



## VIBRATION ANALYSIS HARDWARE



**Zone 2 Sensors**  
**AC93X, AC94X, AC95X, LP82X,**  
**LP92X, TA93X, VE80X**  
**Product Manual, Rev A**

**TABLE OF CONTENTS**

- Introduction.....3
- Product Description.....4
- Installation .....6
- Warranty and Refund..... 10



# 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 V <sub>DC</sub> (IEPE), 2-10 mA
AC94* Series	18 to 28 V <sub>DC</sub> (IEPE), 2-10 mA
AC95* Series	18 to 28 V <sub>DC</sub> (IEPE), 2-10 mA
LP82* Series	12 to 28 V <sub>DC</sub> , 4-22 mA
LP92* Series	12 to 28 V <sub>DC</sub> , 4-22 mA
TA93* Series	18 to 28 V <sub>DC</sub> (IEPE), 2-10 mA
VE80* Series	18 to 28 V <sub>DC</sub> (IEPE), 2-10 mA

***Table 1. Nominal Electrical Ratings***

## Compliance with the Following Standards

IECE <sub>x</sub>	ATEX
IEC 60079-0:2017	EN IEC 60079-0:2018
IEC 60079-31:2022	EN 60079-31:2014
IEC 60079-7:2017	EN IEC 60079-7:2015/A1:2018

***Table 2. Compliance Standards***


# PRODUCT DESCRIPTION

## General Product Description

Vibration sensors are used for acceleration measurement by means of a piezo-electric device. The piezoelectric is subjected to a shear force, which produces 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 series (LP prefix), the output is converted to a 4-20 mA signal. 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. For the negative voltage, Low power and LP series sensor, an external power source is required necessitating an extra conductor wire. The sensors are mounted to the desired surface via a threaded bolt or 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:

Detail	IECEX	ATEX
Certificate number:	IECEX CSA 24.0015X	CSA Ca 24ATEX1004X
Certification code:	For all listed sensors:  Ex ec IIC T*°C Gc Ex tc IIIC T135°C Dc  *Temperature Class depends on the ambient temperature	For all listed sensors:  Ex ec IIC T*°C Gc Ex tc IIIC T135°C Dc  *Temperature Class depends on the ambient temperature
Other marking:		

**Table 3. Nameplate Markings**



II 3 GD  
CSA Ca 24ATEX1004X

APPROVAL TO  
IECEX CSA  
24.0015X

***Figure 1. Markings on the Front of Sensor***

CSA Ca 24ATEX1004X  
IECEX CSA 24.0015X  
Ex ec IIC T\* °C Gc  
Ex tc IIIC T135 °C Dc

\*Temperature code for gas for ambient range:

T4 for ambient range of -40 °C to +80 °C

T3 for ambient range of -40 °C to +121 °C

V=28VDC I=10mA

WARNING  
CONNECT OR DISCONNECT ONLY  
IN NON-HAZARDOUS AREA  
(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: CONNECT OR DISCONNECT ONLY IN NON-HAZARDOUS AREA

Mise en garde: CONNECTEZ OU DÉCONNECTEZ UNIQUEMENT DANS UNE ZONE NON DANGEREUSE

## INSTALLATION

### Cabling Information

CTC has several cabling options available for hazardous applications:

