



CONNECTION TECHNOLOGY CENTER, INC.

CLASS 1, DIVISION 2 SENSORS

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DOCUMENT & REVISION

**Product Manual MNX10128
Rev A**

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INTRODUCTION

This document contains information on the installation, operation, and maintenance of Class 1, Division 2 Vibration Sensors with an **Ex** rating.

Products Affected

Sensor Series	Voltage Rating
AC93* Series	18 to 28 V _{DC} (IEPE), 2-10 mA
AC94* Series	18 to 28 V _{DC} (IEPE), 2-10 mA
AC95* Series	18 to 28 V _{DC} (IEPE), 2-10 mA
LP82* Series	12 to 28 V _{DC} , 4-22 mA
LP92* Series	12 to 28 V _{DC} , 4-22 mA
LPH82* Series	12 to 28 V _{DC} , 4-22 mA
LPH86* Series	12 to 28 V _{DC} , 4-22 mA
LPH92* Series	12 to 28 V _{DC} , 4-22 mA
LPH96* Series	12 to 28 V _{DC} , 4-22 mA
TA93* Series	18 to 28 V _{DC} (IEPE), 2-10 mA
VE80* Series	18 to 28 V _{DC} (IEPE), 2-10 mA

Table 1. Nominal Electrical Ratings

Compliance with the Following Standards

CSA C22.2 No. 25-17 (R2022)
CAN/CSA C22.2 No. 60079-0:19
CAN/CSA C22.2 No. 60079-7:16
CSA C22.2 No. 60079-31:25
CAN/CSA C22.2 No. 61010-1-12 + UPD1:2015, UPD2:2016, AMD 1-18 (R2022), UPD3:2023
ANSI/UL 1203-2009 Fourth Edition (October 28, 2009)
ANSI/UL 60079-0-2020 Seventh Edition
ANSI/UL 60079-7-2017 Fifth Edition
UL 60079-31:2025
ANSI/UL 61010-1-2023 Third Edition

Table 2. Compliance Standards

PRODUCT DESCRIPTION

General Product Description

Vibration sensors which are used for acceleration measurement by means of piezo-electric device. The piezoelectric is subjected to compression pressure from a mass which produce a voltage in proportion to the acceleration. The voltage is then amplified by internal electronic circuitry. This can also be integrated within the amplifier board to produce a velocity output, referred to with a VE prefix. For the Loop Power and Premium Loop Power series (LP/LPH prefix), the output is converted to a 4-20 mA. These sensors can be used in conjunction with a temperature board to provide the temperature of the environment the sensor is contained within this configuration is referred to with a TA prefix. The sensors are mounted to the surface of the desired surface via a threaded bolt or by other means to be approved of by the authority having jurisdiction.

Nameplate Markings

The following is a complete recapitulation of markings so the customer has complete information for usage:

CSA 25CA80263368X
CLI, DIV 2, GRP A, B, C and D T3/T4
CLII, DIV 1, GRP E, F and G T135°C
CLIII
Ex ec IIC T* Gc
Ex tc IIIC T135°C Dc
CLI, ZN 2, AEx ec IIC T* Gc
ZN 22, AEx tc IIIB T135°C Dc
*Temperature Class depends on the ambient temperature
T4, T135°C for ambient temperature range of -40°C to +80°C
T3 for ambient temperature range of -40°C to +121°C
Vmax = 28VDC Imax = 10mA
Reference Product Manual MNX10128
CSA 221421
(Year of Manufacture)

Figure 1. Markings on the Back of Sensor

Specific Conditions of Use

Cables of the following CTC part numbers CB190, CB191 and CB192 are restricted only for use with sensors of a maximum ambient temperature of +80°C, the manufacturer shall ensure that the product is marked accordingly. Temperature code depends on the ambient range: T4 for ambient range of -40°C to +80°C and T3 for ambient range of -40°C to +121°C. The sensors have to be used with the cables, offered and sold by the manufacturer.

For applications in explosive dust atmospheres the equipment must not be exposed to charge generating mechanisms as flow of particles, charge spraying or strong electrostatic fields.

Warning: EXPLOSION HAZARD. DO NOT DISCONNECT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS FREE OF IGNITABLE CONCENTRATIONS.

