



## **INSTALLATION DATA MANUAL**

**MODEL 509/709/809**

**PRESSURE TRANSMITTER**

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## PRODUCT OVERVIEW

*NOTE: All information contained in this document is representative of a standard Model 509/709/809. If the product you ordered has special requirements or modifications, refer to the Laser Marked information on the product and your purchase order for possible alteration to the product's configuration. Failure to verify product configuration before installation may cause permanent product damage and in most cases, void the manufacturer's product warranty. If you are unsure or have questions about your product, please contact our Application Engineers for assistance.*

*Remove and retain all instruction manuals and performance certificates that are shipped with the product. These documents provide important information on the product's calibration, operation, safety precautions, recommended maintenance, recalibration requirements, repair service instructions and warranty information. These documents are updated from time to time as changes to the product occur and should be reviewed at receipt so that proper and safe installation can occur.*

### DESCRIPTION

Viatran Models 509, 709 and 809 are pressure transmitters designed specifically for oil field service applications. Depending on the model, these transmitters provide either a 4-20mA (509), 0-5VDC (709) or 3mV/V (809) signal output proportional to pressure. The hammer union pressure connection and low profile design make it ideal for use at the well site. Additional features such as field calibration make the Viatran "X09" Series a leader in oil field pressure instrumentation.

### FIELD CALIBRATION

The X09 Series Transmitters are provided with a unique feature which permits field calibration to be performed by electronically simulating pressure. Powering the calibration terminals (Model 509) or connecting (shorting) the calibration terminals (Models 709 and 809) produces a signal output equivalent to approximately 100% of full scale pressure. This can be used to adjust the gain on the user's meter or data acquisition equipment. The transmitter should be connected as shown below.

### GENERAL REQUIREMENTS & CAUTIONS

*Note: This is only a partial list. Please refer to the Installation Data section of this manual for specific requirements.*

1. All electrical & pressure connections should be compatible with the model specifications as outlined in the Installation Data section of this manual.
2. Installation should occur only after electrical (input power) and line pressure is verified as being off and at zero.
3. The product's internal electrical circuitry is isolated from case ground. It is not recommended that the case or ground of the unit be connected to the input, output or calibrate pins of the product or wiring system. Ground loops and line noise will affect the product's performance and will in most cases cause internal electrical failure.
4. All products should be protected from direct or continued exposure to fluids at the electrical connection. It is recommended that for products installed in areas where the potential for contamination at the electrical connection is possible, protective measures be taken to eliminate possible deterioration of the product's electrical connection and corrosion that will impede product performance.
5. At no time should an object be inserted into the pressure port or pressed against the sensing area to deflect the sensor (to test or simulate pressure), as on some models permanent damage to the sensing diaphragm may occur.
6. Never Remove the transmitter when it is under pressure, if it is hot, or if it exposes noxious gases.

### HANDLING

Although there are variations within the series of sensors, the nominal weight of the assembly is about 5.5 lbs. This is of significant size and a handle is available to facilitate handling. High surface temperatures can remain in place and the unit should be checked before removing the unit from service if it was operated at high temperatures. Suitable gloves are recommended for handling the unit under those conditions. There are no sharp edges associated with the instrument.

