumatic systems, agriculture equipment, energy generation and management, liquid level applications	Diesel tanks, chemical tanks, water tanks
Agency Approvals	CE (EMC)	UL/CSA Class I Div I, ATEX/IECEx Exia, ABS, CE

TRANSDUCERS AND TRANSMITTERS

Hazardous Location

	AST43xx, AST44xx	AST46xx
Type	Gage, sealed gage, compound, absolute	Gage, sealed gage, compound, absolute
Pressure Range	0 - 1 to 15 psi (AST43LP, AST44LP) 0 - 25 to 20K psi (AST4300, AST4400, AST4401)	0 - 1 to 20K psi
Output/Span	0.5 - 4.5 V [Ratiometric], 1 - 5 V, 4 - 20 mA, 0.5 - 2.5 V	0.5 - 4.5 V [Ratiometric], 1 - 5 V, 4 - 20 mA, 0.5 - 2.5 V, switch (AST46SW)
Unique Features	• Available with 316L, Hastalloy C276, or Inconel 718 materials • Low current consumption options • Low power options • High proof and burst pressure	• Available with 316L, Hastalloy C276, or Inconel 718 materials • Low current consumption options • Low power options • Local display (AST46DS) • Additional temperature output
Accuracy	±0.25% FSO	±0.25% FSO (AST4600, AST46DS), ±0.1% FSO (AST46HA, AST46PT)
Operating Temp.	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	Application dependent	Application dependent
Typical Applications	Compressors, well sites, ships, factory automation, SCADA equipment, offshore equipment	SCADA/RTU, well sites, offshore equipment, hydraulic controls
Agency Approvals	UL/CSA Class I Div I and II, ATEX/IECEx Exia/Exn, CCOE, CNEx, ABS, CE	CSA Class I/II Div I, ATEX/IECEx Exd, ABS, CE

	AST5100, AST5300, AST5400	AST2000H2
Type	Differential	Gage, sealed gage
Pressure Range	0 - 5 H_2O to 5K psi	0-10 PSI to 10000 PSI
Output/Span	0.5 - 4.5 V [Ratiometric], 0 - 5 V, 1 - 5 V, 4 - 20 mA	0.5 - 4.5 V [Ratiometric] 1 - 5 V, 4 - 20 mA
Unique Features	• Wide range of pressures available • Full line pressure on either side without zero shifts • Hazardous location approvals (AST5300, AST5400)	• 20 bar, 448 bar, 900 bar • High pressure H2 Storage • CE EN61326
Accuracy	±0.25% FSO (AST5100, AST5300), 1% TEB (AST5400)	±0.25% BFSL
Operating Temp.	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	Application dependent	Application dependent
Typical Applications	Filter monitoring, flow measurement, tank level measurement	PEM fuel cells, hydrogen storage, hydrogen filling stations, backup power
Agency Approvals	CSA Class I/II Div I and II, ATEX/IECEx Exd/Exn, ABS, CE	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
Package	Electroless nickel plated Aluminum	Electroless nickel plated Aluminum	Electroless nickel plated Aluminum	Anodized aluminum	Anodized aluminum
FS Ranges	±50, ±180°/sec	±300°/sec	±50, ±180, ±1,000°/sec	±500 to ±50K°/sec	±100 to ±24K°/sec
Unique Features	• IdentiCal™ interchangeable sensor • ±0.5% accuracy from -40°C to +85°C • Silicon MEMS gyro • EN61000-6-2/-4 certified for industrial environment	• IdentiCal™ interchangeable sensor • High stability • Low noise • Vibration-rejecting	• Triaxial angular rate sensor • Stable performance over temperature • Power supply regulation • Temperature calibration data	• Small, lightweight package • SAE-J211, ISO-6487, NHTSA approved • Crash testing certified • Insensitive to shock	• MEMS triaxial rate sensor • SAEJ211 compliant • Shock resistant housing • Rugged compact package
Accuracy	±0.1% non-linearity	±0.01% non-linearity	±0.1% non-linearity	±0.5% non-linearity	±0.5% non-linearity
Excitation Voltage	8.5 - 36 VDC	10 - 36 VDC	8.5 - 36 VDC	5 - 16 VDC	5 - 16 VDC
Operating Temp.	-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
Dimensions (mm)	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
Typical Applications	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	634
Package	Stainless steel	Anodized aluminum
FS Ranges	±500 to ±50K°/sec ±50g to ±6,000g	±100 to ±18K°/sec ±2g to ±100g
Unique Features	• Complete six degree-of-freedom (6DoF) analog sensor • Shock resistant rugged housing • Silicon MEMS gyros • PR MEMS high-g shock sensors	• 6DoF analog sensor • Signal conditioned output • Silicon MEMS gyros • UltraStable VC MEMS low-g sensors
Accuracy	±0.5% non-linearity	±0.1% non-linearity
Excitation Voltage	5 - 16 VDC	5 - 16 VDC
Operating Temp.	-40°C to 105°C	-40°C to 105°C
Dimensions (mm)	21.3 x 21.3 x 15.2	30.5 x 30.5 x 24.6
Typical Applications	Aerospace testing, weapons testing, biomechanics, shock and impact testing	Automotive testing, motion measurements, biomechanics

INERTIAL SENSORS

	65210E	65210ES
Package	Electroless nickel plated Aluminum	Electroless nickel plated Aluminum
FS Ranges	±1K to ±20K°/sec, ±10g to ±100g	±1K to ±20K°/sec, ±10g to ±100g
Unique Features	• 6DoF and telemetry kit • User configurable, IRIG encoder • Parabolic and radome ring mounting adaptor options • Up to 4hr battery options	• 6DoF and telemetry kit • Parabolic and radome ring mounting adaptor options • AES encryption option • Wide range of signal conditioning modules
Accuracy	±0.2% non-linearity error	±0.2% non-linearity error
Excitation Voltage	Li-Ion battery included	Li-Ion battery included
Operating Temp.	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	Ø69.85 x 197.3 length	Ø69.85 x 161.3 length
Typical Applications	Weapons separation testing, captive carry testing, GTV and JTV test vehicles	Weapons separation testing, captive carry testing, GTV and JTV test vehicles

SCANNERS AND SYSTEMS

PRESSURE AND TEMPERATURE SCANNERS

NetScanners

	NetScanner 9216	NetScanner 9146-R	NetScanner 9146-T	NetScanner 9022
Measurement Type	Pressure	Temperature	Temperature	Pressure
Media	Dry	RTD/TC/Volt	TC	Liquid
Accuracy	±0.05% FS	±0.25°C	±0.25°C	±0.05% FS
# of Channels	16	16/32	16	12
EU Throughput Rate	500 Hz/chan/sec	33 Hz/chan/sec	33 Hz/chan/sec	100 Hz/chan/sec
Operating Temp.	-30°C to 80°C	-30°C to 70°C	-30°C to 70°C	-30°C to 70°C
Enclosure	IP66/30 g vibration	IP66/30 g vibration	IP54/30 g vibration	IP64/30 g vibration
Typical Applications	Engine testing, portable data acquisition, wind tunnel research, process monitoring	Engine testing, portable data acquisition, wind tunnel research, process monitoring	Engine testing, portable data acquisition, wind tunnel research, process monitoring	Engine testing, third party transducers, close coupled requirements, high pressure

PRESSURE SCANNERS & TRANSDUCERS

NetScanners, Transducers, and Accompanying Equipment

	NetScanner 9032, 9033	NetScanner 9034, 9038	NetScanner 9916, 98RK-1 Rack	NetScanner 9400 Transducer
Measurement Type	Barometer, Differential Standard	Calibrator	Pressure	Pressure
Media	Dry	Dry	Dry	All-media
Accuracy	±0.01% FS	±0.01% FS	±0.05% FS	±0.05%
# of Channels	1	1	128	1
EU Throughput Rate	10 Hz	10 Hz	100 Hz/chan/sec	Analog Output
Operating Temp.	-10°C to 60°C	-10°C to 60°C	0°C to 50°C	-30°C to 100°C
Enclosure	Laboratory grade	Laboratory grade	19" rackmount/4U	IP66
Typical Applications	Barometric monitor, precision reference	Calibration, transfer standard, verification testing	Turbine engine test, control room location	Turbine Engine Test, liquids, hydraulics

