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 LCIE 17.0016X**	Page 1 of 4	Certificate history:
Status:	**Current**	Issue No: 1	Issue 0 (2018-07-11)
Date of Issue:	2023-02-28		
Applicant:	**PCB Piezotronics Inc.** 3245 Walden Avenue Depew, New York 14043 **United States of America**		
Equipment:	**Vibration sensors – Type: EX(M)64*****/M**, EXTO(M)64*****/M**, EXRV(M)64*****/M****		
Optional accessory:			
Type of Protection:	**Ex ia ; Ex ec**		
Marking:	Ex ia IIC T4 Ga Ex ec IIC T4 Gc *(refer to Annex for full marking)*		

Approved for issue on behalf of the IECEx Certification Body: **Julien GAUTHIER**

Position: **Certification Officer**

Signature: (for printed version)

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES
S.A.S au capital de 15.745.984 €
RCS Nanterre B 408 363 174
33 avenue du Général Leclerc
F - 92266 FONTENAY AUX ROSES

Date: (for printed version) 2023-02-28

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3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses

IECEx Certificate of Conformity

Certificate No.: **IECEx LCIE 17.0016X**

Issue No: 1

Date of issue: 2023-02-28

Manufacturer: **PCB Piezotronics Inc.**
3245 Walden Avenue
Depew, New York 14043
United States of America

Manufacturing locations: **PCB Piezotronics Inc.**
3245 Walden Avenue
Depew, New York 14043
United States of America

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 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

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 Reports:

FR/LCIE/ExTR17.0009/00
US/ETL/ExTR22.0037/00

FR/LCIE/ExTR17.0041/00

FR/LCIE/ExTR22.0086/00

Quality Assessment Report:

NL/DEK/QAR14.0004/06

IECEx Certificate of Conformity

EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

These vibration sensors have a stainless steel housing comprising of electronics, completely encapsulated in potting compound, associated to a sensing element (piezoelectric crystal with a capacitance value ≤ 700 pF). The metallic enclosure of the sensor is a fully welded construction. The shape of the housing differs depending on the type of the equipment.

The sensors are fitted with an integral connector or an integral (unarmoured or armoured) cable. The maximum length of cable is 305 m. The electrical connection can also be done via a terminal block or flying leads depending on the type of the equipment. In this case, the vibration sensor is screwed, thanks to a 1 inch NPT external thread, into a Y-3 capped conduit elbow (100-7094-90) from Killark providing a degree of protection IP54.

The vibration sensors provide a 4-20mA current output when subjected to mechanical motion.
The products with TO (Temperature Output) option includes an additional independent 4-20mA output for temperature measurement. The imbedded temperature sensor monitors the environment internal to the sensor housing.
The products with RV option includes a 0-2.5 V a.c. and 2.5 V d.c. output that corresponds to raw vibration from the imbedded accelerometer.

Range details: Refer to the Annex
Ratings: Refer to the Annex

SPECIFIC CONDITIONS OF USE: YES as shown below:
Refer to the Annex for full Specific Conditions of Use.

IECEx Certificate of Conformity

Certificate No.: **IECEx LCIE 17.0016X**

Date of issue: 2023-02-28

Issue No: 1

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
Issue 1:
- Normative update according to IEC 60079-0 Ed. 7.0 and IEC 60079-7 Ed. 5.1.
- Update of the Range details to introduce "modified" sensors (M) for customer special request (no impact on the types of protection).
- Update of the name of the applicant/manufacturer.
- Update of Specific Conditions of Use.

Annex:

Annex 01 to Certificate IECEx LCIE 17.0016X issue 1.pdf

Annex 01 to Certificate
IECEx LCIE 17.0016X issue 1

MARKING

Complete marking:
PCB Piezotronics Inc. or IMI Sensors or IMI
Address: ...
Type: EX(M)64*****/M** or EXTO(M)64*****/M** or EXRV(M)64*****/M** (1)
Serial number: ...
Year of construction: ...

