



Hazardous Rated Proximity Probe Systems Product Manual

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INTRODUCTION

This document contains information on the operation, installation guidelines and maintenance of proximity probe series products located in hazardous or volatile areas. This manual is intended to cover the PRO DD, DP, and DC series and Bently™ Compatible DX Series Proximity Probe systems. This manual is to be used in conjunction with the non-hazardous location manual that accompanies this system.

Intrinsic Safety (IS) is based on the principle that the electrical energy in hazardous area circuits is deliberately restricted such that any electrical sparks or hot spots that may occur are too weak to cause ignition. This is achieved by inserting an energy limiting interface in the wiring between safe and hazardous areas. The interface passes signals in either direction as required but limits the voltage and current that can reach the hazardous area under fault conditions. It may be integral with the safe area equipment or separate for greater flexibility.

Hazardous Rated Proximity Probe Series Overview

Proximity probe products utilize an eddy current that produces a negative voltage that is directly proportional to the "gap" distance between the probe and measured surface. The assembly consists of a proximity probe, extension cable and driver.

The driver can be a 3 or 4 wire device powered by a negative voltage power supply or by a 4-20mA loop of a PLC, DCS, or SCADA system. 4-20mA drivers can be configured so that the 4-20mA loop is directly proportional to the "usable gap" distance between the probe and measured surface. The 4-20mA driver can also be configured so that the 4-20mA output is directly proportional to a selectable full scale range.



INSTALLATION

The IECEx control drawing INS10060 (pg. 5-6) shows the installation requirements for CTC IECEx proximity probes. As shown, properly installed barriers are required to limit the energy the proximity probe and driver can receive. Cabling brings the signal from the proximity probe to the Zener diode barrier or galvanic isolator, which is the energy-limiting interface. The signal is transferred through the barrier (which is located in a non-hazardous area to measure equipment, such as a data collector or junction box) for further processing.

Here are a few highlights we thought might be useful to point out:

- As shown on INS10060, the proximity probe driver must be installed inside of an enclosure that has been approved by the local authority for the site. The proximity probe driver must be installed inside a Type 4 and IP6X approved and is acceptable to local authoring for the site.
- Properly installed barriers and/or galvanic isolators are required to limit the energy the proximity probe can receive. These barriers and/or galvanic isolators must meet the entity parameters listed on INS10060 for a safe installation.
- All exposed metallic surfaces, probe body and/or armor must be grounded to earth ground.

