



## **IECE<sub>x</sub> ZONE 2 SENSORS**

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### **DOCUMENT & REVISION**

**Product Manual MNX10132  
Rev A**

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## INTRODUCTION

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

### Products Affected

Sensor Series	Voltage Rating
AC93* Series	18 to 28 VDC (IEPE), 2-10 mA
AC94* Series	18 to 28 VDC (IEPE), 2-10 mA
AC95* Series	18 to 28 VDC (IEPE), 2-10 mA
LP82* Series	12 to 28 VDC, 4-22 mA
LP92* Series	12 to 28 VDC, 4-22 mA
LPH82* Series	12 to 28 VDC, 4-22 mA
LPH92* Series	12 to 28 VDC, 4-22 mA
TA93* Series	18 to 28 VDC (IEPE), 2-10 mA
VE80* Series	18 to 28 VDC (IEPE), 2-10 mA

**Table 1. Nominal Electrical Ratings**

### Compliance with the Following Standards

EC 60079-0:2017 Edition:7.0 Explosive atmospheres - Part 0: Equipment - General requirements
IEC 60079-31:2022 Edition:3.0 Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t" IEC
60079-7:2017 Edition:5.1 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

**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.

### Sensor Markings

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

**Approval to  
IECEX CSA  
24.0015X**

### ***Figure 1. Marking on the Front of Sensor***

IECEX CSA 24.0015X  
Ex ec IIC T\*°C Gc  
Ex tc IIIC T135°C Dc  
T4, T135°C for ambient temperature range of -40°C to +80°C  
T3 for ambient temperature range of -40°C to +121°C  
\*Temperature Class depends on the ambient temperature  
Vmax=28VDC Imax=10mA  
Install per INS10208  
Reference Product Manual MNX10132  
CSA221421  
(Year of Manufacture)

### ***Figure 2. 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.

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

## INSTALLATION

### Cabling Information

CTC has several cabling options available for hazardous applications\*:

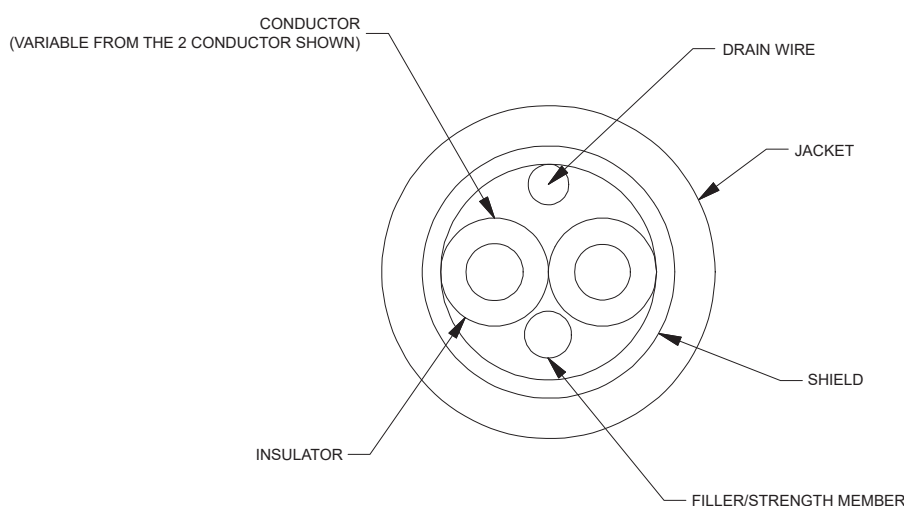
Part Number	Conductor Count	Cable Jacketing	Temperature Rating
CB102	Two (2) Conductors	FEP Jacket	150 °C
CB111	Two (2) Conductors	FEP Jacket	150 °C
CB190	Two (2) Conductors	TPE Jacket	105 °C
CB206	Two (2) Conductors	FEP Jacket with SS Armor	150 °C
CB212	Three (3) Conductors	FEP Jacket with SS Armor	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 3. Cabling Cross-Section**

