

---

# HDI 2021 Pressure Transmitter

Operation and Maintenance Manual

Revision 2.0, December 2018



## Table of Contents

<b>Section I</b> .....	<b>3</b>
A. General Information .....	3
B. Unpacking and Inspection .....	3
C. Precautionary Information .....	3
D. Personnel Qualifications .....	3
<b>Section II</b> .....	<b>3</b>
A. System Description .....	3
B. System Components .....	3
C. Pressure Ranges .....	4
<b>Section III</b> .....	<b>4</b>
A. Installation .....	4
A.1 Transducers .....	4
A.2 Cables .....	4
<b>Section IV</b> .....	<b>4</b>
A. Operation .....	4
A.1 Pressure System .....	4
A.2 Preset Calibration by HDI .....	5
<b>Section V</b> .....	<b>5</b>
A. Maintenance Guidelines .....	5
B. Spare Parts List .....	5
<b>Section VI</b> .....	<b>6</b>
A. Warranty .....	6
<b>Appendix A – Data Sheet</b>	

## Section I

### A. General Information

This manual describes the installation, operation, maintenance and calibration of the HDI 2021 Series 4-20mA Transmitter. This manual will provide the user with information necessary to properly utilize the instrument. Included in this manual are all the necessary procedures to install and maintain this instrument properly.

### B. Unpacking and Inspection

Upon receipt account for all pieces on the packing list. If any items are missing, immediately inform the freight forwarder. If any items are damaged, immediately inform the freight forwarder and HDI.

### C. Precautionary Information

Ensure all directions on the packages are followed during unpacking and handling. Extra care should be taken to ensure that the pressure sensor, which is mounted in the transducer housing supplied with the system, is protected from contact with any hard or sharp objects, i.e. screwdriver, fingernail, etc., during the installation of the sensor. Any evidence of mishandling or abuse shall **void** the warranty (see Section VI, Warranty for detailed coverage). Also avoid any extreme tightening efforts, with a hammer, at installation.

### D. Personnel Qualifications

This equipment requires experienced personnel to handle, install and maintain. HDI can provide technical training if required. Contact HDI's Service Department for training at the Houston facility or on-site at the customer's location.

---

## Section II

### A. System Description

The transmitter (sensor) is an embedded strain gauge located in a stainless-steel housing. The strain gauge is commonly housed in 1502 Hammer Union, 2202 H2S Hammer Union or a Flange. Any style housing may be specified by the customer, contact HDI for detailed options.

### B. System Components

The 2021 Series most commonly consists of the sensor/housing (1502 Hammer Union, 2202 H2S Hammer Union, or Flanged assembly) with a 2' pigtail and a cable assembly. The housing, cable length and connector type are specified by the customer.

HDI Instruments, LLC | 4130 Directors Row Houston, Texas 77092 | 713-688-8555 | [www.hdigauges.com](http://www.hdigauges.com)

A high-grade shipboard approved instrument cable with woven shield is recommended to reduce noise interference. Other types of cable, including armored cable, are available at additional cost. Maximum recommended cable length is 200 feet.

### C. Pressure Ranges

HDI offers a variety of pressure ranges for the 2021 Series. Each transmitter is rated for the full range. Transmitters with a pressure range of 10,000 PSI and less are capable of withstanding a 30% over pressurization without damage to the system. 16,000 PSI transmitters are capable of withstanding a 10% over pressurization without damage to the system. Pressure Ranges are as follows:

6,000 PSI

10,000 PSI

16,000 PSI

20,000 PSI

---

## Section III

### A. Installation

#### A.1 Transmitter

The transmitter is to be installed by the customer at the locations deemed most suitable for such equipment, determined by the housing type (1502 Hammer Union, 2202 H2S Hammer Union or Flange discussed in Section II, A and B). The pressure system transmitter comes from the factory as a complete assembly and only requires mounting of the transmitter housing using standard practices for such installations.

**Note:** Special care should be taken to ensure the transmitter sensor mounted in the center of the transducer housing, is not allowed to make contact with any hard and/or sharp object as the accuracy and the sensitivity could be affected. The transmitter sensor is vulnerable to this type of contact. Any evidence of mishandling or abuse shall **void** the warranty.

#### A.2 Cables

Cabling will be installed using acceptable industry standards for such installations. Care should be taken during installation to make sure the proper barriers are installed to ensure certification compliance, as required.

---

## Section IV

### A. Operation

#### A.1 Pressure System

The major components of this system are the transmitter and the cable (communications link). The transmitter utilizes a four active arm Wheatstone Bridge Strain Gauge which, when excited

by the current source, will produce an electrical signal that is proportional to pressure applied to it. The cabling serves act as an interconnect for the transmitter, taking the excitation power in and carrying away the signal.

### A.2 Preset Calibration by HDI

The HDI 2021Series is a digital electronic pressure measurement device designed specifically for oilfield applications. This system has been factory preset and will not require periodic calibration.

The baseline for calibration is the current excitation across the bridge. This is preset at the factory and cannot be changed.

## Section V

### A. Maintenance Guidelines

Maintain the integrity of the cable and visually check for abuse.

Ensure the system is cleaned and checked regularly for damage. HDI installs an orifice plate to protect the sensor and help minimize direct contact, but cleaning and checking the system regularly is required.

Set a schedule for annual calibration and inspection by HDI. Contact the HDI Service Department for further details.