**Mise en garde: AVERTISSEMENT – RISQUE D’EXPLOSION.
NE PAS DÉBRANCHER PENDANT QUE LE CIRCUIT EST SOUS TENSION OU
À MOINS QUE L’EMPLACEMENT NE SOIT EXEMPT DE CONCENTRATIONS
INFLAMMABLES.**

This equipment may only be powered by a power supply unit with a limited energy electric circuit in accordance with CAN/CSA C22.2 No. 61010-1-12 and ANSI/UL 61010-1, or Class 2 as defined in the Canadian Electrical Code C22.1, Section 16-200 and/or National Electrical Code (NFPA 70), article 725.121.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Specifications for the range of environmental conditions for which the equipment is designed including the following:

- Specification of the Pollution Degree: 2.
- Specification of the Overvoltage Category: II.
- Specification for the maximum use altitude: 2000 m above sea level.

INSTALLATION

Cabling Information

CTC has several cabling options available for hazardous applications*:

Part Number	Conductor Count	Cable Jacketing	Temperature Rating
CB102	Two (2) Conductors	FEP Jacket	150 °C
CB111	Two (2) Conductors	FEP Jacket	150 °C
CB190	Two (2) Conductors	TPE Jacket	105 °C
CB206	Two (2) Conductors	FEP Jacket with SS Armor	150 °C
CB212	Three (3) Conductors	FEP Jacket with SS Armor	150 °C
CB191	Three (3) Conductors	TPE Jacket	105 °C
CB192	Four (4) Conductors	TPE Jacket	105 °C
CB218	Four (4) Conductors	FEP Jacket with SS Armor	200 °C
CB296	Two (2) Conductors	FEP Jacket with SS Armor	200 °C
CB298	Four (4) Conductors	FEP Jacket with SS Armor	200 °C

*Cable conductors range from 20 AWG - 26 AWG

Table 3. Hazardous Cabling Options

In addition, CTC has connectors specifically designed for Zone 2 applications. Each of the JQ and Q connectors feature a grounded backshell to aid in arc prevention, as well as locking rings with eyelets to secure the connector to the sensor, or provide additional ground to the machine.

All cabling utilizes the layout illustrated in the following drawing. All cabling has a temperature rating of 105 °C or higher.

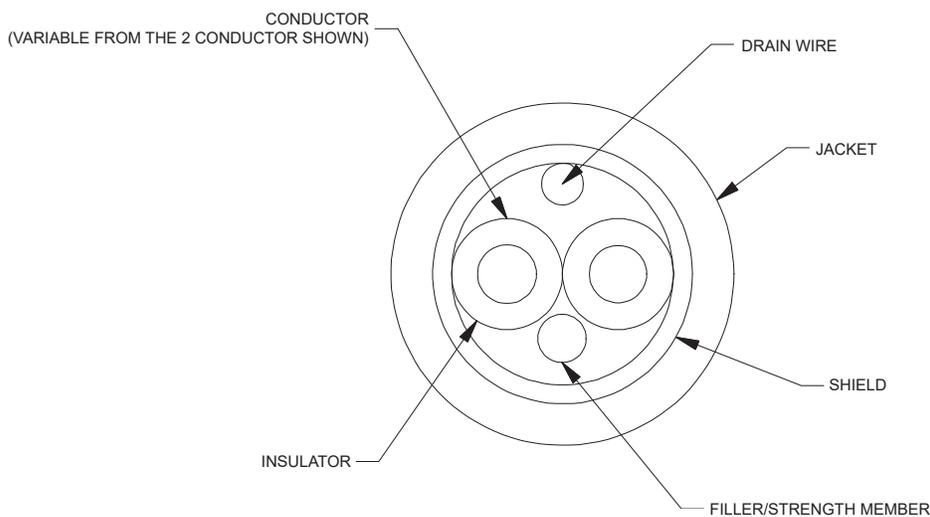


Figure 2. Cabling Cross-Section

Installation Procedure

The following drawings shows the installation requirements for CTC Zone 2 Sensors.

Notes:

- a. Authorized Zone 2 CTC cabling required. Refer to Table 3 on page six of this document. Cabling from other manufacturers may not be used.
- b. Mechanical locking connector or integral connection
 - CTC's Q Series and JQ Series connectors has the cable shield drain connected to the connector backshell.
 - The sensors have to be used with the cables offered and sold by the manufacturer.