INSTALLATION DRAWINGS

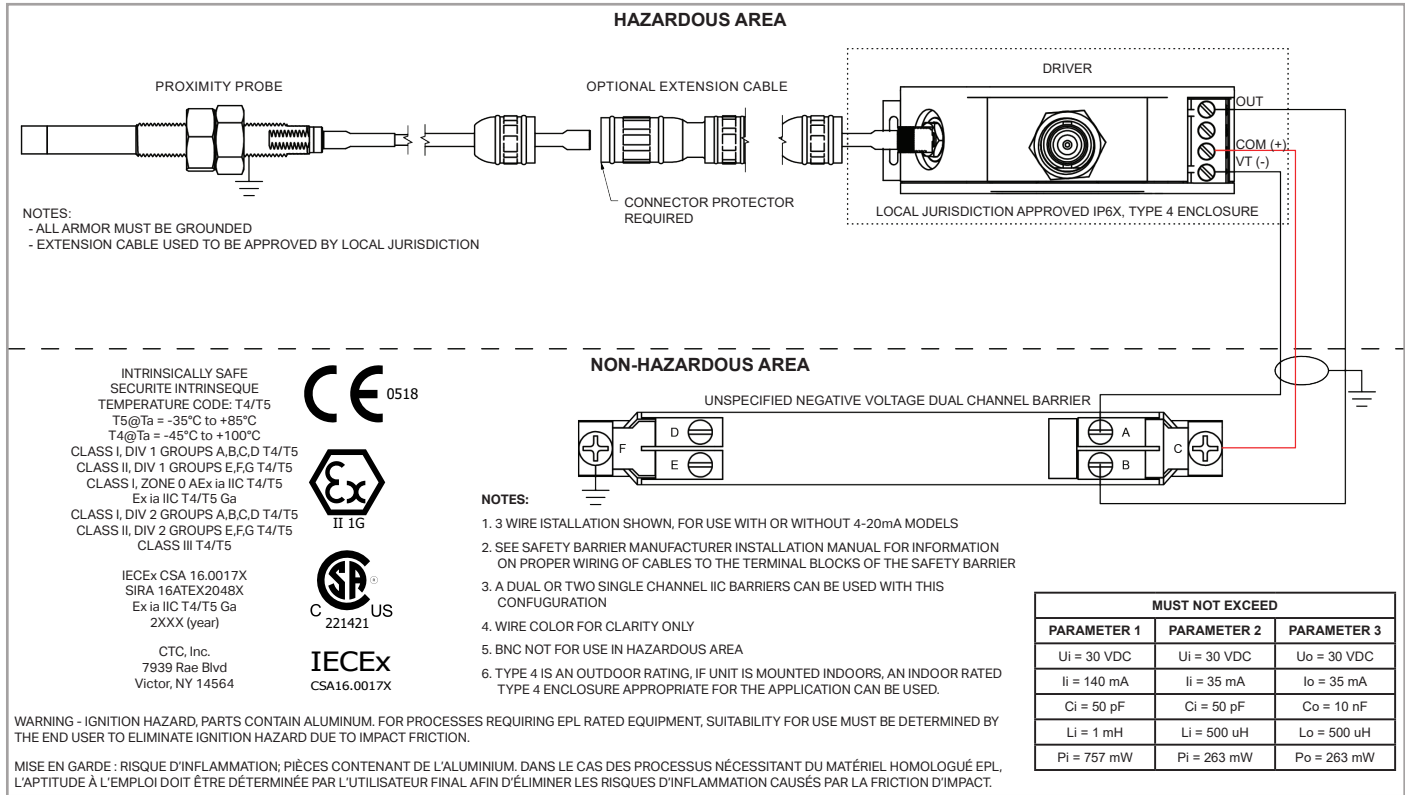


Figure 1. INS10060 - Three Wire Installation



STANDARDS

Each proximity probe that is approved for IS must meet or exceed the requirements for standards recognized by the countries that would use the proximity probes.

Specific Conditions of Use:

1. Specific Ambient Conditions of Use include:
 - a. -45 C to 100 C for all proximity probes and drivers (T4)
 - b. -35 C to 85 C for all proximity probes and drivers (T5)

Special Conditions of Use:

5. Cautionary Markings - The following are required:

Warning – Ignition hazard, parts contain Aluminum. For processes requiring EPL rated equipment, suitability for use must be determined by the end user to eliminate ignition hazard due to impact friction.

Mise en garde : risque d'inflammation; pièces contenant de l'aluminium. Dans le cas des processus nécessitant du matériel homologué EPL, l'aptitude à l'emploi doit être déterminée par l'utilisateur final afin d'éliminer les risques d'inflammation causés par la friction d'impact.

Warning – Electrostatic charge hazard on the plastic cover, unarmored probe, and extension cable covering. Do not rub or clean with solvents. To do so could result in explosion.

Mise en garde : risque de charge électrostatique sur le couvercle de plastique, la sonde sans armature et l'enveloppe de la rallonge. Ne pas frotter ni nettoyer avec des solvants. Cela pourrait causer une explosion.

Assured Compliance With:

EN 60079-0:2012/A11:2013

EN 60079-11:2012

EN 60529:1989 A2:2013

IEC 60079-0 Ed. 6

IEC 60079-11 Ed. 6

IEC 60529 Ed. 2.2

CSA C22.2 No. 213-15

CSA C22.2 No. 94-2-2015

CAN/CSA C22.2 No. 60079-0-15

CAN/CSA C22.2 No. 60079-11-14

UL Standard 913, 8th Ed.

ANSI/ISA-12.12.01-2015

UL Standard 508 17th Ed.

UL Standard 50E, 2nd Ed.

UL Standard 60079-0 6th Ed.

UL Standard 60079-11 6th Ed.



