

High-Accuracy 0.5–4.5 V Pressure Sensor for Oil, Fuel, Coolant & Hydraulic Telemetry

1. PRODUCT OVERVIEW & APPLICATIONS

The GE-PRS series consists of high-reliability stainless steel pressure transducers engineered for fluid pressure monitoring in motorsport telemetry, dynamometer testing, and high-performance automotive systems. Converted directly from the original MegaPascal rating (1.6 MPa and 4.0 MPa) into standard bar units (16 bar and 40 bar), the sensors feature a piezoresistive ceramic sensing core with an integrated ASIC conditioning circuit. Offering high accuracy ($\pm 0.5\%$ FS), linear 0.5–4.5 V DC ratiometric output, G1/4" male thread, and an IP67 weatherproof Packard/Delphi connector, the 16 bar version is ideal for engine oil, fuel rail, and coolant circuits, while the 40 bar version covers high-pressure hydraulic lines and clutch/brake circuits, connecting seamlessly to Gubellini GUBELOG and MICROLOG dataloggers.

2. KEY FEATURES

- **Standard Bar Measurement Scale:** Calibrated in bar units: 0 to 16 bar relative (1.6 MPa / 232 psi) and 0 to 40 bar relative (4.0 MPa / 580 psi).
- **Linear 0.5–4.5 V Ratiometric Output:** Standard 0.5 V zero-point and 4.5 V full-scale output, powered directly by data logger 5.0 V regulated supply.
- **Rugged AISI 304 Stainless Steel Body:** Corrosion-resistant metal body compatible with engine oil, gasoline/petrol, diesel, ethanol E85, coolant, and brake fluid.
- **Piezoresistive Sensing Element:** High-grade ceramic/silicon diaphragm with integrated ASIC temperature compensation and high shock resistance.
- **High Overpressure Safety:** Safe overload rating of $2.0\times$ FS (32 bar / 80 bar) and burst pressure limit of $3.0\times$ FS (48 bar / 120 bar).
- **Standard G1/4" Pressure Port:** G1/4" BSP male thread with Viton (FKM) fluorocarbon sealing ring and 22 mm hexagonal wrench flats.
- **Sealed IP67 Electrical Connection:** Sealed 3-pin Packard Metri-Pack connector (or high-flex cable) resistant to engine bay washdown and track vibrations.

3. DIMENSIONAL & MECHANICAL SCHEMATIC

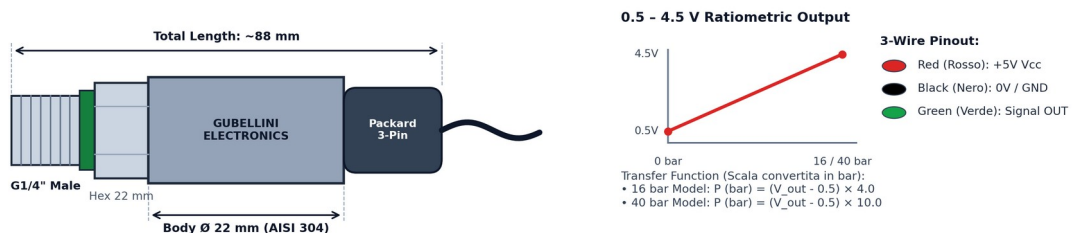


Figure 1: GE-PRS Series Mechanical layout (G1/4" port, hex 22 mm, AISI 304 body) and 0.5–4.5 V calibration transfer curve.

