



TE SENSOR SOLUTIONS FOR AEROSPACE AND DEFENSE

TE SENSOR SOLUTIONS FOR AEROSPACE AND DEFENSE

TE Connectivity (TE) is one of the largest connectivity and sensor companies in the world. Our broad portfolio of sensor technologies is designed for a wide range of mission critical applications in Aerospace and Defense and other industries. By leveraging our core competencies in high reliability sensors for harsh environments such as Temperature, RFI, EMI, Vibration, and Lightning, we enable our customers to transform their concepts into creations — redefining what's possible using intelligent, efficient and high-performing TE products and solutions.



INNOVATIVE SENSOR SOLUTIONS



SENSOR TYPES

- FLOW
- FLUID PROPERTY
- FORCE/TORQUE
- HUMIDITY
- LIQUID LEVEL
- RATE/INERTIAL
- POSITION
- PRESSURE
- TEMPERATURE
- ULTRASONIC
- VIBRATION/SHOCK

QUALITY STATEMENTS

- AS/EN 9100
- ATEX
- ESA/ESCC QUALIFIED
- NADCAP
- ISO 14001
- ISO 9001
- MEASURING INSTRUMENTS
DIRECTIVE 2004/22/EC ANNEX D
- NASA/GSFC QUALIFIED
- PART21G
- TS 16949

DESIGN/DEVELOPMENT

- DO-160
- DO-254
- MIL-STD-810
- GRESS

APPLICATION SOLUTIONS

Long development cycles and high qualification costs require aerospace companies to identify stable, reliable, cost-effective partners. TE Connectivity has design engineering groups, as well as AS9100 certified sensor manufacturing facilities, in North America, Europe and Asia Pacific which support Tier 1, 2 and 3 providers with a wide variety of critical sensor solutions for aerospace and defense applications. Regional design and manufacturing allows TE to furnish ITAR free designs and supply products close to our customers' assembly facilities.

Cockpit Controls

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

Flight Controls & Actuation

- High lift load sensors
- THSA secondary load path engagement sensors
- Aileron LVDT position sensors
- Resolvers for flap and slat position monitoring
- Force and position sensors for spoiler electro-mechanical actuation
- Brake actuator force sensors for rotorcraft

Landing Gear & Brakes

- Brake torque sensors
- Pressure sensors for Nose Wheel steering feedback
- Resolvers for steering position
- Load on wheels force sensors
- Centre of gravity force sensors

Cabin, Galley & Cargo

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

Launch & Space

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

Engine, Turbine & APU

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

Military (Missile, Ground Vehicle, Marine, UAV...)

- Missile fin actuation
- Fuel tank level & flow sensors
- Gun stabilization and shock measurement
- Tamper detection for missiles
- Electronic safe arm and fire
- Oil pressure and temperature sensors
- Airspeed and altitude sensors



TE SENSOR SOLUTIONS FOR AEROSPACE AND DEFENSE

Pressure Sensors

Board Mounted
mV Output



1230

Package	8 pin DIL
Type	Gage, absolute, differential
Pressure Range	0 - 5 & 10" H ₂ O 0 - 0.07, 0.14, 0.35, 1, 2, 3, 7 bar / 0 - 1, 2, 5, 15, 30, 50, 100 psi
Output/Span	50 mV and 100 mV typical
Unique Features	• Temperature compensated • High performance UltraStable die Current excitation
Accuracy	±0.1% Non-linearity
Operating Temp	-40°C to 125°C
Dimensions (mm)	15.2 x 20.3
Typical Apps	Air flow measurement, leak detection, cabin control, ventilation



MS52xx, MS54xx

Package	Surface mount
Type	Gage, absolute
Pressure Range	0 - 1, 12 bar / 0 - 15, 174 psi (MS52xx) 0 - 1, 7, 12 bar / 0 - 15, 102, 174 psi (MS54xx)
Output/Span	150 mV, 240 mV
Unique Features	• Small size (MS54xx) • High linearity or high sensitivity options • Plastic tube or metal ring options • With gel to protect against moisture • High endurance (Option HM)
Accuracy	±0.05% or ±0.2% Non-linearity
Operating Temp	-40°C to 125°C
Dimensions (mm)	7.6 x 7.6, height model dependent (MS52xx) 6.4 x 6.2 (MS54xx)
Typical Apps	Absolute pressure sensor systems, engine controls, high resolution altimeters, variometers, barometers