ELECTRONIC & MINIATURE PRESSURE SCANNERS

ESP & MicroScanner

	ESP 64HD DTC	ESP 32HD DTC	ESP 64HD, 32HD, 16HD	MicroScanner 16MS
Type	Pressure	Pressure	Pressure	Pressure
Media	Dry	Dry	Dry	Dry
Accuracy	±0.03% FS	±0.03% FS	±0.05% FS	±0.05%
# of Channels	64	32	64, 32 or 16	16
Thermal Comp.	Active (DTC)	Active (DTC)	Passive	Active
Operating Temp.	-25°C to 80°C	-25°C to 80°C	-25°C to 80°C	-20°C to 100°C
Multiplex Scan Rate	70 KHz	70 KHz	20 KHz	100 KHz
Port Sizes (Inches)	0.040	0.040 or 0.063	0.040 or 0.63	Direct mount
Typical Applications	Wind tunnel research, flight test, on vehicle research	Wind tunnel research, flight test, on vehicle research	Wind tunnel research, flight test, on vehicle research	For confined space, wind tunnel, flight test

DATA ACQUISITION SYSTEMS

Multi-Scanner Data Acquisition Systems

	Optimus	Initium	mSDI Interface	Pneumatics
Type	Pressure scanning	Pressure scanning	A/D conversion	Quick disconnect
Media	Dry	Dry	Dry	Dry
Accuracy	±0.03% FS	±0.05% FS	±0.05% FS	—
# of Channels	2048	512	512	19, 31, 36, 55
EU Throughput Rate	2000 Hz	1200 Hz	2000 Hz	—
Operating Temp.	0°C to 50°C	0°C to 70°C	-25°C to 80°C	-40°C to 80°C
Enclosure	Laboratory grade	Laboratory grade	Miniature	Miniature
Typical Applications	Aerospace development	Wind engineering	In-model placement, Optimus System interface	Pressure connections for confined spaces

SPEED SENSORS

3 & 4 CHANNELS HALL EFFECT SPEED SENSORS

	Jaquet DSD 25
Technology	Differential Hall Effect three and four channels
Package	• Stainless steel • Shaft lenght 29 mm • Shaft diameter 24.5 mm
Frequency Range	0 - 20 kHz
Nominal Supply Voltage	Nominal 15VDC (9 VDC to 30 VDC)
Output Signal	3 & 4 channels push-pull
Operating Temp.	-40°C to 125°C
Typical Applications	Railway

DUAL CHANNEL HALL EFFECT SPEED SENSOR

	Jaquet DSD 70
Technology	Differential Hall Effect two channels
Package	• Stainless steel • Shaft lenght 29 mm • Shaft diameter 16 mm
Frequency Range	0 - 20 kHz
Nominal Supply Voltage	Nominal 15VDC (9 VDC to 30 VDC)
Output Signal	2 channels push-pull
Operating Temp.	-40°C to 125°C
Typical Applications	Railway

EDDY CURRENT SPEED SENSORS

	Jaquet DSH
Technology	Eddy Current single channel
Package	• Stainless steel • Shaft lenght 42 mm • Shaft diameter 18 mm
Frequency Range	up to 20 kHz
Nominal Supply Voltage	10 - 30VDC
Output Signal	Square Wave
Operating Temp.	-40°C to 125°C
Typical Applications	Industrial (Power Generation, Hydraulic, Engines, Industry)

	Jaquet DSH 16
	Eddy Current two channels
	• Stainless steel • Shaft lenght 29 mm • Shaft diameter 16 mm
	up to 20 kHz
	Nominal 15 VDC (8 VDC to 30 VDC)
	2 channels push-pull
	120°C
	Railway

HALL EFFECT SPEED SENSORS

	Jaquet Green Line D	Jaquet Green Line Y12AD	Jaquet Green Line F
Technology	Differential Hall Effect single channel	Hall Speed Sensor single channel + direction signal	Hall Effect quasi static
Package	• Stainless steel • Shaft length 26 mm, 64 mm • Shaft diameter 12 mm	• Stainless steel • Shaft length 36 mm • Shaft diameter 12 mm	• Stainless steel • Shaft length various • Shaft diameter various
Frequency Range	5-20 kHz	0-15 kHz	0.05-15 kHz
Nominal Supply Voltage	8-32 VDC	8-32 VDC	8-25 VDC
Output Signal	Square Wave, single channel	Square Wave, single channel + direction signal	Square Wave. single channel
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-40°C to 125°C
Typical Applications	Industrial, non demanding, low cost applications	Industrial, non demanding, low cost applications	Industrial, non demanding, low cost applications

	Jaquet DSD	Jaquet DSF extended power supply	Jaquet DSF EX-ATEX
Technology	Differential Hall Effect single channel	Hall Effect	Hall Effect
Package	• Stainless steel • Various shaft lengths M12, M14, M16, M18, M22 • Various shaft diameter	• Stainless steel • Various shaft lengths • Various shaft diameter	• Stainless steel • Various shaft lengths • Various shaft diameter
Frequency Range	up tp 20 kHz	up to 20 kHz	up to 15 kHz
Nominal Supply Voltage	8-30 VDC	8-28 VDC 10-30 VDC	9-18 VDC
Output Signal	Square Wave, single channel	Square Wave, single channel	2-wire
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-40°C to 125°C
Typical Applications	Industrial (Power Generation, Hydraulic, Engines, Industry)	Industrial (Power Generation, Hydraulic, Engines, Industry)	Industrial (Power Generation, Hydraulic, Engines, Industry), explosion protected, classifed areas

	Jaquet DSF	Jaquet DSL	Jaquet DSS
Technology	Hall Effect	Hall Effect	Hall Effect zero speed
Package	• Stainless steel • Shaft length various • Various shaft diameter	• Stainless steel • Shaft length various • Various shaft diameter	• Stainless steel • Shaft length various • Shaft diameter various
Frequency Range	up to 15 kHz	up to 15 kHz	up to 15 kHz
Nominal Supply Voltage	9-18 VDC	10-25 VDC	8-30 VDC
Output Signal	One channel	Square Wave	Square Wave
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-40°C to 125°C
Typical Applications	Industrial, non demanding, low cost applications	Industrial, non demanding, low cost applications	Industrial, non demanding, low cost applications

HALL EFFECT SPEED SENSORS

	Jaquet DSY	Jaquet DSD 17	Jaquet DSD 40
Technology	Hall Effect chopped	Differential Hall Effect single channel, 3 wires, voltage output	Differential Hall Effect single channel, 2 wires, current output
Package	• Stainless steel • Shaft length various • Various shaft diameter	• Stainless steel • Shaft length various • Various shaft diameter	• Stainless steel • Shaft length various • Various shaft diameter
Frequency Range	0 - 15 kHz	Up to 20 kHz	0 - 20 kHz
Nominal Supply Voltage	4.5 - 16 VDC 8 - 32 VDC	Nominal 15 VDC (9 VDC to 30 VDC)	Nominal 15 VDC (12 VDC to 30 VDC)
Output Signal	Square Wave	1 channel push-pull, voltage output	1 channel push-pull, current output
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-40°C to 125°C
Typical Applications	Industrial (Power Generation, Hydraulic, Engines, Industry)	Railway	Railway

VARIABLE RELUCTANCE SPEED SENSORS

	Jaquet Green Line EV	Jaquet Green Line EX	Jaquet Green Line E	Jaquet SIL-3
Technology	Variable Reluctance (VR) square wave output	Variable Reluctance (VR) Classified Areas (explosion proof)	Variable Reluctance (VR)	Variable Reluctance (VR)
Package	• Stainless steel • Shaft lenght various • Various shaft diameter	• Stainless steel • Shaft lenght 48, 89, 129 mm • Shaft diameter 5/8" and 3/4"	• Stainless steel • Shaft lenght various • Shaft diameter various	• Stainless steel • Shaft lenghts 35 mm up to 101 mm • Shaft diameter M16 and 5/8"
Frequency Range	25 Hz - 20 kHz	25 Hz - 20 kHz	25 Hz - 20 kHz	up to 30 kHz
Nominal Supply Voltage	5-32 VDC	Passive	Passive	Passive
Output Signal	Square Wave	Sine Wave	Sine Wave	Sine Wave
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-40°C to 125°C	-40°C to 150°C
Typical Applications	Industrial, non demanding, low cost applications	Industrial, non demanding, low cost applications	Industrial, non demanding, low cost 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
Raliway 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

