TESTING AND CERTIFICATION

ANZEx 18.4160-1

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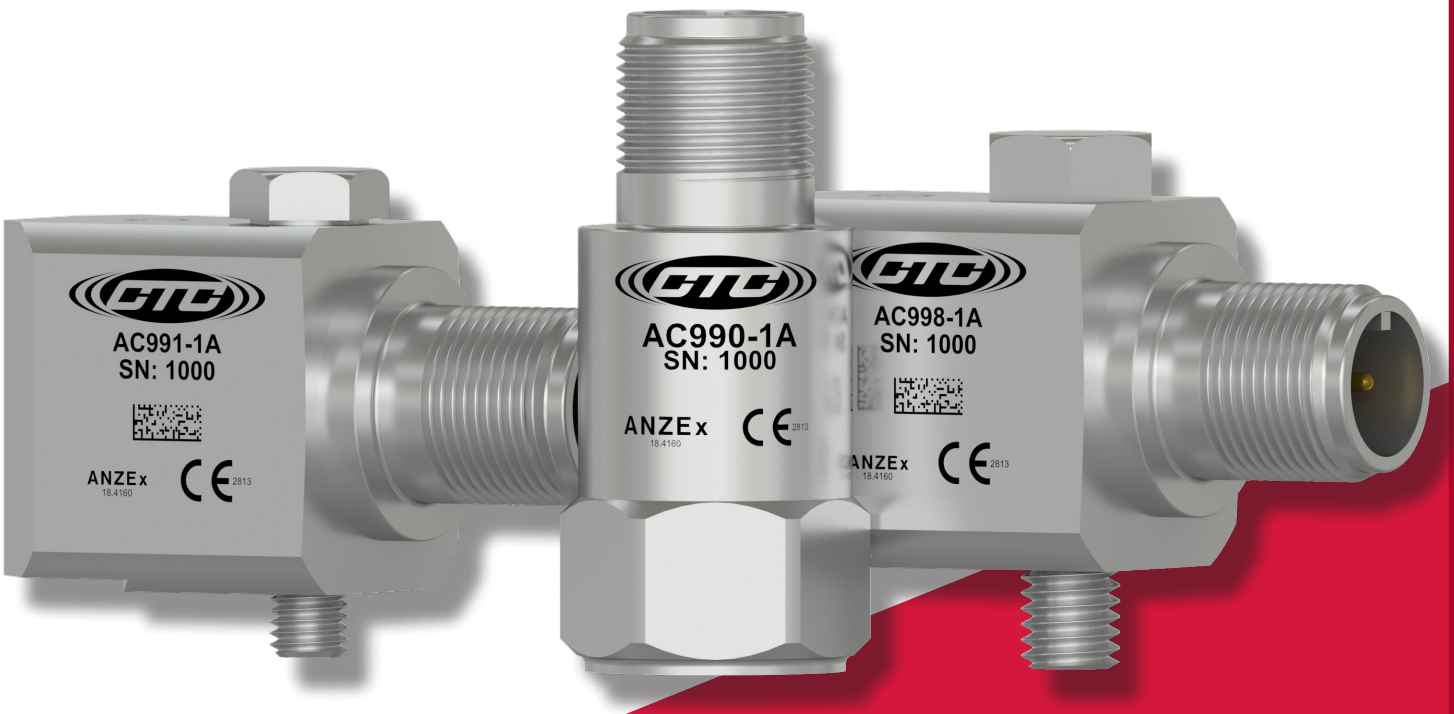
VIBRATION ANALYSIS HARDWARE



Intrinsically Safe Sensors
AC990, AC991, AC998
Product Manual, Rev B

Table of Contents

Introduction

This document contains information on the installation, operation, and maintenance of the Intrinsically Safe Vibrations Sensor.

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.

Products Affected

Sensor Series	Voltage Rating
AC990 Series	18 to 28 VDC (IEPE), 2-10 mA
AC991 Series	18 to 28 VDC (IEPE), 2-10 mA
AC998 Series	18 to 28 VDC (IEPE), 2-10 mA

Table 1. Nominal Electrical Ratings

Compliance with the Following Standards

ANZEx
IEC 60079-0:2017
IEC 60079-11:2011

Table 2. Compliance Standards

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Product Description

General Product Description

Vibration sensors are used for acceleration measurement by means of a piezoelectric device. The piezoelectric is subjected to a shear force, which produces a voltage in proportion to the acceleration.

