

Application Note

Low Temperature Passive Probes, LTP Series Engine Cooling System

Background

Multiple sensors are used in many heavy duty transportation automotive systems to monitor temperature, gases, voltages/ currents, vacuum and torque, to name a few. Twenty years ago, the typical heavy duty application used approximately five sensors. Today, typically 50 sensors may be used to control many vehicle systems

Solution

Honeywell's Low Temperature Passive Probes, LTP Series, are a modular range of temperature sensors designed for potential use in transportation applications. The LTP Series feature a durable, closed-tip design that maximizes reliability in harsh applications. The sensor's thermistor sensing element effectively senses gases, liquids or solids because of its enhanced sensitivity, accuracy and reliability. Easy-to-install threaded mounting provides reliable operation in harsh environments. Numerous options—from mechanical and electrical interface—simplify installation, allow customers to meet their specific application needs, and facilitate backwards-compatibility with most existing applications.

TRANSPORTATION

Description: An engine cooling system allows an engine to reach optimum operating temperature as quickly as possible and maintains that temperature while the vehicle is in operation. The system removes excess heat from the combustion process so that the engine parts are not damaged, and the oil does not break down. Engine coolant is used in the vehicle to:

- Effectively remove heat generated from the combustion of fuel in the engine block
- Provide corrosion protection to engine components
- Overheating and low temperature protection
- Prevent heat transfer to the vehicle's passenger compartment
- Lubricate the water pump and provide general chemical protection

Sensor: Engine Coolant Temperature (ECT) sensor

Location: The ECT sensor is typically located in a coolant passage in the engine, usually near the thermostat

Function: The ECT sensor may be used to measure the temperature of the engine coolant of an internal combustion engine by sending that information to the Engine Control Unit (ECU) which maintains the temperature of the engine by controlling fuel supply for combustion.

In addition to fuel calculations, the temperature sensor signal plays a role in almost every function that the ECU serves. The ECU uses the signal from ECT sensor and an Intake Air Temperature (IAT) sensor to determine the cold start (when the temperature is below 8 °C [46.4 °F]). The ECM (Engine Control Module) uses the ECT sensor to calculate ignition spark advance, fuel delivery to the engine, engine idle speed, EGR (Exhaust Gas Recirculation) operation, and torque converter clutch enable.

Value to Customers

- Reduces the possibility of overheating
- Helps maximize engine life
- Helps maximize engine efficiency
- Helps reduce operation costs

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LTP Series	Features
<p>Bosch Kompakt</p> 	<ul style="list-style-type: none">• Temperature range: -40 °C to 150 °C [-40 °F to 302 °F]• Response time [T63.2% of 25 °C to 85 °C step]: stirred silicon oil <15 s; stirred water <15 s; air flow 10 m/s <20 s• Accuracy:<ul style="list-style-type: none">- -40 °C to 25 °C [-40 °F to 77 °F]: ±2.5 °C- 25 °C to 100 °C [77 °F to 212 °F]: ±0.8 °C- 100 °C to 125 °C [212 °F to 257 °F]: ±2.0 °C- 125 °C to 150 °C [257 °F to 302 °F]: ±3.5 °C
<p>Delphi Metri-Pack 150 Series</p> 	<ul style="list-style-type: none">• Electrical interface: Bosch Kompakt, Delphi Metri-Pack 150 Series, AMP Seal 16, AMP Minitimer, AMP Superseal, and Deutsch DT04-2P
<p>AMP Seal 16</p> 	<ul style="list-style-type: none">• Probe length options: 20 mm to 50 mm (other lengths available upon request)
<p>AMP Minitimer</p> 	<ul style="list-style-type: none">• Mechanical fastening options: M10 to M18, 3/4 UNF, and G 1/4 (other threads available on request)
<p>AMP Superseal</p> 	<ul style="list-style-type: none">• Retainer ring with hex: provides complete location for socket wrench in axial and radial directions, enabling the operator to first locate the sensor inside the socket to freely and more easily install the sensor
<p>Deutsch DT04-2P</p> 	<ul style="list-style-type: none">• Insulation resistance between I/O pin and the sensor's housing: >10 MOhm at 250 Vdc, 25 °C [77 °F]• Ingress protection: IP67• Vibration: 30 g sine wave, 10 Hz to 2000 Hz• Mechanical shock: 50 g• Service pressure: 10 bar• Burst pressure: 40 bar
	<ul style="list-style-type: none">• Wire harness (with or without a connector) or other sensing elements (PTC or RTD) available upon request

Find out more

To learn more about Honeywell Sensing and Productivity Solutions' products, call **+1-815-235-6847** or **1-800-537-6945**, visit sensing.honeywell.com, or e-mail inquiries to info.sc@honeywell.com

Sensing and Productivity Solutions
Honeywell
1985 Douglas Drive North
Golden Valley, MN 55422
honeywell.com

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