HDI 1522/2522 POSITION INDICATOR GAUGE

User's Manual Rev B

HDI

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Table of Contents

Section 1 – Introduction

1.A General Information

This manual describes the installation, operation, and maintenance of the HDI 1522 and 2522 Position Indicator Gauge Systems. The 1522 Series products includes HDI's Calibration Certificate and Certificate of Compliance. The 2522 Series products include the third-party approval (ATEX / IECEx / CSA) along with HDI's Calibration Certificate and Certificate of Compliance.

For brevity, we will use the name "2522" to refer to both the 1522 and 2522 products. The 1522 and 2522 Series unites are identical for purposes of this user's manual, unless noted otherwise (E.G., third-party approvals).

The HDI 2522 is an industrial position indicator gauge designed for use in explosive atmospheres. The 2522 is a 4-inch panel mounted gauge with remote sensor connections. The 2522 gauge system is powered by a replaceable battery pack HDIBATT-E608-DOT-AA and can be optionally provided with various configurations for user feedback and connection to other indicator gauges. See section 8 HDI installation configuration drawings.

This manual describes the installation, operation, and maintenance of the HDI 2522 gauge system. This manual will provide the user with all the necessary information to properly inspect, install, operate and perform routine maintenance and troubleshooting for onsite repairs.

The HDI 2522 has three key elements: the control head, a sensor assembly specified by the end client, and the cable assembly connecting the control head to the sensor assembly. These items will be discussed at greater detail in Section 2.

1.B Unpacking and Inspection

Upon receipt of the equipment, it is critical to confirm all the necessary items are accounted for as some items can settle to the bottom of the box. In the past, some items have inadvertently been removed from packaging by freight forwarders or third party (Custom agents) during transit. The customer should compare the packing list against items located within the packaging. If a discrepancy exists, the customer is advised to first contact their shipping agent and then HDI if the items have not been located.

1.C Cautionary Information

1.C.1 Power

This system is powered by an internal power pack HDI part number HDIBATT-E608-DOT-AA. The 2522 gauge will be damaged if connected to a 12 or 24VDC system. Note that the battery should only be replaced while in a non-hazardous area.

1.C.2 Exposed Electronics

CAUTION: Do not leave the equipment exposed to outside elements without being properly connected as this may expose the connector leads to moisture and outside elements damaging the electronics.

1.C.3 Cleaning

CAUTION: The customer should use caution when cleaning the Gauge (LCD) Head to prevent any static discharge. From time to time the customer will need to use a damp cloth to clean the LCD overlay or the gauge case. HDI suggests that the customer use a soft cloth to prevent accidental damage (scratching) to the protective lens.

1.C.4 Returns

HDI requires that inbound returns should have a Return Material Authorization (RMA) control number issued from the HDI website. The customer will find this by visiting the website: http://hdigauges.com/quality/repairs/ and complete the required fields to identify basic contact details. HDI will then provide the customer repair return quotation and will contact the customer for additional clarity if necessary. The customer may return multiple units on one RMA submittal request. HDI will use the inbound notification email for all related correspondence. Proper protection of the equipment should be a top priority when returning the equipment back to HDI or an authorized agent for repair. Additionally, it is the shipper's responsibility to ensure equipment clears all customs as different agencies may hold equipment without notifying HDI.

1.C.5 Personnel Qualifications

CAUTION: Anyone testing the equipment should have basic electrical understanding, knowledge of circuitry, and use of a multi-meter. The customer should read the entire manual prior to opening the display or testing. Any modifications to the HDI 2522 system will void the one year warranty and jeopardize the IECEX certifications.

Section 2 – HDI 2522 Series Position Indicating Gauge Systems Overview

2.A System Overview

The HDI 2522 position indicator gauge is a standalone and intrinsically safe electronic indicator gauge system powered with the HDI field replaceable internal 3.6 Vdc power pack. This battery provides the power to run the internal circuitry of the gauge assembly, including its display and microcontroller. The internal battery ***does not*** provide the power to drive the 4-20 mA loop (if equipped). The indicator gauge system requires minimal power during normal operation. The gauge is designed for continuous operation but can be turned off by the user if desired. The gauge will retain its calibration information even when powered down. The battery life is guaranteed for one year of continuous operation.

All HDI position indicator gauge Displays are comprised of a liquid crystal display (LCD) display that includes both a numeric (5 digit) representation (for accuracy) and a bar-graph representation (for trend) and low battery alarm indicator.

The 2522 gauge system will enable the user to have either a 4-20mA output signal (as an added option) for chart recording or PLC integration or with the ability to have a slave gauge display to repeat the same position reading at a different location. The HDI 2522 is configured to allow for a maximum of two slave gauge displays in addition to the master.

The 2522 gauge systems are shipped as matched and calibrated systems, comprised of the gauge head and potentiometer assembly. The potentiometer assembly is matched to the head appropriately and both serialized. Once calibrated, are a matched set.

2.B Accuracy

HDI 2522 gauges are factory calibrated to measure and display the exact position of the item that is being monitored to a tolerance of 1 percent full scale (FS) Each gauge system is shipped with the signed and witnessed factory calibration test sheets.

2.C Control Head

The HDI 2522 gauge has a 4-inch diameter LCD face providing a bar graph and is supplied with numeric digits at the bottom of the LCD for quick glance reading. Some adjustments may be necessary depending upon location and mounting methods to take into account deck lighting and overhead sunlight conditions. See Section 10 for mounting dimensions.

When preparing or deciding upon a location for mounting, the customer should consider the interconnecting cable and the access route to attach or remove the cable from the gauge. HDI recommends having a minimum of four inches of clearance for cable bend allowance from the bottom edge of the case. See Section 10 for cable clearance details. Alternatively, the customer may request custom specific cables (in increments of 5 feet) with 90 degree mating connectors if spacing is limited. These would face directly to the rear of the gauge. For enclosed control panel applications, HDI suggests a bulkhead access plate on the side so the interconnect cables to the gauges can be pre-routed. This would allow for plug and play installation with the inline cable coming from the sensors.

2.D Potentiometers

The HDI 2522 gauge comes with several different sensor housings to be compatible to various mount styles to reduce onsite customization and to simplify installation after removing the existing pneumatic sensors. This device is specifically matched to the gauge's control head and is tracked with corresponding serial numbers that allows HDI to track repair history and specific configuration requirements. It is important for the customer to properly retain their serial number records for more efficient support by HDI. The 2522 gauge can be supplied with various potentiometer housing options: See related connection types in Section 11. General dimensional drawings or photos are also available upon request to ensure compatibility.

CAUTION:

- Use of non-HDI approved potentiometers could severely damage the instrument and voids the standard HDI one year warranty.
- Replacement or substitution of the potentiometer **will require** the user to recalibrate the gauge to the new sensor based on the indication required range. Customer to review calibration procedures in Section 5.C.2 or may visit: http://hdigauges.com for more details.

2.E Cable

To better serve HDI's clients, interconnect cables are ordered in 5-foot increments only. In the event the customer receives their specified interconnect cable only to find that it is too short, the customer can order an additional inline cable. This is basically an extension cable with corresponding Male / Female connectors for a plug and play installation.

2.F System Options

HDI offers various options as listed in the following subsections. The customer must use the installation drawings listed in Section 8 to connect the HDI 2522 gauge from a hazardous to a non-hazardous zone. Any deviations from the drawings will void the applicable certifications.

2.F.1 4-20 mA Output

A current loop providing a 4-20 mA output is added as an option to the 2522 gauge system. This may be used for chart recorder inputs, data logging or PLC interface. This option requires that the 4-20 mA current loop be externally powered via customer supplied 12 or 24 Vdc. This is a factory installed option and does not require field calibration. Please refer to Section 8 for the connection diagram and for any applicable zone barrier requirements.

2.F.2 0-1 Vdc Output

HDI offers as an option a 0-1 Vdc remote output that may be used for chart recorder inputs, slave configuration, or data logging. This is a factory installed option and does not require field calibration. Please refer to Section 8 for the connection diagram and for any applicable zone barrier requirements.

2.F.3 Remote/Slave Gauge Display

The remote ("slave") function utilizes the 0-1 Vdc output signal from the master 2522 gauge display. The slave gauge provides repeated gauge readout as displayed on the master unit. This is done utilizing only one potentiometer. The slave can be installed at any desired location and may also be installed with the 4-20 mA output option if required.

2.G Certification

HDI currently offers the HDI 2522 with the below certifications.

1. IECEX/ATEX. See Section's 12, 13, and 14 for IECEX/ATEX certification details. Intrinsically Safe for Class 1, Div 1 Groups A-D.

Changing inline cable length does not require re-calibration of the HDI 2522.

The customer may verify which certifications are applicable to their system by locating the data plate on the back side of the gauge head.

Section 3 – Installation

3.A Control Head 2522

The control head can be mounted using the 3 bolt (120 degree) or 4 bolt (45 degree) mounting pattern. The gauge comes with applicable screws by default for the 120 degree bolt pattern and utilizes lock nuts for securing the gauge. See drawing Section 10 for installation details. The lock nuts need to be removed from the back before removing the screws from the case.

CAUTION: The customer will need to take caution to not over tighten the bolts since cracking the front case ring is possible.