Media Isolated Modules
Analog Output



89 Button, 89 with Fittings

Package	O-ring mount and threaded / weldable or process fitting
Type	Sealed gage, absolute
Pressure Range	0 - 69, 207, 345 bar / 0 - 1K, 3K, 5K psi
Output/Span	100 mV typical
Unique Features	• High pressure, modular design
Accuracy	±0.25% FSO Non-linearity
Operating Temp	-40°C to 125°C
Dimensions (mm)	89 Button: Ø 9.0 x 7.5 89 with Fittings: Ø 22.2 x 23.6
Typical Apps	Air tank pressure, hydraulics, process control, oxygen generation, inerting systems

Transducers and Transmitters



P900

Package	Threaded ports with stainless steel housing and various heavy duty electrical connections, various electrical outputs
Type	Gage, absolute
Pressure Range	0 - 5 bar to 0 - 689 bar / 0 - 75 psi to 0 - 10K psi
Output/Span	0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA
Unique Features	• High overpressure (10X over pressure) • Shock & vibration resistant • Heavy Industrial grade transducer • Advanced digital compensation / calibration • Mechanical over pressure stops • High temperature operation
Accuracy	0.1% to 0.2% FSO
Operating Temp	-54°C to 120°C
Dimensions (mm)	Application dependent
Typical Apps	Hydraulic controls / steering, torpedo depth, vehicle braking systems, drones, weapon systems
Agency Approvals	CE, CENELEC (Intrinsically Safe)



M7100, U7100

Package	Automotive grade, stainless steel hermetic pressure ports and integral electrical connector, heavy duty
Type	Gage, no vent gage (M7100) Gage, sealed gage, absolute (U7100)
Pressure Range	0 - 10 thru 0 - 689 bar / 0 - 150 thru 0 - 10K psi (M7100) 0 - 1 thru 0 - 10 bar / 0 - 15 thru 0 - 150 psi (U7100)
Output/Span	0.5 - 4.5 Vdc [Ratiometric Output]; 1 - 5 Vdc [Regulated] (M7100) 0.5 - 4.5 Vdc [Ratiometric Output] (U7100)
Unique Features	• 1% total error band (-20°C to 85°C) • Solid state reliability • Survives high vibration and immersion • Microfused technology (M7100) • UltraStable technology (U7100)
Accuracy	0.25% FSO
Operating Temp	-40°C to 125°C
Dimensions (mm)	26.7 x 26.7 x 50.0
Typical Apps	Military vehicles engine control, compressors, hydraulic
Agency Approvals	CE (EMC), UL 508

TE SENSOR SOLUTIONS FOR AEROSPACE AND DEFENSE

Pressure Sensors

Miniature Transducers and Transmitters



XP Series

Unique Features	• Titanium construction (XP5, XPM4) • Stainless steel housing (XPM6, XPM10) • Amplified output options (XP5, XPM6, XPM10) • Cable and connector options (XPM4) • For static and dynamic applications
Non Linearity	Up to $\pm 0.25\%$ FSO (XP5, XPM6, XPM10) Up to $\pm 0.35\%$ FSO (XPM4)
Output/Span	20, 30, 75, 100mV (XP5) 30mV, 60mV, 100mV (XPM4) 100mV (XPM6) 50, 100mV (XPM10)
Pressure Range	1 - 345 bar / 15 - 5K psi (XP5, XPM10) 5 - 207 bar / 75 - 3K psi (XPM4) 103 - 1K bar / 1.5K - 15K psi (XPM6)
Overpressure	2X
Operating Temp	-40°C to 120°C
Dimensions (mm)	XP5: Hex 10 XPM4: Hex 8 XPM6: Hex 12 XPM10: Hex 15
Typical Apps	Military and aerospace, explosive test benches, space



XPC10

Unique Features	• Amplified output available • For static and dynamic applications • Optional IP67 ingress protection • High temperature operation
Non Linearity	Up to $\pm 0.25\%$ F.S.
Output/Span	12mV FSO, 4V FSO (amplified)
Pressure Range	0 - 10, 21, 34, 52, 69, 103, 207, 345, 517 bar / 0 - 150, 300, 500, 750, 1K, 1.5K, 3K, 5K, 7.5K psi
Overpressure	1.5X
Operating Temp	-40°C to 220°C
Dimensions (mm)	Hex 15
Typical Apps	Aerospace, test benches, high frequency / high temperature pressure applications



