VIBRATION ANALYSIS HARDWARE

Intrinsically Safe Sensors
AC82X, AC83X, AC86X, AC90X, AC91X, AC95X, AC97X, AC98X, LP80X, LP81X, LP90X, LP91X, TA82X, TA91X & VE9XX Series
Product Manual, MNX10126 Rev A

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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.

Description
Accelerometers will produce a voltage output that is proportional to the vibration output (in g's) the sensor is experiencing. 4-20mA Vibration Sensors will create a 4-20mA output proportional to the specified full scale range of sensor (for 4-20mA acceleration model), or integrates accelerometer (g's) to velocity and then creates a 4-20 mA output proportional to the full scale range specified by the part ordered.

Compliance with the following standards:

IEC 60079-0:2017-12 Ed 7
IEC 60079-11:2011 Ed 6
EN IEC 60079-0:2018
EN 60079-11:2012

Related Nameplate Markings

The following is an example recreation of nameplate markings. The customer should refer to INS10012 for the complete recapitulation of a sensor's specific entity parameters:

Figure 1. Nameplate Marking

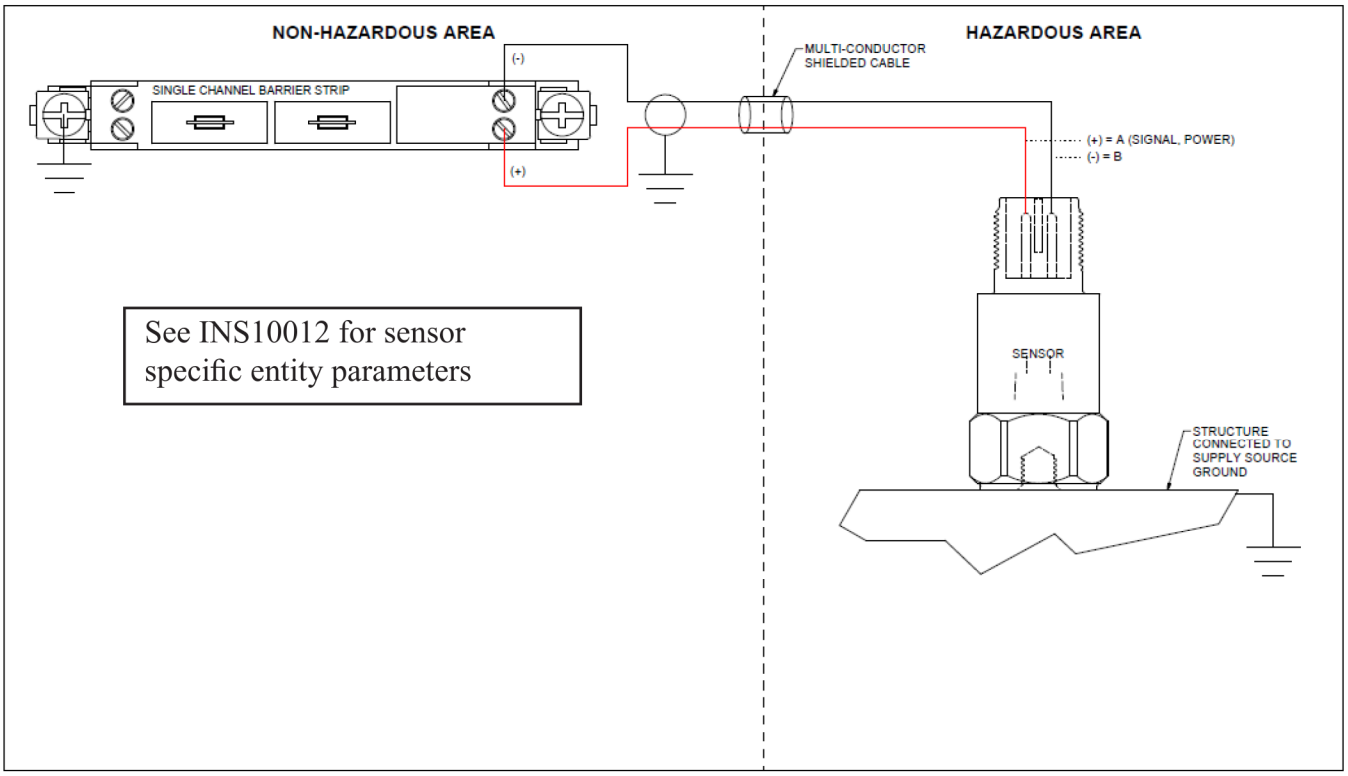
Intrinsically Safe
Securite Instrinseque
Ex ia IIC T3/T4 Ga
Ex ia I Ma
AEx ia IIC T3/T4
CLI GPS A,B,C,D
CLII, GRS E,F,G, CL III
Operating Temp Code: T3
Ambient Temp Range = -40ºC TO 121ºC
Operating Temp Code: T4
Ambient Temp Range = -40ºC TO 80ºC
Control Drawing INS10012
Ex ia IIC T3 -40ºC < Ta < +121ºC
Ui = 0 VDC Ii = 120Ma
Ci = 28nF Li = 0uH Pi = 1W
CSA 221421