3.B Cables and Routing

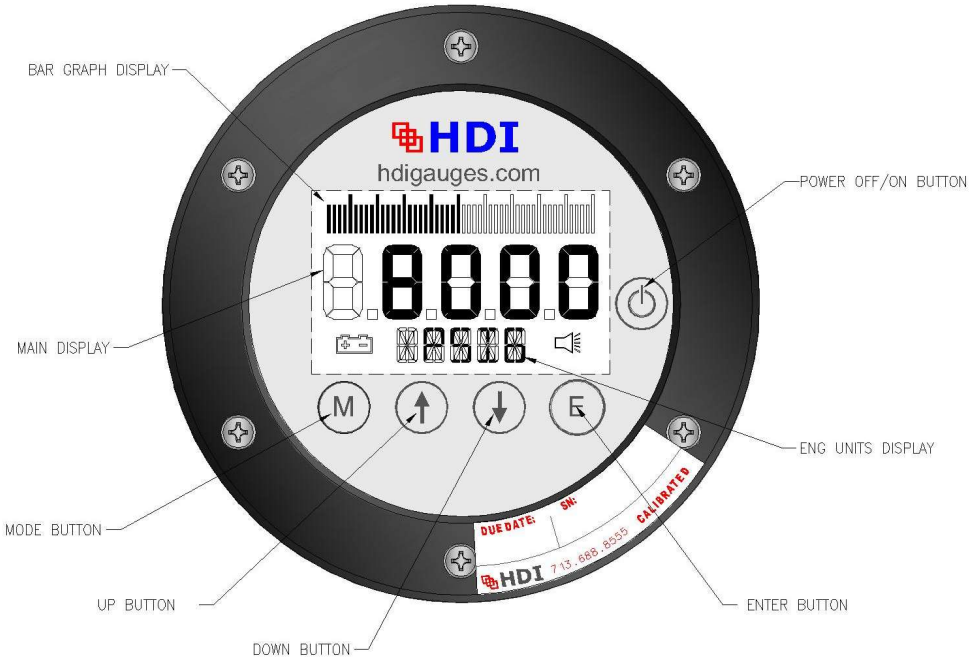
See Section 9 for cable connections. Cable assemblies are built with an instrument grade cable with user defined cable lengths with preinstalled connectors allowing for simple plug and play installation for most applications. HDI may provide an open lead cable for output options or for location junction box termination for common cable runs of multiple pair cables, etc. Changing inline cable length does not require re-calibration of the HDI 2522.

CAUTION: It is extremely important to pay close attention to cable routing as to avoid noise sources that may impact gauge operation. HDI signal cable must be routed at least 6 inches from high voltage cable, 110 Volts and above.

Section 4 – Gauge Functions

4.A Overview

The following illustration will be used for general reference in explaining operation of the 2522 gauge. There are two primary modes utilized with the 2522 gauge: run mode and configuration mode. Configuration mode will be utilized for setting the calibration of the unit but also contains all gauge settings.



4.B Gauge Head Features

As shown in the above figure, the gauge system has several distinctive features and functions that this manual will explain in following subsections. The buttons (M,↑,↓,E) and On/Off are part of the membrane panel and are discussed below.

4.C Engineering Units Display

See Section 2.D for the list of applicable engineering units.

4.D Main Display

The main display in normal run mode displays the measured percentage in numerical format. The main display is also used for other features such as calibration and serial number identification.

4.E Bar Graph Display

In all operating modes in which the bar graph is active the bar graph display will indicate the relative resistance as a percentage of full scale. The bar graph display consists of 100 segments and gives the user a graphical representation of the main display.

4.F Membrane Panel

The membrane panel is a momentary contact switch. This panel is used for operations such as calibrating the unit, to set low and high calibration reference points, set and identify the related serial number on the unit, and other applicable functions.

4.G Power Off / On Button

The power ON/OFF button is located on the bottom center of the membrane panel and is a momentary contact switch. The power On/Off button is used to turn on or off the gauge. If the gauge is off, pressing and releasing the button will turn the gauge on.

4.H Mode (M) Button Calibration Only

The Mode (**M**) Button is used to cycle through the different operating modes of the gauge system In normal run mode.

4.I Up (🡅) Button

The Up (🡅) button is used to cycle through certain settings within the configuration mode. During calibration, it will be used to adjust the pressure range for setting high or low set points and the serial number. In normal run mode, the (🡅) button has no effect on operation.

4.J Down (🡇) Button

The down (🡇) button is used to cycle through certain settings within the configuration mode. In the configuration mode the (🡇) button is used to set low reference point. In normal run mode, the (🡇) button has no effect on operation.

4.K Enter (E) Button

The enter (**E**) button is used to confirm the selection by the user in both the run mode and the configuration mode.

Section 5 – Gauge Operation

5.A Gauge Operation Overview

The following sections will cover the two operational modes of the 2522 gauge: run mode and calibration mode. The run mode is the primary operating mode for the gauge. The calibration mode is utilized for gauge calibration.

5.B Run Mode

In run mode, the measured percentage will appear on the main display. The gauge will display the engineering units selected (PERCT).

- in configuration mode, the user will need to power the unit down and then follow the step above.

HDI keeps records on all the products it ships, and these records are filed by the serial number of the system. An additional feature of the 2522 gauge system is to be able to locate this serial number through the configuration mode. This is also available in the run mode.
To view the serial number, with the unit powered on, press the (**M**) button once and the serial number will display.

5.C Calibration

The HDI 2522 gauge is electronically calibrated from the front panel.
All calibration is performed in units of PERCENTAGE. The gauges will require field calibration after first field installation of potentiometer and for such circumstances as potentiometer replacement, control head replacement, or replacing the primary PCB. Calibration is valid for at least one year from the date stamped by HDI.

5.C.1 Setting Closed Position Level

1. Once the installation is complete the position should be closed completely.
2. Apply power to device by pressing the POWER button.
3. The Position Indicator will perform a short self-test during which time all LCD segments will be active.
4. After the self-test is complete, the display will be in the run/active mode.
   (RUN indicator will appear at the lower left side of the LCD display).
5. Check to verify the position is completely CLOSED, **press** the **MODE** button.
   (RUN indicator will turn OFF).
6. **Press** the **Down ↓ button**. (Unit is now in calibration mode)
7. The down arrow and a four digit number will appear at the top of the LCD display.
8. **Press** the **Enter** button.
   (This function causes the gauge to accept (store) the low / closed set point position, unit returns to RUN mode).
9. The closed position level is now set, and the three digit display should read 000.0

5.C.2 Setting Open Position Level

1. Function to the fully Open position.
2. Once in the Open position, **press MODE** button.
   (RUN indicator will turn OFF)
3. **Press UP ↑ button**. (Now in calibration mode)
4. The up arrow and a four digit number will appear at the top of the LCD display.
5. **Press** the **Enter** button.
   (This function causes the gauge to accept the high / open set point position, unit returns to RUN mode).
6. The Open position level is now set, and the three digit display should read 100.0

Note: If the customer feels comfortable that the gauge is properly calibrated and within acceptable tolerances, please turn off the gauge to lock in the calibration settings until the next calibration is required.

Section 6 – Maintenance

The HDI 2522 position indicator gauge systems will require the following periodical maintenance.

6.A Cleaning

CAUTION: The customer should use caution when cleaning the gauge head to prevent any static discharge. The customer will need to use a damp cloth to clean the gauge face or the gauge case. The gauge head should always be cleaned prior to opening the unit to prevent debris from entering the case. HDI recommends that the customer uses a soft cloth to prevent scratching to the protective lens.

6.B Power Pack

The system is powered by an internal 3.6VDC power pack that is warranted for 12 months from the date of shipment. Battery life can be greatly extended by powering down when not in use. The customer should monitor the low battery symbol located on the upper left corner of the LCD. Once illuminated, this should provide 15-20 days to procure a replacement. The replacement battery will have a

desiccant pack, corrosion inhibitor, humidity indicator and a sticker to be applied to the case ring once replaced with the new installation date.

Warning: Low battery voltage will affect calibration.

6.C Processor Boards

The 2522 gauge has two main internal boards, the LCD and the processor board. Both boards can be replaced in the field if either component has failed. The HDI LCD display board can be replaced without any requirements for calibration; however, if the processor board is replaced, full calibration is required.

For 2522 gauge systems purchased with the optional 4-20 mA output, the user will need to recalibrate the PLC, slave gauge or any other interfacing components.

The HDI support team can assist in troubleshooting by phone or email to help identify possible issues. The customer should contact HDI for assistance and possible troubleshooting suggestions prior to attempting repairs on their own.

6.D Potentiometers

Note: HDI sensors are typically 2 to 25K. The HDI website www.HDIGauges.com has a training video available which covers the disassembly and repair procedure.

Section 7 – Troubleshooting

7.A Battery Voltage

Once the low voltage battery symbol appears on the gauge display, this should provide 15-20 days to procure a replacement. After this 15-20 days, accuracy of the gauge is impacted.