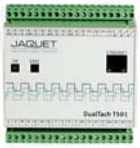
FTP554 Pole Band

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

Module
≥ 3.0

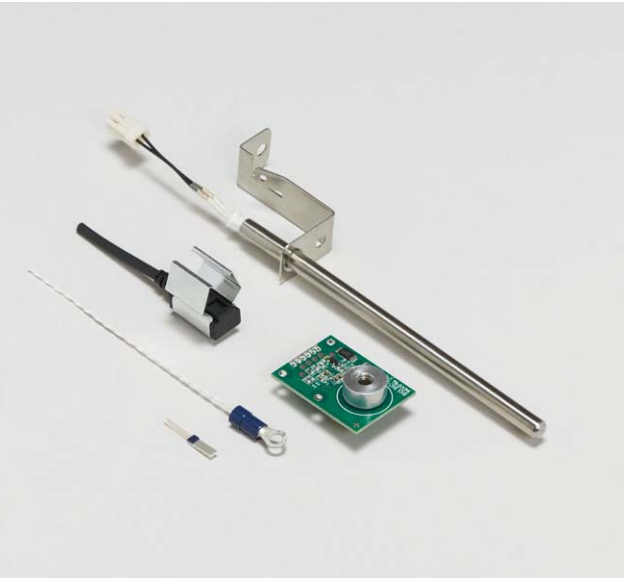
Typical Applications
Typically used for shafts with large diameters (diameter >500mm), large axial and radial movements of the shaft

TACHOMETERS



	T400 Tachometer	T500 dual channel Tachometer	T600 Multitasker
Analog Inputs	0	0	1
Binary Inputs	1	2	2
Analog Ouptuts	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	Radial Leaded Thermistors	Axial Leaded Thermistors	Space Qualified (Hi-Rel)
Package	Leadless chips, SMD 0402, 0603, 0805	Radial, beads	DO-35	Radial, bead, custom
Type	Gold or silver electrodes, surface mounted	Epoxy or glass coated	Glass coated	NTC, epoxy, glass, probes
Resistance Range	Chip: 100 to 1MΩ/ SMD:2K to 200KΩ	100 to 1MΩ	5KΩ to 100KΩ	1KΩ to 100KΩ
Unique Features	• Wire bonding compatible • End band SMD	• Interchangeable • Moisture resistant • Stability	• Tight tolerance (±1%) • Max. stability using high density (HD) chip • Hermetically sealed • Tinned and nickel plated leads	• ESA and NASA approved • High reliability and accuracy
Accuracy	±1% to 10%	0.25% to 20%	±1% to ±3%	0.5% to 10%
Operating Temp.	-40°C to 125°C	-55°C to 280°C	-40°C to 300°C	-55°C to 160°C
Dimensions (mm)	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	0.4 to 4.9	2.0 x 4.0 body	From 2.4
Typical Applications	Temperature compensation, communication (DWDM), infrared sensing systems, PCB mounting temperature measurement	Temperature sensing for OEM, automotive, medical, HVACR	Refrigeration including cabinet sensing and evaporator coil, white goods, fire detection units, air-conditioning systems, PCB temp. sensing	Instrumentation and compensation for aerospace applications

SENSING ELEMENTS—DIGITAL

Digital Output

	Temperature System Sensor (TSYS)
Package	QFN16, TDFN8
Type	I²C, SPI, PWM, SDM (Convertible to analog voltage)
Unique Features	• Low power • Small size • Calibrated and ready to use • 16-bit resolution
Accuracy	Up to ±0.1°C at -5°C to 50°C
Operating Temp.	-40°C to 125°C
Dimensions (mm)	QFN16: 4 x 4 x 0.85 TDFN8: 2.5 x 2.5 x 0.75
Typical Applications	Industrial control, replacement of precision RTDs, thermistors and NTCs, heating and cooling systems, HVACR

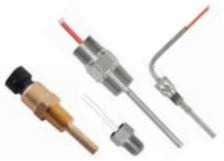
SENSING ELEMENTS—RTD

Analog Output

	Nickel RTD	Platinum Thin Film Chips
Package	SOT 23 Bare die on request	Leadless chips, SMD 1206
Type	• Thin film nickel structure on silicon substrate, protected with a passivation layer • SOT 23 package for SMT • Bare die for COB assembly	• Thin film platinum deposited on ceramic substrate • Contact pads on top and bottom side for NTC chip like assembly • Contact pads on both ends for SMT
Resistance Range	1,000Ω	100Ω, 1,000Ω (Other values on request)
Unique Features	• Harsh environment compatible • Automotive qualified • Very small dimensions • Very short response time • Good linearity • High temperature coefficient • Low power consumption • Good thermal connection of sensing element through leadframe-pin	• Long term stability • Interchangeability • Assembly like NTC chips • Very small dimensions • Short response time
Accuracy	Class B, according to former DIN 43760 standard	According to DIN EN 60751
Operating Temp.	-55°C to 160°C	-50°C to 400 °C
Dimensions (mm)	2.1 x 2.5 x 2.1 (SOT 23), 0.7 x 0.7 x 0.4 (Bare die)	1.5 x 1.5 (Top/bottom pads), 1.2 x 3.6 (SMT)
Typical Applications	Automotive, industrial, OEM, thermal compensation, thermal management	White goods, automotive, industrial, aerospace, medical, test and measurement

	Platinum Thin Film Sensors	Glass Wire Wound Sensors	Ceramic Wire Wound Sensors
Package	Wired component	GO, GX	CWW600, CWW850, CWW1000
Type	• Thin film platinum deposited on ceramic substrate, glass coated • Tube outline available • Connection via radial leads	Glass rod, radial leads	Ceramic rod, radial leads
Resistance Range	100Ω, 1,000Ω (Other values on request)	100Ω (2X 100Ω on few versions)	100Ω (2X 100Ω on few versions)
Unique Features	• Long term stability • Interchangeability • Small dimensions • Short response time • High electrical insulation	• Aggressive environments (Acid, oil, solvent) • Small dimensions • Stability • No hysteresis • Short response time • Interchangeability	• High temperature • Stability • No hysteresis • Small dimension • Interchangeability
Accuracy	Class T (F0.1), A (F0.15), B (F0.3) according to DIN EN 60751	Class W0.3, W0.15, W0.1 according to IEC60751	Class W0.3, W0.15, W0.1 according to IEC60751
Operating Temp.	-50°C to 600°C (Standard) down to -200°C or up to 1,000°C (On request)	-200°C to 400°C	-200°C to 600°C (CWW600) -200°C to 850°C (CWW850) -200°C to 1000°C (CW1000)
Dimensions (mm)	2.0 x 2.3 x 1.1 (Standard) 1.2 x 4.0 x 1.1 (Standard) Other dimensions (On request)	Ø1.8/length 5 mm to Ø4.5/length 48 mm	Ø1.5/length 8 mm to Ø4.5/length 30 mm Ø2.7/length 45 mm (CWW1000)
Typical Applications	White goods, automotive, industrial, aerospace, medical, test and measurement	Oil and chemical industry, aviation, aeronautic, food industry	Process industry, laboratories, reference sensors

SENSOR ASSEMBLIES



	Ring Sensors	Push-in Sensors	Screw-in Sensors	Refrigeration Molded Probes
Package	Ring for surface assembly Threaded bolt, tube style	Brass, copper or stainless steel closed-end tube	Brass, copper or stainless steel housing with integrated connector	PVC or TPE
Type	Epoxy potted element	Epoxy potted element, miniature design	Epoxy potted element, rigid sheath	Overmolded
Sensor Range	• NTC • RTD: Pt, Ni	• NTC • RTD: Pt, Ni • Thermocouple: Type J, K, T, E	• NTC • RTD: Pt, Ni, Cu • Thermocouple: Type J, K, T, E	• NTC • RTD: Pt
Unique Features	• Surface mount sensing • For use where space is limited • Simple installation	• Corrosion resistant • Available with mounting tabs or clips	• Corrosion resistant • Different thread types • Connectors available	• Mounting clips available
Accuracy	• NTC: Custom tolerances available • Pt RTD: Class AA, A, B according to IEC60751	• NTC: Custom tolerances available • Pt RTD: Class AA, A, B according to IEC60751	• NTC: Custom tolerances available • Pt RTD: Class AA, A, B according to IEC60751	• NTC: Custom tolerances available • Pt RTD: Class AA, A, B according to IEC60751
Operating Temp.	Varies: -50°C to 250°C	Varies: -50°C to 250°C	Varies: -50°C to 250°C	-40°C to 125°C
Dimensions (mm)	Case specific dimensions	Case specific dimensions	Custom lengths, diameters and threads available	8 x 30, 6.5 x 25, 6 x 50, 6 x 5 x 15
Typical Applications	Surface plates, heat exchangers, fluid pumping systems, generators	Boiler, liquid, evaporator, HVACR, industrial processes control, district heating and cooling, automotive, bearing monitoring, motors, gear boxes	Boiler, liquid, HVACR, industrial processes control, district heating and cooling, immersion	HVACR, industrial processes control