EPIH

Unique Features	• 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)
Non Linearity	$\pm 1.0\%$ FSO
Output/Span	12 mV to 75 mV
Pressure Range	0 - 0.35, 0.69, 1, 2, 3, 5, 7, 14, 21 bar / 0 - 5, 10, 15, 25, 50, 75, 100, 200, 300 psi
Overpressure	2X to 5X
Operating Temp	-40°C to 120°C
Dimensions (mm)	Application dependent
Typical Apps	Aerospace testing, wind tunnels, aircraft body and wing dynamics

Force / Torque Sensors



FN HL Series

Package	Flange mount
Operating Mode	Tension/Compression
Unique Features	• Extremely robust design • Very high EMC/RFI immunity
Ranges N (Lbf)	Airframe dependent
Output	4/20 mA
Temperature Range	-70°C to +90°C
Dimensions	Airframe dependent
Typical Apps	Measurement of force between geared rotary actuator and slat on high lift systems



FN TH Series

Package	Load pin
Operating Mode	Tension
Unique Features	• Built in test feature • Dual redundant • Very high ultimate load
Ranges N (Lbf)	Airframe dependent
Output	0.5 to 5.5Vdc or 4/20mA
Temperature Range	-70°C to +90°C
Dimensions	Airframe dependent
Typical Apps	Detection of secondary load path engagement on trimmable horizontal stabilizer actuator



FN PC Series

Package	Tail stock/control rod
Operating Mode	Tension/Compression
Unique Features	• Compact • Extremely high performance design • Mono or dual channel
Ranges N (Lbf)	Airframe dependent
Output	0.5 to 10.5Vdc
Temperature Range	-55°C to +55°C
Dimensions	Airframe dependent
Typical Apps	Monitoring of pilot input forces for flight data recording

TE SENSOR SOLUTIONS FOR AEROSPACE AND DEFENSE

Force / Torque Sensors



FN EM Series

Package	Pancake
Operating Mode	Compression
Unique Features	• Ultra-flat for integration directly into electro-mechanical actuators
Ranges N (Lbf)	Airframe dependent
Output	0.5 to 10.5Vdc
Temperature Range	-55°C to 55°C
Dimensions	Airframe dependent
Typical Apps	Compression force measurement electro-mechanical actuators



VR BT Series

Pin
Torque
• High temperature variable reluctance technology
Airframe dependent
50mV rms (AC)
-40°C to 150°C
Airframe dependent
Monitoring of force brakes



FN AF Series

Load pin
Compression
• Built in test feature, dual redundant • Very high ultimate load
Airframe dependent
0.5 to 5.5Vdc or 4/20mA
-70°C to 90°C
Airframe dependent
Monitoring of force between the electrical actuator and the ailerons

Temperature Sensors

Sensing Elements



Platinum Thin Film Chips

RTD Package	Leadless chips
Type	• Thin film platinum deposited on ceramic substrate • Contact pads on top and bottom side for NTC chip like assembly • Contact pads on both ends for SMT
Resistance Range	100Ω, 1000Ω (Other values on request)
Unique Features	• Long term stability • Interchangeability • Assembly like NTC chips • Very small dimensions • Short response time
Accuracy	According to DIN EN 60751
Operating Temp	-50°C to +400°C
Dimensions (mm)	1.5 x 1.5 (top / bottom pads) 1.2 x 3.6 (SMT)
Typical Apps	Aerospace, test and measurement



Platinum Thin Film Sensors

Wired component
• Thin film platinum deposited on ceramic substrate, glass coated • Tube outline available • Connection via radial leads
100Ω, 1000Ω (Other values on request)
• Long term stability • Interchangeability • Small dimensions • Short response time • High electrical insulation
Class T (F0.1), A (F0.15), B (F0.3) according to DIN EN 60751
-50°C to 600°C (standard) down to -200 °C or up to 1000 °C (on request)
2.0 x 2.3 x 1.1 (standard) 1.2 x 4.0 x 1.1 (standard) other dimensions (on request)
Aerospace, test and measurement