7.B Additional Troubleshooting

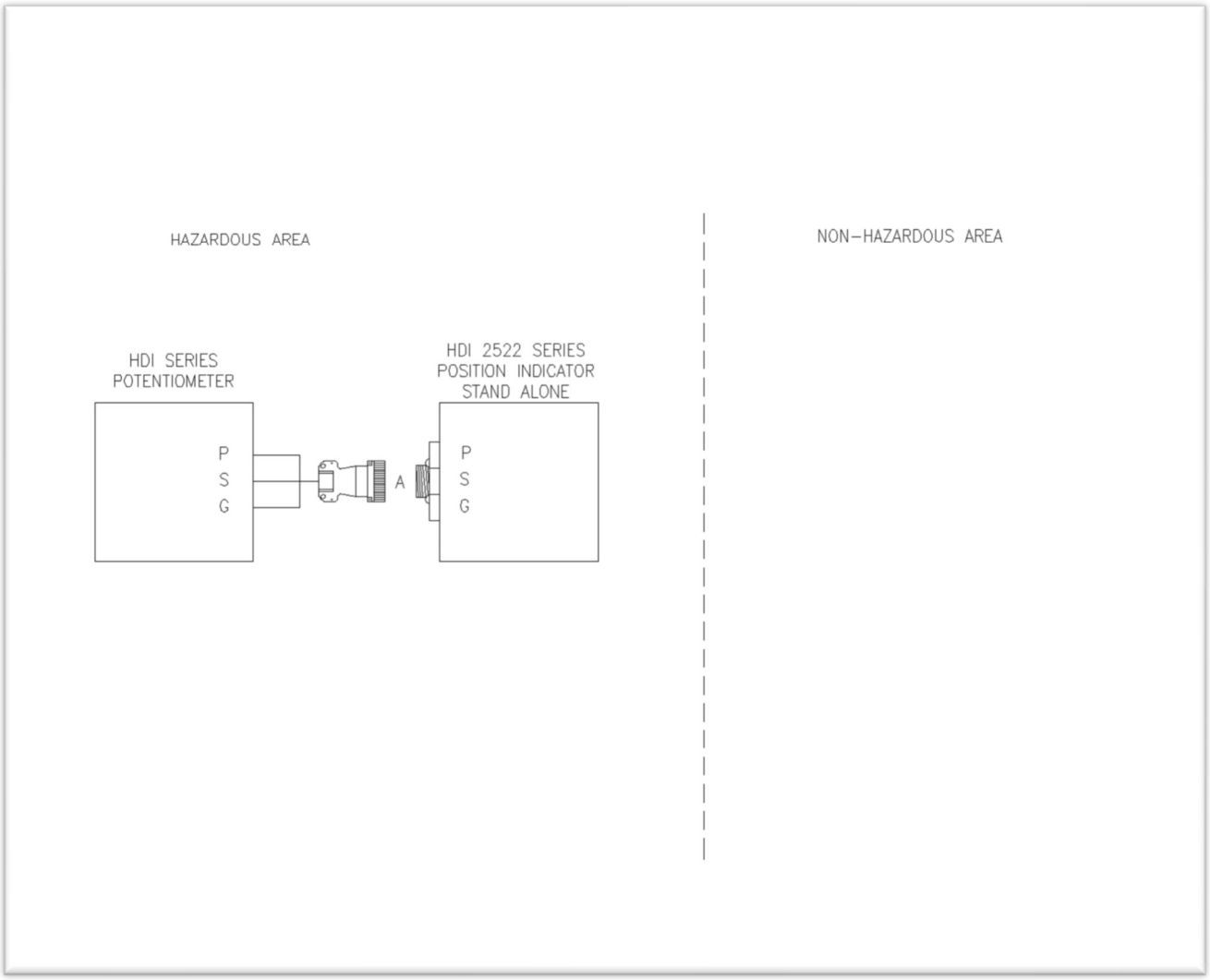
For any additional troubleshooting support, the customer will need to contact HDI in Houston, Texas at 713.688.8555.

Section 8 - Installation Configurations

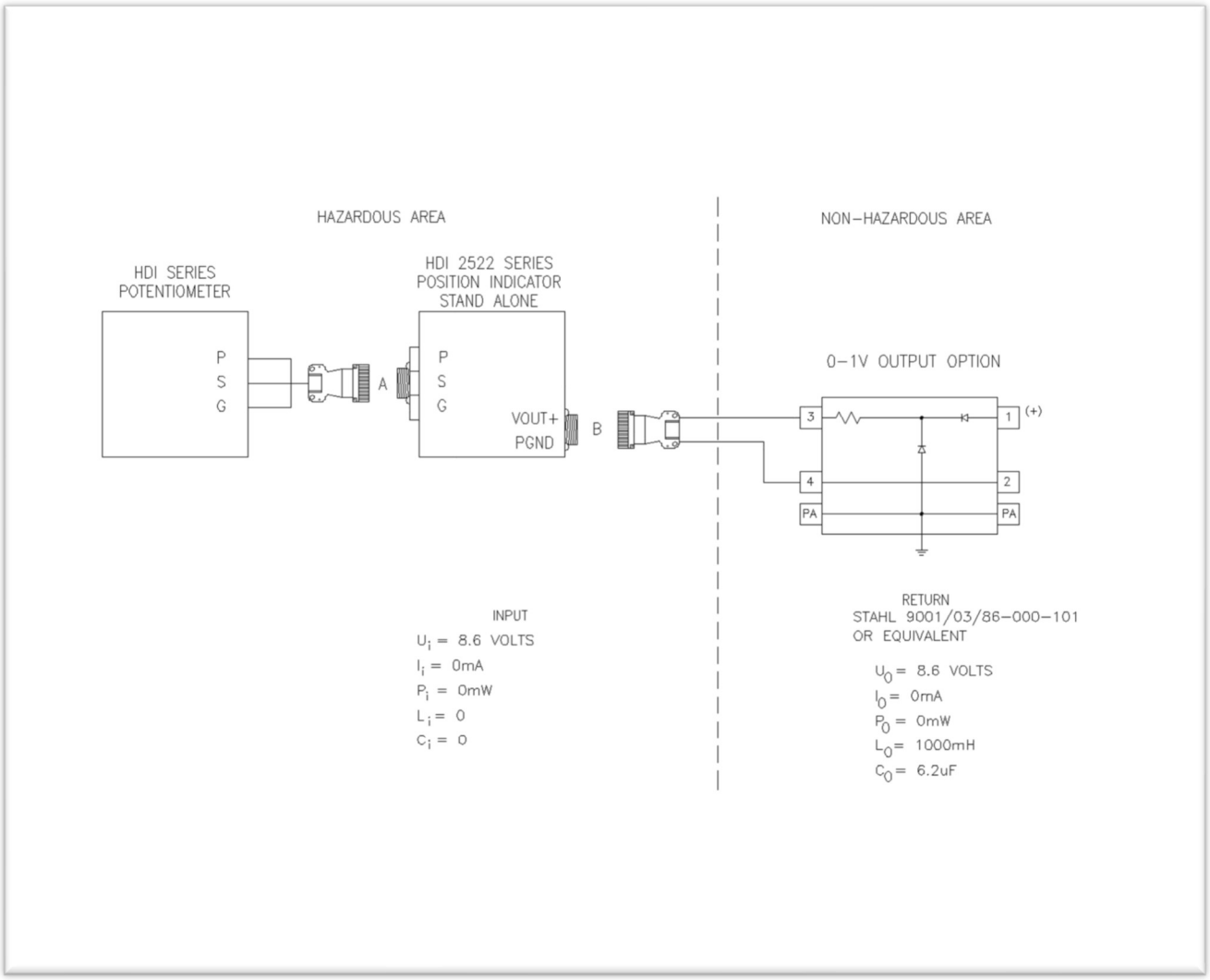
SOCKET TERMINAL DEFINITIONS

A: 3 SOCKET = INLINE B: 3 PIN = 0-1V OUTPUT C: 5 PIN= 4-20ma OUTPUT

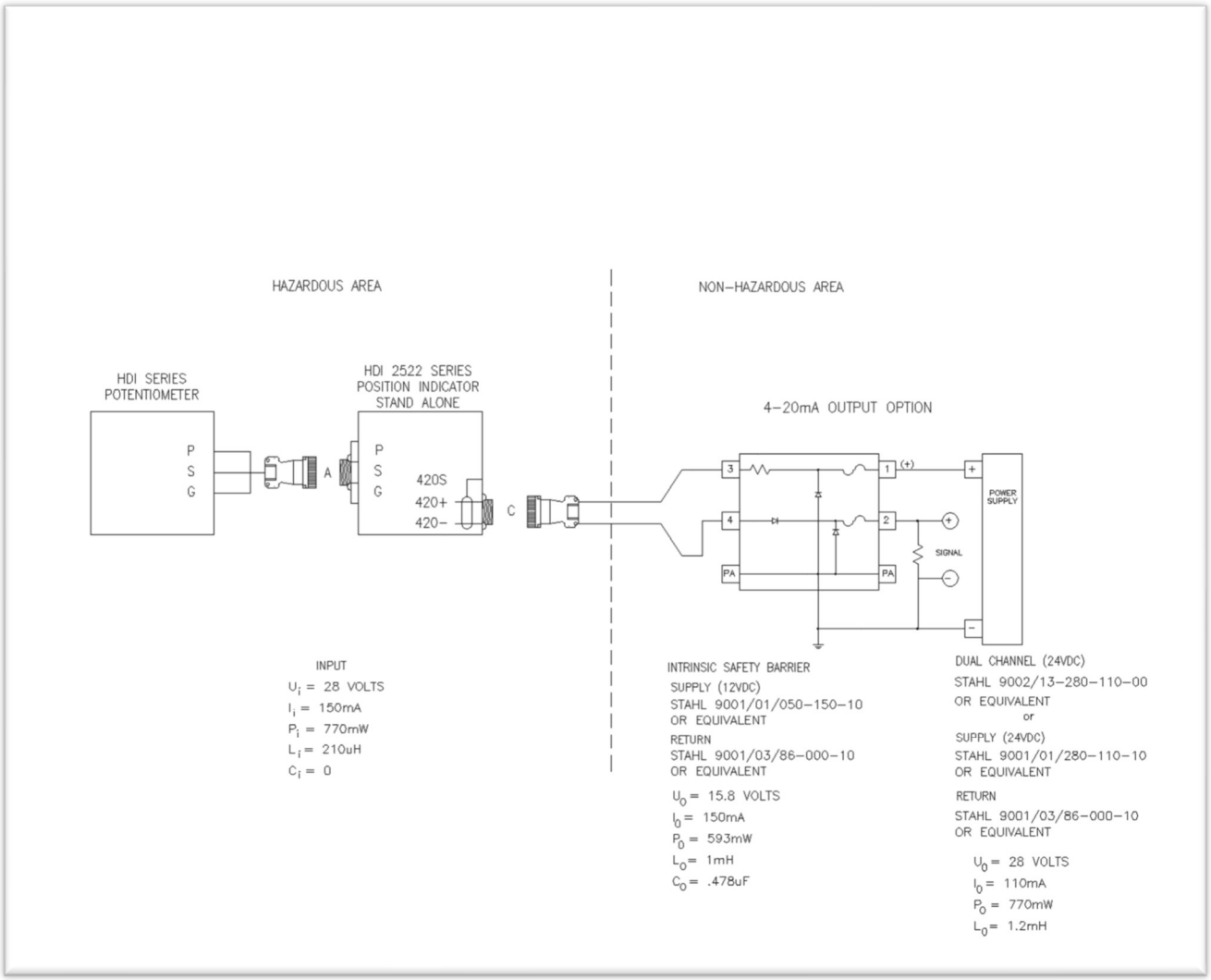
2522 Position Indicator Gauge with No Output Options