## Installation Procedure

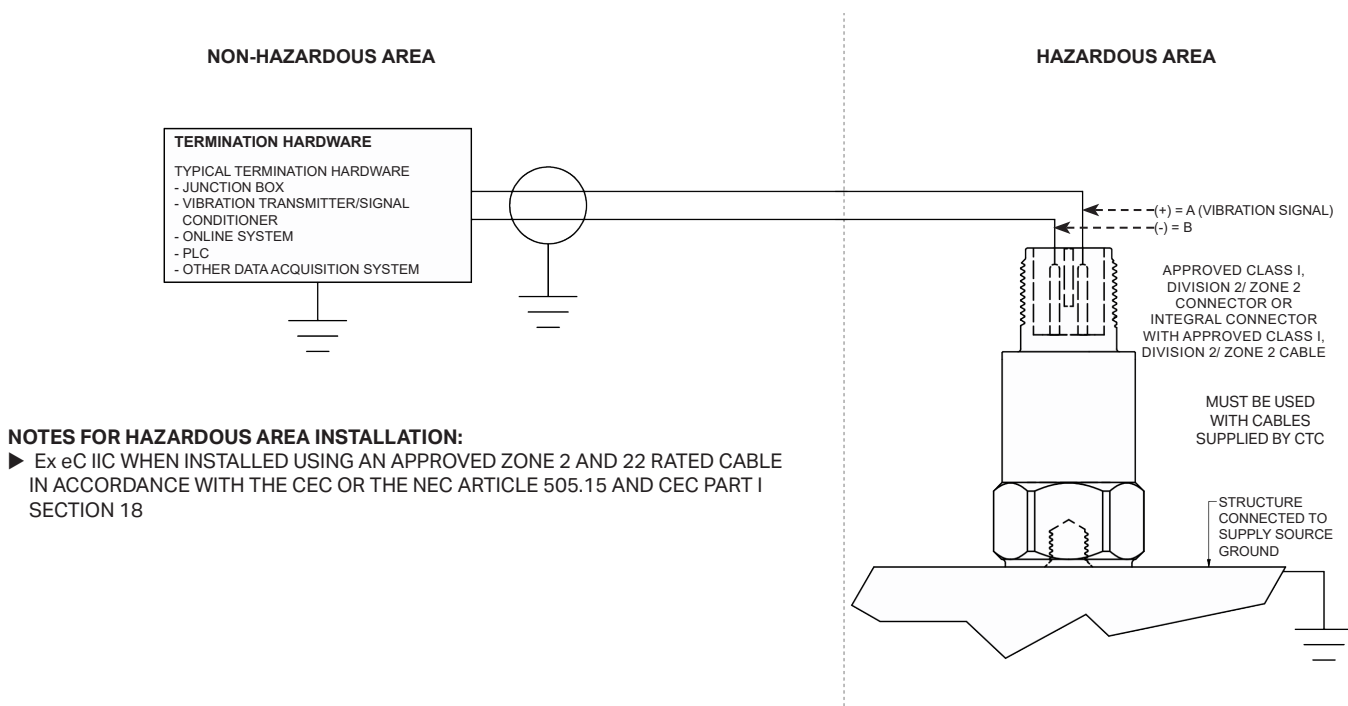
The following drawings shows the installation requirements for CTC Zone 2 Sensors.

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.



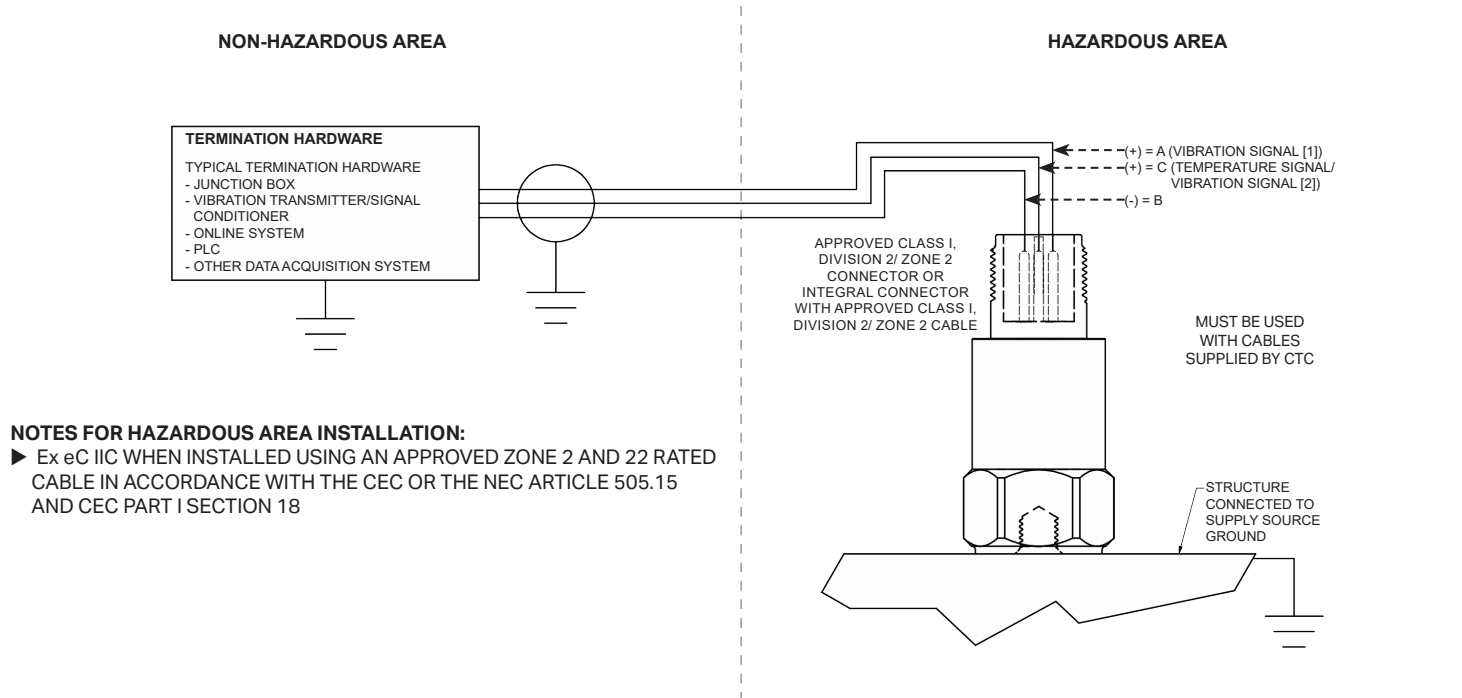
**Figure 4. A Fully Assembled Non-Integral Sensor and Cable Assembly**