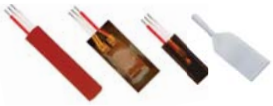
	Pipe Mount Sensors	Outdoor Air Sensors	Pool and Spa Sensors	Boiler Sensors
Package	Copper or stainless steel housing	Metal housing with PVC sun shield with or without weatherproof box	Plastic or metal housing with o-ring seal designed for band clamp or backing nut	Brass or SS housing
Type	• Overmolded • Epoxy potted	• Fast response time	• Overmolded subassembly	• Threaded housing
Unique Features	• Fast response time • Moisture resistant construction	• Easy installation – threads into mounting hole or standard handy box • Fully potted housing protects sensing element and provides fast, accurate response	• O-ring seals • Compatible with pool and spa chemicals	• Integrated connector • Corrosion resistant • Different threads types and connectors available
Accuracy	• NTC: custom tolerances available	±0.2°C at 0°C to 70°C	±0.2°C	• NTC: Custom tolerances available • Pt RTD: Class AA, A, B according to IEC60751
Operating Temp.	-40°C to 125°C	-40°C to 105°C	0°C to 90°C	Varies: -50°C to 250°C
Dimensions (mm)	Custom configurations available	Ø12 X 64	6.4 x 50	Custom lengths, diameters and threads available
Typical Applications	Industrial process, boiler control, HVACR, refrigeration, food service, energy management, test equipment	Residential and commercial building controls, energy management systems	Pools, hot tubs	Boiler control, liquid, industrial processes control, district heating and cooling, immersion

SENSOR ASSEMBLIES

	Oven Sensors	Urea Temperature Sensors	Exhaust Gas Temperature Probes
Package	Stainless steel housing	Plastic housing with screw hole mountings	EGT thermocouple probe
Type	• Pt element encapsulated into ceramic tube, with rigid stainless steel housing • High temperature cable	• Overmolded plastic housing with integrated 2 pin connector	• Mineral insulated alloy sheath, screwed mechanical interface, cable extension and automotive connector • Option: CANbus interface (From 1 to 4 thermocouples, fully configurable)
Sensor Range	Pt100, Pt500, Pt1000 sensor	NTC	Thermocouple: Type K, N
Unique Features	• High temperature • Easy integration/installation • Higher dielectric strength according to type	• Temperature measurement of urea liquid used in Selective Catalytic Reduction (SCR) systems • Suitable for high pressure applications	• High temperature, robust design • Vibration and corrosion resistant • Fast response time
Accuracy	Class B, C according to IEC60751	• NTC: custom tolerances available • ±2%, 3% and 5% • Beta 25/85: 3976	Class 1 according to IEC584
Operating Temp.	-20°C to 750°C (According to version)	-40°C to 125°C	-40°C to 900°C
Dimensions (mm)	• OD Ø4 mm to Ø6 mm • Immersion length 35 mm to 100 mm • Custom mechanical interface and cable length	Sensor tip 8 mm diameter	• OD Ø4 to OD Ø8 • Custom immersion length and cable length
Typical Applications	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
Package	Fine gage thermocouples	Sensor with cable and connector	TLH100/TLH600	Push-in probe with handle
Type	• Micro sized thermocouple: 44 AWG, 40 AWG, 38 AWG, 36 AWG • Polymer encapsulated or bare junction	• Reusable: Skin; 10FR and 12FR GP Disposable: Skin; 9FR and 12FR GP; 12FR, 18FR, 24FR Esoph/ Stethoscope; 14FR, 16FR, 18FR Foley catheter	• Rigid protective external stainless steel sheath and stainless steel handle, unique internal design to insure stability	• Versatile push-in probe with stainless steel sheath and plastic or stainless steel handle • High precision sensing element combined with integrated electronics for signal processing, calibration and USB interface
Sensor Range	Thermocouple type: T, K	400 series, 700 series (Reusable only)	Pt100 sensor	Not applicable due to direct digital output
Unique Features	• Welded or soldered junction • Low profile, fast response • Polyesterimide wire insulation	• Autoclavable reusables • Sterile disposables	• Stability • Provided with calibration report or option of calibration certificate by national committee for accreditation (COFRAC)	• USB conformal interface • Calibrated digital output, recalibration possible on request • Robust design for general purpose applications • Long term stability
Accuracy	Varies by type: standard, special and custom limits 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)
Operating Temp.	Varies by type: Rated up to 240°C	-40°C to 100°C, Patient: 0°C to 50°C	-80°C to 350°C (TLH100) -180°C to 600°C (TLH600)	-55°C to 160°C for probe tip -40°C to 85°C for handle with electronics (Other temperature ranges on request)
Dimensions (mm)	Varies by thermocouple 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)
Typical Applications	Medical, catheters	Patient monitoring, laboratory	Laboratory, temperature sensors calibration by comparison	Laboratory, mobile research, test and measurement

SENSOR ASSEMBLIES



	Stator Sensors	Surface Sensors	Bearing Sensors
Package	TPE/CPME G11 epoxy glass laminated, Class F or H	Silicone rubber or polyimide laminated element SP683	Copper alloy tip Stainless steel, isolated stainless steel or epoxy glass case
Type	• Rigid flat, slot sensor • Cable or leadwire options	• Flat, flexible, rectangular sensor • Variety of designs available	• Rigid sheath • Tip sensitive • Cable/leadwire options
Sensor Range	• RTD: Pt, Ni, Cu • Thermocouple: Type J, K, T, E	• RTD: Pt, Ni, Cu • Thermocouple: Type J, K, T, E	• RTD: Pt, Ni, Cu • Thermocouple: Type J, K, T, E
Unique Features	• Extended sensitive length • Single or dual elements • Calibration available	• Surface sensing for curved or uneven surfaces • Noninvasive, simple installation • Adhesive backing option	• Cut-to-length • Copper tip for fast time response • Assemblies with fluid seal and spring loading • Single or dual elements
Accuracy	RTD: Class A, B according to IEC60751	RTD: Class A, B according to IEC60751	RTD: Class A, B, C according to IEC60751
Operating Temp.	Max. temperature: Class F, 155°C Max. temperature: Class H, 180°C Available up to 200°C	Varies: -50°C to 200°C Available up to 220°C	Sheath specific, up to 250°C
Dimensions (mm)	Custom dimensions available	Custom dimensions available	Custom lengths Standard sheath diameters: Ø4.78, Ø5.46, Ø6.35
Typical Applications	Monitor temperature between stator coils, electric motors, generators	Chemical and pharmaceutical industry, process industry, laboratory, aerospace, motor end windings of stator coils, generators	Bearing monitoring, electric motors, generators

	Thermocouple	Transmitter
Package	Screw-in or push-in design with cable extension, connector, or connecting head	Brass, copper and stainless steel housing, flexible sheath with integrated connector.
Type	• Collapsible Mineral Insulated (MI) with alloy sheath (Radius ≥5*OD) • Flexible cable with plastic or composite insulation • Rigid protection sheath: ceramic, quartz or alloy sheath	• Epoxy potted element • Screw-in
Sensor Range	Type T, J, K, N, R, S, B (According to TC type and insulation type)	4 - 20 mA output
Unique Features	• High temperature and high vibration level (For MI) • Available in small diameters for fast respond time • Grounded or ungrounded or apparent hot junction • Single or multiple measuring points	• Compact, welded design • Highly sensitive and stable • High vibration application • Good waterproof properties
Accuracy	Class 1 according to IEC584	0.5 or 1% FS
Operating Temp.	-40°C to 1,700°C (According to TC type and insulation type)	-20°C to 120°C
Dimensions (mm)	• OD Ø0.3 mm to Ø8 mm for MI • Ø0.15 mm for smallest flexible cable • Custom dimensions, fittings and cable lengths (From few centimeters to many meters)	• Customer sheath length, thread type • Probe diameter: Ø4.75 mm; Ø5 mm; Ø6 mm; Ø6.35 mm; Ø8 mm
Typical Applications	Aeronautic, process industry, medical, semiconductor industry (spike, profile)	Heavy industry, general industrial monitoring

