



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx CSA 24.0015X** Page 1 of 3 [Certificate history:](#)

Status: **Current** Issue No: 0

Date of Issue: 2024-12-11

Applicant: **CTC - Connection Technology Center, Inc.**
7939 Rae Blvd.
Victor
New York 14564
United States of America

Equipment: **AC93*-***, AC94*-***, AC95*-***, LP82*-***, LP92*-***, TA93*-***, VE80*-*** Series Transducer Sensors.**

Optional accessory:

Type of Protection: **Increased safety and dust protection**

Marking: Ex ec IIC T°C Gc
Ex tc IIIC T135°C Dc

T4 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

Approved for issue on behalf of the IECEx
Certification Body:

Dave Magee

Position:

Senior Director of Operations, Toronto

Signature:
(for printed version)

Date:
(for printed version)

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Certificate issued by:

CSA Group
178 Rexdale Boulevard
Toronto, Ontario M9W 1R3
Canada





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This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

[IEC 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

[IEC 60079-31:2022](#) Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t"
Edition:3.0

[IEC 60079-7:2017](#) Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:5.1

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

[CA/CSA/ExTR24.0033/00](#)

Quality Assessment Report:

[CA/CSA/QAR08.0011/12](#)



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

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 series (LP 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. For the, Low power and LP series sensor, an external power source is required necessitating an extra conductor wire. 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.

See annexe for further information.

Conditions of Manufacture

- The equipment shall be subjected to dielectric strength test using test 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 test shall not exceed 5 mA r.m.s. at any time. Refer to IEC 60079-7:2017 Ed. 5.1 clause 7.1.
- 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.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- 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.

Annex:

[IECEx CSA 24.0015X Annexe Issue 0_1.pdf](#)

Annexe to: IECEx CSA 24.0015X Issue 0

Applicant: CTC - Connection Technology Center, Inc.



Apparatus: AC93*-***, AC94*-***, AC95*-***, LP82*-***, LP92*-***, TA93*-***, VE80*-*** Series Transducer Sensors.

EQUIPMENT (continued)

In terms of connectors and cables, there could be 3 wiring configurations:

Model types	Connector type		
	Connector with 2 pins and 2 wire cables	Connector with 3 pins and 3 wire cables	Connector with 4 pins and 4 wire cables
AC93*-** Series - Low Capacitance Accelerometer (schematic INS10053) AC94*-** Series - Compact Accelerometer (schematic INS10048) LP82*-** Series - Loop Power Velocity Sensor (schematic INS10026) LP92*-** Series - Loop Power Accelerometer (schematic INS10026) VE80* Series - Velocity Sensor (schematic INS10074)	1 wire is for the sensing element and 1 common/ground.	N/A	N/A
AC949-XR Biaxial Accelerometer (schematic INS10048)	N/A	2 wires are for the different sensing elements and 1 common.	N/A
TA93* Series - Dual Output Accelerometer with Temperature INS10049+ INS10053	N/A	1 wire is for signal, 1 for temperature, 1 shared common	N/A
AC950-XR Triaxial Accelerometer (schematic INS10048)	N/A	N/A	3 wires are for the different sensing elements and 1 common.

Construction:



Date: 11 December 2024

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Apparatus: AC93*-*, AC94*-***, AC95*-***, LP82*-***, LP92*-***, TA93*-***, VE80*-*** Series Transducer Sensors.**

Critical aspects of the equipment are described below:

1. **Enclosure:** Welded 316/316L (molybdenum-bearing austenitic Stainless Steel), measured 52mm (L) with 22mm (diameter) for vertical mounting sensor or 53mm (L) by 25mm (W) by 27mm (H) for horizontal mounting sensor, 39.53mm (L) by 14mm (O.D.) for the compact sensor, the biaxial dimensions and the triaxial dimensions can be found under INS10013 and INS10014 drawings. Minimum thickness 1.5mm. The sensor is hermetically sealed with melted glass also at the pins as indicated in INS10013 and INS10014. The melted glass could be of type Corning 9013, Glass AB89 or Elan 13 manufactured Material Research Group with a Softening Temperature of 655°C.

Various enclosure configurations available for single axial, biaxial and triaxial, vertical or horizontal mounting, see drawing INS10013.

2. **Printed Circuit Board:** FR4 with dimensions as shown in their schematic drawing are encapsulated with encapsulant as described below.

3. **Schematics:** Seven schematics are available:

- INS10026 – LP sensors
- INS10048 – AC small series schematic
- INS10049 – Temperature board
- INS10053 – Low Capacitance sensors
- INS10074 – Velocity sensors
- INS10076 – Low power sensors

4. **Encapsulation:** The following types are utilized:

Detail	Details			
Manufacturer	Epoxy Technology	Dow Corning	Dow Corning	Resin Lab
Generic name:	Two component, optically opaque epoxy.	Silicone Elastomer	Silicone Elastomer	Black casting resin
Type designation	EPO-TEK 509FM-1	SLYGARD 170 Fast Cure	SLYGARD 170 with Catalyst 9	EP1350-T1
COT	-55°C to +200 °C	-45°C to +200°C	-45°C to +200°C	-55°C to +230°C

5. **Piezo-electric:** Navy Type Equivalent: Navy II.

6. **Cables:** For models specified with integral cables the following list has to be utilised, as per drwg. INS 10120.

The size of the cables inside of the sensors are 32AWG.

The size of the conductors inside of the cable are 22AWG.

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The construction of the cables with their assembly are shown on INS10120 connectors.

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

For models without integral cables, a cable should be used as per INS10120, item 9 with a temperature rating of at least 105°C.

7. Connector P/N Q Series Q** where the first asterisk "*" is the number of pins (2 or 3) and the second asterisk is the type of the moulding material which is "R" is Polyphenylene Sulphide, (PPS). There is another 4 pins connector P/N JQ4R as described in drawing INS10120 with cable type CB191 manufactured by CTC, temperature ratings 105°C or CB218, CB298 manufactured by CTC, temperature ratings 200°C containing a S500 -70 Silicone compound made O-ring, manufactured by Boyd Corp. ID: 7/16 by OD: 9/16 inch, 70A durometer, -50 to +240°C operation temperature

The insulator material use in the Cable Connector is Ryton R-4-230 which is a Polyphenylene Sulphide (PPS) material mentioned on the INS10120 connector drawing. It has an RTI (Imp and Elec) of 200°C for the material thickness of 0.71mm which in this case is thicker than that.