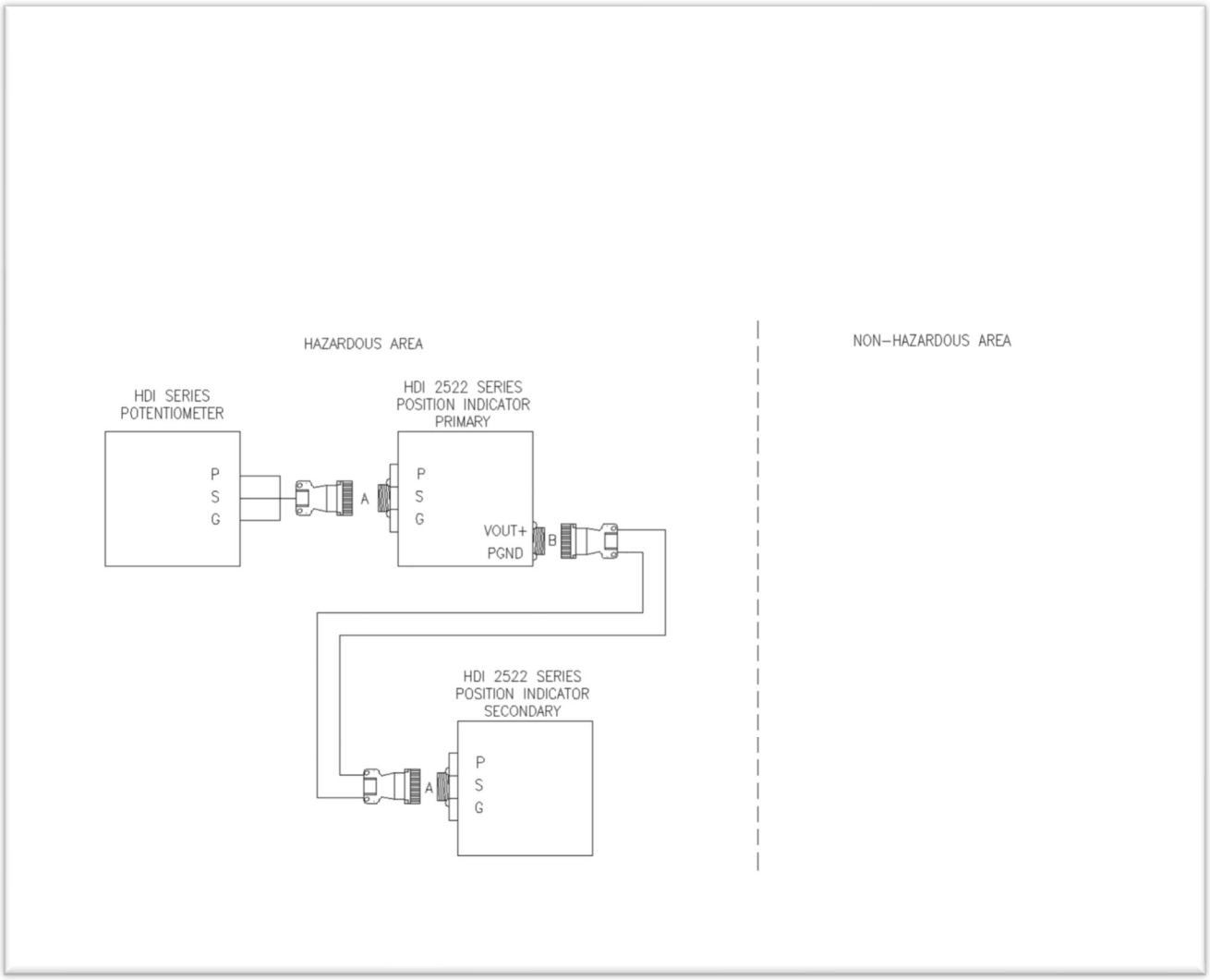
2522 Position Indicator Gauge with 0-1 Volt Output Option



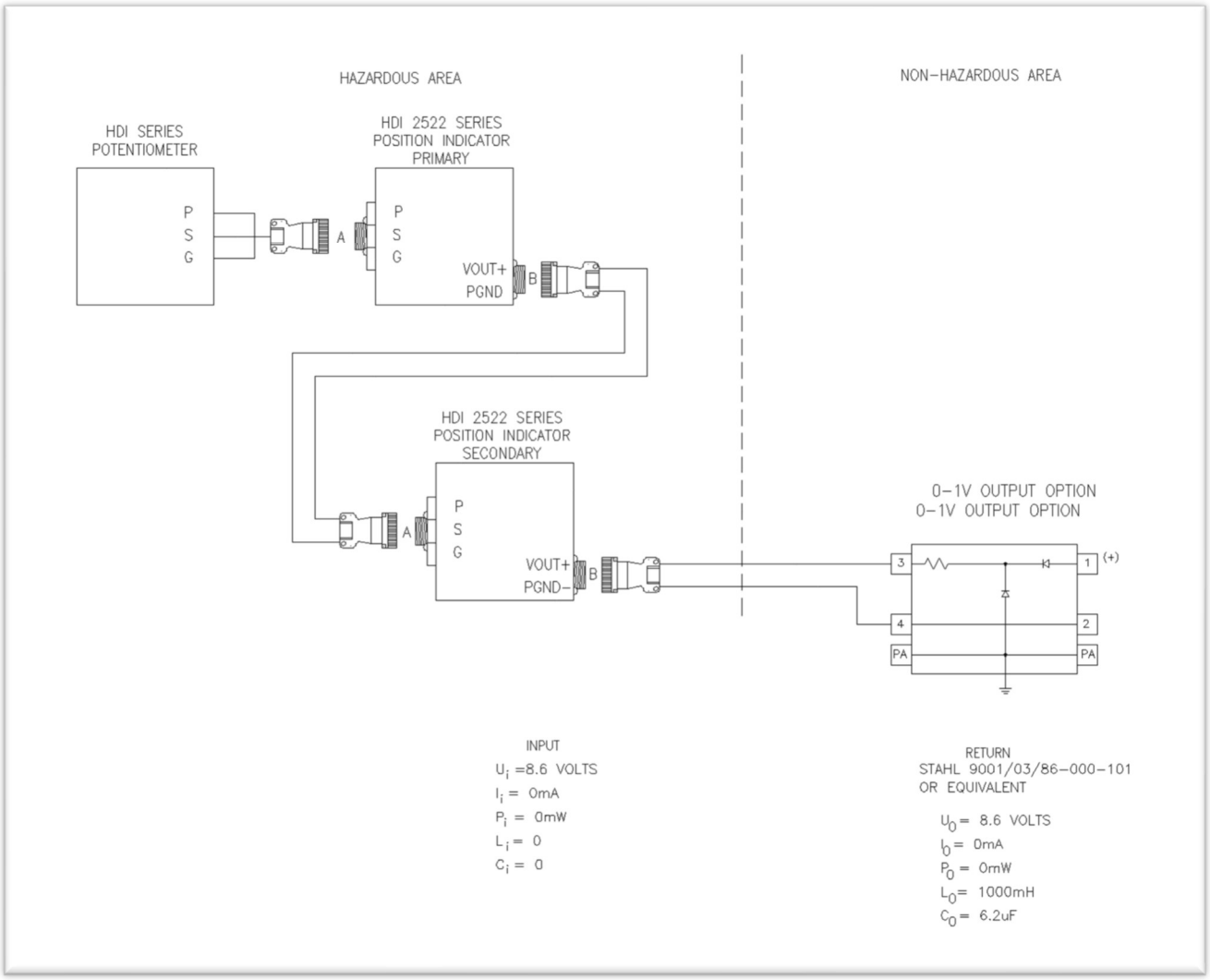
2522 Position Indicator Gauge with 4-20 mA Output Option



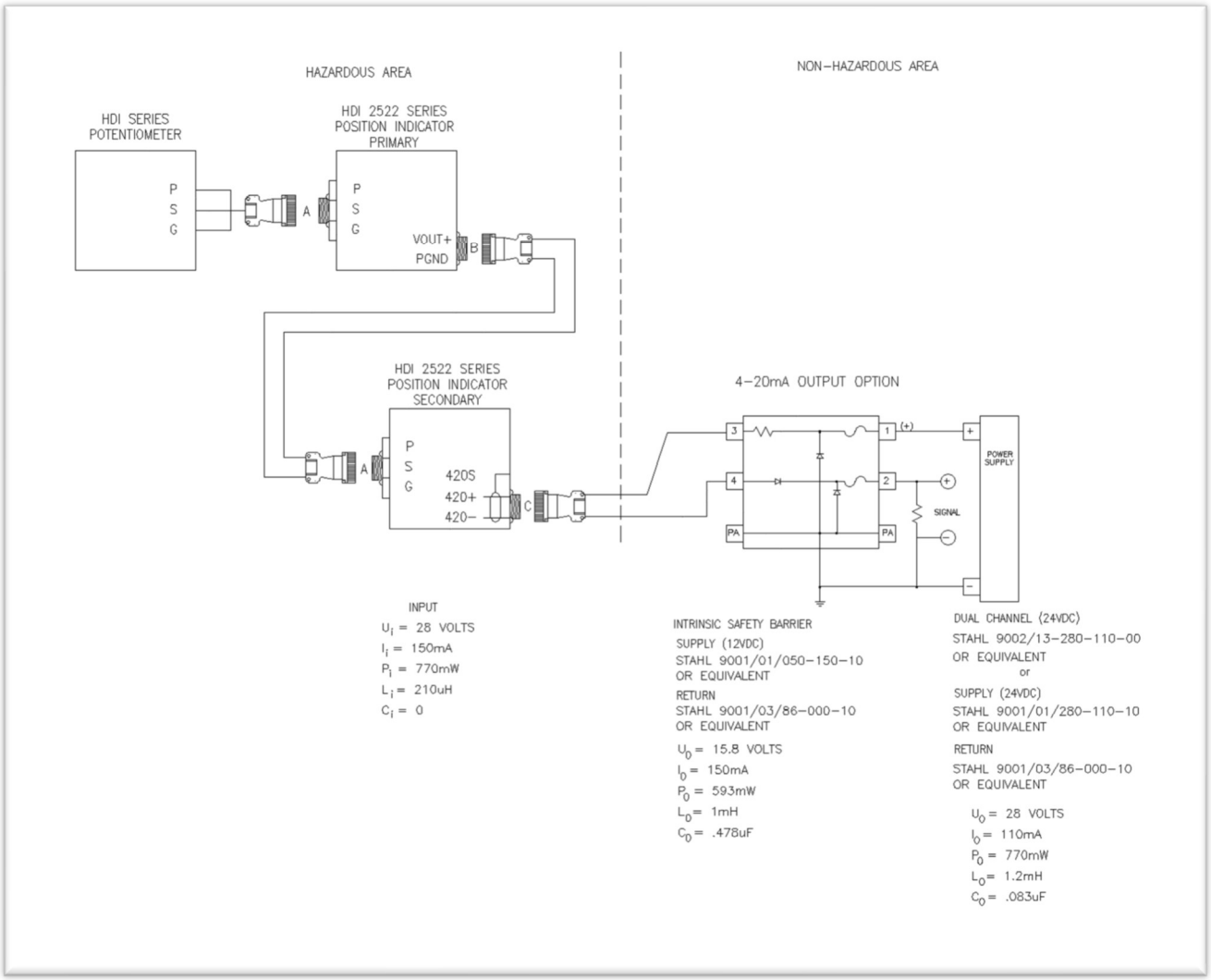
2522 Position Indicator Gauge with a Primary/Secondary Option