THERMOPILES

	TS TS318-3B0814, TS318-5C50, TS305-10C50	**TSD** Single Pixel Digital Output Series
Package	TO-18, TO-5	TO-5
Type	Thermopile sensor components	Digital thermopile sensor component
Temp. Range	Depends on applied electronics and calibration, filter types optimal for object temperature range -40°C to 300°C (Extended range: -60°C to 1,000°C)	Object temperature range 0°C to 300°C (Other temperature ranges available upon request)
Unique Features	• High signal output • Accurate reference sensors	• Calibrated and ready to use, I²C interface • Direct assembly to PCB, no additional components needed
Accuracy	Depends on applied electronics and calibration	Depends on temperature range, typical 1% full range
Operating Temp.	Ambient temperature range: -20°C to 85°C	Ambient temperature range: -20°C to +85°C
Dimensions (mm)	Ø9.15 x 4.4 (Body)	Ø9.15 x 4.4 (Body)
Typical Applications	Medical thermometer (ear, forehead), pyrometer	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	**TSEV** Multi Pixel Series	**TPT** TPT300V
Package	OEM-module	OEM-module	IP65 stainless steel tube
Type	Single-pixel thermopile module	8-pixel-linear array thermopile module	Thermopile system for industrial use
Temp. Range	Object temperature range 0°C to 300°C (Other temperature ranges available upon request)	Object temperature range -20°C to 120°C	Object temperature range 0°C to 300°C
Unique Features	• Calibrated, Interfaces: I²C, SPI • Different field of views: • 5° at 50%, 10° at 50%, 90° at 50%, others on request	• Calibrated and ready to use • Digital output • Small field of view	• Calibrated and ready to use • Digital or analog outputs • Small field of view
Accuracy	Depends on temperature range, typical 1% full scale, max. accuracy 0.1°C	Depends on temperature range, typical 2% full scale	Depends on temperature range, typical 1% full scale
Operating Temp.	Ambient temperature range: 0°C to 85°C	Ambient temperature range: -20°C to 85°C	Ambient temperature range: 0°C to 85°C
Dimensions (mm)	35 x 25 x 13 to 31	25 x 35 x 15.2	Ø18 x 111
Typical Applications	Contactless temperature measurement, e.g. on moving parts or heated rolls, laminators, people detection, microwave oven, air conditioner	Contactless temperature measurement, e.g. on moving parts or heated rolls, laminators, people detection, microwave oven, air conditioner	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	CS1120	CS1210
Package	Square male coupling	Keyed shaft connections	Collar mechanical fittings
Operating Mode	Reaction	Reaction	Reaction
Unique Features	• Optional high level output • Keyed shaft connection • Static measurements	• Optional high level output • Static torque measurement • Excellent temperature stability	• High stiffness • Low transverse sensitivity • Optional high temp option
FS Ranges	±5 to ±7,000 Nm ±4 to ±5,600 lbf-ft	±5 to ±2,500 Nm ±4 to ±2,000 lbf-ft	±160 to ±10,000 Nm ±128 to ±8,000 lbf-ft
Max. Over-range	1.5X FS	1.5X FS	1.5X FS
Output/Span	±20 mV , 0.5-4.5V	±20 mV , 0.5-4.5V	±20 mV , 0.5-4.5V
Combined Non-linearity & Hysteresis	< ±0.25% FS	< ±0.25% FS	< ±0.25% FS
Operating Temp.	-20°C to 100°C	-20°C to 100°C	-40°C to 150°C
Dimensions (mm)	Application dependent	Application dependent	Application dependent
Typical Applications	Non-rotating parts torque measurement, robotics and effectors, laboratory and research	Non-rotating parts torque measurement, robotics and effectors, laboratory and research	Non-rotating parts torque measurement, robotics and effectors, laboratory and research

DYNAMIC TORQUE SENSORS

	CD1050	CD1095	CD1110
Package	Square male couplings	Keyed shaft couplings	Keyed shaft couplings
Operating Mode	Dynamic rotary	Dynamic rotary	Dynamic rotary
Unique Features	• Optional high level output • Rugged • Slip ring measurement interface	• High accuracy • Built-in amplifier • Bi-directional measurement	• Low range measurements • Bi-directional measurement • Mechanical over-range stops
FS Ranges	±5 to ±7,000 Nm ±4 to ±5,600 lbf-ft	±5 to ±2,500 Nm ±4 to ±2,000 lbf-ft	±0.05 to ±2 Nm ±0.04 to ±1.6 lbf-ft
Max. Over-range	1.5X FS	1.5X FS	10X FS
Output/Span	±20 mV, 0.5-4.5V	±20 mV, 0.5-4.5V	±20 mV, 0.5-4.5V
Combined Non-linearity & Hysteresis	< ±0.25% FS	<±0.25% FS	<±0.25% FS
Operating Temp.	-20°C to 80°C	-20°C to 80°C	-20°C to 80°C
Dimensions (mm)	Application dependent	Application dependent	Application dependent
Typical Applications	Engine efficiency, robotics and effectors, laboratory and research	Process control equipment, robotics and effectors, test and measurement	Process control equipment, robotics and effectors, test and measurement

CONTACTLESS TORQUE SENSORS

	CD1140	CD9515
Package	Keyed shaft couplings	Keyed shaft couplings
Operating Mode	Contactless	Contactless
Unique Features	• High accuracy • Built-in amplifier • Speed and angle detection	• Economical • Small form factor • Speed and angle detection
FS Ranges	±0.05 to ±20,000 Nm ±0.04 to ±16,000 lbf-ft	±5 to ±1,000 Nm ±4 to ±738 lbf-ft
Max. Over-range	2X FS	2X FS
Output/Span	±10 V (60 pulses/rev)	±5 V (60 pulses/rev)
Combined Non-linearity & Hysteresis	±0.1% FS	±0.3% FS
Operating Temp.	0°C to 60°C	0°C to 60°C
Dimensions (mm)	Application dependent	Application dependent
Typical Applications	Process control equipment, robotics and effectors, test and measurement	Industrial applications, process control equipment, PLC compatible

AUTOMOTIVE TEST TORQUE SENSORS

	FCA7300	CD1124T
Package	Steering wheel adaptable	Engine shaft dynamic torquemeter
Operating Mode	Multi-sensing	Contactless
Unique Features	• Dual torque/angle range • Steering velocity measurement • Fits all road vehicles	• Heavy duty vehicles • Telemetry based • Gearbox to engine shaft measurement
FS Ranges	10 to 200 Nm (7 lbf-ft to 150 lbf-ft)	20,000 Nm 16,000 lbf-ft
Max. Over-range	10X FS	1.5X FS
Output/Span	±10 V	±10 V
Combined Non-linearity & Hysteresis	±0.1% FS	±1% FS
Operating Temp.	-20°C to 80°C	-20°C to 80°C
Dimensions (mm)	Ø195 x 50	Ø195 x 35
Typical Applications	On-car road test, truck and buses steering test, armored vehicles steering test	Automotive test benches for engine shaft torque measurement

ULTRASONIC SENSORS

(air bubble, point level, continuous level monitoring)

STANDARD CONTACT POINT LEVEL

	LL-01	LL-10
Type	Gap	Tip
Unique Features	• All 316L SS • Integral electronics • Miniature threads • No adjustment for viscosity, density	• All 316L SS • Integral electronics • No adjustment for viscosity, density
Input	5 - 30 VDC	5 - 30 VDC
Output	• 30 V, 3 W relay • Analog 4 - 20 mA power loop	• 1 A SPDT • Analog 4 - 20 mA power loop
Pressure Range	250 psi	1000 psi
Operating Temp.	-30°C to 80°C	-30°C to 80°C
Actuation point	0.25 inches	Custom (2.25, 6, 12, 18, 24 inches)
Process Connection	1/4"NPT and 1/2"NPT	3/4"NPT
Cable	1, 4, 10, 20 feet	1, 4, 10, 20 feet
Approvals	CE	CE
Typical Applications	Medical waste tanks, histology processors, compressors, chillers, coolant reservoirs	Hydraulic reservoirs, storage tanks, pipe lines, sewage systems