### INSTALLATION REQUIREMENTS & CAUTIONS

1. To comply with CE requirements for electromagnetic compatibility, the transmitter case must be earthed by the ground lug at the connector.
2. It is recommended that the connector cover be placed on the product's connector after each use. Simple cleaning and removal of foreign material in the connector will increase the life and operation of the product.
3. The included carrying handle and connector cover should be used when the product is being handled or transported between locations.
4. Installation of the unit is accomplished by placing the pressure transmitter into the hammer union pressure fitting and securing the unit by tightening the hammer union nut (Fig. 1) over both the unit and pressure fitting. Once installed, check for leaks and adjust as necessary.
5. When installing the pressure transmitter, hand tightening of the hammer union nut is recommended. Use of a hammer to tighten the hammer union nut is discouraged because inadvertent blows to the transmitter may result in damage. To ensure a watertight seal between the adapter and sensor, the O-ring, should be inspected and replaced if needed, whenever the transmitter is disassembled. (Figure 2)
6. When installing the unit to the pressure connection, care should be taken to avoid direct hits to the unit. A direct hit from a sledgehammer to the product itself could cause latent failure to the product. Direct hits can result in the loss of retention clips, failure of the electrical connector or electronics, or bending of the top assembly from the body which would allow sensor cavity contamination. In all cases this would be determined as a non-warranty related product failure and repair.
7. Product fasteners must be replaced when found to be missing or broken. Spare fastener kits are available from Viatran to maintain the seal of the product. If the product is operated with missing or broken clips, the potential for seal failure is considerable. In all cases this would be determined as a non-warranty related product failure and repair.



**INSTALLATION DATA**

**Model 509**

**Wiring:**

Pin A: +Signal  
 Pin B: - Signal  
 Pin C: No Connection  
 Pin D: No Connection  
 Pin E: +Calibration  
 Pin F: - Calibration  
 Grn Ter: Case Ground

**Model 709**

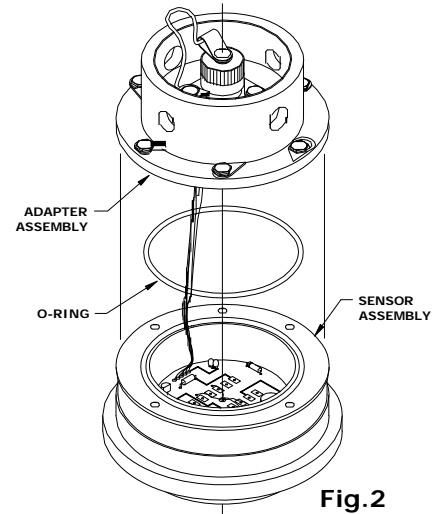
**Wiring:**

Pin A: +Power  
 Pin B: - Power  
 Pin C: +Signal  
 Pin D: - Signal  
 Pin E: Calibration  
 Pin F: Calibration  
 Grn Ter: Case Ground

**Model 809**

**Wiring:**

Pin A: +Power  
 Pin B: -Power  
 Pin C: +Signal  
 Pin D: -Signal  
 Pin E: Calibration  
 Pin F: Calibration  
 Grn Ter: Case Ground



**Fig.2**

To activate cal on Model 509, the cal circuit must be powered.  
 To activate cal on Models 709 & 809 short pins E & F.

**Input:**

9-30VDC  
 10.5-28 VDC

**Input:**

9-30VDC  
 10.5-28 VDC

**Input:**

10-15VDC  
 input for approved units

**Output:**

4 to 20mA

**Output:**

0 to 5VDC

**Output:**

3.0mV/V

**Sensor Construction:**

All Ranges: Inconel X-750

**Electrical Connector:**

6 pin bayonet (standard)

**Adapter & Connector Bolt Torque Settings\***

**Connector Fasteners:**

Size 4-40 (with gasket) = 4 in-lbs  
 Size 4-40 (no gasket) = 8 in-lbs  
 Size 6-32 = 25 in-lbs

**Adapter Fasteners:**

Size 8-32 = 40 in-lbs

\* Lightly hand-tighten bolts in alternating fashion (star pattern). Ensure that the item to be secured is fully and evenly seated, and the O-ring, if applicable, is fully compressed. Torque bolts in alternating fashion (star pattern).