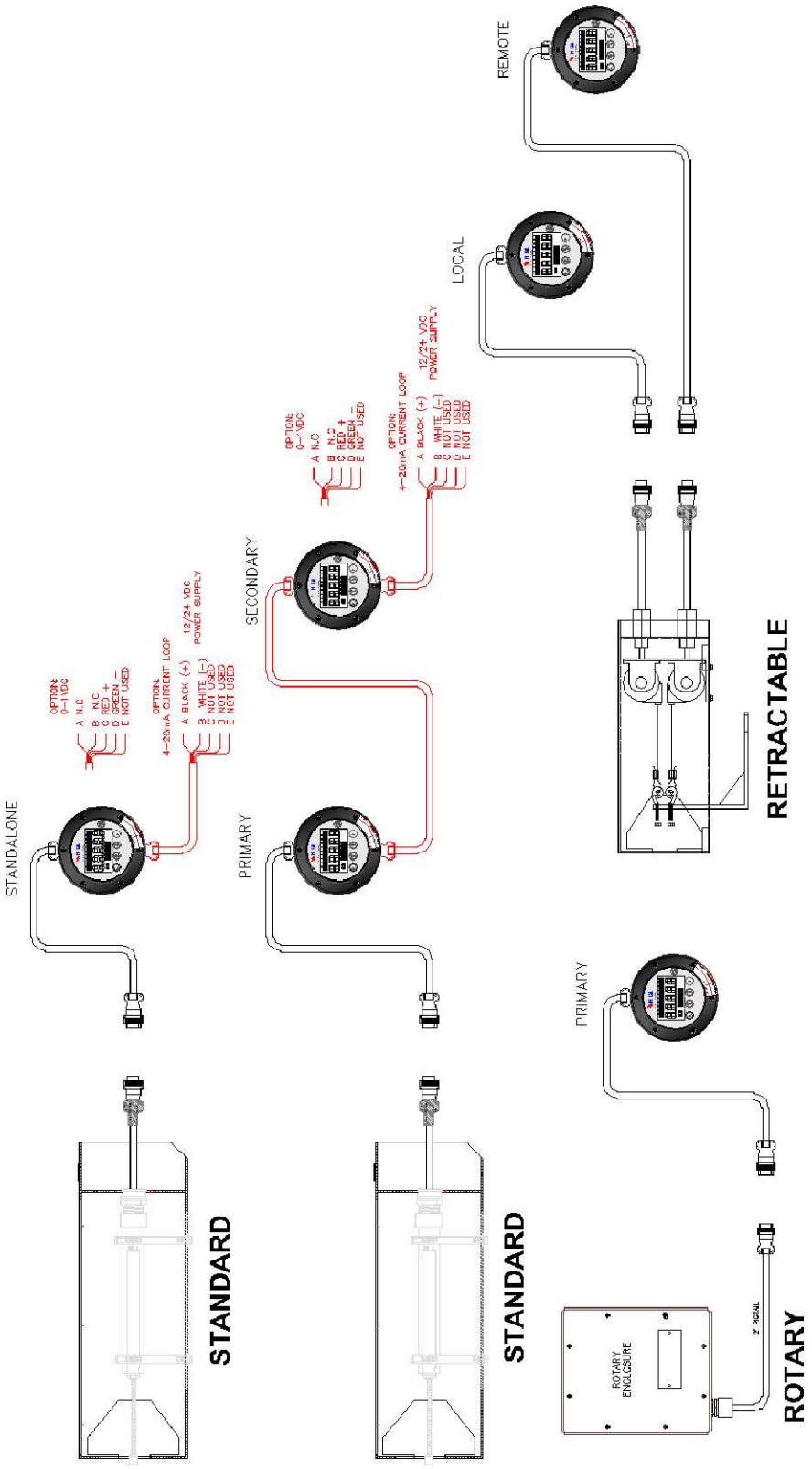
2522 Position Indicator Gauge Primary/Secondary with 0-1V



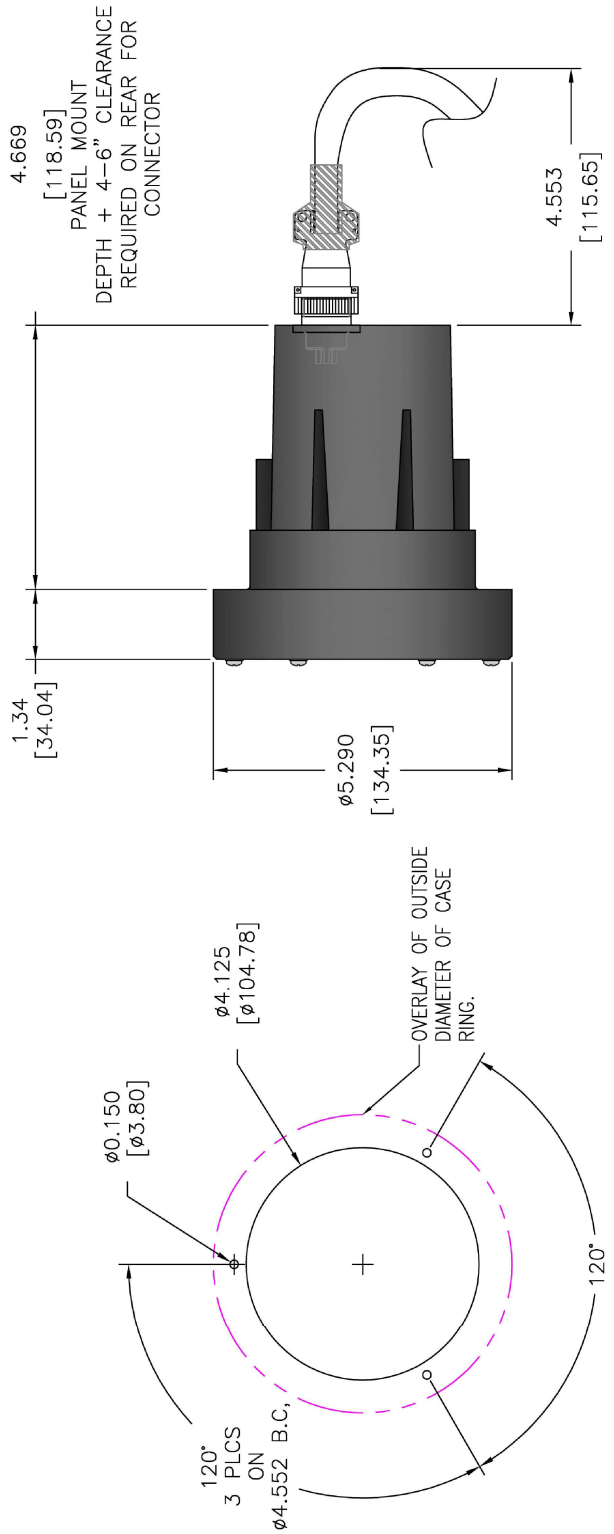
2522 Position Indicator Gauge Primary/Secondary with 4-20 mA Output Option