**NOTES FOR HAZARDOUS AREA INSTALLATION:**

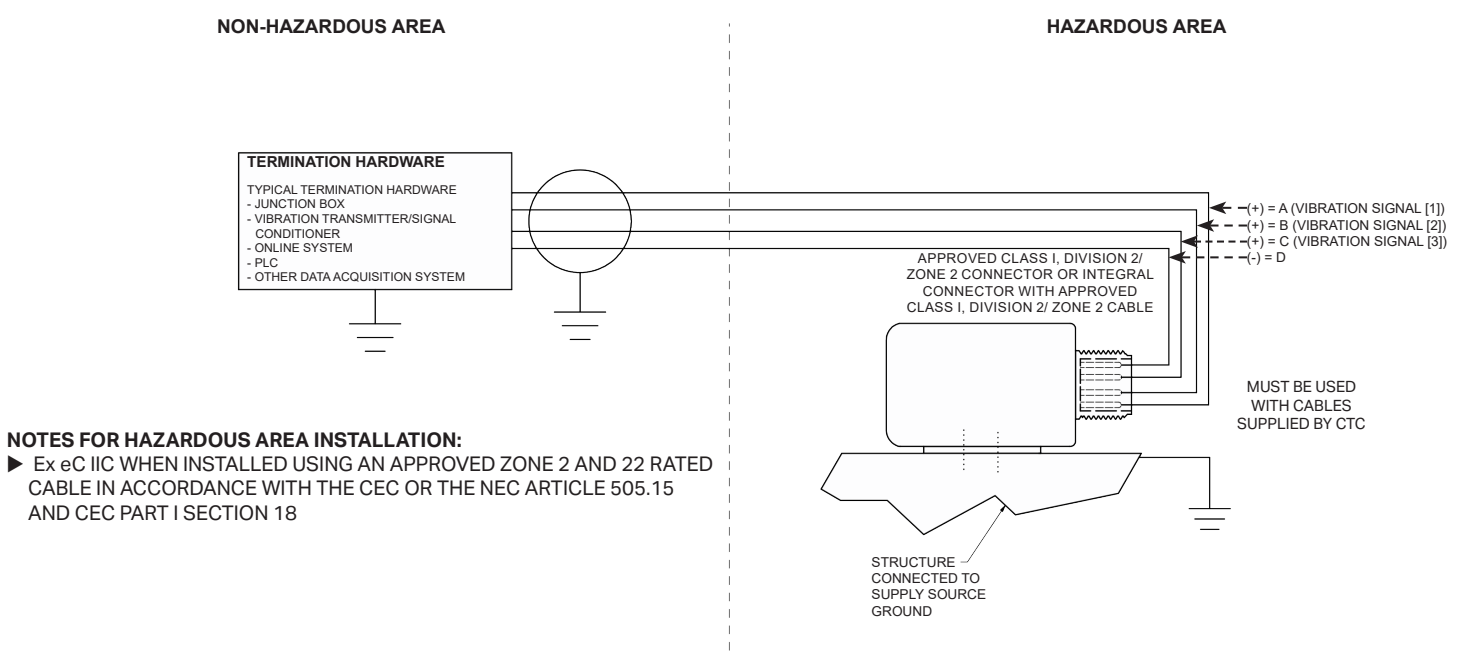
- ▶ Ex eC IIC WHEN INSTALLED USING AN APPROVED ZONE 2 AND 22 RATED CABLE IN ACCORDANCE WITH THE CEC OR THE NEC ARTICLE 505.15 AND CEC PART I SECTION 18

**Figure 5. Two Pin Sensor Installation**



**NOTES FOR HAZARDOUS AREA INSTALLATION:**  
 ► Ex eC IIC WHEN INSTALLED USING AN APPROVED ZONE 2 AND 22 RATED CABLE IN ACCORDANCE WITH THE CEC OR THE NEC ARTICLE 505.15 AND CEC PART I SECTION 18

**Figure 6. Three Pin Sensor Installation**



**NOTES FOR HAZARDOUS AREA INSTALLATION:**  
 ► Ex eC IIC WHEN INSTALLED USING AN APPROVED ZONE 2 AND 22 RATED CABLE IN ACCORDANCE WITH THE CEC OR THE NEC ARTICLE 505.15 AND CEC PART I SECTION 18

**Figure 7. Four Pin Sensor Installation**



## **WARRANTY & REFUND**

Please visit [www.ctconline.com](http://www.ctconline.com) to view a complete recapitulation of our warranty and refund policies. Installation