



Pressure, Level & Temperature Products

Installation Manual

Model 311 Hazardous Approved Products

TABLE OF CONTENTS



1. [Introduction](#)
 - 1.1 [Product Description](#)
 - 1.2 [Warning](#)
 - 1.3 [Unpacking/Inspection](#)
 - 1.4 [Using this Manual](#)
2. [Installation](#)
 - 2.1 [Mounting/Process Connection](#)
 - 2.2 [Power Supply Connection](#)
 - 2.3 [Wiring/Grounding](#)
 - 2.4 [Environment](#)
3. [Operation/Maintenance/Handling](#)
4. [Trouble Shooting/Return Information](#)
5. [Warranty](#)
6. [Appendix A – Specs](#)
7. [Appendix B – Approval Info](#)

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Pressure, Level & Temperature Products

1. INTRODUCTION

1.1 Product Description

The Model 311 is an oil field service pressure transmitter with a ¼" NPT (F) pressure port fitting (standard, optional ports available), 4-20 mA output and measures pressures up to 75,000 PSI (5,171 BAR).

1.2 Warning

Pressurized vessels and associated equipment are potentially dangerous. The product described in this guide should be operated only by personnel trained in the procedures that will assure safety to themselves, to others, to the equipment, and to the product. Specific warnings are noted as  in specific installation/operation sections.

1.3 Unpacking and Inspection

The Model 311 was carefully tested, inspected, and packed. Upon receipt of the shipment, thoroughly inspect the transmitter. If you see any visible signs of obvious shipping damage, notify the freight company immediately.

1.4 Using this Manual

This manual is intended to help the end user install, maintain, and provide general service of GP:50 Model 311 Pressure Transmitter. The user should have a general understanding of current loops and general instrument control. The Model 311 is a precision instrument and should be given the same care as any other precision instrument during installation and operation.

2. INSTALLATION

2.1 Mounting/Process Connection

The standard Model 311 transducer is supplied with a ¼" NPT (F) pressure port. Installation of the device shall be in accordance with industry standard pipe fitting requirements for this size. Torque shall only be applied to the transducer during installation (or removal) from the wrench flats provided on the pressure port. As a general rule, the device shall be torqued "wrench-tight" to preclude leakage from the process connection. Contact GP:50 sales personnel for additional information if required, or for specific installation requirements for non-standard process connections.



Ensure media is compatible with 17-4 PH SST (standard material, optional materials available, check part number ([Appendix A](#)) to verify wetted material) to avoid premature corrosion of the diaphragm. This can cause performance degradation and eventual sensor rupture/failure.



Properly tighten process connections before applying pressure to ensure no leaks or mechanical failure can occur.



Never insert sharp objects into diaphragm. This could cause permanent damage to the sensor and/or mechanical failure/diaphragm rupture.



Pressure, Level & Temperature Products

2.2 Power Supply Connection

For best operation, the pressure transmitter needs clean, regulated power with an output impedance less than 20Ω . Minimum voltage is 10 volts with no resistive loading, to a maximum of 36 VDC (Z, P + X Series) (28 VDC for I, AI + GI Series units). As loads are added to the current loop (galvanic barriers, current measuring devices resistors), the minimum excitation voltage must increase in order to maintain proper operating voltage.

