

# Amphenol Sensors

## Sensor Innovations

### Military Applications

Amphenol Sensors is a leading innovator in sensor technologies and measurement solutions. Offering the most diverse sensor portfolio of standard and customized products for the world's most demanding regulatory and industry-driven applications, Amphenol creates value by providing critical information for real-time decisions.

For Military Applications, Amphenol Sensors provides advanced engineering design and product offerings to solve diverse challenges across today's sophisticated military technologies and rugged applications. We provide sensor solutions for military aircraft, ground systems, vehicles, missiles, munitions, soldier-worn systems, unmanned systems, underwater naval applications, and space.



# Amphenol Sensors

## Military Sensor Solutions

- Temperature ● Pressure ● Gas ● Vibration ● Position ● Level ● Shock & G
- Force ● Acoustics ● Weatherstations® ● Ultrasonic Transducers & Arrays

### Soldier-Worn Systems

- Temperature Sensors
- Pressure Sensors
- Gas Detection Sensors
- Weatherstations



### Military Aircraft

- Gas Detection Sensors
- Pressure Sensors
- Vibration Sensors
- Ultrasonic Level Sensors
- Position Sensors

### Naval

- Vibration Sensors
- Pressure Sensors
- Microphones
- Gas Detection Sensors
- Position Sensors
- Weatherstations
- Synthetic Aperture Sonar Transducers (SAS)
- Acoustic Communications Transducers (ACOMMs)
- Forward Lookers and SideScans Transducers



### Ground Vehicles

- Pressure Sensors
- Gas Detection Sensors
- Position Sensors
- Shock Sensors
- Ultrasonic Level & Concentration Sensors
- Vibration Sensors
- Weatherstations

### Missiles • Munitions • Torpedoes

- Temperature Sensors
- Pressure Sensors
- Shock and Vibration Sensors
- Vibration Sensors
- Position Sensors



### Space

- Temperature Sensors
- Pressure Sensors
- Force Sensors
- Microphones
- Shock Sensors
- Vibration Sensors
- Gas Detection Sensors
- Position Sensors

## NAVAL

### Vibration Sensors

**Application: underwater acoustics, ordinance monitoring**

- Ultra low-noise internal amplifier
- Encapsulated in polyurethane



**Application: underwater vibration monitoring**

- High pressure rating • High sensitivity
- Wide frequency range
- Ground isolated to eliminate ground loops

**Applications: towed arrays, sonobuoys, deep ocean**

- Incorporates low-noise preamplifier with calibration circuit
- Electrostatically shielded and molded in polyurethane

**Applications: underwater unmanned vehicles (UUV), towed arrays, ACOMM**

- 4-channel combination: orthogonal axis accelerometers and omnidirectional hydro phone
- Improved signal-to-noise ratio

### Pressure Sensors

**Application: measurement of dynamic pressure due to turbulent water flow or cavitation**

- Integral waterproof cable hydro-tested during production
- Acceleration compensated
- Ground isolated
- Integral waterproof cable hydro-tested during production
- Acceleration compensated • Ground isolated



### Position Sensors

**Applications: rudder control, launch tube control, anchor control, periscope control**

- Rugged design • Reliable position feedback



### Gas Detection Sensors

**Application: fuel leakage**

- 0 to 100% LEL
- Approved EX-d • Mechanical robust



**Application: detection of toxic gases**

- Detectable gases: VOCs, CO<sub>2</sub>, CO, NO<sub>2</sub>, NH<sub>3</sub>
- Custom & robust packaging options

### Custom Transducers and Arrays

**Application: Mine Detection, Harbor Security, Acoustic Communications**

- Proven Defense contract history
- Custom designed transducers to fit any application
- High bandwidth complex arrays



### WeatherStations®

**Application: Mobile and stationary platforms (custom colors available)**

- Hyper-local weather
- True wind speed and direction
- GPS, heading, air temp, barometric pressure and relative humidity
- Rugged, compact, maintenance-free weather sensors (IPX7)



## GROUND VEHICLES

### Pressure Sensors

**Applications: engine fuel and air filter, transmission fluid, air blast measurement, blast pressure measurement, unmanned ground vehicles/drones**

- High accuracy
- Harsh media compatibility



### Gas Detection Sensors

**Application: fuel leakage**

- 0 to 100% LEL
- Approved EX-d • Mechanical robust



**Application: detection of toxic gases**

- Detectable gases: VOCs, CO<sub>2</sub>, CO, NO<sub>2</sub>, NH<sub>3</sub>
- Custom & robust packaging options

### Ultrasonic Level & Concentration Sensors

**Applications: fuel, coolant, hydraulic fluid, DEF SCR systems**

- Continuous monitoring • High accuracy
- Robust, non-contact sensing



**Applications: wheel speed, engine speed and position**

- Variable reluctance, active hall effect or magneto resistive sensors
- Zero speed, large air gap capability

## GROUND VEHICLES (cont.)

### Position Sensors

**Application: multi-turn steering wheel angle**

- Patented through-hole solution
- Long life for harsh environments



### Vibration Sensors

**Application: Health and Usage Monitoring Systems (HUMS)**

- Rugged • Reliable • Durable
- Condition-based maintenance of vibrating / rotating parts
- Vehicle dynamics
- NVH
- Shock measurement due to blast