AIR-BUBBLE AND NON-INVASIVE POINT LEVEL

	AD-101	SL-630
Type	Non-invasive	Non-invasive
Unique Features	• Detect minimum bubble size of 70% ID • Immune to EMI/RFI • Acoustic coupling agent not required • Continuous self testing • LED indicator	• Stick on dry contact • Point level detection
Input	5 - 24 VDC standard	5 - 24 VDC
Output	TTL & Open collector	TTL (High), dry condition
Pressure Range	Atmosphere	Atmosphere
Operating Temp.	0°C to 40°C	-30°C to 70°C
Actuation point	—	Variable
Process Connection	—	Reusable sensor, disposable tape
Cable (Inches)	12	12
Approvals	-	CE
Typical Applications	Infusion pumps, dialysis machines, semi-conductor equipment, 3D printing	Chromatography, chemical analyzer, hemodialysis, reagent vessels

CONTACT MULTI-POINT LEVEL

	SL-900
Type	Contact
Unique Features	• Miniature • 10 µRA electropolished finish • 316 LSS body • Designed for high purity market
Input	Variable
Output	Dual color LED and ½ A relay
Pressure Range	250 PSIG
Operating Temp.	-30°C to 93°C
Actuation point	Variable
Process Connection	1/2", 3/4" VCR, male/female
Cable (Inches)	Up to 24" shielded with strain relief, 9 pin connector
Approvals	NEMA 1 housing
Typical Applications	Pharmaceutical and semiconductor industries, high pressure vessels

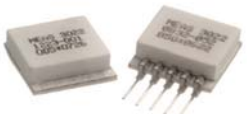
CONTINUOUS LEVEL

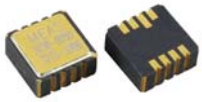
	ML
Type	Continuous transmitter through air
Unique Features	• Non-contact • Remotely mounted • 316 SS or epoxy sensor material • Configurable via RS-232
Input	24 VDC
Output	RS-232, analog, relay setpoints
Pressure Range	Atmosphere
Operating Temp.	-30°C to 70°C
Sensing Range	0.5" to 5" inches
Process Connection	—
Accuracy	±0.0075"
Elect Connection	Terminal block
Approvals	NEMA 1 housing
Typical Applications	Microplate well level, test tubes and vials, bottle fill level, surface flaw detection

VIBRATION SENSORS

EMBEDDED ACCELEROMETERS

MEMS DC Accelerometer



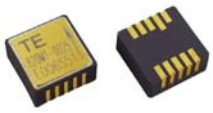



	3022, 3028	3052A, 3058A	3038	3255A
Package	Pins or pads	Pins or pads	SMD	SMD
Type	Board level	Board level	Board level	Board level
FS Range	±2g to ±100g	±2g to ±100g	±50g to ±6,000g	±25g to ±100g
Unique Features	• mV output, critically gas damped • Board and screw mount options • Pin or solder pad option	• Temperature compensated • Board and screw mount options • Pin or solder pad option	• Hermetically sealed • High over-range protection • Gas damping	• Amplified, signal conditioned • Gas damping • Bidirectional mounting
Accuracy	±1.0% non-linearity	±1.0% non-linearity	±1.0% non-linearity	±1.0% non-linearity
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-54°C to 125°C	-40°C to 125°C
Dimensions (mm)	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
Typical Applications	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





	805, 805M1	808, 808M1	820M1	832, 832M1	834, 834M1
Package	TO-5	TO-8	Board level	SMD	SMD
Type	Adhesive (Stud mount option)	Adhesive (Stud mount option)	SMD	Board mount	Board mount
FS Range	±20g to ±500g	±4g to ±50g	±25g to ±500g	±25g to ±500g	±2,000g to ±6,000g
Unique Features	• Hermetically sealed • Case grounded design • Bandwidth to 12 kHz	• Hermetically sealed • Case grounded design • Bandwidth to 8 kHz	• Small size, low cost • Dynamic response • Wide >6000Hz bandwidth	• SMT mount, triaxial • Wide bandwidth >6000Hz • Low power consumption	• SMT mount, triaxial • Wide bandwidth >6,000Hz • Low power consumption
Accuracy	±1.0% non-linearity	±1.0% non-linearity	±2.0% non-linearity	±2.0% non-linearity	±2.0% non-linearity
Operating Temp.	-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)
Dimensions (mm)	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
Typical Applications	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	52, 52M30, 52F	58
Package	Anodized aluminum	Anodized aluminum	Anodized Aluminum
Type	Screw mount	Adhesive and Screw mount	Adhesive mount
FS Range	±25g to ±2,000g	±50g to ±6,000g	±50g to ±6,000g
Unique Features	• Critically damped • Euro NCAP certified • Compact	• SAE-J211/2570 and ISO-6487 compliant • Gas damping, thin profile • Over-range stops	• Most reliable crush zone accelerometer availbale • Rugged, water proof • Mounting on any sides of housing
Accuracy	±1.0% non-linearity	±1.0% non-linearity	±1.0% non-linearity
Operating Temp.	-20°C to 80°C	-40°C to 90°C	-20°C to 85°C
Dimensions (mm)	16.7 x 10.0 x 5.0	11.2 x 10.1 x 3.8	14.0 x 6.3 x 6.3
Typical Applications	Pedestrian crash testing, Euro NCAP testing	Vibration and shock testing, safety impact testing, side-impact testing	On-vehicle crash and impact testing, drop testing, harsh environment

	64B, 64C, 64X	1201, 1201F
Package	Anodized aluminum	Anodized aluminum
Type	Screw mount	Adhesive/screw mount
FS Range	±50g to ±6,000g	±50g to ±2,000g
Unique Features	• SAE-J211/2570 and ISO-6487 compliant • ATD dummy certified • Market performance leader	• Cube form factor, low noise cable • Adhesive or screw mount • Over-range stops
Accuracy	±0.7% non-linearity	±1.0% non-linearity
Operating Temp.	-40°C to 121°C	-20°C to 85°C
Dimensions (mm)	13.1 x 10.0 x 5.0	8.9 x 8.9 x 9.4
Typical Applications	In-dummy crash and impact testing, Euro NCAP testing	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; ±2g to ±200g 3801A; ±50g to ±6,000g
Unique Features	• Hermetically sealed sensor • mV and amplified output options • Integral connector, detacheable cable
Accuracy	±0.1% non-linearity on 4801A
Operating Temp.	-54°C to 121°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	±50g to ±6,000g
Unique Features	• No zero shift • mV output • 20,000 g over-range protection
Accuracy	±1.0% non-linearity
Operating Temp.	-54°C to 121°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	±5g to ±2,500g
Unique Features	• Sub-miniature, fluid damped • Miniature single and triaxial designs • 10,000 g over-range protection
Accuracy	±1.0% non-linearity
Operating Temp.	-40°C to 120°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	±5g to ±10,000g
Unique Features	• Rugged housing • Critically damped • 20,000 g over-range protection
Accuracy	±1.0% non-linearity
Operating Temp.	-40°C to 120°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	±2g to ±200g
Unique Features	• UltraStable MEMS • Low noise, signal conditioned • <2% TEB (total error band)
Accuracy	±0.1% non-linearity
Operating Temp.	-54°C to 125°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	±2g to ±200g
Unique Features	• UltraStable MEMS • Hermetically sealed • <2% TEB (total error band)
Accuracy	±0.1% non-linearity
Operating Temp.	-55°C to 125°C
Dimensions (mm)	25.4 x 29.1 x 7.6
Typical Applications	Low frequency monitoring, road testing, motion analysis

PLUG AND PLAY ACCELEROMETERS

Triaxial DC Response

	53A, 53AF	68CM1	4630	4020, 4030	606M1
Package	Anodized aluminum	Stainless steel	Anodized aluminum	Molded plastic	Nitrile rubber pad
Type	Adhesive mount	Screw mount	Screw mount	Screw mount	Removable
FS Range	±50 to ±2,000g	±50 to ±2,000g	±2g to ±200g	±2g to ±6g	±25g
Unique Features	• Low cost • Gas damping • Low power	• World SID • Gas damping • Low power	• UltraStable MEMS • Low noise, signal conditioned • <2% TEB (total error band)	• Low cost • Biaxial, with triaxial option • DC response	• 606M2 IEPE option • Triaxial, hermetic • Seat pad accelerometer
Accuracy	±1.0% non-linearity	±1.0% non-linearity	±0.1% non-linearity	±1.0% non-linearity	±1.0% non-linearity
Operating Temp.	-20°C to 85°C	-20°C to 85°C	-40°C to 115°C	-40°C to 85°C	-20°C to 85°C
Dimensions (mm)	18.3 x 13.2 x 7.1	12.7 x 12.7 x 12.7	26.2 x 26.2 x 23.4	71.2 x 40.0 x 15.2	199 x 4
Unique Features	Auto safety, passenger comfort, transportation, NVH analysis	Auto safety, in-dummy crash, on-vehicle crash	Road testing, motion control, structural testing	Structural monitoring, seismic array, bridge testing	Off road equipment, amusement rides, commercial aircraft