Figure 3. A Fully Assembled Non-Integral Sensor and Cable Assembly

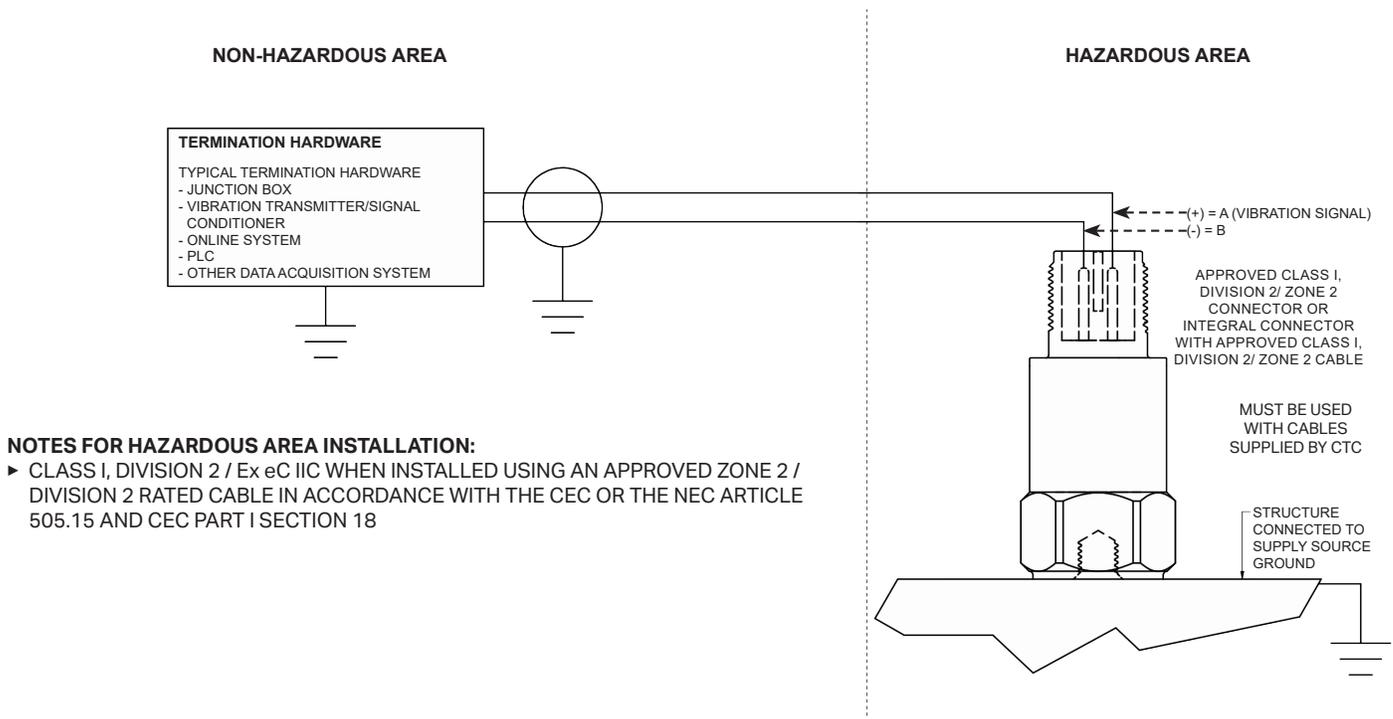
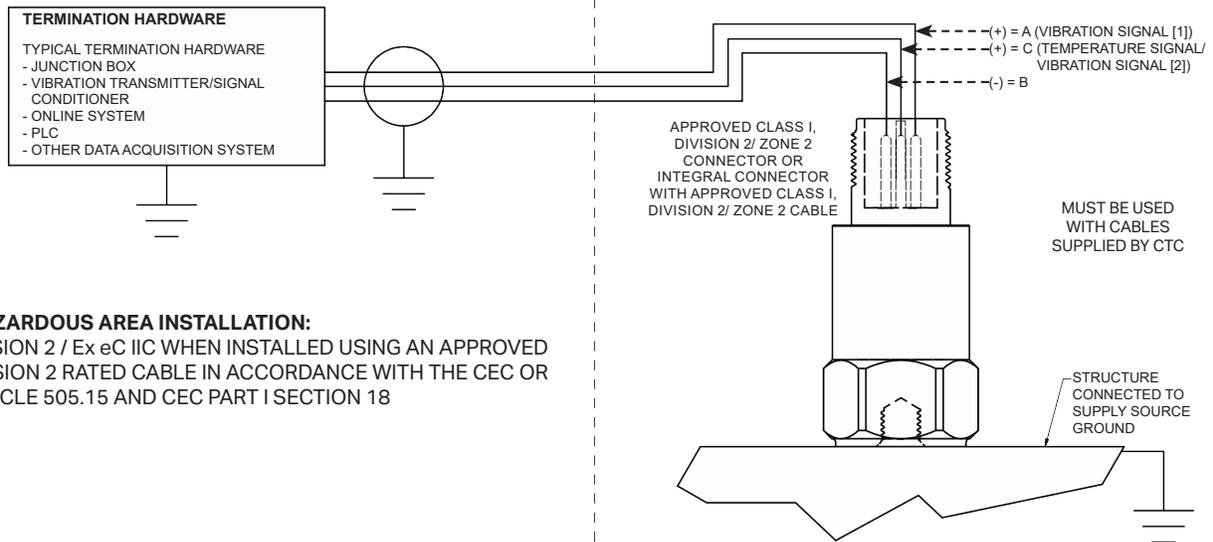