4. ORDERING INFORMATION & PRESSURE RANGES

Part Number	Pressure Range (bar)	Equivalent Range (MPa)	Typical Motorsport Application
GE-PRS-16B	0 to 16 bar Relative (Gauge)	0 to 1.6 MPa (~ 232 psi)	Engine Oil Pressure, Fuel Rail, Coolant Pressure
GE-PRS-40B	0 to 40 bar Relative (Gauge)	0 to 4.0 MPa (~ 580 psi)	Hydraulic Clutch, Transmission Line, Brake Circuit
GE-ADAPT-M10	Adapter Fitting G1/4" F to M10×1.0 M	Stainless Steel AISI 304	Brembo / AP Racing brake & clutch line adaptors

5. TECHNICAL SPECIFICATIONS

Parameter	Specification
Measurement Ranges	0 to 16 bar (Model GE-PRS-16B) 0 to 40 bar (Model GE-PRS-40B)
Original Manufacturer Scale	0 to 1.6 MPa (GE-PRS-16B) 0 to 4.0 MPa (GE-PRS-40B) [1 MPa = 10 bar]
Pressure Measurement Type	Relative / Gauge pressure (reference to ambient atmospheric pressure)
Supply Voltage (Excitation)	5.0 ± 0.5 V DC (Regulated sensor excitation supply)
Current Consumption	< 5.0 mA at 5 V DC (< 8.0 mA max)
Output Signal Type	0.5 to 4.5 V DC Linear Ratiometric (Span = 4.0 V)
Zero Output (P = 0 bar)	0.50 ± 0.05 V DC
Full Scale Output (P = P_max)	4.50 ± 0.05 V DC
Measurement Accuracy	± 0.5% FS (Combined non-linearity, hysteresis, and repeatability)
Safe Overload Pressure	2.0 × Full Scale (32 bar for 16 bar model 80 bar for 40 bar model)
Burst Pressure Limit	3.0 × Full Scale (48 bar for 16 bar model 120 bar for 40 bar model)
Response Time (t90)	< 2.0 ms (fast dynamic pressure wave detection)
Operating Temperature Range	-40°C to +125°C (-40°F to +257°F) medium temperature
Compensated Temperature Range	-20°C to +85°C (-4°F to +185°F)
Temperature Drift (Zero & Span)	± 0.02% FS / °C
Pressure Port Thread	G1/4" BSP Male thread (with Viton / FKM O-ring)
Housing & Wetted Materials	Stainless Steel AISI 304 body, ceramic diaphragm, Viton seal
Enclosure Ingress Rating	IP67 (Dust-tight and resistant to water jet and fluid spray)
Electrical Connector	Standard 3-pin sealed automotive connector (Packard Metri-Pack 150)

6. SYSTEM INTEGRATION & WIRING (GUBELLINI DAQ)

The GE-PRS-16B and GE-PRS-40B connect directly to the 0–5 V analog inputs of the Gubellini Electronics GUBELOG and MICROLOG dataloggers. The logger supplies a stable 5.0 V reference excitation and samples the 0.5–4.5 V signal at up to 200 Hz. The software converts voltage directly to bar using the linear calibration formulas below.

Pin / Wire Color	Signal Function	Electrical Level	GUBELOG / MICROLOG Connection
Pin A / Red (RD)	Supply Voltage (+Vcc)	+5.0 V DC Regulated	Terminal +5V_REF (Regulated Sensor Vcc)
Pin B / Black (BK)	Ground Return (GND)	0 V Power Ground	Terminal AGND (Analog Sensor Ground)
Pin C / Green (GN)	Signal Output (V_out)	0.5 to 4.5 V DC Analog	Terminal AN_IN (Analog 0–5V Channel)
Shield Mesh (Drain)	Cable Noise Shield	Chassis Earth Ground	Terminal SHIELD / Chassis Ground

7. INSTALLATION & HANDLING GUIDELINES

- Tightening Torque Limit:** Apply tightening torque strictly to the 22 mm hexagonal boss using a proper wrench (max torque: 20–25 Nm). Never twist the sensor by the cylindrical body or connector.
- Remote Hose Mounting:** On high-vibration racing engines, mount the pressure sensor remotely on the chassis using a flexible braided hose (-3 AN or -4 AN) rather than rigidly threading into the engine block.
- O-Ring Sealing Integrity:** Ensure the Viton O-ring is properly seated in its undercut and lubricated with clean engine oil before threading into the port to guarantee leak-free sealing.