	4835A	4630M12, 4630M14	4332M3	XL403D
Package	Titanium	Titanium	Stainless steel	Nickel plated aluminum
Type	Screw mount	Screw mount	Screw mount	Screw mount
FS Range	±2g to ±200g	±2g to ±200g	±2g to ±50g	±2g to ±15g
Unique Features	• UltraStable MEMS • Welded connector, hermetic • <2% TEB (total error band)	• UltraStable MEMS • Compact, rugged and double shielded cable • <2% TEB (total error band)	• Low noise ranges • Temperature compensated • High over-range	• Digital triaxial accelerometer • Smart, onboard processing • Temperature output included
Accuracy	±0.1% non-linearity	±0.1% non-linearity	±1.0% non-linearity	±0.25% non-linearity
Operating Temp.	-55°C to 125°C	-55°C to 125°C	-40°C to 115°C	-40°C to 85°C
Dimensions (mm)	22.9 x 22.9 x 17.1	22.9 x 22.9 x 16.0	34.5 x 34.5 x 31.2	36.5 x 25.4 x 17.5
Typical Applications	Road testing, motion control, flight testing	Road load testing, transportation testing	Structural monitoring, bridge testing	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	• Single axis, shear mode • Isolated mounting surface • Wide bandwidth, >10 kHz
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	• Single axis, shear mode • Wide bandwidth
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	• Single axis, shear mode • Wide bandwidth • Small size
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	• Single axis, shear mode • Wide bandwidth
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	• Triaxial, shear mode • >12 kHz bandwidth • Hermetically sealed
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	• Triaxial, through hole mount • Case isolated, internally shielded • Hermetically sealed
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	• Industrial accelerometer • Case isolated, internal shielding • Low cost
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	• Industrial accelerometer • Case isolated, internal shielding • Reverse wiring protection
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	• Industrial accelerometer • Case isolated, internal shielding • Low cost, molded strain relief
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	• Certified for wind tubines • ±2,500VAC lightning protection • Case isolated, internal shielding
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	8011, 8021-VR/VP
Package	Stainless steel	Stainless steel
Type	Stud/center-hole mount	Stud/center-hole mount
FS Range	5g to 50g	0.5in/sec to 5.0in/sec
Unique Features	• Industrial 4-20mA accelerometer • Case isolated, internal shielding • Top mount or side mount connector	• Industiral 4-20mA velocity transmitter • Case isolated, internal shielding • Top mount or side mount connector
Operating Temp.	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	22.2 x 48.3	22.2 x 48.3
Typical Applications	Industrial applications, machine monitoring, intrinsic safety	Industrial applications, machine monitoring, intrinsic safety

PLUG AND PLAY ACCELEROMETERS

3 Wire Voltage AC Accelerometer

	8102A
Package	Anodized aluminum
Type	Screw mount
FS Range	±25g to ±6,000g
Unique Features	• Triaxial PE accel, low cost • Environmentally sealed, rugged • <22µA current consumption
Operating Temp.	-40°C to 125°C
Dimensions (mm)	25.4 x 21.6 x 10.8
Typical Applications	Impact and shock testing, R&D and lab applications

PLUG AND PLAY ACCELEROMETERS

PE Charge Accelerometer

	7500A	7501A	7502A
Package	Stainless steel	Titanium	Titanium
Type	Center-hole mount	Center-hole mount	Adhesive mounting
Sensitivity	7pC/g to 20pC/g	5.6pC/g	1.8pC/g
Unique Features	• Single axis, shear mode • Hermetically sealed • Isolated mounting surface	• Single axis, shear mode • Hermetically sealed • Bandwidth to >15 kHz	• Single axis, shear mode • Hermetically sealed • Miniature, <1 gram
Operating Temp.	-73°C to 260°C	-73°C to 260°C	-73°C to 260°C
Dimensions (mm)	8.4 x 22.3	5.8 x 14.5	4.4 x 11.9
Typical Applications	Gearbox vibration monitoring, flight test, high temp. applications	Gearbox vibration monitoring, flight test, high temp. applications	Small structures monitoring, minimal mass loading, high temp. applications

	7504A, 7505A	7514A	7531A
Package	Stainless steel	Stainless steel	Titanium
Type	Stud mount	Stud mounting	Adhesive mount
Sensitivity	5.6pC/g	30pC/g to 100pC/g	1.8pC/g
Unique Features	• Single axis, shear mode • Top and side connector option • >15 kHz Bandwidth	• Single axis, shear mode • >12 kHz bandwidth • High sensitivity	• Triaxial, shear mode • Miniature, light weight • >10 kHz bandwidth
Operating Temp.	-73°C to 260°C	-73°C to 260°C	-73°C to 260°C
Dimensions (mm)	7504A; 11.1 x 14.1, 7505A; 11.1 x 19.0	15.0 x 15.0	11.0 x 13.6 x 11.0
Typical Applications	Small structures monitoring, general purpose, high temp. applications	Low frequency vibration, general purpose, high temp. applications	High temp. applications, flight testing, structural monitoring

PLUG AND PLAY ACCELEROMETERS

Amplifiers

	121	130	140A & 142A	160	161
Type	Bench top	In-line charge converter	Inline amplifier with auto-zero	Bench top	Bench top
No. of Channels	3	1	1	1	4
Gain Range	x0.001 to 9999	x0.1, 1, 10	x10, 25, 50, 100, 200	x1, 10	x0.001 to 999.9
Unique Features	• Universal DC amplifier • Low noise operation with auto-zero • For bridge type sensors	• Low noise, small package • BNC male or female • Wide bandwidth	• ±1.5 mV auto-zero • 140A for bridge type sensor, 142A for strain gages • 5 to 30 VDC excitation	• Economical IEPE power supply • Portable, compact • Rechargeable battery	• Charge and IEPE conditioner • Sensitivity normalization • Support IEEE 1451.4 TEDS
Dimensions (mm)	301 x 258 x 102	Ø13.8 x 52.2	57 x 25 x 13	101 x 83 x 32	310 x 180 x 115
Typical Applications	Instrumentation labs, test benches, R&D facilities	Instrumentation labs, high temperature testing PE accelerometer	Instrumentation labs, test benches, R&D facilities	Instrumentation	Instrumentation labs, PE/IEPE sensors

WATER LEVEL SENSORS

WATER LEVEL DATA LOGGERS

	TruBlue Logger 555 Level, 575 Baro, 585 CTD	TruBlue Logger 255 Level	TruBlue Logger 275 Baro
Accuracy	±0.05% FS TEB (TruBlue 555, 575, 585) 1% of reading or 20 µs/cm (TruBlue 585)	0.05% FS TEB	0.05% FS TEB
Range	0 - 692 ft (TruBlue 555, 585) 8 - 16 psia (TruBlue 575) 5 - 200,000µs/cm (TruBlue 585)	0 - 658 ft H_2O	8 - 16 psia
Max. Over-range	2X FS (TruBlue 555, 585) 32 psia (TruBlue 575)	3X FS	3X FS
Output	RS-485, SDI - 12	RS 485, SDI - 12	RS 485, SDI-12
Data Logging Memory	8 MB	8 MB or 56 MB	8 MB or 56 MB
Operating Temp.	0°C to 50°C	0°C to 50°C	0°C to 50°C
Dimensions (mm)	Ø19.0 x 390.0	Ø19.0 x 222.0	Ø19.0 x 222.0
Typical Applications	Groundwater monitoring, surface water monitoring, oceanographic research, barometric pressure monitoring	Flood and storm monitoring, wave studies and rapid sampling, stream and stage gaging, slug and pump test, aquifer characterization	Barometric pressure monitoring

