NOSHOK 628 Series
Intrinsically Safe Hammer Union Transmitters

• Before installation, please read the entire manual.

• If you do not observe the appropriate regulations, serious injuries and/or damage can occur.

• Do not use the transmitter in any other way than described in these operating instructions, or protection provided by the equipment may be impaired.

• Repairs done by the customer will void the warranty and approvals, and may create an explosion hazard.

• DO NOT use these products as stop devices or in any other application where failure of the product could result in personal injury.

• Ensure that the transmitter is only operated in accordance with the provisions as described in the following instructions.
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Chapter 1

Product Specifications

Excitation Voltage: 10-28 VDC
Output: 4mA -20mA*
Span: 16 mA *

Connections: +PWR/SIG: +EXCITATION VOLTAGE
-PWR/SIG: - EXCITATION VOLTAGE
(This terminal must also be grounded**. This is normally accomplished in a non-hazardous area by grounding the supply return terminal per control drawings 21076, 21077, 21078, & 21079)

Safe overload: ≥150% rated capacity
Max. overload: ≥300% rated capacity

Shunt Calibration Circuit (optional):

Units with “-cal” connection but no “+cal”:
CONNECT TO NEGATIVE SIDE OF POWER SUPPLY TO ENGAGE the shunt calibration circuit. Do not engage the calibration circuit longer than one minute in a hazardous location.

Units with “+cal” & “-cal” connection:
To engage shunt, connect negative side of power supply to “-cal” and positive side of power supply to “+cal”. For units with a “+cal” connection, the shunt calibration circuit cannot be used or hooked up in hazardous locations.

IP rating:
Units are hermetically sealed and have an IP rating of at least IP54.

* Review calibration sheet for any customer specified variations.
** For ordinary, non-hazardous locations, the requirement for grounding the “-PWR/SIG” connection can be waived if powered by a class 2 circuit.
Installation, General

- See Chapter 2 for additional requirements when installing in hazardous locations.
- Ensure that the transmitter is only used within the safe overload limit at all times.
- Do not use the transmitter in any other way than described in these operating instructions, or protection provided by the equipment may be impaired.

Unpacking:
- Inspect the transmitter for possible damage during transportation; should there be any damage, inform the transport company and NOSHOK right away.
- Protection caps removed for inspection should be reinstalled until just before installation.
- Never insert objects into the pressure port or press against the sensor to deflect in an attempt to simulate a load; this can cause permanent damage to the diaphragm.

Installation:
- The Safety of any system incorporating this transmitter is the responsibility of the installer.
- Do not install the pressure transmitter if it has any damage. (Mark damaged units to prevent them from accidently being installed).
- Some installations require special and/or expert knowledge for safe installation. For example, applications such high pressures, dangerous media, and mounting of heavy loads are beyond the scope of this manual. Trained and knowledgeable persons should be consulted during installation.
- A shielded cable is preferred for signal quality. It should be grounded at one end. Grounded at both ends may introduce ground loop problems.
Installation, continued

- Verify that process connections are compatible.
- Verify that wetted parts are compatible with the media.
- Do not use with abrasive media.
- When using o-rings, thread tape or sealants, verify that they are compatible with the media, temperature range, and pressure range of the transmitter.
- Only tighten on the wrench flats closest to the pressure port.
- Do not allow media to freeze in pressure port.

Removal, Maintenance and Repair

- Transmitters require no maintenance during use.
- All adjustments and repairs should be performed by NOSHOK. No disassembly or adjustments are permitted in hazardous locations.
- Recommended recalibration cycle is one year, under normal conditions.
- Never attempt to remove the transmitter when it is under load or pressure.
- Take precaution with regard to remaining media in transmitter. It may be hazardous, toxic, or flammable.
- Repairs done by the customer will void warranty, approvals, and may create an explosion hazard.
- Never insert objects into the pressure port or press against the sensor to deflect in an attempt to simulate a load; this can cause permanent damage to the diaphragm.
- PTIH-10-6P connector must have the Flat Face Interfacial Seal or O-ring as shown in Figure 1.
- Before Installing a mating connector Figure 2 make sure the face of seal is clean of dirt, debris, and water. Figure 1 and 2.
Hazardous Location Installations

