

PRESSURE TRANSMITTER

# Models 509 / 709 / 809



## FEATURES

- **FM, CSA and ATEX Intrinsically Safe Models available**
- **Hammer Union pressure fitting**
- **Shock and vibration resistant**
- **Eight gage sensor design**
- **Pressure up to 20,000 psi (1400 bar)**

## TYPICAL APPLICATIONS

- **Oil Well Drilling and Servicing**
  - **Cementing**
  - **Fracturing**
  - **Acidizing**

## OIL EXTRACTION EXPERIENCE

Viatran's years of oil field experience helps us solve typical application problems. The X09 was created as a solution to the application that a customer couldn't solve. Once solved, we modified the unit to accomplish even more in oil extraction.

## VIATRAN'S ALTERNATIVE

Viatran's unique fastening system locks under severe vibrations ensuring that the environmental integrity of the assembly is maintained much like a welded unit without welding.

## FINITE ELEMENT ANALYSIS

Instability can also come from subtle variations in the Hammer Union and tightening torque. These variances generate point loading of stress on the sensor. Viatran's product development engineers used Finite Element Analysis (FEA) to determine the most effective distribution of the strain gages to reduce the clamping effect. The resulting eight gage sensor design is unaffected by the orientation or tightness of the nut. Using FEA, the X09 Series has been designed with high overpressure protection, allowing it to withstand pressure spikes found in oil field equipment.

## SEMI FLUSH

Our exclusive semi flush design provides a lower cavity volume to prevent clogging. This eliminates the need for tedious cleaning, especially in cementing applications.

Viatran is oil field proven. What often begins as a nagging application turns into a successful solution. The X09 Series, and the various other oil and gas solutions, are shining examples of this success.

*For more information, contact Viatran.*



**PERFORMANCE**

	Full Scale Pressure Range .....	0-5K, 10K, 15K, 20K PSIG (0-350, 700, 1000, 1400 bar)
	Combined Accuracy (BFSL) (Non-Linearity, Hysteresis & Repeatability).....	≤ ±0.25% FSO
Full Scale Output (FSO)	509 .....	16 mA ±1% FSO
	709 .....	5 Vdc ±1% FSO
	809 .....	30 mVc ±1% FSO at 10 V excitation
Zero Balance	509 .....	4 mA ±1% FSO
	709 .....	0 Vdc ±1% FSO
	809 .....	0 mV ±1% FSO
	Long-Term Stability .....	≤±0.25% FSO per 6 months
	Response Time .....	≤2.5 mSec to reach 90% of FSO
	Temperature Effect on Zero .....	≤±1% FSO per 100°F (37°C)
	Temperature Effect on Span .....	≤±1% FSO per 100°F (37°C)
	Compensated Temperature.....	-20°F to 185°F (-29°C to 85°C)
	Operating Temperature 509.....	-40°F to 200°F (-40°C to 93°C)
	Operating Temperature 709 & 809 .....	-40°F to 250°F (-40°C to 121°C)
	Storage Temperature Limits.....	-67°F to 302°F (-55°C to 150°C)

**ELECTRICAL**

Supply Voltage	509 .....	9-30 Vdc (10.5 to 28 Vdc w/approval)
	709 .....	9-30 Vdc (10.5 to 28 Vdc w/approval)
	809 .....	10 Vdc nominal (15 Vdc max)
Power Supply Regulation Effect (Calibrated at 12 Vdc)	509 .....	≤±0.01% FSO per Volt
	709 .....	≤±0.01% FSO per Volt
	809 .....	Output varies with input (calibrated at 10 Vdc)
Output Signal	509 .....	4 - 20 mA at 70°F (21°C)
	709 .....	0 - 5 Volts at 70°F (21°C)
	809 .....	3 mV/Volt at 70°F (21°C)
Current Draw	709 .....	7.5 mA
	809 .....	1 mA at 10 Vdc nominal
Load Impedance	509 .....	750 Ohms maximum at 24 Vdc
	709 .....	410K Ohms minimum
	809 .....	350,000 Ohms minimum for <0.1% FSO attenuation
	Range Calibration Signal .....	100% of FSPR
Calibration Power	509 .....	9-30 Vdc at 15 mA nominal
	709 .....	Short pins E & F
	809 .....	Short pins E & F
	Calibration Signal Accuracy .....	≤±0.2% FSO. The exact signal to pressure correlation is provided with each unit
Circuit Protection	509 & 709 .....	Varistor protected across the input leads for surges above 1000V at 50 microseconds
	809 .....	Varistor protected across the input leads for surges above 34V to 20a. @ 0.02 milliseconds
	Bridge Resistance .....	10K Ohms nominal
	Insulation Resistance .....	≥100 MegOhms to case ground
	Electrical Connection.....	Mates with Bendix P/N PT06E-10-6S or equivalent. See table for pin connections