Glass Wire Wound Sensors

GO, GX
• RTD • Glass rod • Radial leads
100Ω (2x100Ω on few versions)
• Aggressive environments (acid, oil, solvent) • Small dimensions • Stability • No hysteresis • Short response time • Interchangeability
Class W0.3, W0.15, W0.1 according to IEC60751
-200°C to 400°C
Ø 1.8 / Length 5mm to Ø 4.5 / Length 48mm
Aviation and aeronautics

Temperature Sensors

Sensing Elements



Space Qualified (Hi-Rel)

Package	Radial, bead, custom
Type	- Epoxy - Glass - Probes - ESCC 4006013 - ESCC 4006014 - GSFC 319-P18 449900 Series
Resistance Range	1kΩ to 100kΩ
Unique Features	- ESA and NASA approved - High reliability and accuracy
Accuracy	0.5% to 10%
Operating Temp	-55°C to 115°C
Dimensions (mm)	From 2.4
Typical Apps	Instrumentation and compensation



Nickel RTD

- SOT 23, bare die on request - Thin film nickel structure on silicon substrate, protected with a passivation layer - SOT23 Package for SMT - Good thermal connection of sensing element through leadframe-pin - Bare die for COB assembly
1000Ω
- Harsh environment compatible - Automotive qualified - Very small dimensions - Very short response time - Good linearity - High temperature coefficient - Low power consumption
Class B, according to former DIN 43760 standard
-55 °C to 160 °C
2.1 x 2.5 x 2.1 (SOT23), 0.7 x .7 x 0.4 (bare die)
Thermal compensation, thermal management



Radial Leaded Thermistors

Radial, axial, beads
- NTC - Epoxy or glass coated
100 to 1MΩ
- Interchangeable - Moisture resistant - Stability
0.25% to 20%
-55°C to 280°C
0.4 to 4.9
Temperature sensing for OEM



Axial Thermistors

DO-35
- NTC - Glass coated
5kΩ to 100kΩ
- Tight tolerance (±1%) - Max stability using high density (HD) chip - Hermetically sealed - Tinned & Nickel plated leads
±1% to ±3%
-40°C to 300°C
2.0 x 4.0 body
Fire detection units, PCB temp sensing

Sensor Assemblies



Thermocouple Probes and Harnesses

Package	Screw-in or push-in design with cable extension, connector, or connecting head
Type	- Collapsible Mineral Insulated (MI) with alloy sheath (radius≥5°OD) - Flexible cable with plastic or composite insulation - Rigid protection sheath: ceramic, quartz or alloy sheath
Sensor Range	Type T, J, K, N, R, S, B (According to TC type and insulation type)
Unique Features	- High temperature and high vibration level (for MI) - Available in small diameters for fast respond time - Grounded or ungrounded or apparent hot junction - Single or multiple measuring points
Accuracy	Class 1 according to IEC584
Operating Temp	-40°C to 1700°C (according to TC type and insulation type)
Dimensions (mm)	- OD Ø0.3 mm to Ø8 mm for MI - ø0.15mm for smallest flexible cable - Custom dimensions, fittings and cable lengths (from few centimeters to many meters)
Typical Apps	Engine temperature



Surface Sensors

Silicone rubber or polyimide laminated element, SP683
- Flat, flexible, rectangular sensor - Variety of designs available
- RTD: Pt, Ni, Cu - Thermocouple: Type J, K, T, E
- Surface sensing for curved or uneven surfaces - Noninvasive, simple installation - Adhesive backing option
RTD: Class A, B according to IEC60751
Varies: -50°C to 200°C Available up to 220°C
Custom dimensions available
Aerospace, motor end windings of stator coils, generators

Position Sensors

Angular Position Sensors, Encoders Absolute



Resolver

Package	Hollow Shaft, Size 15
Range	360 degrees absolute
Output	Analog (sin, cos)
Input Voltage (VR1-R2), Typical	2V rms - 10Vrms
Input Frequency, Typical	4kHz - 20kHz
Operating Temperature	-55°C to 150°C
Angular Error Rang, Typical	±7 arcmin to ± 20 arcmin
Pairs of Pole	1 / 3
Maximum Rational Speed	20,000 rpm
Weight	Approx. 90g
Unique Feature	Robust, wear-free, EMI insensitive
Typical Apps	Angular position of rotary actuators, rotating shafts