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 ANZEx nameplate markings:

Detail	ANZEx
Certificate number:	ANZEx 18.4160-1
Certification code:	For all listed sensors: Ex ia I Ma Ex ia IIC T3 Ga Ex ia IIC T4 Ga *Temperature Class depends on the ambient temperature

Table 3. Nameplate Markings

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PART NUMBER
SERIAL NUMBER

ANZEx
18.4160-1

CE 0344

Figure 1. Markings on the Front of Sensor

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Ex ia I Ma (-40°C ≤ Ta ≤ +80°C)
Ex ia IIC T3 Ga (-40°C ≤ Ta ≤ +125°C)
Ex ia IIC T4 Ga (-40°C ≤ Ta ≤ +80°C)
Control Drawing INS10172
Vmax/Ui = 28V Imax/Ii=100mA
Ci=0nF Li=0uH Pi=1W
(Year of Manufacture)

Figure 2. Markings on the Back of Sensor

Specific Conditions of Use

Specific Ambient Conditions of Use include: AC99X Series use Temperature Code T3 or T4.

Conditions of Manufacture

The equipment shall be subjected to dielectric strength test using text voltage of 500 VAC applied between circuit and earth for 60 seconds. Alternatively a voltage of 20% higher may be applied for 1 second. There shall be no evidence of flashover or breakdown and the maximum current flowing during the dest shall not exceed 5 mA r.m.s. at any time. Refer to IEC 60079-11:2011 Ed. 6 clause 6.3.13.

Cables of the following part number 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: CB103, CB190, CB193.

Installation

Cabling Information

CTC has several cabling options available for hazardous applications:

Part Number	Conductor Count	Cable Jacketing	Temperature Rating
CB103	Two (2) Conductors	Polyurethane Jacket	105 °C
CB111	Two (2) Conductors	FEP Jacket	150 °C
CB190	Two (2) Conductors	TPE Jacket	105 °C
CB193	Two (2) Conductors	Polyurethane Jacket	80 °C
CB296	Two (2) Conductors	FEP Jacket with SS Armor	150 °C

Table 3. Hazardous Cabling Options

Ui	28V
Ii	100mA
Pi	1W
Ci	Negligible*
Li	Negligible*

*For sensors with an integral cable, an additional cable capacitance of 193pF/m and cable inductance of 0.827µH/m shall be taken into account.

Table 4. Electrical Parameters for Sensors

All cabling utilizes the layout illustrated in the following drawing. All cabling has a temperature rating of 80 °C or higher.

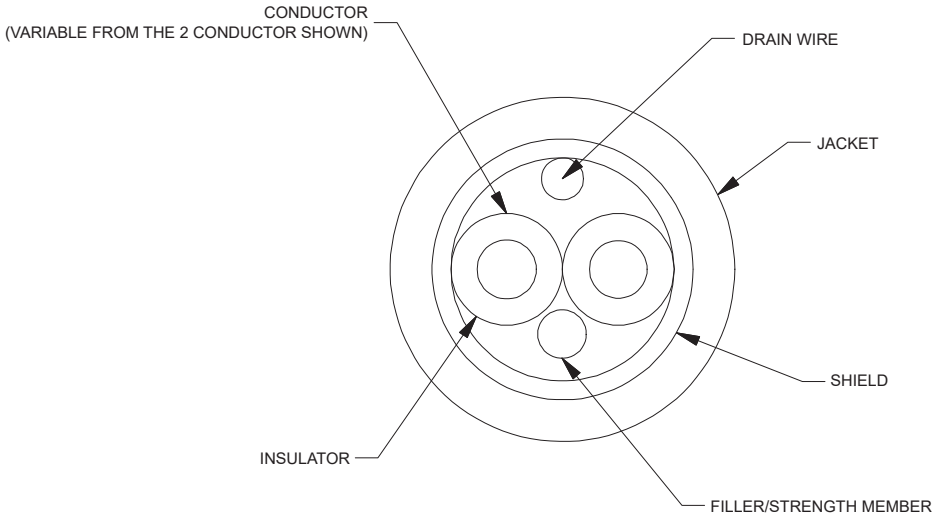

Figure 3. Cabling Cross-Section

Installation Procedure

The Intrinsic Safety Control Drawing INS10172 shows the installation requirements for CTC IS Sensors. As shown, properly installed barriers are required to limit the energy the sensor can receive. Cabling brings the signal from the sensor 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 measurement equipment, such as a data collector or junction box) for further processing.