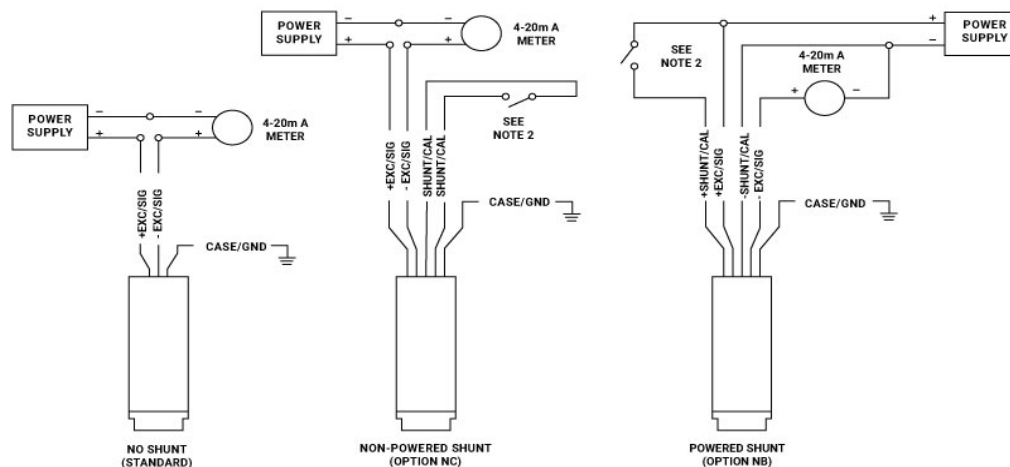


Exceeding maximum supply voltage can damage electronics and cause malfunctions or failure and can cause an explosion with Intrinsically Safe units. Please refer to the IS connection diagram ([Appendix B](#)), and applicable local codes for proper electrical installation. Always inspect/clean electrical connection and sealing surface prior to installation.

2.3 Wiring/Grounding

Wire per Fig. 1 connection diagram for standard wiring or specific shunt option. Do not run wires next to power lines, electrical systems, motors, generators, or any other equipment which may generate a significant amount of electrical noise or magnetic fields.

Fig. 1: Connection Diagrams (for IS units see Appendix B)



NOTE 1: QUALIFIED END-USER TO INSTALL GROUND WIRE PER CODE REQUIREMENTS.
NOTE 2: SHORT WIRES TOGETHER OR CLOSE SHUNT SWITCH (SUPPLIED BY END USER) TO ACTIVATE SHUNT.



Install only after verifying both input power and line pressure are off and at zero.



Avoid contact with exposed leads or connector pins, high voltage may be present on leads and can cause electrical shock.



Observe safe ESD handling precautions to avoid static damage to sensitive components.



Pressure, Level & Temperature Products

2.4 Environment

The typical operating temperature range for the electronics is from -40 °F (-40 °C) to 176 °F (80 °C). The unit should be mounted as close to the process as possible with the ambient temperature surrounding the electronics in the range as specified above.



Exceeding maximum temperature rating can cause electronics malfunction or failure and is an explosion risk with IS units.



Protect electrical connection from direct/continued exposure to fluids. Moisture ingress can occur and cause eventual electrical failure.

3. OPERATION/MAINTENANCE/HANDLING

The Model 311 is designed to give a 4-20 mA output directly proportional to pressure. Specific pressure range, input voltage requirements, and electrical connections are marked on unit. See [Appendix A](#) for all performance specifications. Standard electrical connection is a HEYCO connector on the I.S. approved product + ½" NPT (M) on Explosion Proof Series and pressure port is ¼" NPT (F). Appropriate mating connections are required for proper installation and safety. Other port and electrical connections are available and noted as option code in part number. See [Appendix A](#) for list of options.



Replace broken fasteners (available through the factory) as they may compromise the seal and cause contamination and/or electronics failure.



Unit can be hot when removed from service. Wear protective gloves when handling unit in this condition.



Pressure, Level & Temperature Products

4. TROUBLESHOOTING & RETURN INFORMATION

No output

- Verify power supply voltage meets transmitter requirements
- Check wiring connections
- Verify pressure if being applied
- Verify output load is not shorted

Erratic output or zero drift

- Verify pressure applied is constant
- Verify power supply remains within specifications
- Inspect electrical connections for discontinuity or damage
- Verify output with a multi-meter
- Check insulation resistance between amplifier and transducer case

Slow Response

- Verify pressure port is not clogged

If the problem persists, please call the factory as indicated below for assistance. Please have the following information ready:

- Serial number
- Model number
- Loop setup details (power supply, resistor, cable routing/length)
- What action caused device failure?

Contact: sales@gp50.com
Phone: 716-773-9300



Repairs should only be done by GP:50. Repairs done by customer will void any warranties and may cause permanent damage to unit. Repairs done by customer on Intrinsically Safe units will void the approvals and are a potential explosion hazard.



Returned products that have been exposed to hazardous substances must be cleaned prior to return and include the Material Safety Data Sheet for all substances.