Section 9 - Cable Connection Drawing



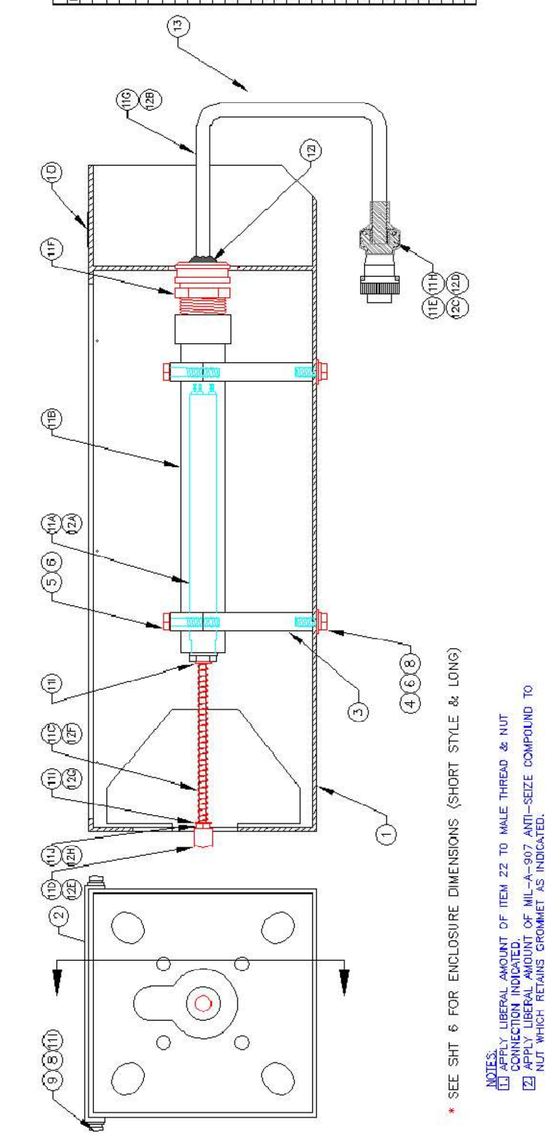
Section 10 - Gauge Mounting Diagram

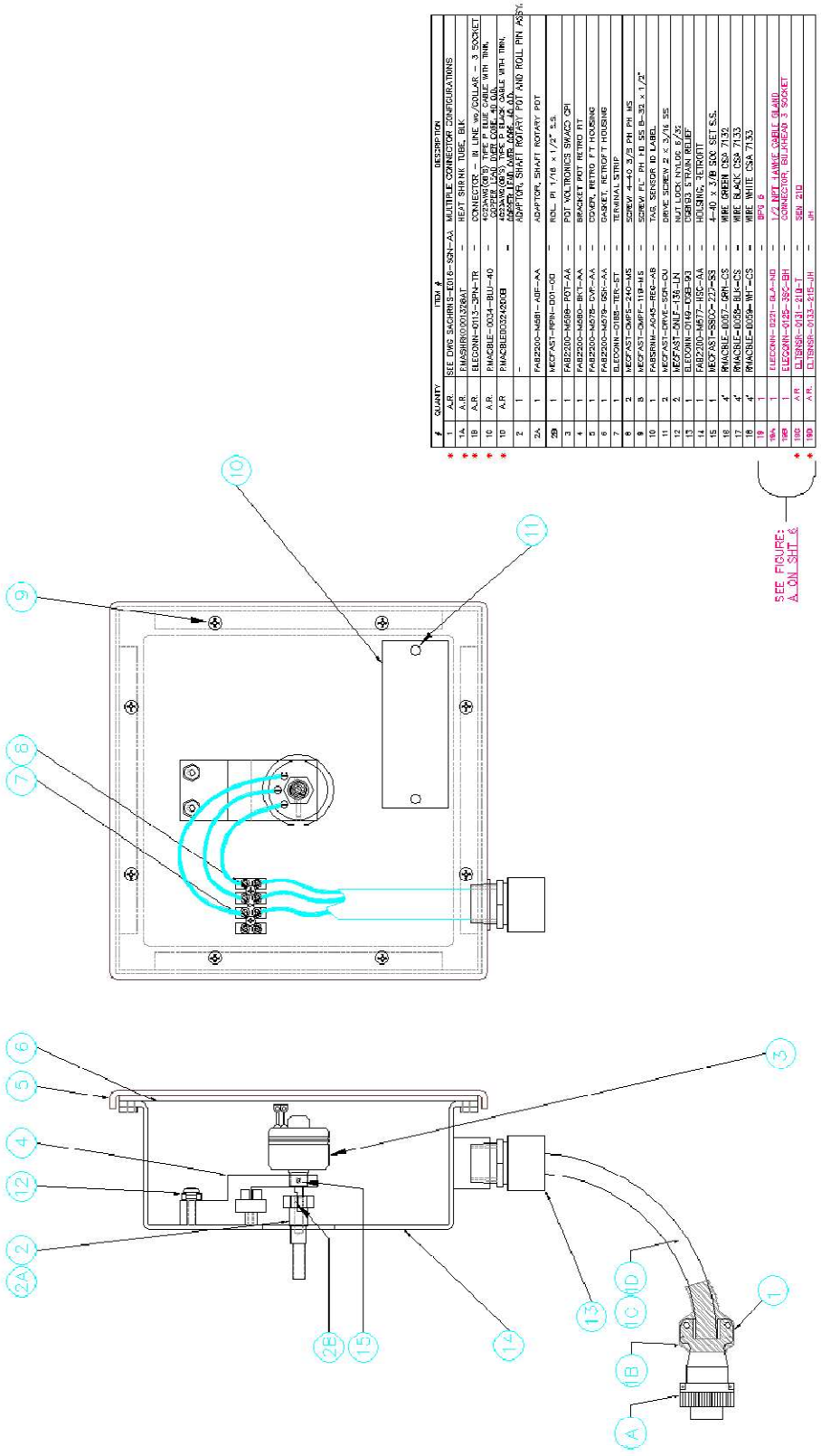


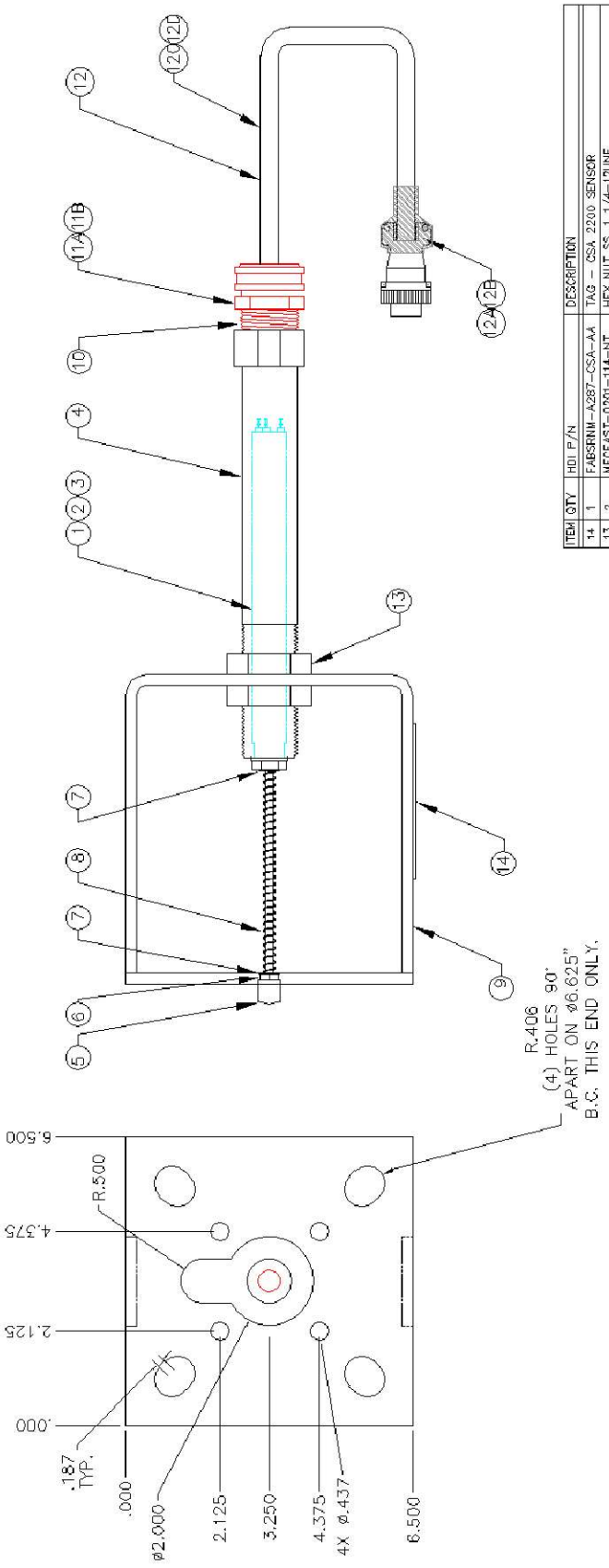
Section 11 – Potentiometer Configurations

STANDARD OPTION

BOM			
ITEM	QTY	HDI P/N	DESCRIPTION
1	1	FAB2200-M334-CMS-AC	HDI SINGLE CPI SENSOR ENCLOSURE
2	1	FAB2200-M869-CVR-AA	COVER-SHAFFER CPI SENSOR ENCLOSURE
3	2	FAB2200-M336-CMS-AA	CPI POT HSG BLOCK
4	4	MECFAST-00HC-130-CS	CAP SCREW HEX SS 1/4-20 x 3/4 LG
5	4	MECFAST-00HC-165-MS	CAP SCREW HEX SS 1/4-20 x 1-1/2 LG
6	8	MECFAST-00LW-145-WH	LOCK WASHER SPLIT SS 1/4
7	2	MECFAST-00WW-127-WH	FLAT WASHER SS 1/4
8	6	MECFAST-0MLW-156-WH	LOCK WASHER SPLIT SS 10
9	6	MECFAST-0000-001-SC	PAN SCREW 10-32 x 3/8 LG
10	1	FABSRNM-A287-CSA-AA	TAG-CSA 2200 SENSOR
11	–	HDI2200-SNSR-CAM-PT	2K SS CYLINDER ENCLS W/ 2' PIG
11A	1	ELTPMTR-0102-146-2K	POT LINEAR MOTION 2K
11B	1	FAB2200-M095-CAM-AA	HSG ASSY CPI POTENTIOMETER
11C	1	FAB2200-M139-SPR-AB	RETURN SPRING WOM STYLE
11D	1	FAB2200-M097-CAM-AB	CPI SNR CONTACT BUTTON-CAME
11E	1	ELECONN-0113-3PN-TR	CONN TERMINATOR W/ COLLAR 3 PI
11F	1	ELECONN-0117-STR-RF	CONNECTOR STRAIN RELIEF 1"
11G	A.R.	RMACBLE-0034-BLU-40	4C 20AWG(OB'S) TYPE P BLUE
11H	1	RMASHRK-0001-328-AT	HEAT SHRINK TUBE, 4FT, BLK
11I	1	MECFAST-00WW-114-WH	WASHER FLAT SS 10
11J	1	MECFAST-0MLF-143-NT	NUT HEX SS 10
12	–	HDI2200-SNSR-CAM-KT	LINEAR POT REPAIR KIT
12A	1	ELTPMTR-0102-146-2K	POT LINEAR MOTION 2K
12B	A.R.	RMACBLE-0034-BLU-40	4C 20AWG(OB'S) TYPE P BLUE
12C	1	ELECONN-0113-3PN-TR	CONN TERMINATOR W/ COLLAR 3 PI
12D	1	RMASHRK-0001-328-AT	HEAT SHRINK TUBE, 4FT, BLK
12E	1	FAB2200-M097-CAM-AB	CPI SNR CONTACT BUTTON-CAME
12F	1	FAB2200-M139-SPR-AB	RETURN SPRING WOM STYLE
12G	1	MECFAST-00WW-114-WH	WASHER FLAT SS 10
12H	1	MECFAST-0MLF-143-NT	NUT HEX SS 10
12I	1	ELECONN-0152-GRO-MT	GROMMET RUBBER BLACK FOR CABL
13	–	CBL2200-0002-PIG-TL	2' PIGTAIL