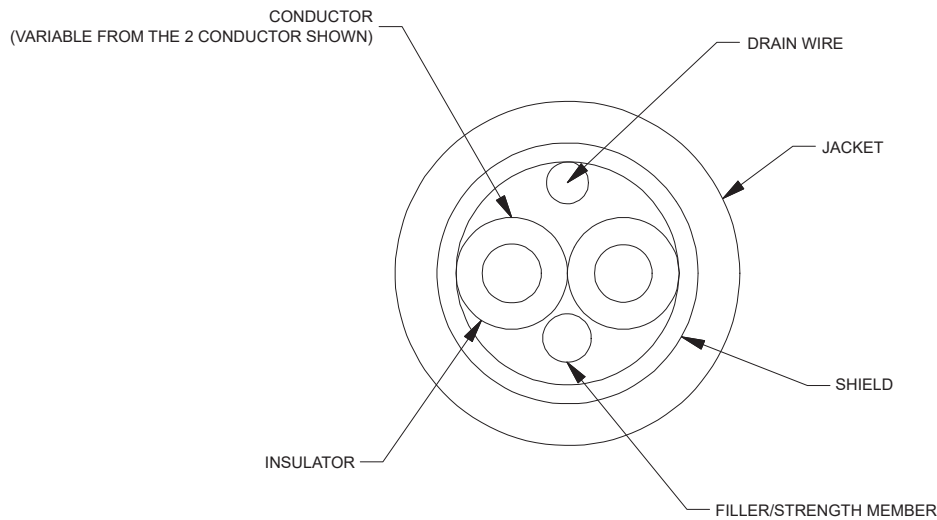
Part Number	Conductor Count	Cable Jacketing	Temperature Rating
CB102	Two (2) Conductors	FEP Jacket	150 °C
CB111	Two (2) Conductors	FEP Jacket	150 °C
CB190	Two (2) Conductors	TPE Jacket	105 °C
CB212	Three (3) Conductors	FEP Jacket with SS Armor	150 °C
CB191	Three (3) Conductors	TPE Jacket	105 °C
CB192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