Pressure, Level & Temperature Products

5. WARRANTY

GP:50 warrants its products to the original customer/purchaser against defects in material and workmanship for a period of one (1) year from the date of delivery by GP:50, as shown in its shipping documents, subject to the following terms and conditions:

Without charge GP:50 will repair or replace products found to be defective in materials or workmanship within the warranty period provided that:

1. The product has not been subjected to abuse, neglect, accident, incorrect wiring (not provided by GP:50), improper installation or servicing, or use in violation of instructions furnished by GP:50.
2. As to any prior defect in materials or workmanship covered by this warranty, the product has not been repaired or altered by anyone except GP:50 or its authorized service agencies.
3. The serial number has not been removed, defaced or otherwise changed.
4. Examination discloses, in the judgment of GP:50, a defect in materials or workmanship which developed under normal installation, use and service.
5. GP:50 is notified in advance of, and approves, the return by issuing a Return Material Authorization Number; and the products are returned to GP:50 transportation prepaid. Products returned without an RMA number will not be accepted and be returned to sender at sender's expense.

THIS WARRANTY IS THE ONLY WARRANTY AND IS IN LIEU OF ANY OTHER WARRANTY EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OR MERCHANTABILITY OR FITNESS. NO REPRESENTATIVE OR PERSONS ARE AUTHORIZED TO GIVE ANY OTHER WARRANTY OR TO ASSUME FOR GP:50 ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF ITS PRODUCTS. GP:50 DOES NOT ASSUME THE COSTS OF REMOVAL AND/OR INSTALLATION OF THE PRODUCT OR ANY OTHER WORKMANSHIP, OR WILL GP:50 BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OR INSTALLATION OF ITS PRODUCT.

For a copy of our warranty policy and to fill out a warranty registration form, visit our website at: <https://www.gp50.com/products/warranty/>

For assistance with repairs, call our Repair Dept. at 716-773-9300, ext. 237, or complete a Repairs, Returns, RMA form at: <https://www.gp50.com/resources/repairs-returns-rma/>.

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Pressure, Level & Temperature Products

6. APPENDIX A – SPECS

6.1 Specifications

Accuracy – RSS [Non-linearity (terminal), Hysteresis, Repeatability]	Option B: + 0.5% FSO Option C: + 0.2% FSO Option D: + 0.1% FSO
Zero Balance	4.0 mA ± 1% FSO @ 70 °F (21 °C) and 24 VDC
Full Scale Output	20 mA ± 1.0% FSO @ 70 °F (21 °C) and 24 VDC
Compensated Temperature Limits	0 °F to 180° F (18 °C to 82 °C)
Operating Temperature Limits	-40 °F to 180 °F (-40 °C to 80 °C)
Temperature Compensation – Zero	Less than ± 1.0% FSO/100 °F
Temperature Compensation – Span	Less than ± 1.0% FSO/100 °F
Excitation Voltage	10-36 VDC (10-28 VDC for I/AI/GI approvals)
Input Current	23 mA max
Output Current	23 mA max
Load Impedance	N/A
Proof Pressure: <15K / >15K	2x FSPR (22.5K PSI max) / 1.2X FSPR
Burst Pressure: <15K / >15K	5X FSPR (923K PSI max) / 1.5X FSPR
Sensor Material	316 SST & 17-4 PH SST
Housing Material	316 SST
Pressure Connection	¼ " NPT (F) standard, (other available, contact factory)
Electrical Connection	HEYCO w/36" Cable – I.S. units, ½" NPT (M)-Explosion Proof
Identification	Etched onto housing or nameplate



Pressure, Level & Temperature Products

7. APPENDIX B – APPROVAL INFORMATION

7.1 Approval Documentation packages to be shipped with units, per option code:

AI – ATEX Intrinsic Safety

- o A8EG-10AIA.CC ATEX C of C
- o 8C1-55.01-2 ATEX/IEC Connection Diagram, Model 311
- o A8EG-10AIA.DC CE: ATEX Declaration of Conformity
- o A8EG-10AIE.DC CE: EMC Declaration of Conformity
- o A8EG-10AIP.DC CE: PED Declaration of Conformity

EC – CE Compliance (EMC and PED)

- o A8EG-10AIE.DC CE: EMC Declaration of Conformity
- o A8EG-10AIP.DC CE: PED Declaration of Conformity

I – FM/CSA Intrinsic Safety

- o A8EG-10IC.CC CSA C of C
- o A8EG-10IF.CC FM C of C
- o 8C1-56.01-2 FM/CSA IS Connection Diagram, Model 311