Ex ia IIC T4 Ga

Ex ec IIC T4 Gc

-40 °C ≤ T_{amb} ≤ +80 °C

IECEx LCIE 17.0016X

For Intrinsic safety "ia" type of protection only:
Ui: ...V; *Ii*: ...mA; *Pi*: ...W; *Ci*: ...nF; *Li*: ...µH (related to the type, see Ratings section)

For increased safety "ec" type of protection only:
WARNING – DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED

Reduced marking:
PCB Piezotronics Inc. or IMI Sensors or IMI
Type: EX(M)64*****/M** or EXTO(M)64*****/M** or EXRV(M)64*****/M** (1)
Serial number: ...
Year of construction: ...

Ex ia IIC T4 Ga, T_a = 80 °C

Ex ec IIC T4 Gc, T_a = 80 °C

IECEx LCIE 17.0016X

(1) Completed as per the type

RATINGS

Intrinsic safety "ia" type of protection:

Type of the equipment	Configuration	IS electrical parameters				
		Ui (V)	Ii (mA)	Pi (W)	Ci (nF)	Li (µH)
EX(M)64**0**, EX(M)64**9**	with integral connector	30	100	1	0	121.1
EX(M)64**1**/M**, EX(M)64**6**/M**	with integral cable	30	100	1	61	426.1
EXTO(M)64**3**, EXTO(M)64**9**	with Temperature Output and connector	28	120	1	0	122.2
EXTO(M)64**1**/M**, EXTO(M)64**6**/M**	with Temperature Output and integral cable	28	120	1	61	427.2
EXRV(M)64**0**, EXRV(M)64**9**	with Raw Vibration Output and connector	28	120	1	25	121.1
EXRV(M)64**1**/M**, EXRV(M)64**6**/M**	with Raw Vibration Output and integral cable	28	120	1	80	426.1
EX(M)64**7**, EX(M)64**8**	with flying leads or terminal block + capped conduit elbow	30	100	1	0	121.1
EXRV(M)64**7** EXRV(M)64**8**	with Raw Vibration Output and flying leads or terminal block + capped conduit elbow	30	120	1	25	121.1

Annex 01 to Certificate
IECEx LCIE 17.0016X issue 1

Increased safety "ec" type of protection:

Maximum input voltage U_{max} : 30 V d.c.
Maximum power P_{max} : 1 W

RANGE DETAILS

EX	*	64	*	*	*	*	*	/	M	*	*

Optional Two characters to designate cable termination type

Optional Three to six digits using xxx-xx to designate length in feet-inches or meters-centimeters with M in previous column

Optional Metric Cable Length

Optional Cable length modifier

For M only; A number (01 to 999) which designates a special model number with custom sensitivity, measurement range, frequency range, cable length and cable termination. May include added customer Logo and model number in addition to PCB Model and Logo.

A number or letter 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, M which designates measurement range and filtering
M = Customer special

One number 0, 1, 3, 6, 7, 8 or 9 which denotes the type of connector:
0 = For 2-Pin MIL-C-5015 connector or 3-Pin MIL-C-5015 if RV option
1 = For Integral polyurethane jacketed cable
3 = For 4-Pin MIL-C-26482 connector for TO option
6 = Integral armoured polyurethane jacketed cable
7 = Terminal Block for conduit hub version sensor (with capped elbow)
8 = Flying Leads for conduit hub version sensor (with capped elbow)
9 = For M12 4/5-Pin connector

One letter A to Z to denote model revision level

One number 0, 1, 2, 3, 4, 5, 6, 7 or 8 which denotes the type of sensor and output measurement range:
0 = For Top-Exit or Conduit Hub configurations with measurement range in in/sec pk
1 = For Top-Exit or Conduit Hub configurations with measurement range in in/sec rms
2 = For Side-Exit configurations with measurement range in in/sec pk
3 = For Side-Exit configurations with measurement range in in/sec rms
4 = Reserved for future exit location and measurement range
5 = For Top-Exit or Conduit Hub configurations with measurement range of 0 to 5 g rms
6 = For Top-Exit or conduit Hub configurations with measurement range of 0 to 10 g rms
7 = For Side-Exit configurations with measurement range of 0 to 5 g rms
8 = For Side-Exit configurations with measurement range of 0 to 10 g rms

64 Series Family of sensors

One or more Sensor Options:
M = Metric Mount
TO = Temperature Output
RV = Raw Vibration Output

Product Type :
EX = ATEX/IECEx Product

Annex 01 to Certificate
IECEx LCIE 17.0016X issue 1

FULL CONDITIONS OF CERTIFICATION

For all types of protection:

- Ambient operating temperature range: -40 °C up to +80 °C.
- The mounting of the sensor into an installation must be carried out in such a way that sensor metallic body and cable shield are reliably connected to the system earth.
- The equipment must be connected according to the instruction manual of the manufacturer.

