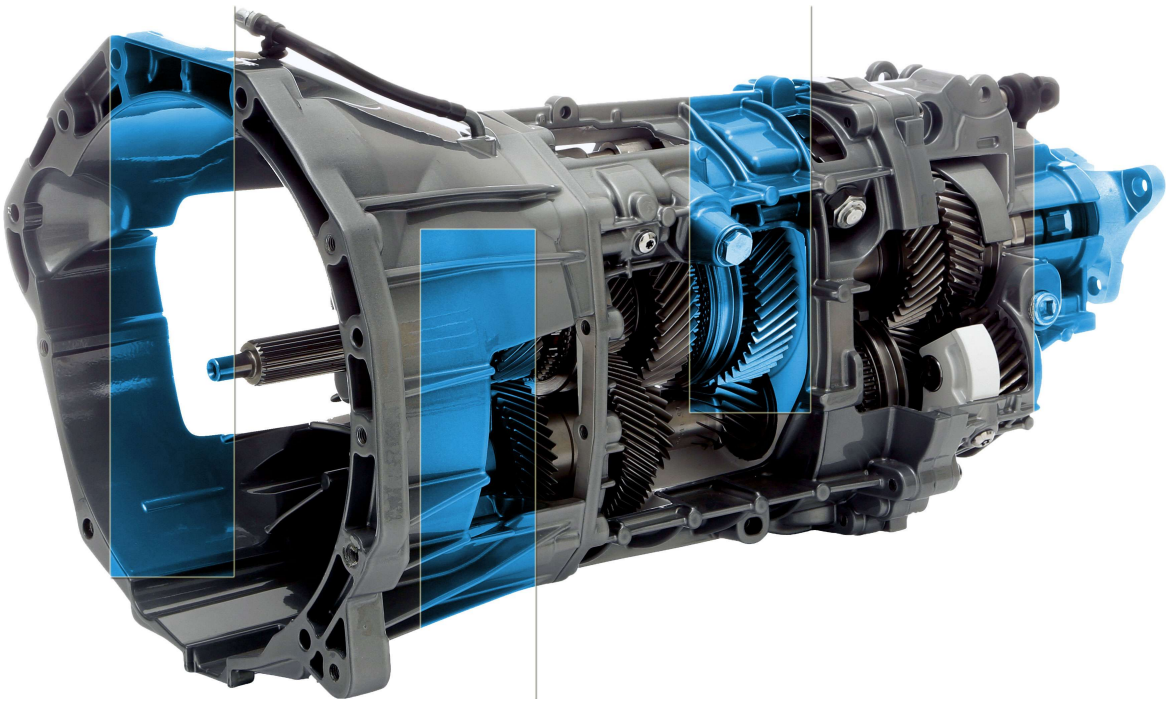
PIHER sensing systems



TRANSMISSION SENSORS

Amphenol Sensors

AMPHENOL OVERVIEW

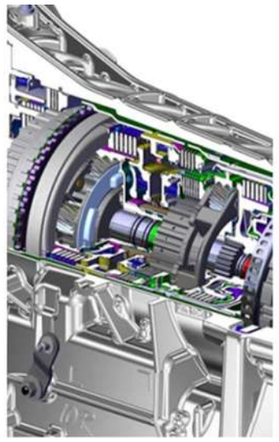
Amphenol is the world leader in connectivity and sensing solutions for powertrain.

A global business headquartered in the United States, Amphenol has manufacturing and engineering centers strategically located to minimize costs while providing local customer support.

An intentionally flat organization, Amphenol is a uniquely dynamic manufacturing firm capable of taking on all projects, large and small. With a customer focused, decentralized corporate structure, Amphenol is built to respond quickly to custom or individual projects while maintaining a large catalog of standard components.

Amphenol is a one-stop-shop for electrification projects, offering virtually every component and assembly throughout the drivetrain/powertrain.