**Pressure Connection By Range:**

5,000, 10,000, 15,000 & 20,000 PSI: 1502 Hammer Union

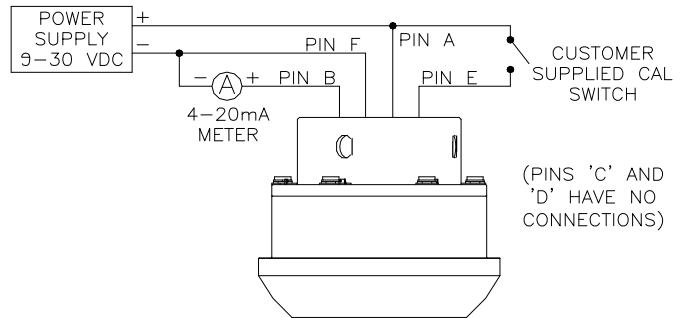
**STANDARD VIATRAN PRODUCT MARKING**



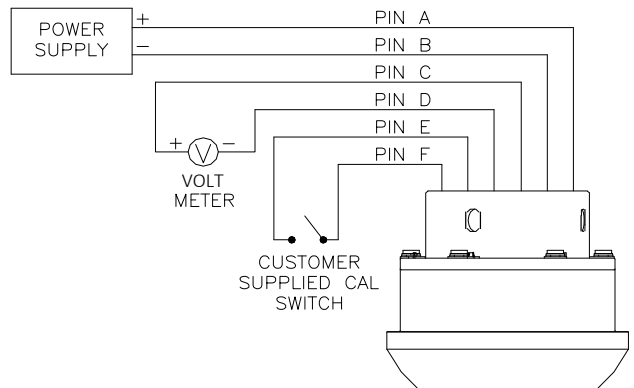
P/N:  
 S/N:  
 Year of Mfg:  
 Press Range:  
 Proof Press:  
 Input:  
 Output:  
 C/O:

**Connection Diagrams  
 (Non Hazardous environments)**

For Hazardous locations, see attached connection Diagram per approval code ordered.















**MODEL 509**



**MODEL 709 & 809**

## OPTIONAL CERTIFICATIONS

1. **Enclosure Classification:** NEMA4X (Standard)
2. **Hazardous Locations Classifications/Marking:** (Approval option codes specified in part number to obtain appropriate agency labeling.)  
See the product & connection drawing for any approvals & ratings for your unit, if applicable. The following are typical examples.

<p>509_NX_</p>  <p>CSA 03.1437390</p> <p>INT. SAFE FOR CL I, DIV 1, GP A,B,C,D CL I, ZN 0, Ex ia IIC INSTALL PER CD0640 T4, Ta=80°C, T5, Ta=40°C HAZ. LOC.</p>	<p>509_TF_</p>  <p>APPROVED</p> <p>INT. SAFE FOR CL I, DIV 1, GP A,B,C,D CL I, ZN 0, AEx ia IIC INSTALL PER CD0641 T4, Ta=80°C, T5, Ta=40°C HAZ. LOC.</p>	<p>509_NK_</p>  <p>II 1 G</p> <p>Ex ia IIC Ga Presafe 16 ATEX 8465X T4: -20°C &lt; Ta &lt; 80°C T5: -20°C &lt; Ta &lt; 40°C Ui=28V, Ii=100mA, Pi≤1W Ci=12nF, Li=0.5mH</p>  <p>2460</p>	<p>509_TG_ or 509_NXTF_</p>   <p>CSA 03.1437390</p> <p>APPROVED</p> <p>INT. SAFE FOR CL I, DIV 1, GP A,B,C,D T4, Ta=80°C, T5, Ta=40°C Canada: CL I, ZN 0, Ex ia IIC INSTALL PER CD0640 USA: CL I, ZN 0, AEx ia IIC INSTALL PER CD0641 HAZ. LOC.</p>	<p>709_NX_</p>  <p>CSA 03.1437390</p> <p>INT. SAFE FOR CL I, DIV 1, Gr. A,B,C,D CL I, ZN 0, Ex ia IIC INSTALL PER CD0640 T4, Ta=80°C, T5, Ta=40°C HAZ. LOC.</p>	<p>709_TF_</p>  <p>APPROVED</p> <p>INT. SAFE FOR CL I, DIV 1, Gr. A,B,C,D CL I, ZN 0, AEx ia IIC INSTALL PER CD0641 T4, Ta=80°C, T5, Ta=40°C HAZ. LOC.</p>	<p>709_NK_</p>  <p>II 1 G</p> <p>Ex ia IIC Ga Presafe 16 ATEX 8465X T4: -20°C &lt; Ta &lt; 80°C T5: -20°C &lt; Ta &lt; 40°C Ui=28V, Ii=100mA, Pi≤1W Ci=12nF, Li=0.5mH</p>  <p>2460</p>	
<p>509_NJ_ 709_NJ_ 809_NJ_</p> 			<p>509_TW_ 709_TW_ 809_TW_</p> 				