### Position Sensors

**Applications: door control, armoured hatch control, suspension control, protective shield control, outrigger control, steering control**

- Rugged design • Reliable position feedback



### WeatherStations®

**Application: Mobile and stationary platforms (custom colors available)**

- Hyper-local weather
- True wind speed and direction
- GPS, heading, air temp, barometric pressure and relative humidity
- Rugged, compact, maintenance-free weather sensors (IPX7)



## MILITARY AIRCRAFT

### Gas Detection Sensors

**Application: fuel leakage**

- 0 to 100% LEL
- Approved EX-d
- Mechanical robust



**Application: detection of toxic gases**

- Detectable gases: VOCs, CO<sub>2</sub>, CO, NO<sub>2</sub>, NH<sub>3</sub>
- Custom & robust packaging options

### Ultra Low Pressure Sensors

**Applications: test/simulation, unmanned aerial vehicles (UAV)**

- Dual Wind Speed and Altitude Measurement
- High Stability and Repeatability • Compact Package



**Application: general military grade and barometric pressure**

- Calibrated -40C to +125C • High stability and repeatability
- Digital and amplified outputs



### Vibration Sensors

**Application: Health and Usage Monitoring Systems (HUMS)**

- Rugged • Reliable • Durable
- Condition-based maintenance of vibrating / rotating parts



### Ultrasonic Level Sensors

**Applications: fuel, coolant, hydraulic fluid, DEF SCR systems**

- Continuous monitoring • High accuracy
- Robust, non-contact sensing



**Applications: helicopter landing gear and fuel systems**

- Absolute, gauge and sealed gauge
- From 3 psi to 7500 psi • High accuracy

### VC Flight Test Accelerometers

**Applications: flutter testing, vibration and g loading during maneuvers**

- From 2 g's to 200 g's



### 6DoF Accelerometers and Rate Measurement

**Applications: aircraft, helicopter, and missile flight testing**

- Acceleration from 2 g's to 500 g's
- Angular rate from 100 to 18,000 degrees per second



### Position Sensors

**Application: automated positioning**

- Rugged design • Reliable position feedback



## MISSILES • MUNITIONS • TORPEDOES

### Temperature Sensors

**Applications: torpedo guidance and tracking**

- High accuracy • Proven reliability
- Various temperature and resistance values



### Pressure Sensors

**Applications: torpedoes, Air blast measurement, Underwater blast pressure measurement**

- Calibrated -55C to +200C
- Robust and rugged
- Long-term stability



### Gas Detection Sensors

**Application: fuel leakage**

- 0 to 100% LEL • Approved EX-d
- Mechanically robust



### Shock and Vibration Sensors

**Applications: fuzing and alarming**

- Accelerometers
- Rugged • Reliable • Durable



### Position Sensors

**Application: accurate positioning**

- Rugged design, reliable position feedback



## SPACE

### Temperature Sensors

**Application: atomic clock**

- Long-term stability • Proven reliability
- All definitions and test methods per MIL-PRF-23648



### Pressure Sensors

**Application: satellite propulsion**

- Robust and rugged • Long-term stability
- High repeatability • High accuracy



### Vibration Sensors

**Application: vibration and shock testing of spacecraft before launch and during flight**

- Hermetic and low outgassing accelerometers
- Force limited vibration testing sensors
- Shock accelerometers for explosive bolts and stage separation



### High Temperature Accelerometers

**Application: rocket motor testing**

- Continuous vibration measurement up to 760C



### Cryogenic Accelerometers

**Application: cryogenic fuel system testing**

- Vibration measurement capability down to -269C



### Pressure Sensors

**Application: combustion instability measurement**

- Dynamic pressure measurement capability down to -240C for cryogenic fuel system testing
- Dynamic pressure measurement capability up to 760C for combustion instability measurement



### Microphones

**Application: acoustic stress testing of spacecraft before launch**

- From 16 dB to 174 dB



### Position Sensors

**Application: unfolding control**

- Rugged design, reliable position feedback



### Gas Detection Sensors

**Application: fuel leakage**

- 0 to 100% LEL
- Approved EX-d
- Mechanical robust



**Application: detection of toxic gases**

- Detectable gases: VOCs, CO<sub>2</sub>, CO, NO<sub>2</sub>, NH<sub>3</sub>
- Custom & robust packaging options

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## SOLDIER-WORN SYSTEMS

### Temperature Sensors

#### Applications: various

- High accuracy • Proven reliability
- Various temperature and resistance values



### Pressure Sensors

#### Application: blast gauge

- High stability • Miniature size
- Low power requirements • Board-mounted



### Gas Detection Sensors

#### Application: detection of toxic gases

- Detectable gases: VOCs, CO, NO<sub>2</sub>, NH<sub>3</sub>
- Custom & robust packaging options



### WeatherStations®

#### Application: Mobile and stationary platforms (custom colors available)

- Hyper-local weather
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Sensors**

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