Connecting your world through Sensing Innovations

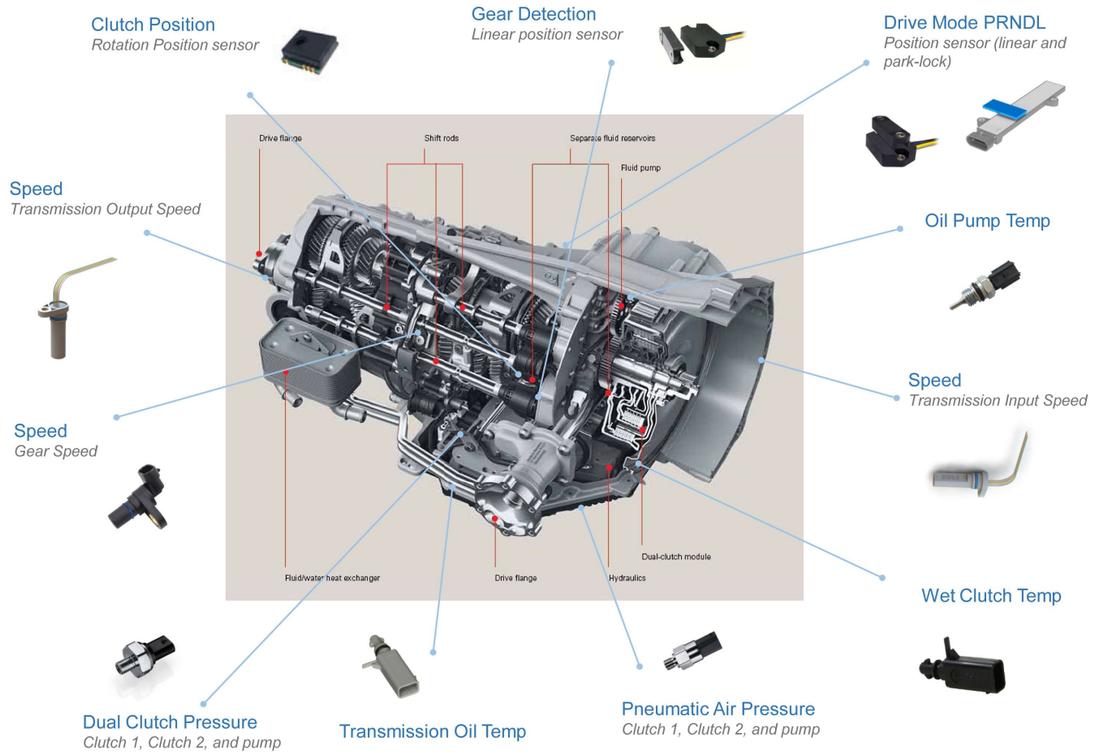


PRODUCT CATEGORIES

Amphenol carries a wide range of products with unique capabilities, applications and target industries. From individual components to complex assembly, Amphenol has a solution for any complex project.

How to use this document:
This is intended as a glimpse into Amphenol's capabilities and standard catalog. Due to the large number of parts, configurations, specifications and details, only a small portion of Amphenol's full leading-edge portfolio can be presented in this format. For additional information and specific product requests, please use the contact information shown in the last page.

POSITION **PRESSURE** **SPEED & DIRECTION** **TEMPERATURE**



TEMPERATURE SENSORS

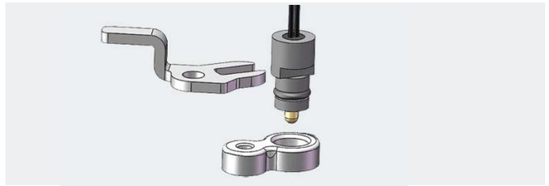
Temperature Sensors are used in automotive applications to monitor the temperature of transmission fluid and provide feedback to prevent overheating of the transmission, which can cause performance and reliability issues. Learn more about the benefits, features and applications.

TFT

-40°C ~ 160°C | 30 KOhms @ 25°C

Transmission Fluid Temperature Sensor (TFT) that measures the temperature of transmission fluid. It provides input to the control module to modify shift patterns for smoother shifting in automatic transmissions, and also provides over-temperature protection by locking the torque convertor.

- Integral connector
- Twist and lock design for easy installation
- Anti-rotation lock feature
- Existing field-proven design
- Alternate RvT curves available
- Different geometries to meet package requirements



CTTS

-40°C ~ 150°C | 2009 Ohms @ 25°C

Transmission Fluid Temperature Sensor (TFT) that measures the temperature of transmission fluid. It provides input to the control module to modify shift patterns for smoother shifting in automatic transmissions, and also provides over-temperature protection by locking the torque convertor.

- Operating Pressure Range: 0 Bar ~ 20 Bar
- Sealing Spec: Leakage rate <0.5% when exposed to 20 Bar oil pressure for 1 min.
- Fast Response: T63 <15s seconds (25°C~85°C in oil)
- Insulation Resistance: >100MO at 500VDC between copper shell and wire
- RoHS Compliant

PRESSURE SENSORS

Amphenol is a single source for high-tech pressure sensors for both manufacturers and consumers. With more than 65 years experience, Amphenol leads the way in the design and manufacture of high quality sensors for temperature, gas, humidity and pressure.

OPS

MEMS-based | 150 °C

The OPS sensor is specially designed for the use in demanding automotive applications. By using a special MEMS pressure sensing element, the sensor can withstand typical pressure pulses of oil pressure applications. The sensor design is modular and can be adapted to different electrical and mechanical customer interfaces. The state-of-the-art conditioning electronics provide a reliable and highly accurate measurement over a wide temperature range. Especially designed for the automotive industry, the OPS fulfils the latest automotive requirements regarding EMC and ESD.

- For oil pressure applications and pressure ranges between 0…5 bar and 0…50 bar
- SENT output (other analog and digital output signals possible)
- Operating temperature: -40 … 125 °C (150 °C)
- Pressure connector: M10x1.25 male (others possible), HEX 24
- Electrical connector: RD and Yazaki connector (others possible)
- Media compatibility: Engine oil & Transmission oil (others possible)
- Robustness against pressure spikes

VSP

Stainless steel element | 150 °C

Robust design which makes it a reliable partner for any oil application in motor and commercial vehicles. The VSP is able to measure relative pressures in a nominal pressure range of up to 200 bar. The specially developed evaluation electronics make it possible to take very precise and stable measurements at temperatures of up to 150 °C, even under tough conditions.