Figure 4. Two Pin Sensor Installation

NON-HAZARDOUS AREA

HAZARDOUS AREA



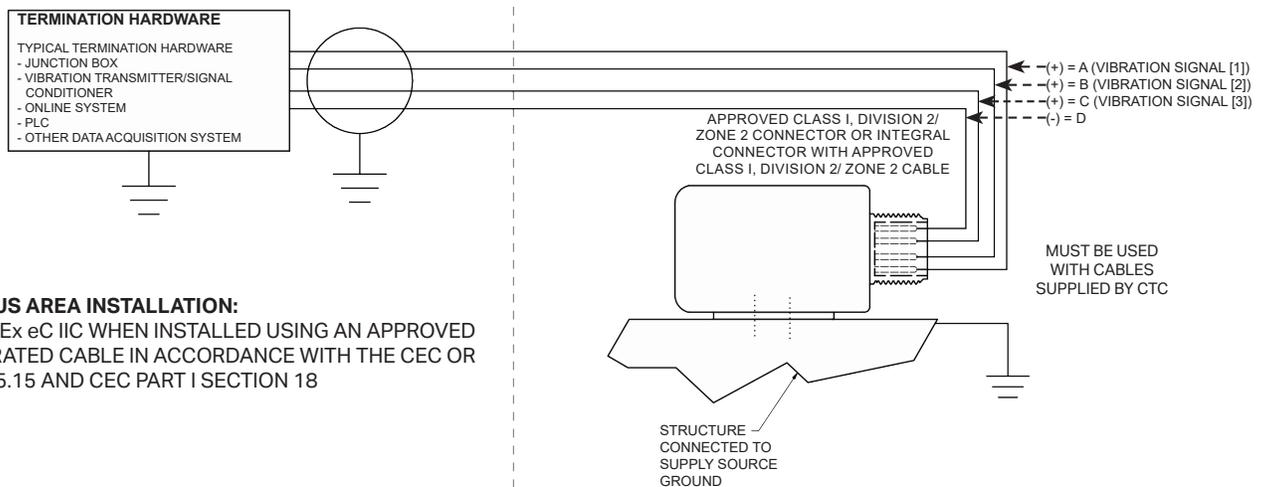
NOTES FOR HAZARDOUS AREA INSTALLATION:

- ▶ CLASS I, DIVISION 2 / Ex eC IIC WHEN INSTALLED USING AN APPROVED ZONE 2 / DIVISION 2 RATED CABLE IN ACCORDANCE WITH THE CEC OR THE NEC ARTICLE 505.15 AND CEC PART I SECTION 18

Figure 5. Three Pin Sensor Installation

NON-HAZARDOUS AREA

HAZARDOUS AREA



NOTES FOR HAZARDOUS AREA INSTALLATION:

- ▶ CLASS I, DIVISION 2 / Ex eC IIC WHEN INSTALLED USING AN APPROVED ZONE 2 / DIVISION 2 RATED CABLE IN ACCORDANCE WITH THE CEC OR THE NEC ARTICLE 505.15 AND CEC PART I SECTION 18

Figure 6. Four Pin Sensor Installation

WARRANTY & REFUND

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

