



# Protran<sup>®</sup> PR3900

Hazardous Area  
Pressure Transmitter



- ATEX and IECEx certified
- Designed for operation in zone 0, zone 20 and M1 mining
- Wide choice of pressure ranges from 0-10 bar to 0-1,500 bar
- NACE corrosion resistant materials
- Rugged, weatherproof design
- DNV GL certification available





# Protran® PR3900

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## Description

The PR3900 pressure transmitter is designed to meet the majority of industrial pressure measurement applications where installation in an explosive and hazardous area is required.

Designed and certified in accordance with the ATEX and IECEx approval this product is intended for installation and operation in potentially explosive atmospheres in zone 0 gas group IIC, temperature class T4 and zone 20 dust and M1 mining. Protection is by intrinsic safety when used with a safety or isolation barrier. The PR3900 provides a stable and accurate intrinsically safe two wire output signal of 4-20 mA when powered through a safety or isolating barrier such as MTL7706+, MTL5541 or other similar protection device.

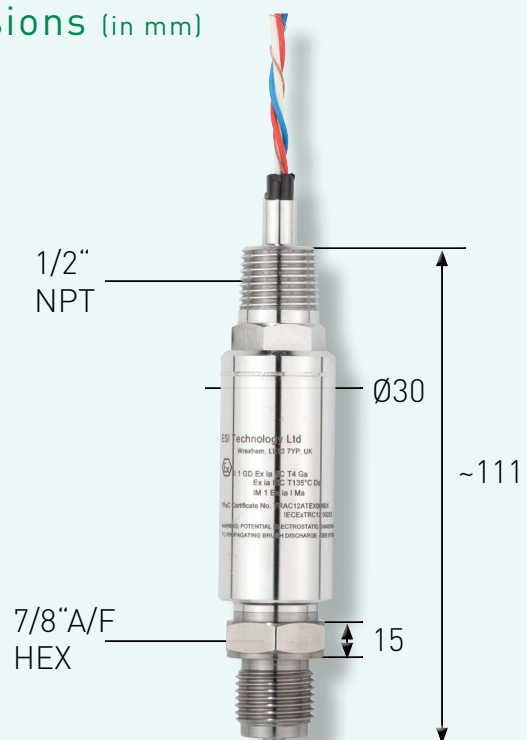
The unique Silicon-on-Sapphire sensor technology provides outstanding performance and gives excellent stability over a wide temperature range. The advanced sensor design consists of a piezoresistive silicon strain gauge circuit, which is epitaxially grown onto the surface of a sapphire diaphragm to form a single crystalline structure. The sapphire sensor element is then molecularly bonded to a titanium alloy sub-diaphragm. This enables the sensor to endure higher over-pressures and provides superb corrosion resistance. The completed sensor exhibits virtually no hysteresis and excellent long-term stability. With outstanding insulation properties, the sapphire substrate allows the sensor to operate over a very wide temperature range without loss of performance.

The fully welded stainless steel enclosure makes the product extremely robust and able to withstand corrosive demanding environments. Electrical connection is via a strong and durable polyurethane cable with integral vent tube for effective gauge venting to atmosphere. In addition to the standard 1/4" NPT female connection optional 1/4" and 1/2" BSP male and 1/2" NPT male process connections are also available. Applications include any above ground explosive / hazardous environment installations, oil and gas industries and volatile chemical processing and storage. Pressure ranges available from 0-10 bar to 0-1,500 bar.

DNV GL rules for classification of ships, high speed & light craft and DNV GL offshore standards.

## Dimensions (in mm)

| ELECTRICAL CONNECTION (mA) |                   |
|----------------------------|-------------------|
| <b>Colour code</b>         | <b>Function</b>   |
| Red                        | Supply (13-36Vdc) |
| Blue                       | Signal (4-20mA)   |
| Drain                      | Cable Screen      |