***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.



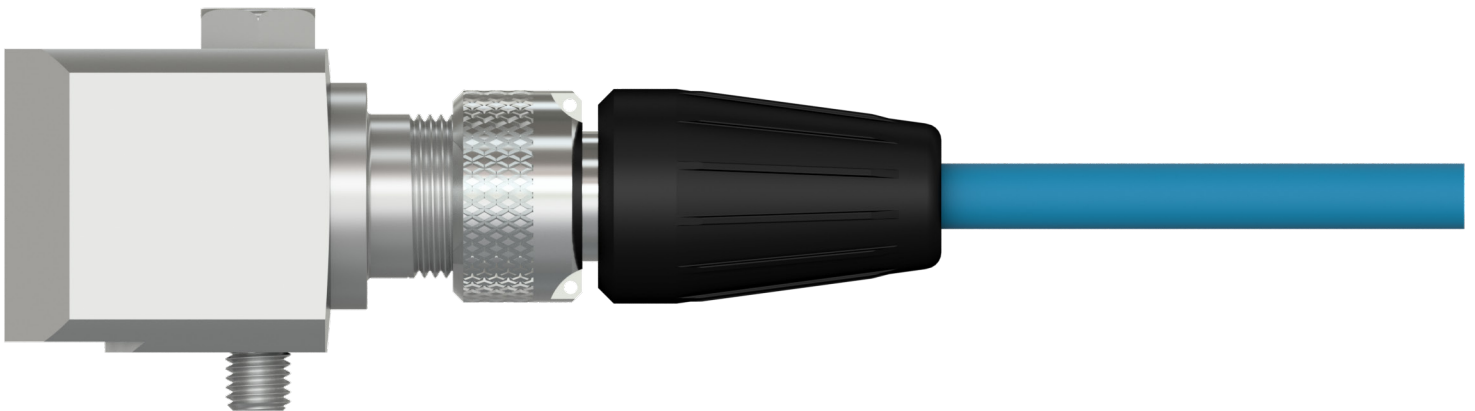
**Figure 3. Cabling Cross-Section**

### Installation Procedure

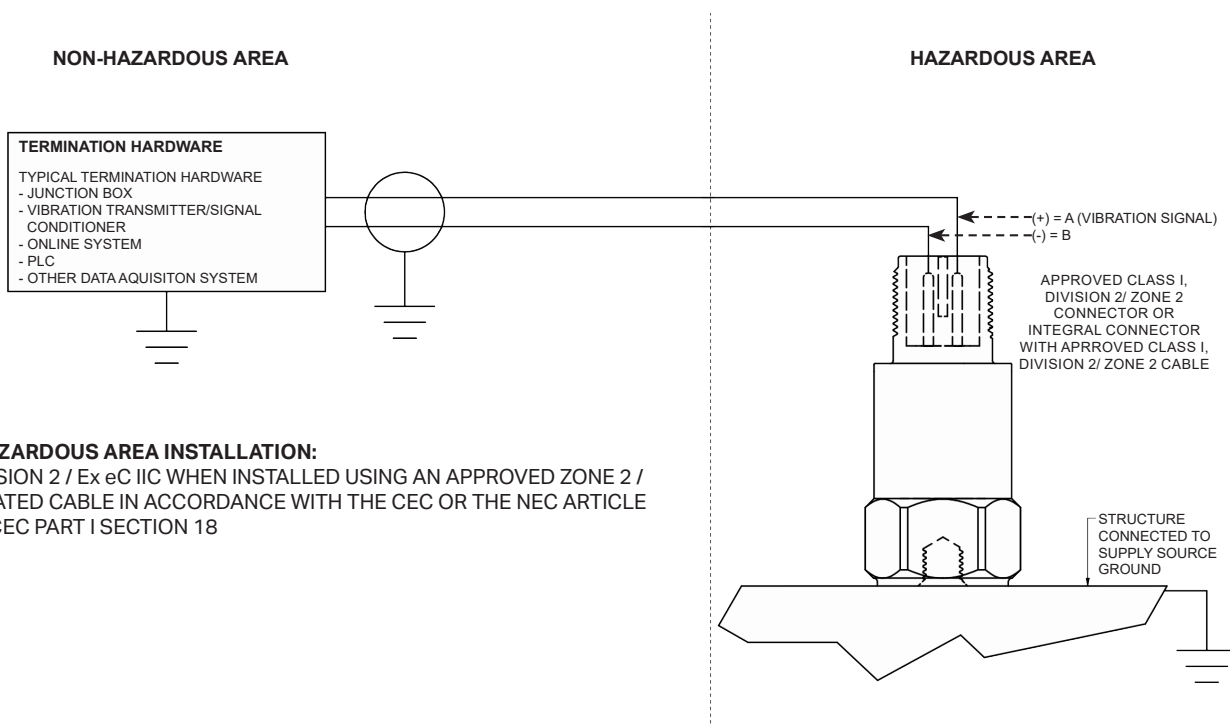
The following drawings shows the installation requirements for CTC Zone 2 Sensors.

#### Notes:

- a. Authorized Zone 2 CTC cabling required. Refer to Table 3 on page six of this document.
- 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.



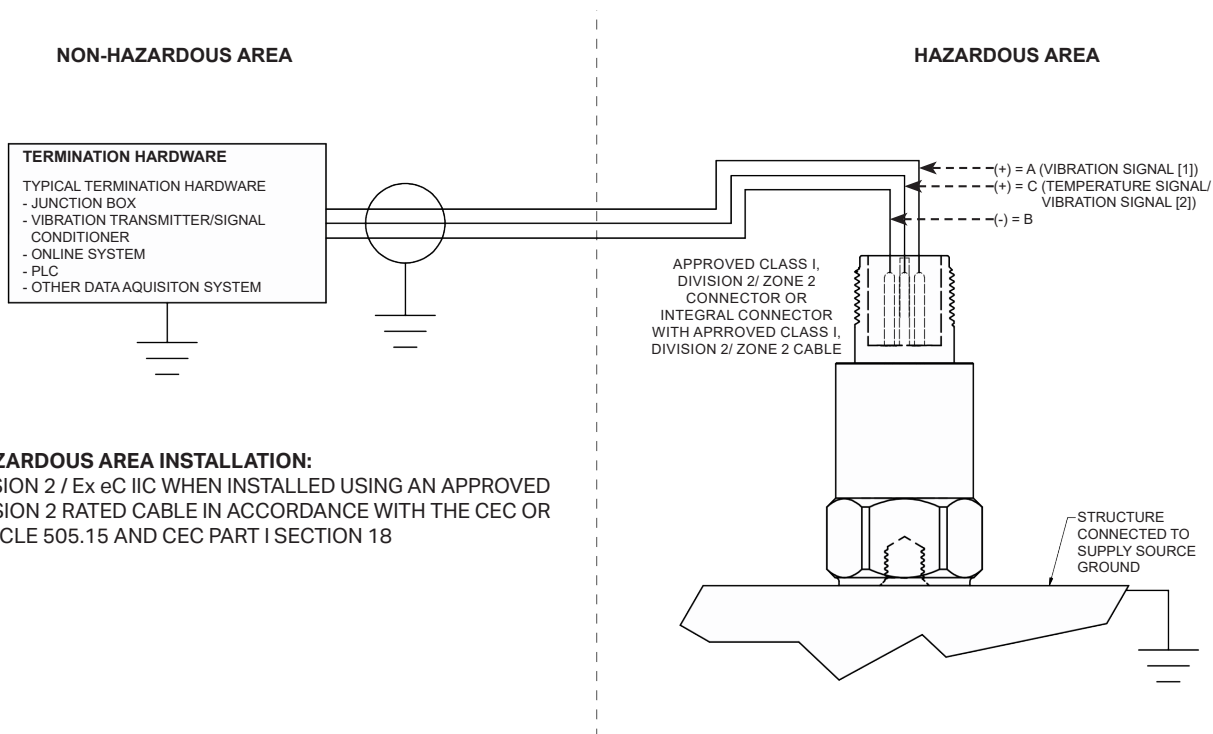
**Figure 4. A Fully Assembled Non-Integral Sensor and Cable Assembly**