Resolver

Package	Hollow Shaft, Size 21
Range	360 degrees absolute
Output	Analog (sin, cos)
Input Voltage	2V rms - 12V rms
Input Frequency	2kHz - 15kHz
Operating Temperature	-55°C to 150°C
Angular Error Rang, Typical	±7 arcmin to ± 20 arcmin
Pairs of Pole	1 / 2 / 3 / 4
Maximum Rational Speed	20,000 rpm
Weight	Approx. 240g
Unique Feature	Robust, wear-free, EMI insensitive
Typical Apps	Angular position of e-motors (commutation) and permanent magnet generators



Resolver

Package	Input Shaft, Integrated Bearing, Size 11
Range	360 degrees absolute
Output	Analog (sin, cos)
Input Voltage	2V rms
Input Frequency	2,5kHz
Operating Temperature	-55°C to 150°C
Angular Error Rang, Typical	±10 arcmin
Pairs of Pole	1
Maximum Rational Speed	10,000 rpm
Weight	Approx. 120g
Unique Feature	Robust, wear-free, EMI insensitive
Typical Apps	Measuring angular position of cockpit controls (lever, stick and pedal)



Synchro

Package	Input Shaft, Integrated Bearing, Size 11
Range	360 degrees absolute
Output	Analog (3 phase)
Input Voltage (VR1-R2), Typical	21V rms - 26V rms
Input Frequency, Typical	400Hz - 2500Hz
Operating Temperature	-55°C to 150°C
Angular Error Rang, Typical	±5 arcmin to ±10 arcmin
Pairs of Pole	1
Maximum Rational Speed	10,000 rpm
Weight	Approx. 150g
Unique Feature	Robust, wear-free, EMI insensitive
Typical Apps	Angular position of cockpit controls (lever, stick and pedal)



Multiturn Position Sensor Unit

Package	Input Shaft, Integrated Bearing, Customized [1]
Range	Multiturn (50.400 to 129.600) degree
Output	2 x Analog (3 phase), Redundant
Input Voltage	21V rms - 26V rms
Input Frequency	400Hz - 2500Hz
Operating Temperature	-55°C to 90°C
Angular Error Rang, Typical	±80 arcmin (400Hz) / ±25 arcmin (2.500Hz)
Pairs of Pole	1
Maximum Rational Speed	600 rpm
Weight	Approx. 935g [1]
Unique Feature	Robust, DO160 qualified
Typical Apps	Multiturn position of primary and secondary flight control actuators

TE SENSOR SOLUTIONS FOR AEROSPACE AND DEFENSE

Position Sensors

Potentiometers

Angular Position Sensors

				
	6000 Series Servo Mount	6200 Series Bushing Mount	6900 Series Element/Wiper/Insul	6100 Series Hollow Shaft
Package	• 12.7 mm - 50.8 mm / .500 in - 2.00 in housing diameter • 3.170mm - 6.34mm / .1248 in - .2498 in shaft diameter • 12.7mm - 1.74mm / .500 in - .680 in housing length • 11.1mm - 47.62mm / .438 in - 1.875 in mounting pilot diameter	• 12.7 mm - 50.8 mm / .500 in - 2.00 in housing diameter • 3.170mm - 6.34mm / .1248 in - .2498 in shaft diameter • 12.7mm - 1.74mm / .500 in - .680 in housing length • 3/8 32 NEF thread / 10.31mm / .4062 in pilot diameter	• 17.81 mm - 45.85mm / .702 in - 1.805 in element outside diameter • 4.724 mm - 11.05mm / .186 in - .435 in element inside diameter • 3.175 mm - 6.35 mm / .125 in - .250 shaft insulator inside diameter • 4.064 mm - 7.80mm / .160 in - .307 in mating wiper inside diameter • 5.08 mm / .200 in assembled package height	• 27.94 mm - 66.5 mm / 1.100 in - 2.62 in housing diameter • 3.175 mm - 19 mm / .125 in - .752 in hollow shaft diameter
Resistance	1K - 20K	1K - 20K	1K / 5K/ 10K	1K - 20 K
Range	Up to 355 degrees	Up to 355 degrees	Up to 350 degrees	Up to 355 degrees
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 min.	50 million cycles min.	50 million cycles min.	50 million cycles min.
Typical Apps	Flight control actuators, missile fin actuators	Rocket engine fuel valves, brake pedals	Cargo handling systems, cockpit controls	Targeting pod gimbals, missile thrust diverters