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### Technical Data

| Type:                           | PR3900  |
|---------------------------------|---|
| Sensor Technology:              | Silicon-on-Sapphire (SoS)   |
| Output signal:                  | 4 - 20 mA (2 wire)  |
| Supply Voltage:                 | 10 - 36 VDC   |
| Pressure Reference:             | Gauge   |
| Protection of Supply Voltage:   | Protected against supply voltage reversal up to 50 V  |
| Standard Pressure Ranges (bar): | 0-10 bar; 0-25 bar; 0-60 bar; 0-100 bar; 0-250 bar; 0-600 bar; 0-1,000 bar; 0-1,500 bar (other options available)   |
| Standard Pressure Ranges (psi): | 0-150 psi; 0-300 psi; 0-1,000 psi; 0-1,500 psi; 0-3,000 psi; 0-8,700 psi; 0-15,000 psi; 0-20,000 psi (other options available)  |
| Overpressure Safety:            | 2x for ranges up to 600 bar; 1.5x for 1000 bar; 1.1x for 1,500 bar  |
| Load Driving Capability:        | 4 - 20 mA: $RL < [UB - 10 V] / 20 \text{ mA}$<br>(e.g. with supply voltage (UB) of 36V, max. load (RL) is 1300 $\Omega$ )   |
| Accuracy NLHR:                  | $\leq \pm 0.3 \%$ of span BFSL (optional higher accuracy version of $\leq \pm 0.15 \%$ of span BFSL)  |
| Zero Offset and Span Tolerance: | $\pm 0.5 \%$ FS at room temperature   |
| Operating Ambient Temperature:  | -20 °C to +85 °C (-4 °F to +185 °F)   |
| Operating Media Temperature:    | -20 °C to +85 °C (-4 °F to +185 °F)   |
| Storage Temperature:            | +5 °C to +40 °C (+41 °F to +104°F) Recommended Best Practice  |
| Temperature Effects:            | $\pm 1.5 \%$ FS total error band for -20 °C to +70 °C. Typical thermal zero and span coefficients $\pm 0.015 \%$ FS/ °C   |
| ATEX/IECEX Approval:            | Ex II 1 G Ex ia IIC T4 Ga (zone 0)<br>Ex II 1 D Ex ia IIIC T135 °C Da (zone 20)<br>Ex I M 1 Ex ia I Ma (group 1 M1)   |
| ATEX/IECEX Safety Values:       | $U_i = 28 \text{ V}$ $I_i = 119 \text{ mA}$ $P_i = 0.65 \text{ W}$<br>$L_i = 0.1 \mu\text{H}$ $C_i = 74 \text{ nF}$<br>Temperature Range = -20 °C to +70 °C<br>Max. cable length = 45 m |
| DNV GL Approval Class:          | Temperature: D; Humidity: B; Vibration: B; EMC: B; Enclosure: C (contact sales for more information)  |
| Ingress Protection:             | Fully welded housing. Rated IP67 when correctly installed to conduit connection.  |
| Electromagnetic Compatibility:  | Emissions: EN61000-6-4; Immunity: EN61000-6-2; Certification: CE Marked   |
| Insulation Resistance:          | > 100 M $\Omega$ @ 50 VDC   |
| Response time 10-90 %:          | 1 mS  |
| Wetted Parts:                   | SAE 316 stainless steel with titanium alloy measurement cell  |
| Pressure Media:                 | All fluids compatible with SAE 316 stainless steel and titanium alloy   |
| Pressure Connection:            | 1/4" NPT female standard (other options available)  |
| Electrical Connection:          | 1m polyurethane cable with integral screen, Kevlar strain cord and vent tube. Conductor size 7/0.20 mm (24 AWG)   |



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### Order Matrix

| Output   | Wires | Type   | Electrical Connector | Pressure Range | Process Connection |
|--|-------|--------|----------------------|----------------|--------------------|
| 4-20 mA  | 2     | PR3900 |                      |                |                    |
| <b>Electrical Connection / Option</b>                  |       |        |                      |                |                    |
| 1m submersible polyurethane cable with integral screen |       |        | -                    |                |                    |
| <b>Pressure Range in bar</b>                           |       |        |                      |                |                    |
| 0-10 bar   |       |        |                      | 0010           |                    |
| 0-25 bar   |       |        |                      | 0025           |                    |
| 0-60 bar   |       |        |                      | 0060           |                    |
| 0-100 bar  |       |        |                      | 0100           |                    |
| 0-250 bar  |       |        |                      | 0250           |                    |
| 0-600 bar  |       |        |                      | 0600           |                    |
| 0-1,000 bar  |       |        |                      | 1000           |                    |
| 0-1,500 bar  |       |        |                      | 1500           |                    |
| <b>Process Connection</b>                              |       |        |                      |                |                    |
| 1/4" NPT female  |       |        |                      |                | AS                 |
| 1/4" BSP male (G1/4)                                   |       |        |                      |                | AB                 |
| 1/4" NPT male  |       |        |                      |                | AM                 |
| 1/2" BSP male (G1/2)                                   |       |        |                      |                | AC                 |
| 1/2" NPT male  |       |        |                      |                | AN                 |

### Order Number Example

PR3900-1000AS

For options not listed please contact sales team.

**DISCLAIMER :** ESI Technology Ltd operates a policy of continuous product development. We reserve the right to change specification without prior notice. All products manufactured by ESI Technology Ltd are calibrated using precision calibration equipment with traceability to international standards.



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