Sira 15ATEX2152X
IECEx SIR 15.0060X
Ex ia IIC T3-T4 Ga
Ex ib IIIC T135°C ... T143°C Db
Operating Temp Code: T143°C
Ambient Temp Range = -40°C to +121°C
Operating Temp Code: T135°C
Ambient Temp Range = -40°C to +80°C
Ex ia I Ma
(Year of Manufacture)

Installation

Installation Procedure

The Intrinsic Safety Control Drawing INS10012 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.



Operation

Standards
Each sensor that is approved for Intrinsically Safe must meet or exceed the requirements for standards recognized by the countries that would use the sensors.

Specific Conditions of Use
Specific Ambient Conditions of Use include:

1. -40ºC to 80ºC for LP series sensors (T4 or T135°C).
2. -40ºC to 121ºC for all AC series (T3 or T143°C).

All models of the assessed equipment are required to be connected to a properly rated Intrinsically Safe barrier as per DWG INS10012. The Ui & Ii parameters are the worst case voltage and current from the combination of these barriers, but they cannont appear at the same time. It is the end-users' responsiblity to ensure that the combined voltage and current of the connected barriers does not exceed the values of Table A.1 of IEC 60079-11:2011 Ed6.

Cables of the following part numbers 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:

1. CB103
2. CB190
3. CB191
4. CB192
5. CB193

Maximum Integral Cable lengths are specified and these maximum values shall not be exceeded as per the following list:

Models with Integral Cables	Maximum Integral Cable Length
AC901-XR, AC902-XR	200 ft (61 m)
AC903-XR, AC904-XR	200 ft (61 m)
AC905-XR, AC906-XR	200 ft (61 m)
AC970-XR THROUGH AC979-XR AC980-XR THROUGH AC989-XR	200 ft (61 m)
AC812-XR, AC914-XR AC822-XR, AC824-XR	200 ft (61 m)
AC865-XR, AC866-XR	200 ft (61 m)
TA81-XR, TA82-XR	200 ft (61 m)
AC911-XR, AC912-XR, AC913-XR, AC914-XR, AC915-XR, AC916-XR, AC917-XR, AC918-XR	1600 ft (488 m)

Models with Integral Cables	Maximum Integral Cable Length
AC961-XR, AC952-XR, AC963-XR, AC964-XR, AC965-XR, AC966-XR, AC967-XR, AC968-XR	1600 ft (488 m)
TA91*-XR	1600 ft (488 m)
LP80*-XR, LP81*-XR, LP90*-XR, LP91*-XR	1600 ft (488 m)
LP85*-XR, LP86*-XR, LP95*-XR, LP96*-XR	1600 ft (488 m)
VE901-XR, VE902-XR	1600 ft (488 m)

The entity parameters of the vibration sensors and integrated cables shall not be exceeded as per the marked nameplates. Refer to the following controlled document for details:

1. INS10170

Special Conditions for Safe Use

1. Entity parameters listed for each sensor cannot be exceeded for safe use.
2. Maximum cable lengths are specified and these maximum values shall not be exceeded.

Maintenance

General

There are no customer replaceable parts. This product should provide trouble-free continuous service under normal operating conditions.

Warranty & Refund

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

Contact Information

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