Linear Position Transducers Cable Extension Transducers

			
	M150, MTA	MT2, MT3	5903 / 5905 Series Linear Motion
Range	0 - 1.5 to 0 - 5 inches	0 - 3 to 0 - 30 inches	
Output	Voltage divider	Voltage divider, incremental encoder	
Environment/ IP Rating	IP50	IP50, IP67 (MT3A)	
Enclosure	Aluminum	Aluminum and polycarbonate	
Accuracy	±0.4% to ±1%	±0.25% to ±1.1%	
Unique Features	• M150, one of the world's smallest stringpot • 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	• 7.94 mm - 12.7 mm / .312 in - .500 in housing diameter • 1.98 mm - 3.18 mm / .078 in - .125 in shaft diameter
Operating Temp	-40°C to 85°C (M150) -55°C to 100°C (MTA)	-55°C to 125°C	
Dimensions (mm)	19 x 19 x 10 (M150)	55 x 45 x 55	
Typical Apps	Aerospace	Aerospace and flight testing	
			Package Resistance Range Linearity Output Smoothness Resolution Operating Temp. Rotational Life Typical Apps

TE SENSOR SOLUTIONS FOR AEROSPACE AND DEFENSE

Position Sensors

Linear Position Transducers, Inductive Absolute



M12

Package	AISI-304 Series Stainless steel
Linearity	±0.25% of range
Excitation	AC operated
Output	AC voltage
Range	±10 to ±100 mm
Unique Features	• Metric series • High stroke to length ratio • Constant sum of secondaries • Excellent temperature coefficient
Operating Temp	-55°C to 150°C (220°C optional)
Diameter (mm)	12
Typical Apps	Hydraulic spool valve position feedback, flight simulators, engine thrust reversers

Angular Position Sensors, Hall Effect Absolute



H005 / H009 Series

Package	• 12.7 mm - 22.19 mm / .500 in - .875 in housing diameter • 3.170 mm / .1248 in shaft diameter • 16.9 mm - 17.4 mm / .670 in - .680 in housing length
Range	Up to 359 degrees
Output Options	Analog / PWM / Serial
Resolution	12 Bit - Analog / PWM 14 Bit - Serial
Linearity	± 0.2%
Nominal Supply	5 volts
Operating Temp	-40°C to 150°C
Rotational Life	> 100 million cycles (bearing life)
Typical Apps	Missile fin actuation

H009-1200 Series Dual Output

Package	• 22.23 mm / .875 in housing diameter • 3.170 mm / .1248 in shaft diameter • 26.1 mm / 1.03 in housing length
Range	Up to 359 degrees (dual output)
Output Options	Analog / PWM / Serial
Resolution	12 Bit - Analog / PWM 14 Bit - Serial
Linearity	± 0.2% (dual output)
Nominal Supply	5 volts (dual output)
Operating Temp	-40°C to 150°C
Rotational Life	> 100 million cycles (bearing life)
Typical Apps	Missile fin actuation

Vibration Sensors

DC Accelerometers



3038

Package	SMD
Type	MEMS, Board level
F.S. Range (g)	±50, 100, 200, 500, 2000, 6000
Unique Features	• Hermetically sealed • High over-range protection • Gas damping
Accuracy	±0.5% Non-linearity
Excitation Voltage	—
Operating Temp	-54°C to 125°C
Dimensions (mm)	7.62 x 7.62 x 3.3
Typical Apps	Vibration / shock monitoring, embedded systems, shock testing, safe and arm



EGAXT

Package	Stainless steel
Type	Plug and Play, Unamplified, Adhesive / Screw mount
F.S. Range (g)	±5 through 2500
Unique Features	• Sub-miniature • Lightweight • 10,000 g over-range protection
Accuracy	±1.0% Non-linearity
Excitation Voltage	—
Operating Temp	-40°C to 120°C
Dimensions (mm)	7.2 x 4.6 x 4.6
Typical Apps	Flight test and control, launch, crash, impact testing, robotics