Additionally specific condition(s) for intrinsic safety "ia" type of protection:

- The intrinsically safe sensor shall only be connected to an associated intrinsically safe apparatus certified for the intended use. This association shall comply with the requirements of the standard IEC 60079-25.
- For sensor fitted with a capped conduit elbow: The user shall ensure that the capped elbow is not exposed to any risk of mechanical impact or friction.

Additionally specific condition(s) for increased safety "ec" type of protection:

- The sensor shall only be connected to an external power supply delivering a maximum of 30 V d.c. and 1 Watt.
- Transient protection shall be provided that is set at a level not exceeding 140 % of the peak rated voltage value at the supply terminals to the sensor.
- For sensors with integral connector: the mating connector provided by the end user shall be in accordance with all applicable clauses of IEC 60079-0 and IEC 60079-7 for a zone 2 application. A minimum degree of protection IP54 according to IEC 60079-0 shall be ensured.
  The mating connector shall not be connected or disconnected when energized.
- For sensors with flying leads: the flying leads shall be suitably protected from impact and shall be terminated within a suitably certified enclosure or in safe area. The installation shall guarantee that no pulling force will be applied to the leads.
- For sensors fitted with a capped conduit elbow:
  The user shall use an "Ex e" certified entry device at the capped elbow's entry while respecting the installation requirements of IEC 60079-14.
  Disconnect the equipment from supply circuit before opening the capped conduit elbow.
  The disassembling of the sensor from its capped elbow is not allowed.
- WARNING – DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED

ROUTINE TESTS

In accordance with clause 7.1 of standard IEC 60079-7, each product manufactured shall be subjected to a dielectric strength test at 500 V a.c. for 1 minute. Alternatively the test may be carried out at 600 V a.c. for 100 ms. No breakdown shall occur.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

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

Certificate No.: IECEx LCIE 17.0016X

Issue No: 0

Certificate history:
Issue No. 0 (2018-07-11)

Status: **Current**

Date of Issue: **2018-07-11**

Applicant: **IMI, a division of PCB Piezotronics**
3425 Walden Avenue
DEPEW, NY 14043
United States of America

Equipment: **Vibration Transmitter, Type: EX(M)64xYxx, EXTO(M)64xYxx, EXRV(M)64xYxx**

Optional accessory:

Type of Protection: **Ex ia or Ex nA**

Marking:

Ex ia IIC T4 Ga

or

Ex nA IIC T4 Gc

(See attchment full marking)

Approved for issue on behalf of the IECEx Certification Body: Julien GAUTHIER

Position: Certification Officer

Signature:
(for printed version)

Date: 2018-07-11

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES
S.A.S au capital de 15.745.984 €
RCS Nanterre B 408 363 174
33 avenue du Général Leclerc
F - 92266 FONTENAY AUX ROSES

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3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses
France

IECEx Certificate of Conformity

Certificate No: IECEx LCIE 17.0016X Issue No: 0

Date of Issue: **2018-07-11** Page 2 of 3

Manufacturer: **IMI, a division of PCB Piezotronics**
3425 Walden Avenue
DEPEW, NY 14043
United States of America

Additional Manufacturing location(s):

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 apparatus 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 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-15 : 2010 Edition:4	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"

*This Certificate **does not** indicate compliance with electrical 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:

FR/LCIE/ExTR17.0041/00 FR/LCIE/ExTR17.0009/00

Quality Assessment Report:

NL/DEK/QAR14.0004/03

IECEx Certificate of Conformity

Certificate No:	IECEx LCIE 17.0016X	Issue No: 0
Date of Issue:	**2018-07-11**	Page 3 of 3

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Functional description:

The apparatus is a vibration transmitter integrating a piezoelectric crystal, an electronic signal processing and a connector or a cable or flying leads for external interface. The delivered signal is an output current in the range 4-20mA corresponding to vibration level.