SEE FIGURE: A ON SHT 6

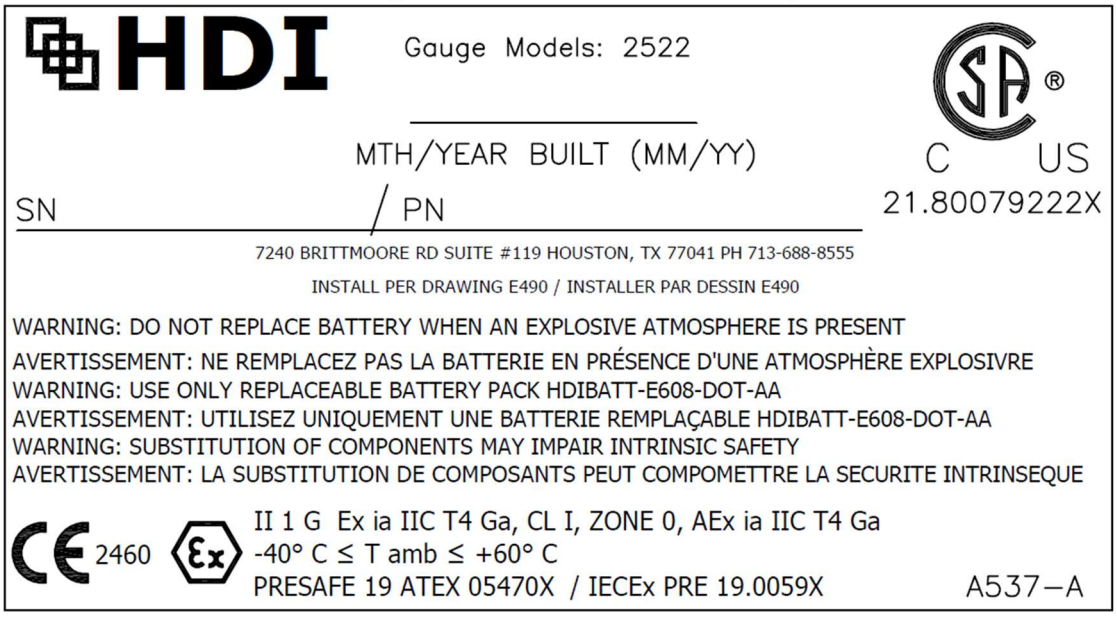


ITEM	QTY	HDI P/N	DESCRIPTION
14	1	FABSRNM-A287-CSA-AA	TAG – CSA 2200 SENSOR
13	2	MECFAST-0201-114-NT	HEX NUT SS, 1 1/4-12UNF
12D	A.R.	RMAOBLE-0034-BLU-40	4C 20AWG(OBFS) TYPE P BLUE
12C	A.R.	RMAOBLE-0032-420-OB	4C 20AWG(OBFS) TYPE P BLACK
12B	1	ELECONN-0113-3PN-TR	CONNECTOR TERMINATOR WITH COLLAR, 3 PIN
12A	1	RMASHRK-0001-328-AT	HEAT SHRINK TUBE, BLACK
12	1	SEE CHART FOR CONFIGURATIONS	MULTIPLE CONNECTOR CONFIGURATIONS
11B	1	ELECONN-0113-3PN-TR	CONNECTOR TERMINATOR WITH COLLAR, 3 PIN
11A	1	ELECONN-0117-STR-RF	CONNECTOR STRAIN RELIEF
10	.1 OZ	CSMSEAL-0105-CMP-ND	LOCKTITE 565
9	1	SK150	BASIC CPI BRACKET
8	1	FAB2200-M139-SPR-AB	CPI RETURN SPRING
7	2	MECFAST-00MM-114-WH	FLAT WASHER SS 10
6	1	MECFAST-0MLF-143-NT	10-32UNF HEX NUT SS
5	1	FAB2200-M097-CAM-AA	CONTACT BUTTON – CPI SENSOR
4	1	FAB2200-M095-CAM-AA	HOUSING – CPI POTENTIOMETER
3	REF	FAB2200-M081-SHF-AA	CPI POTENTIOMETER
2	REF	ELTPMTR-0102-1146-2K	POT LINEAR MOTION 2K
1	1	ELTPMTR-0102-WFD-AA	POT LINEAR MOTION 2K

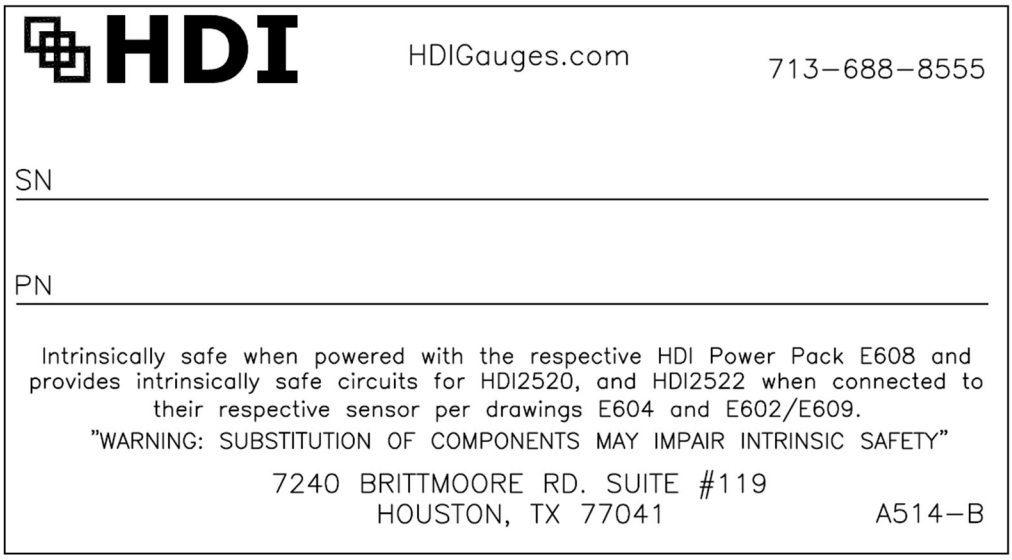
Section 12 - Certification Markings

CSA / ATEX / IECex Certification Markings:

Gauge Head Certification Tag



Gauge Head Tag (No Certification)



Section 13 - IECEX Certificate

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	**IECEx PRE 19.0059X**	Page 1 of 3	Certificate history:
Status:	**Current**	Issue No: 0	
Date of Issue:	2019-11-04		
Applicant:	**HDI Instruments, LLC** 7240 Brittmoore Rd, Suite #119 Houston, TX 77041 **United States of America**		
Equipment:	**Model 2522 Position Indicator**		
Optional accessory:			
Type of Protection:	**Intrinsic Safety (Ex i)**		
Marking:	Ex ia IIC T4 Ga -40°C ≤ Tamb ≤ +60°C		

Approved for issue on behalf of the IECEx Certification Body: **Ståle Sandstad**

Position: **Certification Manager**

Signature: (for printed version) _____

Date: _____

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

DNV GL Presafe AS
Veritasveien 3
1363 Høvik
Norway

DNV·GL

IECEx Certificate of Conformity

Certificate No.: **IECEx PRE 19.0059X** Page 2 of 3

Date of issue: 2019-11-04 Issue No: 0

Manufacturer: **HDI Instruments, LLC**
7240 Brittmoore Rd, Suite #119
Houston, TX 77041
United States of America

Additional manufacturing locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2011 Explosive atmospheres - Part 0: General requirements
Edition:6.0

IEC 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

NO/PRE/ExTR19.0056/00

Quality Assessment Report:

NO/PRE/QAR17.0016/01

IECEx Certificate of Conformity

Certificate No.:	**IECEx PRE 19.0059X**	Page 3 of 3
Date of issue:	2019-11-04	Issue No: 0

EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

The HDI 2522 is a 4" panel mounted industrial Position Indicator designed for use in explosive gas atmospheres. The units are powered by a replaceable battery pack and are provided with connection to a remotely mounted linear potentiometer. Units may be optionally provided with 0-1V output, 4-20mA output, or connection to another HDI 2522 Position Indicator unit in a master/slave configuration. Reference can be made to HDI installation drawing E490 for all permissible installation configurations.

See Annex for battery pack and entity paramter specifications for these units.

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. Installation shall be in accordance with HDI installation drawing E490.
2. The battery pack shall only be replaced in an area known to be non-hazardous.
3. The integral connectors are made of an aluminum alloy. Care shall be taken to avoid impact or friction which may cause an ignition hazard.

Annex:

Annex to IECEx PRE 19.0059X - HDI 2522 Position Indicator.pdf

Section 14 - ATEX Certificate

DNV·GL

EU-TYPE EXAMINATION CERTIFICATE

[2] EQUIPMENT OR PROTECTIVE SYSTEM INTENDED FOR USE IN POTENTIALLY EXPLOSIVE ATMOSPHERES DIRECTIVE 2014/34/EU

[3] EU-Type Examination Certificate Number: **Presafe 19 ATEX 05470X** **Issue 0**

[4] Product: **Model 2522 Position Indicator**

[5] Manufacturer: **HDI Instruments, LLC.**

[6] Address: **7240 Brittmoore Rd. Suite #119**
Houston, Texas 77041
USA

[7] This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] DNV GL Presafe AS, notified body number 2460, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential reports listed in section 16.