### B. Spare Parts List

Part Number	Description
SUB-068	2021 4-20MA PCB 302 BOARD
SUB-024	1502 SENSOR HOUSING
SUB-025	2202 SENSOR HOUSING
SUB-026	AUTOCLAVE SENSOR HOUSING
SUB-076	1502 HOUSING CUSTOMER SUPPLIED (W/ WINGNUT)
SUB-077	2202 HOUSING CUSTOMER SUPPLIED (W/ WINGNUT)
SUB-095	STANDARD PIGTAIL ASSEMBLY
SUB-096	CERTIFIED PIGTAIL ASSEMBLY
SUB-031	SENSOR 600 BAR 6K 10K
SUB-032	SENSOR 1000 BAR 16K
SUB-035	STANDARD SENSOR TAGS
SUB-036	CSA SENSOR TAG
SUB-037	ATEX SENSOR TAGS
SUB-041	1502 HAMMER UNION WINGNUT
SUB-042	1502 H2S HAMMER UNION WINGNUT
SUB-043	2202 H2S HAMMER UNION WINGNUT
SUB-124	1000B/2000B/2021 SENSOR KIT

## Section VI

### A. Warranty

HDI Instruments, LLC. (HDI) warrants this product for a period of one year from the date of shipment. HDI's manufactured products to the extent that HDI will replace those parts having defects in material or workmanship when used for the purpose or specification HDI recommends for Normal Oilfield Usage. For the purpose of this Warranty, Normal Oilfield Usage shall be defined as normal, oilfield monitoring applications.

HDI shall not honor the Warranty if any evidence of tampering, misuse or intrusion is indicated except by an HDI authorized technician or agent.

HDI will replace or repair, as it deems necessary, any products covered by this warranty, after HDI's examination discloses to its satisfaction, that in fact the products are defective and an adjustment is required. If an adjustment is required, the amount of the adjustment is the net sales price of the defective product. No allowances shall be made for labor or expenses of repairing defective products or damage resulting from same. All products accepted under the provisions of this warranty shall be shipped prepaid to HDI and returned to the customer prepaid by HDI. This is to include all applicable custom clearance fees, etc. for inbound international shipments. All products not accepted under the provisions of this warranty shall be shipped prepaid to HDI and returned freight collect.

HDI shall not be responsible for repair or replacement of products, resulting from improper handling, storage, installation, misuse, negligence, or use in a manner contrary to the recommendations of HDI.

HDI warrants only the products that it sells of Other Manufacturers to the extent of their warranties. All warranty claims shall be made in writing to the nearest HDI office or authorized factory representative. HDI makes no other warranty of any kind, expressed or implied, and all implied warranties of merchantability or fitness for a particular purpose which exceed HDI's afore-stated obligation are hereby disclaimed by HDI and excluded from this warranty.

This Warranty is non transferable and HDI shall not be liable for any damage, injury, loss to property or persons resulting from the use of any HDI's products or equipment whether such damage, injury or loss results from, or is caused by: manner of use, defects in materials or workmanship or otherwise.



# HDI

## 2021 PRESSURE TRANSMITTER SYSTEM DATA SHEET



### APPLICATION


The HDI 2021 Pressure Transmitter is an intrinsically safe, certified, field-repairable 4-20mA transmitter built with high quality components HDI is known for throughout its line of products. The transducer (sensor) is an embedded strain gauge placed in a stainless steel housing. HDI's Transmitter is unique because of its field reparability. If the pill or internal board are damaged due to use over time, the user is able to order the spare parts necessary to fix the unit quickly onsite, reducing downtime and saving on overall cost. Video tutorials are available to assist in the repair online.

The 2021 Transmitter is commonly housed in a 1502 Hammer Union. However, the customer may specify a variety of housings to suit their application (2" 1502 Hammer Union, 2" 2202 Hammer Union, or a flanged connection). The transmitter is delivered as a complete assembly ready for installation. All HDI Transmitters provide safety, accuracy, reliability, and low maintenance for the user.

### FEATURES

- 4-20mA output
- Field repairable system
- 6,000 psi, 10,000 psi, 16,000 psi
- 2" 1502, 2" 2202, or 9/16" Autoclave x Flanged Connections
- Solid state platform; no fluids or moving parts

### CERTIFICATIONS

- **CSA:** Intrinsically Safe Class 1, Division 1, Groups A, B, C and D
- **ATEX:** optional,  II 1 G, Ex ia IIC T4
- **IECEX:** (in process)

**SAFETY**  
**PRECISION**  
**INNOVATION**

WELL CONTROL MONITORING AT ITS FINEST

## SPECIFICATIONS

- Weight: 18.2 lbs (as shown with 1502 hammer union)
- Accuracy: 0.5% of full scale to NIST
- Pressure Range: 6,000 psi, 10,000 psi, 16,000 psi resolutions
- Power: Customer supplied 24 vdc
- Media (Process) Temperature: -30°F to 212°F (-30°C to 100°C)
- Sensor Housing: 2" 1502, 2" 2202, 9/16" Autoclave x Flanged Connections
- Sensor Protection: Primary and secondary rubber diaphragms
- Media Pressure Port: Fluids compatible with 410 QDT stainless steel
- Maximum 4-20mA Output Cable Length: 250 feet

## DIMENSIONS

All dimensions given are in inches and [millimeters] unless otherwise noted.