- Observe the relevant national regulations (e.g.: IEC 60079-14, NEC, CEC) and observe the applicable standards and directives for special applications (e.g. with dangerous media such as acetylene, flammable gases or liquids and toxic gases or liquids and with refrigeration plants or compressors).
- If you do not observe the appropriate regulations, serious injuries and/or damage can occur.
- Observe the ambient ratings on unit label.
- All adjustments and repairs should be performed by NOSHOK. No disassembly or adjustments are permitted in hazardous locations.
- Repairs done by the customer will void warranty, approvals, and may create an explosion hazard.
- Protect the diaphragm against any contact with abrasive substances, pressure spikes, and do not touch with tools. If you damage the diaphragm, no intrinsic safety can be guaranteed.
- Units meet dielectric strength requirements of 60079-11 paragraph 6.3.12.
- Negative terminal, marked “-PWR/SIG”, must be grounded.
- Barriers must comply with the entity parameters noted on the control drawings.
- Installation not per the appropriate control drawing will invalidate the safety rating. See product label for applicable control drawing. For example, “install per 21076”.
- Installation per the control drawing is required but it is not necessarily sufficient to ensure safety. The system in which it is installed must still conform to all applicable national and industrial standards.
Understanding Approval Ratings

- The relevant codes and standards should be consulted for precise interpretation of the classifications and marking. The definitions below are only for reference.
- Units are not rated for mines.
INTRINSICALLY SAFE

Class I, DIV 1, Groups A,B,C,D -20°C<T<70°C T4
Class II, DIV 1, Groups E,F,G, Class III
Class I, Zone 0 AEx/Ex ia IIC T4

Lines 1 & 2 refer to approvals in accordance with the "Division" system of classifications. Line 3 restates the approvals in accordance with the "Zone" system of classifications.

Class III approved for areas with combustible dust in the groups and divisions listed on the same line.

With Division 1 approval, rates the transmitter as being safe even in a continuously hazardous environment.

Approved for all the defined categories of dust and fibers.

Class III approved for areas with ignitable fibers in the groups and divisions listed on the same line.
Chapter 2

Intrinsically Safe Installation

Introduction
“Intrinsic safety” insures that a circuit operated under normal and specified fault conditions is not capable of causing ignition of the prescribed explosive atmosphere.

Installation
The certification of each testing laboratory is valid when the transmitter has been installed according the installation drawings or certificates of conformity included in this section.
**CSA Installation Drawings for Intrinsically Safe Applications**

**Non-Hazardous Location**

- Typical CSA Entity Certified Barriers. Barriers must be previously Certified in this configuration, such that the Uo or Vmax is greater than Vcc or Uo and Imax or Ii is greater than Icc or Io.

**Associated Apparatus**

- +PWR/SIG
- -PWR/SIG
- Optional See Note 5

- +CAL
- NO Close to Enable Calibration Circuit

**Power Supply**

- 0V

**NOTE 1:** Two single-channel barriers may be used where both channels have been certified for use together with combined entity parameters.

- The following must be satisfied:
  - Vcc or Uo ≤ Ui or Vmax
  - Io ≤ Ii or Imax
  - PosPi (if applicable)
  - Ca > Li + Ccable

- Cl + Ccable < 41.5 nF
- Li + Lcable < 1612 µH

**NOTE 2:** Equipment connected to barrier cannot use or generate in excess of 250 Volts

**NOTE 3:** Optional Certified Diode Return Barrier with Io or Icc = 0mA. Use only with shunt calibration option

**NOTE 4:** Transducers with Integral Cable

| MAX LENGTH | 130 FT |
| Cl max | 41.2 nF |
| Li max | 840 µH |

**NOTE 5:** Connection to the calibration circuit in hazardous locations is not permitted on units with a "+CAL" connection. The calibration feature on units with a "+CAL" connection can only be used in non-hazardous locations.

**NOTE 6:** Diode Barrier with Isc or Ii = 5mA

**Hazardous Location**

- HAZARDOUS (CLASSIFIED) LOCATION
- RATED INTRINSICALLY SAFE

- Class I, Div 1, Groups A, B, C, D, -40°C to +60°C, T4
- Class II, Div 1, Groups E, G, Class I

- Class I, Zone 0, ATEX/ccc e EEx IIC T4

*See label on unit for actual "T4m" rating

**Pressure Transducer or Load Cell Models:**

- 628

**Transducer without Cable**

- Uo = 28 VDC
- Ii = 110 mA
- Cl = 33.4 nF (SEE NOTE 4)
- Li = 710 µH (SEE NOTE 4)
- Pi = 9 Watt

**Wiring, 2-Wire Amplifier, CSA**

**CSA APPROVED, INTRINSICALLY SAFE**

**TOLERANCES (UNLESS OTHERWISE SPECIFIED)**

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**Title:**

- Wiring, 2-Wire Amplifier, CSA

**CSA APPROVED, INTRINSICALLY SAFE**

**Drawing Number:**

- 21076
Chapter 3

Non-Incendive Installation

Introduction
“Non-incendive” circuits are designed and constructed so that they are not capable under normal operating conditions or due to opening, shorting, or grounding of field wiring, of causing an ignition of the prescribed flammable gas or vapor.