4602/4604HT

Package	Anodized aluminum
Type	Plug and Play, Amplified, Screw mount
F.S. Range (g)	±2, 10, 30, 50, 100, 200, 500
Unique Features	• Exceptional temp compensation • HT version to 170°C • High over-range • Hermetically sealed
Accuracy	±1.0% Non-linearity
Excitation Voltage	8 - 36 Vdc / 8 - 18 Vdc (HT)
Operating Temp	-54°C to 170°C (HT)
Dimensions (mm)	21.08 x 21.59 x 7.62
Typical Apps	Flight testing on engines, flutter test, weapons development

TE SENSOR SOLUTIONS FOR AEROSPACE AND DEFENSE

Vibration Sensors

DC Accelerometers
Plug and Play



3420XA

Package	Anodized aluminum
Type	±1 to 500
F.S. Range (g)	Triaxial
Unique Features	• Analog output • Precision aligned • Performance over temperature
Accuracy	±0.2% Non-linearity
Excitation Voltage	8.5 to 36 VDC
Operating Temp	-40°C to 85°C
Dimensions (mm)	24 x 24 x 28.30
Typical Apps	Safety system, military research and development



3520XA

Package	Anodized aluminum
Type	±1 to 500
F.S. Range (g)	1, 2, or 3
Unique Features	• Digital output • Direct to PC • User configurable settings
Accuracy	±0.2% Non-linearity
Excitation Voltage	8.5 to 36 VDC
Operating Temp	-40°C to 85°C
Dimensions (mm)	52 x 36.50 x 17.50
Typical Apps	Impact detection, stores separation

Piezoelectric Accelerometers
Plug and Play



7202A/7204A

Package	Stainless steel
Type	Voltage mode plug, through hole mount
Sensitivity (mV/g)	100, 10
Unique Features	• Annular shear mode • Integral strain relief • Case isolated, internally shielded • 3-pin connector • +150°C option
Operating Temp	-55°C to 130°C
Dimensions (mm)	13.34 x 19.05
Typical Apps	HUMS applications, rotor track and balance

Piezo Film Sensors



Piezo Cable

Package	Shielded coaxial 20 gage piezo cable
Type	Polymer jacketing; armored jacketing
Range	µPa sensitivity
Unique Features	• Continuous lengths to 1km • Shielded construction
Accuracy	±20% (typical)
Operating Temp	-40°C to 85°C (up to 100°C available)
Dimensions (mm)	3 mm diameter; continuous lengths
Typical Apps	Geophone, impact sensors, intrusion detection



Tamper Box

Package	Flat film or box mounted
Type	Tamper detection sensor
Range	Application dependent
Unique Features	• Low power • Custom shapes and sizes • High security
Accuracy	Application dependent
Operating Temp	-40°C to 85°C
Dimensions (mm)	Application dependent
Typical Apps	Encryption modules, POS card readers, PIN entry devices, tamper

Ultrasonic Sensors

Standard Contact Point Level



LL-01

Type	Gap
Unique Features	• All 316L SS • Integral electronics • Miniature threads • Single machined • No adjustment for viscosity, density
Input	6 - 24VDC
Output	1/2A contact
Pressure	250 psi
Temperature	100°C
Actuation point	0.25"
Process Connection	1/4"NPT & 1/2"NPT
Cable	12"
Approvals	CE
Typical Apps	Compressors, coolant reservoirs



LL-10

Type	Tip
Unique Features	• All 316L SS • Integral electronics • No adjustment for viscosity, density
Input	9 - 24VDC
Output	1A SPDT
Pressure	1000 psi
Temperature	100°C
Actuation point	2.25" standard
Process Connection	3/4"NPT
Cable	12"
Approvals	CE
Typical Apps	Hydraulic reservoirs, dark water

PRODUCT AND APPLICATION MATRIX	Flow	Fluid Property	Force/Torque	Humidity	Liquid Level	Rate/Inertial	Position	Pressure	Temperature	Ultrasonic	Vibration/Shock
Cockpit Controls			●				●				
Flight Controls and Actuation			●				●				
Landing Gear & Brakes			●				●	●			
Cabin, Galley & Cargo				●	●		●	●	●	●	
Launch & Space			●				●	●	●		●
Engine, Turbine & APU	●				●		●	●	●		●
Military (Missile, Ground Vehicle, Marine, UAV...)	●	●			●	●	●	●	●	●	●

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