- For oil pressure applications and pressure ranges between 0 … 10 bar and 0 … 200 bar
- Analog output signal (SENT possible)
- Operating temperature: -40 … 125 °C (150 °C)
- Pressure connector: M10x1 male (others possible), HEX 19
- Electrical connector: MQS and Packard (Series 150) connector
- Media compatibility: Engine oil & Transmission oil (others possible)

POSITION SENSORS

Rotary and linear hall-effect position sensors can be sealed and flange mounted for easy positioning when necessary for use on Tier-1 and OEM platforms. They provide excellent repeatability, accuracy, resolution, linearity and high stability under extreme environment conditions such as vibration, electromagnetic noise, shock, extreme temperatures / humidity, dither, moisture or dirt.

PSC360IC

Non contact | 360º | Rotary

Sealed and flange mounted for easy positioning when necessary. It provides high stability under harsh environment conditions such as vibration, shock, extreme temperatures / humidity, dither, moisture or dirt. Featuring a modular architecture, electrical & mechanical features can be fully customised.

- Asil level B or C
- Selectable output: analogue (ratiometric) or PWM. SPI and SENT upon request
- Absolute position over 360°
- Life: up to 50M cycles
- Dual redundancy available
- Up to 0.5% linearity
- Switch function with programmable position

PS2P

Non contact | 360º | Rotary & Linear

The magnet is attached to the moving parts whose displacement is to be measured, such as hydraulic/pneumatic controls or gear selector, and the electronics module is fixed to the chassis (or vice versa).

- Asil level B or C
- Selectable output: analogue (ratiometric) or PWM. SPI and SENT upon request
- Programmable measuring range: up to 12mm.
- Nominal air gap: 3mm between plastic parts
- Maximum air gap range: 5mm. For higher air gap: check availability
- Maximum magnet lateral offset: ± 1mm.

MTS360

Non contact | 360º | Rotary hollow shaft

Detect the position of the gear, such as first or second, and sends the data as electric signal to the Engine Control Unit (ECU). It generates an output voltage proportional to the displacement of the input shaft.

- Asil level B or C
- Selectable output: analogue (ratiometric) or PWM. SPI and SENT upon request
- Hollow shaft design
- Resistant to vibration and extreme temperatures
- Absolute position over 360°
- Life: up to 50M cycles
- Sensor + PCB + connector combo package available
- Switch function with programmable position

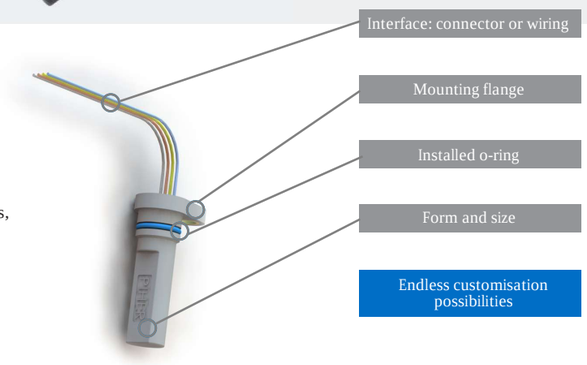
SPEED & DIRECTION SENSORS

Flange mount gear tooth speed sensors precisely calculate the speed and direction in demading enviroments such as vehicle's transmission.
Custom product design packaging can be easily provided to meet any form, fit and function including the choice of wire harness and interface connector.

Speed Sensor

150°C | Hall-effect

- Speed and direction feedback
- Compact and rugged
- Sealed for harsh environments
- Resistant to moist and high vibration environments such as engines, transmissions, brakes and chassis systems
- Output:
  - A/B signal
  - Two wire current source
- ESD protection



MARKETS SERVED

Amphenol Sensors is a leading innovator in sensing technolgies 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.

Automotive

Amphenol Sensors is your best source for automotive sensors, offering the technology that brings your systems together to protect the vehicle, its occupants and the environment.

From engine management to safety systems, consider us your global partner for all your automotive sensing needs. We deliver innovative solutions and high-performing products with the finest customer support-bringging the best results to you and your customers.

Heavy Equipment & Off Road (HVOR)

Efficient under high demand. For agriculture, farm and construction, Amphenol Sensors combines its expertise in automotive sensing with the high demands inherent of heavy equipment. Our robust sensors maximize the efficiency and lifetime of your heavy equipment, which translates to improved operational costs, operator safety and environmental compliance.

CONTACTS

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Our Advantage
Value added proposition

- Engineering design-in support
- Output customization
- Cable harness and connector assembly
- One-stop solution provider for different position sensing technologies
  - Hall-effect
  - Potentiometric
  - Inductive
  - Capacitive
  - Reed switch
  - Printed PCB
- Global footprint
- Manufacturing capabilities for high and low volume programs
- Diverse portfolio of standard and customised sensors: Temperature, Gas & Moisture, Pressure, etc.

Amphenol

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