**MECHANICAL**

Pressure Connections .....	Male hammer union 2 inch #1502
Pressure Cavity Volume.....	0.4 cubic inches
Proof Pressure .....	1.67 times the FS or 22.5K PSI (1550 bar) for union #1502, 30K PSI (2068 for union #2002 whichever is less)
Burst Pressure.....	≥3 times FSPR, limited by union #1502: 22.5K PSI (1550 bar)


**MATERIALS OF CONSTRUCTION**

Enclosure Materials .....	304 stainless steel
Wetted Materials .....	Inconel X-750, heat treated per MR0175-2000
Shock Limitation .....	100 G's
Weight .....	5.5 lbs nominal (2.4 kg)
Identification.....	Laser etched onto body
Enclosure Classification.....	NEMA 4X




# Models 509 / 709 / 809

**Model 509 CERTIFICATIONS (CONSULT FACTORY FOR AVAILABLE OPTIONS: FM, CSA, ATEX, EMC, PED)**

USA	Intrinsically Safe Class I, Div. 1, Groups A-D, Class I, Zone 0 AEx ia IIC T4 at Ta 80°C, T5 at Ta= 40°C. Haz. Loc. Install per CD0641
Canada	Intrinsically Safe Class I, Div. 1, Groups A-D, Class I, Zone 0 Ex ia IIC T4 at Ta=80°C,, T5 at Ta= 40°C. Haz. Loc. Install per CD0640
Europe	ATEX Directive 2014/34/EU
Intrinsically Safe	 II 1 G Ex ia IIC Ga T4 at -20°C ≤ Ta ≤80°C T5 at -20°C Ta ≤ 40°C Haz. Loc. Install per CD0639
EMC Directive	2014/30/EU EN 61326-1:2013
PED Directive	2014/68/EU

**Model 709 CERTIFICATIONS (CONSULT FACTORY FOR AVAILABLE OPTIONS: FM, CSA, ATEX, EMC, PED)**

USA	Intrinsically Safe Class I,, Div. 1, Groups A-D, Haz. Loc. Install per CD0641
Canada	Intrinsically Safe Class I, Div. 1 Groups A-D, ,Class I, Zone 0 Ex ia IIC T4 at Ta = 80 T5 at Ta= 40°C. Haz. Loc. Install per CD0640
Europe	ATEX Directive 2014/34/EU
Intrinsically Safe	 II 1 G Ex ia IIC Ga, T4 -20°C ≤ Ta ≤80°C T5 -20°C Ta ≤ 40°C Haz. Loc. Install per CD0642
EMC Directive	2014/30/EU EN 61326-1:2013
PED Directive	2014/68/EU

**Model 809 CERTIFICATIONS (CONSULT FACTORY FOR AVAILABLE OPTIONS: EMC, PED)**

EMC Directive	2014/30/EU EN 61326-1:2013
PED Directive	2014/68/EU

**OPTIONS**

DH.....	Special range
EA.....	Special calibration run
NK.....	ATEX Intrinsic Safety label (509 & 709 only)
NJ.....	CE label
NX.....	CSA Intrinsic Safety label (509 & 709 only)
TF.....	FM Intrinsic Safety label (509 & 709 only)
TP.....	Low cavity volume sensor design
ZQ.....	CG379-C-145-2P (Glenair) electrical connector
ZT.....	REC-M-10TP-N-04-16 (Jupiter) connector