Apparatus, type EXTO, are provided with an integrated temperature sensor.

Apparatus, type EXRV, delivers raw vibration output int the range 0-2,5VAC.

Mechanical description:

Sensor heads are made of stainless steel housings with different shapes, depending on the type. External connections can be done by connector or shield cable (305 maximum length) or flying leads depending on the type (see drawings in the apparatus overview section).

(See attchment for full equipment description)

SPECIFIC CONDITIONS OF USE: YES as shown below:

Specific conditions of use for Ex ia and Ex nA protections:

- Ambient temperature range: -40°C to +80°C
- The mounting of the apparatus into an installation must be carried out in such a way that sensor metallic body and cable shield are reliably connected to the system earth.
- The apparatus must be connected according to instruction manual.

Specific condition of use for intrinsic safety Ex ia protection:

The intrinsically safe apparatus shall only be connected to associated intrinsically safe apparatus certified for the intended use. This association shall comply with the requirements of the standard IEC 60079-25.

Specific condition of use for non sparking Ex nA protection:

- The equipment must only be connected to an external source with 30V maximum voltage and maximum power 1W.
- For final installation, the user shall take all necessary precuations to maintain the minimum degree of protection IP54 of the sensor connection when connected according to the requirements of IEC 60079-14 requirements.
- WARNING - DO NOT SEPARATE WHEN ENERGIZED.

Annex:

LCIE 17.0016X - Issue 00 - Annex 01.pdf

Annex 01 to Certificate
IECEx LCIE 17.0016X issue 00

MARKING

Full marking :

PCB Piezotronics Inc. or IMI Sensors or IMI
Address: ...
Type: ...
Serial number: ...
Year of construction: ...
Ex ia IIC T4 Ga
Ex nA IIC T4 Gc
-40°C ≤ Tamb ≤ +80°C
IECEx LCIE 17.0016X

For Intrinsic safety Ex ia protection only:
U_i: ...V; I_i: ...mA; P_i: ...W; C_i: ...nF; L_i: ...µH (related to type, see ratings section)

For nA protection only:
WARNING – DO NOT SEPARATE WHEN ENERGIZED

Reduced marking :

PCB Piezotronics Inc. or IMI Sensors or IMI
Type: ...
Serial number: ...
Year of construction: ...
Ex ia IIC T4 Ga, Ta=80°C
Ex nA IIC T4 Gc, Ta=80°C
IECEx LCIE 17.0016X

RANGE DETAILS

List of types references:
- EX(M)64xA0y, EX(M)64xB0y with connector.
- EX(M)64xA1y, EX(M)64xA6y, EX(M)64xB1y, EX(M)64xB6y with cable.
- EXTO(M)64xA3y, EXTO(M)64xB3y with temperature sensor and connector.
- EXTO(M)64xA1y, EXTO(M)64xA6y, EXTO(M)64xB1y, EXTO(M)64xB6y with temperature sensor and cable.
- EXRV(M)64xA0y, EXRV(M)64xB0y with raw vibration output and connector.
- EXRV(M)64xA1y, EXRV(M)64xA6y, EXRV(M)64xB1y, EXRV(M)64xB6y with raw vibration output and cable.
- EX(M)64xB7y with flying leads.
- EXTO(M)64xB7y, with temperature sensor and flying leads.
- EXRV(M)64xB7y, with raw vibration output and flying leads.

M indicates apparatus in Metric version.
Letters x and y are variable digits of the type (values between 0 and 9).

RATINGS

Intrinsic safety Ex ia protection:

Apparatus Types	IS parameters
EX(M)64xA0y, EX(M)64xB0y	U_i: 30V; I_i: 100mA; P_i: 1W; C_i: 0nF; L_i: 121.1µH
EX(M)64xA1y, EX(M)64xA6y, EX(M)64xB1y, EX(M)64xB6y	U_i: 30V; I_i: 100mA; P_i: 1W; C_i: 61nF; L_i: 426.1µH
EXTO(M)64xA3y, EXTO(M)64xB3y	U_i: 28V; I_i: 120mA; P_i: 1W; C_i: 0nF; L_i: 122.2µH
EXTO(M)64xA1y, EXTO(M)64xA6y, EXTO(M)64xB1y, EXTO(M)64xB6y	U_i: 28V; I_i: 120mA; P_i: 1W; C_i: 61nF; L_i: 427.2µH
EXRV(M)64xA0y, EXRV(M)64xB0y	U_i: 28V; I_i: 120mA; P_i: 1W; C_i: 25nF; L_i: 121.1µH
EXRV(M)64xA1y, EXRV(M)64xA6y, EXRV(M)64xB1y, EXRV(M)64xB6y	U_i: 28V; I_i: 120mA; P_i: 1W; C_i: 80nF; L_i: 426.1µH
EX(M)64xB7y	U_i: 30V; I_i: 100mA; P_i: 1W; C_i: 0nF; L_i: 121.1µH
EXTO(M)64xB7y	U_i: 30V; I_i: 120mA; P_i: 1W; C_i: 0nF; L_i: 122.2µH
EXRV(M)64xB7y	U_i: 30V; I_i: 120mA; P_i: 1W; C_i: 25nF; L_i: 121.1µH

Non sparking Ex nA protection:

Maximum input voltage U_{max} : 30V
Maximum power P_{max} : 1W

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CERT-ATEX-FORM 14 Rev. 01

ROUTINE TESTS

Intrinsic safety Ex ia protection:

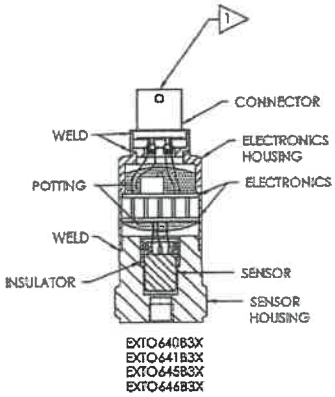
None.

Non sparking Ex nA protection:

Each equipment shall be submitted to the dielectric strength test according to the clause 23.2.1 of IEC 60079-15:2010. Test voltage shall be applied between active electrical signals and the enclosure.

APPARATUS OVERVIEW

Mechanical constructions of the apparatus, head shapes and external connection possibilities:



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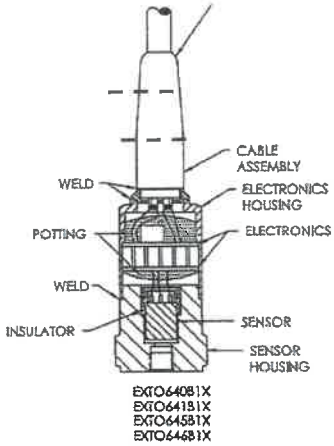
EXTO646B3X



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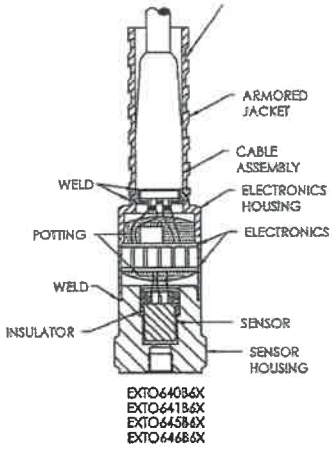

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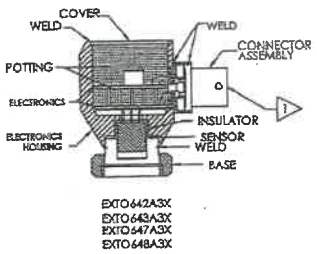

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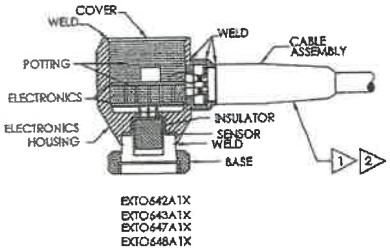
EXTO648A3X



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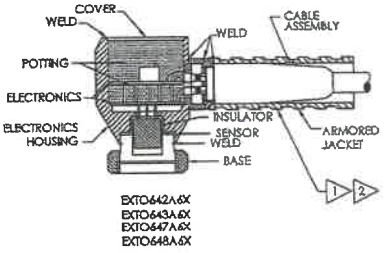

EXTO642A6X
EXTO643A6X
EXTO647A6X
EXTO648A6X

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