MARKINGS

The following is a complete recapitulation of markings so the customer has complete information for specific conditions of use:

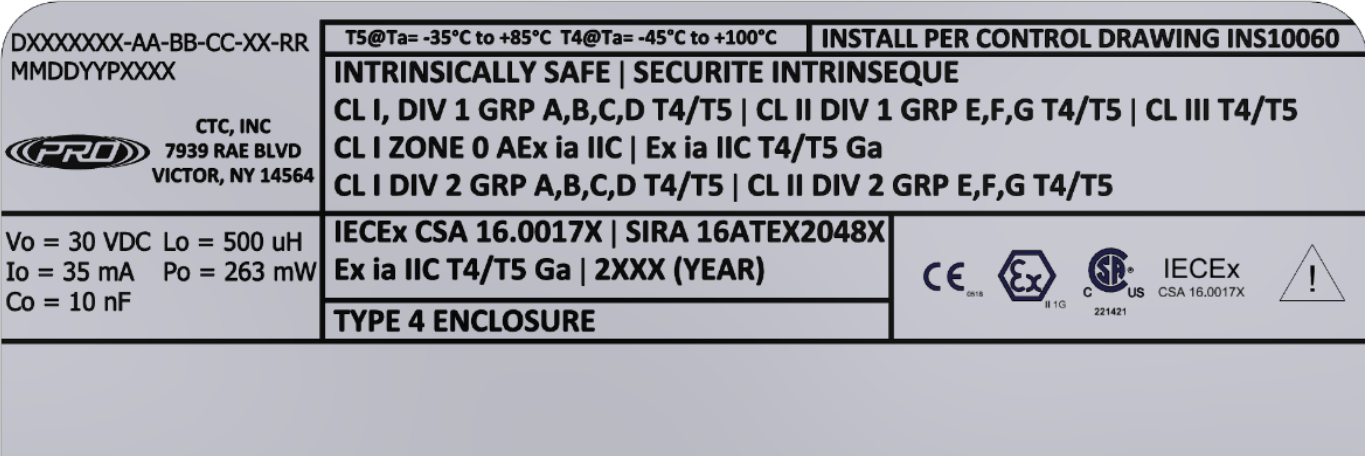


Figure 3. Probe Label Marking



Figure 4. Driver Side Panel Marking



MAINTENANCE

There are no customer replaceable parts on the proximity probe driver. Once the proximity probe assembly has been installed, minimal maintenance will be required. Basic visual checks should be made periodically to ensure integrity and proper function. It is designed to provide trouble-free continuous service under normal operating conditions. Should the instrument require repair, visit ctconline.com for a return material authorization.

WARRANTY AND REFUND

Please visit www.ctconline.com to view a complete recapitulation of our warranty and refund policies.

CONTACT INFORMATION

Connection Technology Center, Inc. (CTC)

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Victor, NY 14564

1.585.924.5900

sales@ctconline.com

www.ctconline.com



TROUBLESHOOTING

Problem	Recommended Action
-05 to -0.6 Vdc signal output	Check probe cable/extension cable connection to driver
No signal output	Check power supply

Probe Drivers and System Length

Each proximity driver is calibrated to a specific system length, which is comprised of both the probe and the overall length of cable that connects it to the driver. The standard lengths are 5 m and 9 m. Issues will arise when using a driver with a mismatched probe length. The example below demonstrates a proper 5 m probe system tested against a 9M probe set with a driver that was programmed to a 5 m system length.