## INTENDED USE AND MISUSE

The instrument is designed for use with materials compatible with Inconel X-750. If fluids that are not compatible are used, accelerated corrosion rates are likely to be seen. This will result in premature failure of the diaphragm.

## MAINTENANCE AND REPAIR

All Viatran transmitters have been designed to function free from routine or scheduled maintenance. Simple cleaning of the electrical connector, pressure port threads and pressure cavity on an as needed basis will provide many years of satisfactory performance. Protecting the product from continued exposure to moisture or fluids at the electrical connection, breather area (model dependent) will eliminate premature internal failure of the product. Generally any time the product is removed from service the connector and pressure port threads should be cleaned and the pressure cavity flushed with a 316SS and/or O-Ring (material model dependent) compatible cleaner to prevent media buildup. During the cleaning process only a soft, lint-free cloth is recommended. Never use a coarse or stiff bristle brush to clean media from the diaphragm surface.

It is suggested that the calibration be verified on a usage dependent schedule. If the product is in continuous service 7 days a week, then calibration verification may be necessary every 6 to 8 months. If the product is in a lab test environment a more lenient verification schedule would be appropriate. In all instances the performance of the product will depend on the individual application or process in which it is installed. More continued usage would require a shorter period between calibration verification and product maintenance.

If a product is perceived to be exhibiting problems, it can be returned to Viatran for analysis and/or repair. It is suggested that only Viatran personnel attempt repair of the product. Any damage resulting from customer disassembly would result in a loss of coverage under the warranty policy. All Viatran products are able to be repaired at minimal cost if simple cleaning and precautions are taken in the handling and application of the product. Older products returned for repair are updated to current specifications unless the repair cost would outweigh the cost of a new replacement model. Products returned for repair should include information on the person to contact for repair quote approval, the individual to contact if Viatran's technical staff requires additional information during analysis, and a brief description of the problem associated with the product's failure.

## WARRANTY

Viatran Corporation products shall be free from defective workmanship and/or material for a period of twelve (12) months from date of shipment, provided that Viatran's obligation hereunder shall be limited to correcting any defective workmanship and/or replacing any defective material F.O.B. destination. If inspection by the Company of such product does not disclose any defect of workmanship or material, the Company's regular charges will apply. The warranty carries no liability, either expressed or implied, beyond our obligation to replace the unit which carries the warranty. This warranty is in lieu of all other warranties of merchantability or fitness. No allowance will be made for any expense incurred for correcting any defective workmanship and/or material without written consent by Viatran. Unit must be shipped to the Company, transportation prepaid, and a return tracking number must be referenced on the package to assure acceptance at our shipping dock. Prices, specifications, and decisions are subject to change without notice.

This warranty is void if the product is subjected to misuse, accident, neglect improper application, installation or operation. This warranty is void if prior defects in materials or workmanship repairs are made by anyone except Viatran or its authorized service agency.

## REPAIR

If failure occurs, the sensor should be returned to the factory for inspection and testing. If the failure is covered by our warranty policy as stated above, the unit will be repaired as necessary and reshipped without delay. Sensors usually not covered by warranty can be repaired within two to three weeks (after approval) for approximately 20-60% of the purchase price. Simple repairs can often be made for a minimal charge. A repair is warranted ninety (90) days from repair date under conditions of original warranty period unless superseded by original warranty period. To return a unit, please contact the Customer Support Department for a Return Tracking Number at 1-800-688-0030. The unit should be sent to the attention of the Repair Service Department.