**ACCESSORIES**

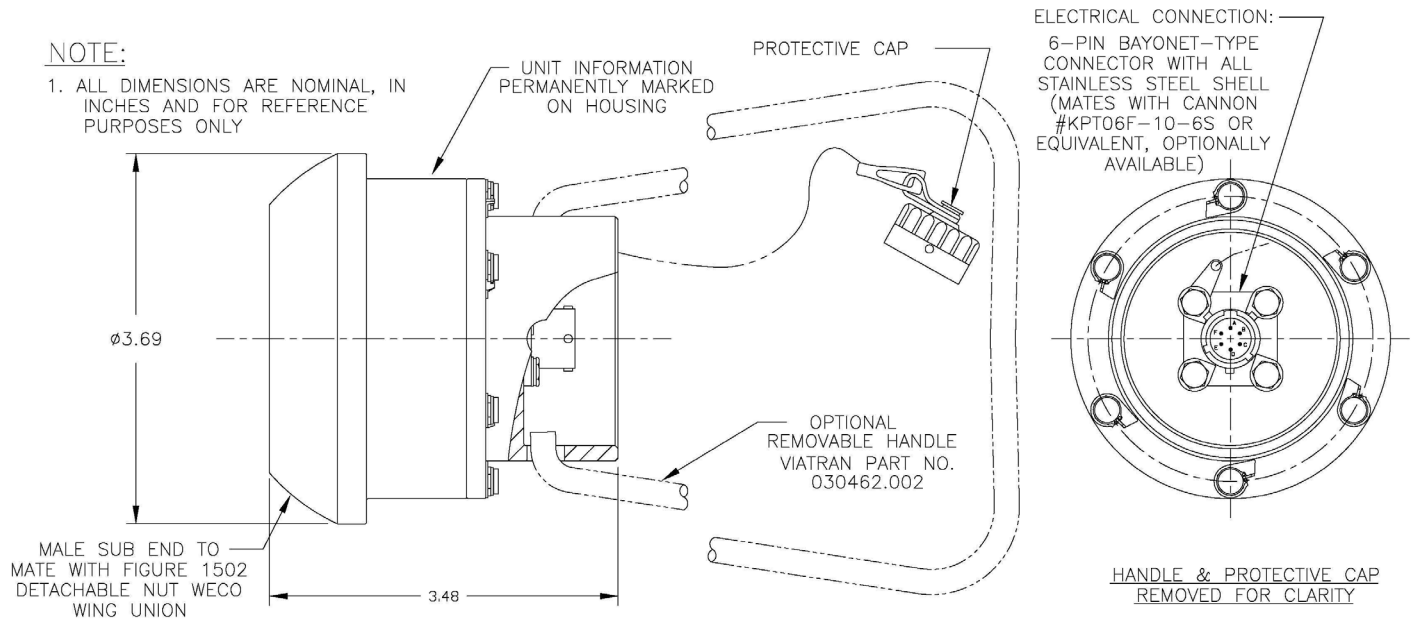
- Carrying handle
- Connector fastener kit
- Buna-N O-Ring seal
- Adapter fastener kit
- Retaining ring tool

## STANDARD PIN CONNECTIONS

	509	709	809
<b>PIN A</b>	+Power/Signal	+Power	+Power
<b>PIN B</b>	-Power/Signal	-Power	-Power
<b>PIN C</b>	No connection	+Signal	+Signal
<b>PIN D</b>	No Connection	-Signal	-Signal
<b>PIN E</b>	+Calibration	Calibration	Calibration
<b>PIN F</b>	-Calibration	Calibration	Calibration

Some models are provided with customer specified wiring. Consult Viatran for exact wiring connections.

## DIMENSIONAL DATA



Information is accurate to the best of Viatran's knowledge. We reserve the right to change specifications at anytime. Please contact Viatran for specific order inquiries.

98DSX09 Rev C

