



# Protran® 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



Vers. 20/1/Eng



## 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 MI 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.

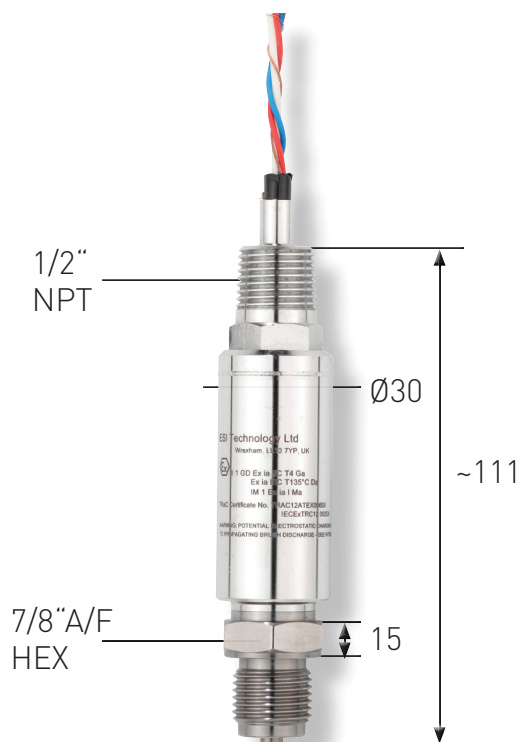
This enables the sensor to endure higher over-pressures and provides superb corrosion resistance. The completed sensor exhibits virtually no hysteresis and excellent long-term stability. With outstanding insulation properties, the sapphire substrate allows the sensor to operate over a very wide temperature 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)	
Colour code	Function
Red	Supply (13-36Vdc)
Blue	Signal (4-20mA)
Drain	Cable Screen



## 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: $RL < [UB - 10V] / 20 \text{ mA}$ (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 available)
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) Ex II 1 D Ex ia IIIC T135 °C Da (zone 20) Ex I M 1 Ex ia I Ma (group 1 M1)
ATEX/IECEX Safety Values:	U <sub>i</sub> = 28 V I <sub>i</sub> = 119 mA P <sub>i</sub> = 0.65 W L <sub>i</sub> = 0.1 $\mu$ H C <sub>i</sub> = 74 nF Temperature Range = -20 °C to +70 °C 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: EN61000-6-3; 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" BSP male (G1/4); 1/4" NPT male; 1/2" BSP male (G1/2) and 1/2" NPT male (others options available)
Electrical Connection:	1/2" NPT M conduit fitting with 1m polyurethane cable with integral screen, Kevlar strain cord and vent tube. Conductor size 7/0.20 mm (24 AWG)
Net. Weight (Kg):	0.3 kg



## Order Matrix

Output	Wires	Type	Electrical Connection/Options	Pressure Range	Process Connection
4-20 mA	2	PR3900			
<b>Electrical Connection/Options</b>					
1/2" NPT M conduit fitting with 1m submersible polyurethane cable with integral screen			EX		
DNV GL Approval plus ATEX/IECEx certified			MEX		
<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
<b>Order Number Example</b>		PR3900EXM1000AS			

For options not listed please contact the 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, traceable to national measurement standards.