**NOTES FOR HAZARDOUS AREA INSTALLATION:**

- ▶ 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. Two Pin Sensor Installation**



**NOTES FOR HAZARDOUS AREA INSTALLATION:**

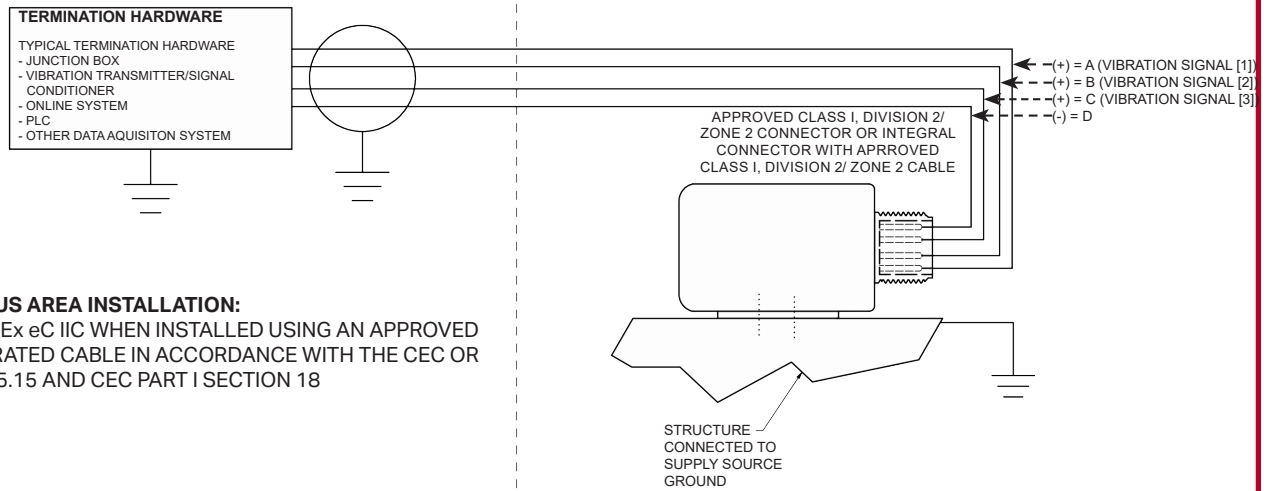
- ▶ CLASS I, DIVISION 2 / Ex eC IIC WHEN INSTALLED USING AN APPROVED ZONE 2 / DIVISION 2 RATED CABLE IN ACCORDANCE WITH THE CEC OR THE NEC ARTICLE 505.15 AND CEC PART I SECTION 18

**Figure 6. 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 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.

## **CONTACT INFORMATION**

Connection Technology Center, Inc. (CTC)

7939 Rae Blvd.

Victor, NY 14564

1.585.924.5900

[sales@ctconline.com](mailto:sales@ctconline.com)

[www.ctconline.com](http://www.ctconline.com)