Installation
The certification of each testing laboratory is valid when the transmitter has been installed according the installation drawings or certificates of conformity included in this section.
NON-HAZARDOUS LOCATION

Any CSA Certified Class I Division 2 and Zone 2 shunt diode
Zener barrier whose parameters meet the requirements
depicted below.

Hazardous Location

HAZARDOUS (CLASSIFIED) LOCATION
RATED NON-INCENDIVE
Class I, DIV 2, Groups A,B,C,D,E
-55°C ≤ Tbase ≤ +65°C
Class I, Zone 2

*See label on unit for actual "Tamb" rating

Note:

TRANSMITTER CASE MUST BE CONNECTED TO SUPPLY SOURCE GROUND WITH EITHER OF THE FOLLOWING METHODS:

A. A separate conductor connecting the transmitter connector to the supply source ground.
B. The transmitter is mounted directly on a conductive structure which is connected to the supply source ground.

CSA CONTROLLED
DRAWING
NO CHANGES WITHOUT AUTHORIZATION

NOTE 1: Optional Diode Barrier. Used only with shunt calibration circuit option
NOTE 2: Equipment connected to Barrier cannot be used or generate in excess of 250 Volts
NOTE 3: This drawing not applicable to units with a "+Cal" connection

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NOTES:

- POWER SUPPLY
- LOAD RESISTANCE
- 0V
- NO CLOSE TO ENABLE CALIBRATION CIRCUIT

NOTE 3 (OPTIONAL): SEE NOTE 3

CSA APPROVED, NON-INCENDIVE

2078
NON-HAZARDOUS LOCATION

HAZARDOUS LOCATION

Class I, Division 2
wiring practices permitted
by Part 1 of the NEC

POWER SUPPLY

+PWR/SIG

CAL

(OPTIONAL)

SEE NOTE 2

NO

CLOSE TO ENABLE CALIBRATION CIRCUIT

-HAZARDOUS (CLASSIFIED) LOCATION
RATED NON-INCIDENTIVE
Class I, DIV 2, Groups A,B,C,D, -40°C< Tamb<+85°C T4
Class II, DIV 2, Groups E,F,G, Class II
Class II, zone 2, ATEX lac l DC T4

*See label on unit for actual "Tamb" rating

PRESSURE TRANSDUCER
OR LOAD CELL
MODELS:
628
(For units with integral cable only)

Note:
Transmitter case must be connected to supply source ground with either of
the following methods:
A. A separate conductor connecting the transmitter connector
shell to the supply source ground.
B. The transmitter is mounted directly on a conductive structure which is
connected to the supply source ground.

CSA CONTROLLED
DRAWING
NO CHANGES WITHOUT
AUTHORIZATION

NOTE 1: EXPLOSIVE HAZARD
DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE
AREA IS KNOWN TO BE NON-HAZARDOUS

NOTE 2: This drawing not applicable to units with a "+Cal" connection

REV. DESCRIPTION ECN DATE PART NO. MATERIAL

TOLERANCES (UNLESS OTHERWISE SPECIFIED)

DECIMAL

FRACTIONAL

ANGULAR

FINISH

XXX ± 0.010 ± 1/64 ± 1/128 63
XXX ± 0.005

TITLE: WIRING, 2-WIRE AMPLIFIER
CSA APPROVED, NON-INCIDENTIVE

APPRV: ML  REV: NONE  DRAWING NUMBER

DRAWN: PLK  SCALE: 1:1

DRAWN: PLK  DATE: 1/17/14

N/A  N/A

21079
WARRANTY INFORMATION

NOSHOK’s Three Year Warranty applies to 628 Series Intrinsically Safe Hammer Union Transmitters.

NOSHOK guarantees all products to be free from defects in material and workmanship, to remain within catalogued accuracy specifications, and to operate within the catalogued performance specifications.

These products must be operated within the catalogued environmental and application parameters. Determination of failure will be made by NOSHOK, Inc.’s equipment and personnel or a certified test facility specializing in this type of evaluation. Instrument failures determined to be caused by over-range, incompatibility with environment or product media and abuse will not be considered under this warranty. NOSHOK, Inc. will, at its discretion, repair or replace the working parts of the damaged gauge without cost to the customer.