DIGITAL LEVEL SENSORS

	KPSI 500, 501	KPSI 351, 353, 355	KPSI 600, 601 - Ceramic
Accuracy	±0.05% FS TEB (KPSI 500) ±0.01 ft H_2O (KPSI 501)	±0.10% FS TEB (KPSI 353) ±0.05% FS TEB (KPSI 355) ±0.01 ft H_2O (KPSI 351)	±0.05% FS TEB (KPSI 600) ±0.01 ft H_2O (KPSI 601)
Range	10 - 230 ft (KPSI 500) 10 - 50 ft (KPSI 501)	10 - 230 ft (KPSI 353, 355) 10 - 50 ft (KPSI 351)	10 - 230 ft (KPSI 500) 10 - 50 ft (KPSI 501)
Max. Over-range	2X FS	2X FS	5X FS
Output	SDI - 12, RS-485	SDI - 12, RS-485	SDI - 12, RS-485
Operating Temp.	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C
Dimensions (mm)	Ø25.4 x 197.0	Ø19.0 x 243.0	Ø25.4 x 197.0
Typical Applications	Groundwater monitoring, surface water monitoring, oceanographic research	Groundwater monitoring, surface water monitoring, oceanographic research	Dissolved gas monitoring, trailrace egress monitoring, ground water monitoring, oceanographic research

DIGITAL TEMPERATURE SENSORS

	KPSI 380
Accuracy	±0.1°C
Range	-20°C to 60°C
Connection	Open port nosepiece
Output	SDI - 12, RS-485
Operating Temp.	-20°C to 60°C
Dimensions (mm)	Ø19.0 x 127.0
Typical Applications	Groundwater monitoring, surface water monitoring, storm water, dam operations and stream gaging

ANALOG LEVEL SENSORS

1" Bore

	KPSI 700, 710, 720	KPSI 730, 735
Accuracy	±1.00%, ±0.50%, ±0.25% FSO	±0.10%, ±0.05% FSO
Range	Custom ranges from: 2.3 - 700 ft H_2O (Vented) 10 - 700 ft H_2O (Sealed) 35 - 700 ft H_2O (Absolute)	Custom ranges from: 5 - 700 ft H_2O (Vented: KPSI 730) 0 - 5 ft H_2O to 0 - 700 ft H_2O (Sealed, Absolute: KPSI 730) 6 - 700 ft H_2O (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

	KPSI 320, 330, 335, 342	KPSI 300DS
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_2O (Vented: KPSI 320, 330, 335) 10 - 700 ft H_2O (Vented KPSI 342) 0 - 5 ft H_2O to 0-700 ft H_2O (Sealed: KPSI 330, 342) 10 - 700 ft H_2O (Sealed: KPSI 320) 35 - 700 ft H_2O (Absolute: KPSI 320, 330, 342)	Custom ranges from: 700 - 6,921 ft H_2O
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




	KPSI 705	KPSI 745, 750	LTA, LT	LTB, LTR
Accuracy	±0.25% FSO	±0.25% FSO	±0.25% FSO	±0.25% FSO
Options	Optional ETFE	Optional standoff (KPSI 745)	Optional lightning protection	Optional lightning protection
Range	Custom ranges from 6 - 115 ft H_2O	Custom ranges from 10 - 115 H_2O	0 - 1 psi up to 0 - 300 psi Custom ranges available	0 - 11.5, 23.1, 34.6, 69.2, 115.4 ft H_2O Custom ranges available
Max. Over-range	2X FS	2X FS	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	4 - 20 mA	4 – 20 mA, 0 – 5 VDC, 0 – 10 VDC, 0 – 2.5 VDC, 0 – 4 VDC, 1.5 – 7.5 VDC
Operating Temp.	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C
Dimensions (mm)	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
Typical Applications	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
Agency Approvals	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


	KPSI 27, 28	KPSI 30
Accuracy	±0.5%, ±0.25%	±0.1%
Options	IP68 submersible option	IP68 submersible option
Range	1 - 300 psi (Vented) 5 - 2000 psi (Sealed) 15 - 2,000 psi (Absolute)	2 - 300 psi (Vented) 5 - 500 psi (Sealed, absolute)
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	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
Agency Approvals	CE, WEEE, RoHS, UL and FM (Intrinsically safe)	CE, WEEE, RoHS, UL and FM (Intrinsically safe)

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31	Suzhou, China Automotive Mfg/R&D
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33	Bankok, Thailand Fluid Property Mfg
34	Seoul, Repulic of Korea Automotive R&D
35	Kyungsan, South Korea Automotive Mfg/R&D

GLOSSARY OF COMMON SENSOR TERMS

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

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

DeviceNet™
Device level network for industrial automation.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GLOSSARY OF COMMON SENSOR ABBREVIATIONS

ABS	American Bureau of Shipping
AC	Alternating Current
ANSI	American National Standards Institute
ASIC	Application-Specific Integrated Circuit
ATEX	Appareils destinés à être utilisés en ATmosphères EXplosibles
BOP	Blow Out Prevention
CAN	Controller Area Network
CE	Communauté Européenne
CENELEC	European Committee for Electrotechnical Standardization
CSA	Canadian Standards Association
CT	Computed Tomography
cUL	Tested to Canadian Standards by Underwriters' Laboratories
DC	Direct Current
DCS	Distributed Control System
DEF	Diesel Exhaust Fluid
DTC	Digital Temperature Compensation
ECU	Engine Control Unit
EGR	Exhaust Gas Recirculation
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
ESA	European Space Agency
FLS	Field Loadable Software
FM	Factory Mutual
FPGA	Field Programmable Gate Array
FS	Full Scale
FSO	Full Scale Output
FT LBS	Foot Pounds
GPS	Global Positioning System
HUMS	Health Usage and Monitoring System
HVACR	Heating, Ventilation, Air Conditioning, and Refrigeration
HVD	High-Voltage Differential
HZ	Hertz
I²C	Inter-Integrated Circuit
IEC	International Electrical Commission
IECEx	International Electrotechnical Commission Explosive
IEEE	Institute of Electrical and Electronics Engineers
IEPE	Integral Electronic Piezoelectric
IP	Ingress Protection
ISO	International Organization for Standardization
ITAR	International Traffic in Arms Regulations
kHz	Kilohertz
LED	Light Emitting Diode
LIN	Local Interconnect Network
LVD	Low Voltage Differential
LVDT	Linear Variable Displacement Transducers
mA	Milliamp
MAF	Mass Air Flow
mbar	Millibar
MCR	Main Control Room
MEMS	Microelectromechanical Systems
mHZ	Megahertz
mm	Millimeter
MQS	Military Qualification Standards
MR	Magnetoresistive
mV	Millivolt
NAV	Navigation
NASA	National Aeronautics and Space Administration
NEMA	National Electrical Manufacturers Association
NIST	National Institute of Standards and Technology
NOx	Nitrogen Oxide
NPT	National Pipe Tapered
NSF	National Science Foundation
NTC	Negative Temperature Coefficient
OEM	Original Equipment Manufacturer
PCB	Printed Circuit Board
PDF	Portable Document Format
PDM	Pulse Density Modulation
PE	Piezoelectric
PLCD	Permanent Magnet Linear Displacement Sensor
PPS	Polyphenylene Sulfide
PSI	Pounds Per Square Inch
PSIA	Pounds Per Square Inch-Absolute Reference
PSID	Pounds Per Square Inch-Differential Reference
PSIG	Pounds Per Square Inch-Gage Reference
PSIS	Pounds Per Square Inch-Sealed Gage Reference
PTFE	Polytetrafluoroethylene
PUDF	Public Use Data File
PWM	Pulse Width Modulation
R&D	Research and Development
RDT&E	Research, Development, Test & Evaluation
RFI	Radio Frequency Interference
RH	Relative Humidity
RMS	Root Mean Square
RoHS	Restriction of Hazardous Substances
RPM	Revolutions Per Minute
RTD	Resistance Temperature Detector
RTU	Remote Terminal Unit
RVDT	Rotary Variable Differential Transformer
SAE	Society of Automotive Engineering
SCADA	Supervisory Control and Data Acquisition
SCR	Selective Catalytic Reduction
SDI-12	Serial Data Interface at 1200 Baud
SMD	Surface Mount Device
$Sp0_2$	Pulse Oximeter Oxygen Saturation
SPDT	Single Pole, Double Throw
SPI	Serial Peripheral Interface
SPST	Single Pole, Single Throw
T&M	Test & Measurement
TDFN	Thin Duel Flats No Leads
TE	TE Connectivity
TEB	Total Error Band
TESS	TE Sensor Solutions
THSA	Trimmable Horizontal Stabilizer Actuators
TPMS	Tire Pressure Monitoring System
TSYS	Temperature System Sensor
UAV	Unmanned Aerial Vehicle
uC	Microcontroller
UL	Underwriters Laboratories
USB	Universal Serial Bus
VAV	Variable Air Volume
VDC	Volts Direct Current
WEEE	Waste Electrical and Electronic Equipment

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