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012/A11:2013 and EN 60079-11:2012

[10] If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

[11] This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

[12] The marking of the product shall include the following:

Ex **II 1 G** **Ex ia IIC T4 Ga** **-40°C ≤ T_{amb} ≤ +60°C**

Date of issue:
2019-11-04

NORSK AKKREDITERING
PROD 021

Ståle Sandstad
For DNV GL Presafe AS
The Certificate has been digitally signed.
See www.dnvgl.com/digitalsignatures for info

DNV GL Presafe AS, Veritasveien 3, 1363 Høvik, Norway, Tel +47 67 57 88 00, www.dnvgl.com

DNV·GL

[13] **Schedule**

[14] **EU-Type Examination Certificate No:** Presafe 19 ATEX 05470X Issue 0

[15] **Description of Product**

The HDI 2522 is a 4" panel mounted industrial Position Indicator designed for use in explosive gas atmospheres. The units are powered by a replaceable battery pack and are provided with connection to a remotely mounted linear potentiometer. Units may be optionally provided with 0-1V output, 4-20mA output, or connection to another HDI 2522 Position Indicator unit in a master/slave configuration. Reference can be made to HDI installation drawing E490 for all permissible installation configurations.

Type designation

Model 2522

Intrinsic Safety Data

Only the following replaceable battery pack shall be used:

- HDIBATT-E608-DOT-AA

External Connection Details:

Output	Connector	U_i	I_i	P_i	C_i	L_i
0-1V Output*	B	8.6V	0	0	0	0
4-20mA Output	C	28V	110mA	770mW	0	210µH
		15.8V	150mA	593mW		

** Alternatively, the 0-1V output may be connected to another HDI 2522 Position Indicator, when connected in accordance with HDI installation drawing E490.*

[16] **Report No.**: 2019-3179, Issue 00
Project No.: PRJC-553167-2016-PRC-USA

[17] **Specific Conditions of Use (X)**

1) Installation shall be in accordance with HDI installation drawing E490.

2) The battery pack shall only be replaced in an area known to be non-hazardous.

3) The integral connectors are made of an aluminum alloy. Care shall be taken to avoid impact or friction which may cause an ignition hazard.

DNV·GL

[18] **Essential Health and Safety Requirements**

Essential Health and Safety Requirements (EHSRs) are covered by the standards listed at item 9

[19] **Drawings and documents**

Number	Title	Rev.	Date
SCH-2522-Z0006	Assembly Drawing for 2522 Position Indicator	A	2019-08-22
E609	IECEx 4" Position Indicator Schematic	A	2019-08-22
M1316-E609-ASY	IECEx 4" Position Indicator Board Assembly Drawing	A	2019-08-22
M1316-E609-FAB	IECEx 4" Position Indicator Board Fabrication Drawing	A	2019-08-22
E490	IECEx Installation Configurations for 2522 Gauges	A	2019-08-22
HDISCHE-E601-SCH-AA	Position Indicator LCD Board Schematic for 4" Gauge	A	2018-02-07

[20] **Certificate History**

Issue	Description	Issue date	Report no.
0	Original issue	2019-11-04	2019-3179, Issue 00

END OF CERTIFICATE

DNV GL Presafe AS, Veritasveien 3, 1363 Høvik, Norway, Tel +47 67 57 88 00, www.dnvgl.com

Section 15 - CSA Certificate

CSA GROUP™

Certificate of Compliance

Certificate: 80079222 **Master Contract:** 159619

Project: 80079222 **Date Issued:** 2021-06-25

Issued To: **HDI Instruments LLC.**
7240 Brittmoore Road
Suite 119
Houston, Texas, 77041
United States

Attention: Michael Nguyen

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

C US

Issued by: *Ronald (Ron) Bell*
Ronald (Ron) Bell

PRODUCTS

2258 03 PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non Incendive Systems - For Hazardous Locations

2258 83 PROCESS CONTROL EQUIPMENT-Intrinsically Safe and Non-Incendive Systems-For Hazardous Locations-Certified to U.S. Standards

Class I, Division 1, Groups A, B, C, D T4
Ex ia IIC T4 Ga
Class I, Zone 0, AEx ia IIC T4 Ga

Model 2522 Position Indicator. Intrinsically safe when used with HDIBATT-E608-DOT-AA Battery Pack power source, and when installed per drawing E490. -40°C ≤ Tamb ≤ +60°C

Conditions of Acceptability

1. Only the HDIBATT-E608-DOT-AA battery pack shall be used, only to be replaced in an area known to be non-hazardous.

DQD 507 Rev. 2019-04-30 Page 1

Certificate: 80079222
Project: 80079222

Master Contract: 159619
Date Issued: June 25, 2021

2. The integral connectors are made of an aluminum alloy. Care shall be taken to avoid impact or friction which may cause an ignition hazard.
3. Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. This is particularly important if the equipment is installed in a Zone 0 location. In addition, the equipment shall only be cleaned with a damp cloth.

Output	Connector	Ui	Ii	Pi	Ci	Li
0-1V Output*	B	8.6V	0	0	0	0
4-20mA Output	C	28V	110mA	770mW	0	210 uH
		15.8V	150mA	593mW		

* Alternately, the 0-1V output may be connected to another HDI 2522 Position Indicator, when connected in accordance with HDI Installation Drawing E490.

APPLICABLE REQUIREMENTS

CAN/CSA C22.2 No. 60079-0:19	Explosive Atmospheres – Part 0: Equipment – General Requirements
CAN/CSA-C22.2 No. 60079-11:14 (R2018)	Explosive Atmospheres – Part 11: Equipment protected by intrinsic safety "i"
CAN/CSA-C22.2 No. 61010-1-12 + Amd 1 - 18	Safety Requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General Requirements
ANSI/UL 60079-0-2020 Seventh Edition	Explosive Atmospheres – Part 0: Equipment – General Requirements
ANSI/UL 60079-11-2018 Sixth Edition	Explosive Atmospheres – Part 11: Equipment protected by intrinsic safety "i"
ANSI/UL 913-2019 Eighth Edition	Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations
ANSI/UL 61010-1-2018 Third Edition	Safety Requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General Requirements

MARKINGS

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.
- Products certified for Canada shall have all Caution and Warning markings in both English and French.

Additional bilingual markings not covered by the product standard(s) may be required by the Authorities Having Jurisdiction. It is the responsibility of the manufacturer to provide and apply these additional markings, where applicable, in accordance with the requirements of those authorities.

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Certificate: 80079222
Project: 80079222

Master Contract: 159619
Date Issued: June 25, 2021

The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only.

Method of Marking:

The following markings are provided on an adhesive nameplate, manufactured by anodized graphics, with 3M 467MP adhesive, CSA Class 7922-01, Meeting CSA Standard C22.2 No. 0.15-15, UL 969, UL Recognized (PGGU2) MH26206, with 0.012 Dead Soft Photosensitive Aluminum manufactured by Horizons Incorporated, designated type Metalphoto. CSA certified, class 7923-01 Indoor / Outdoor use on plastic Group III (80°C) and covered with 3M 467MP Transfer tape for outdoor use on plastics from -35°C up to 204°C. Nameplate is affixed to enclosure top, back (Drawing SCH2522).

- Manufacturer's name: "HDI Instruments LLC.", or CSA Master Contract Number "159619", adjacent to the CSA Mark in lieu of manufacturer's name.
- Model designation: As specified in the PRODUCTS section, above.
- Electrical ratings: As specified in the PRODUCTS section, above.
- Ambient temperature rating: -40°C < Tamb < +60°C.
- Manufacturing date in MMYY format, or serial number, traceable to year and month of manufacture.
- The manufacturing location shall be identified if the equipment can be produced in more than one facility.
- The CSA Mark, with or without the "C" and "US" indicators, as shown on the Certificate of Conformity.
- The designation "CSA 21CA80079222X" indicating year of issue ("zz"), followed by "CA", followed by the CSA Certificate number ("80079222"), followed by an "X" if there are Specific Conditions of Use. Note – The letters "CSA" are optional when this designation is placed adjacent to the CSA mark. *Note -The use of a "."period has been accepted, in lieu of the "CA".*
- Hazardous Location designation: As specified in the PRODUCTS section, above. The word "Class" may be abbreviated "CL", the word "Division" may be abbreviated "DIV", and the word "Groups" may be abbreviated "GRP" or "GP".
- Method of Protection markings (Ex -- markings): *Ex ia IIC T4 Ga, Class I, Zone 0, AEx ia IIC T4 Ga*
- Temperature code: As specified in the PRODUCTS section, above.
- *The following words, or equivalent:*
- *"WARNING: DO NOT REPLACE BATTERY PACK WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT" and "AVERTISSEMENT: NE REMPLACEZ PAS LA BATTERIE EN PRÉSENCE D'UNE ATMOSPHÈRE EXPLOSIVE".*
- *"WARNING: USE ONLY REPLACEABLE BATTERY PACK HDIBATT-E608-DOT-AA" and "AVERTISSEMENT: UTILISEZ UNIQUEMENT UNE BATTERIE REMPLAÇABLE HDIBATT-E608-DOT-AA".*
- "WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY", and "AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SECURITE INTRINSEQUE"
- "Install per drawing E490" in English and French.

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CSA GROUP™

Supplement to Certificate of Compliance

Certificate: 80079222 **Master Contract:** 159619

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
80079222	2021-06-25	Original Certification of model HDI 2522 Position Indicator for Class I, Division 1, Groups A, B, C, D and Class I, Zone 0, AEx ia IIC, Ex ia IIC.

DQD 507 Rev. 2019-04-30 Page 1

Section 16 - 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.

Client Maintenance Notes

ISO 9001:2015

Office Phone: 713.688.8555
After Hours Support, Primary: 713.446.2212
After Hours Support, Secondary: 713.819.6103

7240 Brittmoore Rd Suite #119
Houston, TX 77041