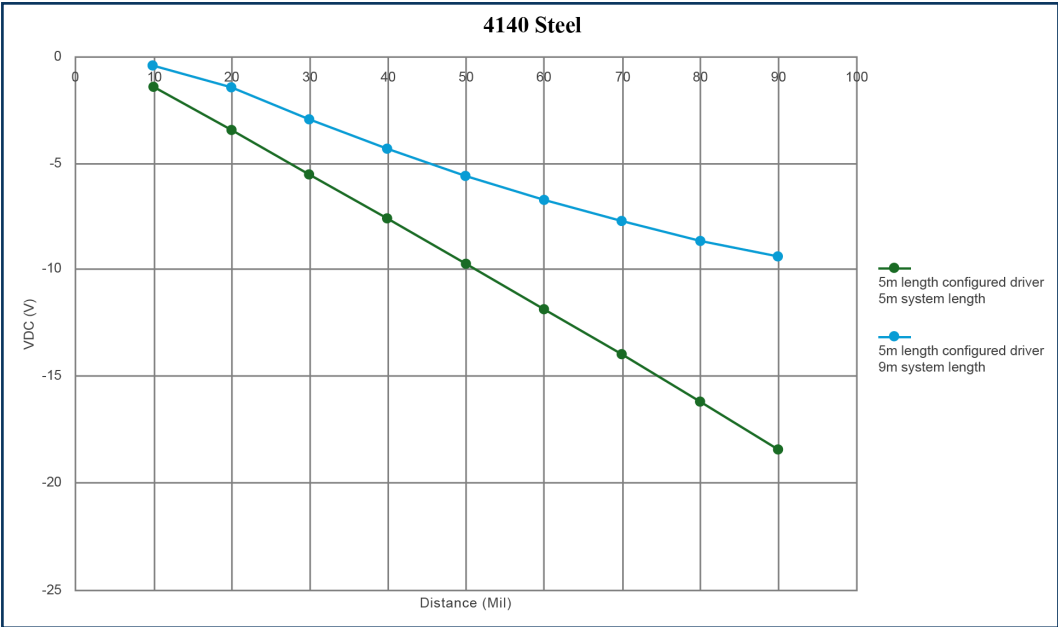


Figure 1. 5 Meter Matched and Mismatched Systems

The green line is the typical response of a 5 m prox driver system. But the blue line, which is a 9 m probe set plugged into 5 m driver, is showing a very low ASF. Figure 2 demonstrates the same circumstance on a 9 m calibrated driver, where the orange line is an intended 9 m system length, and the blue line is a mismatched 5 m probe.

This happens because the probe set is an RLC circuit. The capacitance for the circuit is specified per foot for the probe cable, and so adding length to the probe system beyond what the driver is calibrated for will cause the final ASF result to drop. Inversely, removing cable capacitance will spike the ASF of the system.



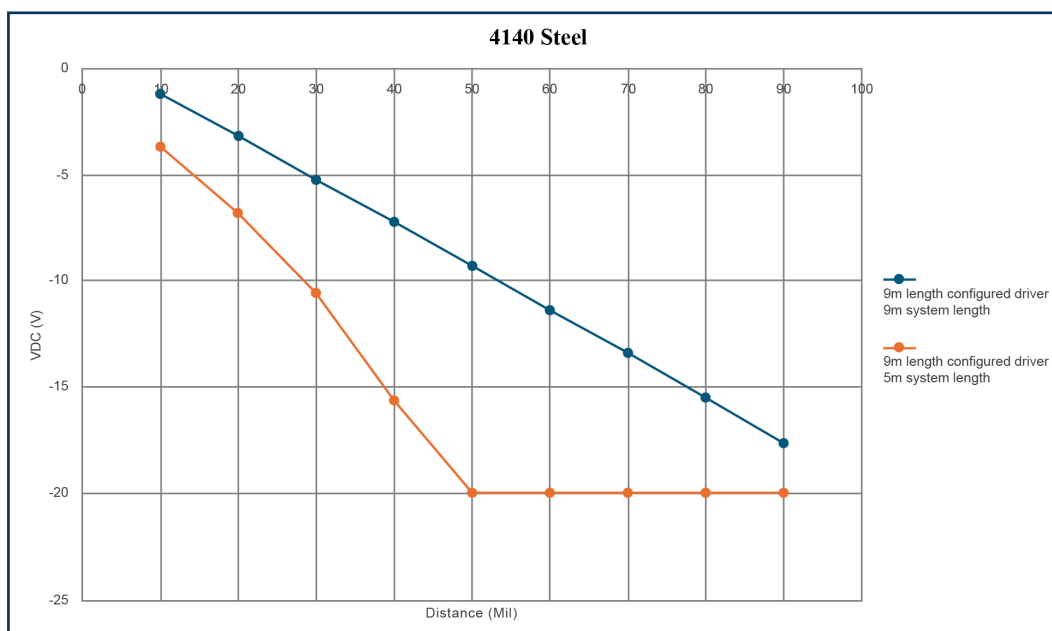


Figure 2. 9 Meter Matched and Mismatched Systems