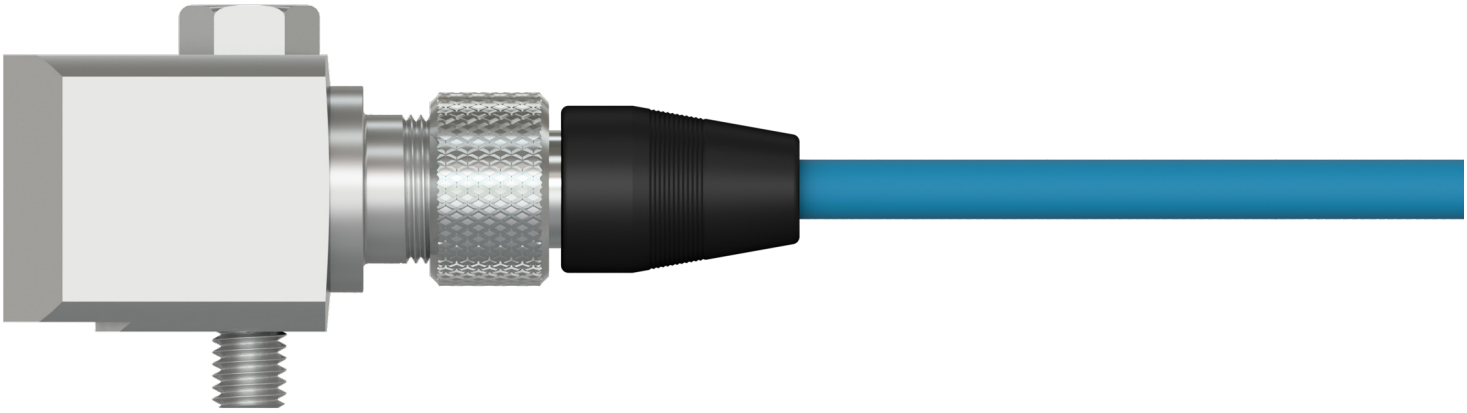

Figure 4. A Fully Assembled Non-Integral Sensor and Cable Assembly

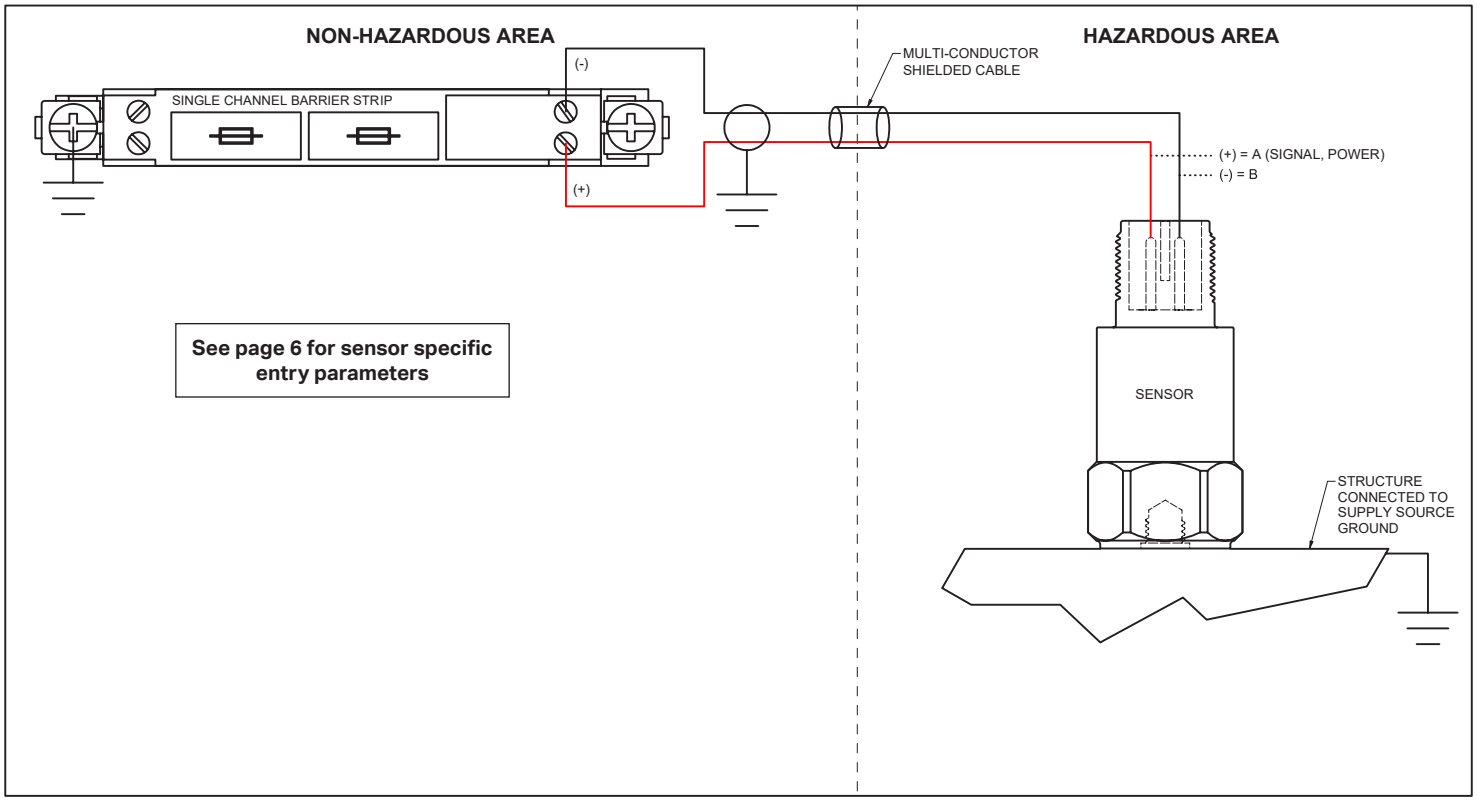

Figure 5. Two Pin Top Exit Sensor Installation

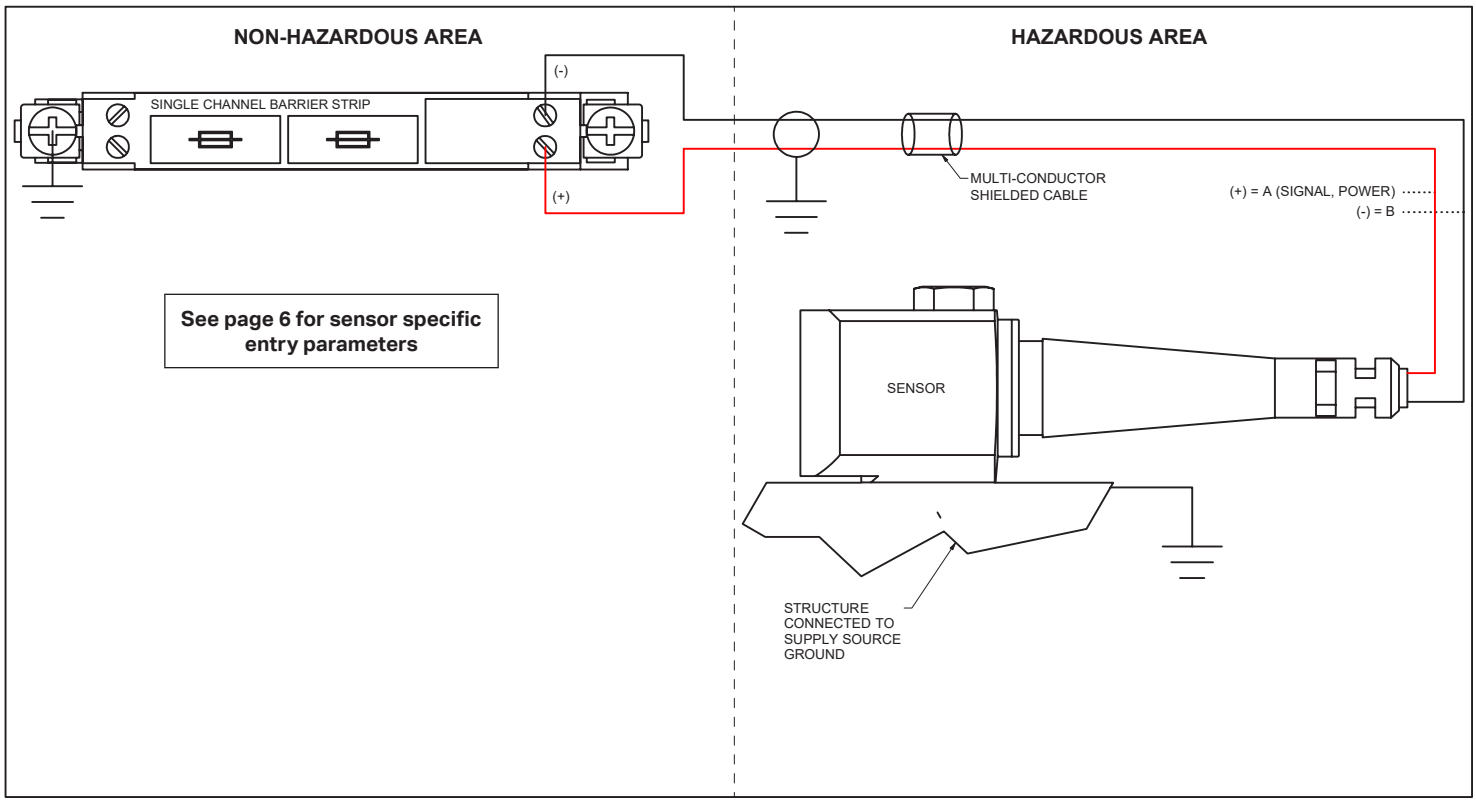

Figure 6. Two Pin Side Exit Sensor Installation

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Warranty & Refund

Please visit 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
www.ctconline.com

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Mnx10121/Rev B