**Model EX646B00**

**Intrinsically-safe vibration sensor, 4 to 20 mA output, 0 to 10 g's RMS, 3 to 1k Hz, top exit, 2-pin conn**

**Installation and Operating Manual**

**For assistance with the operation of this product,**
**contact the PCB Piezotronics, Inc.**

**Toll-free: 800-959-4464**
**24-hour SensorLine: 716-684-0001**
**Fax: 716-684-3823**
**E-mail: imi@pcb.com**
**Web: www.imi-sensors.com**

## Repair and Maintenance

PCB guarantees Total Customer Satisfaction through its "Lifetime Warranty Plus" on all Platinum Stock Products sold by PCB and through its limited warranties on all other PCB Stock, Standard and Special products. Due to the sophisticated nature of our sensors and associated instrumentation, **field servicing and repair is not recommended and, if attempted, will void the factory warranty**.

Beyond routine calibration and battery replacements where applicable, our products require no user maintenance. Clean electrical connectors, housings, and mounting surfaces with solutions and techniques that will not harm the material of construction. Observe caution when using liquids near devices that are not hermetically sealed. Such devices should only be wiped with a dampened cloth—never saturated or submerged.

In the event that equipment becomes damaged or ceases to operate, our Application Engineers are here to support your troubleshooting efforts 24 hours a day, 7 days a week. Call or email with model and serial number as well as a brief description of the problem.

## Calibration

Routine calibration of sensors and associated instrumentation is necessary to maintain measurement accuracy. We recommend calibrating on an annual basis, after exposure to any extreme environmental influence, or prior to any critical test.

PCB Piezotronics is an ISO-9001 certified company whose calibration services are accredited by A2LA to ISO/IEC 17025, with full traceability to SI through N.I.S.T. In addition to our standard calibration services, we also offer specialized tests, including: sensitivity at elevated or cryogenic temperatures, phase response, extended high or low frequency response, extended range, leak testing, hydrostatic pressure testing, and others. For more information, contact your local PCB Piezotronics distributor, sales representative, or factory customer service representative.

## Returning Equipment

If factory repair is required, our representatives will provide you with a Return Material Authorization (RMA) number, which we use to reference any information you have already provided and expedite the repair process. This number should be clearly marked on the outside of all returned package(s) and on any packing list(s) accompanying the shipment.

## Contact Information

PCB Piezotronics, Inc.
3425 Walden Ave.
Depew, NY14043 USA
Toll-free: (800) 828-8840
24-hour SensorLine: (716) 684-0001
General inquiries: info@pcb.com
Repair inquiries: rma@pcb.com

For a complete list of distributors, global offices and sales representatives, visit our website, www.pcb.com.

## Safety Considerations

This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the precautions required to avoid injury. While our equipment is designed with user safety in mind, the protection provided by the equipment may be impaired if equipment is used in a manner not specified by this manual.

Discontinue use and contact our 24-Hour Sensorline if:

- Assistance is needed to safely operate equipment
- Damage is visible or suspected
- Equipment fails or malfunctions

For complete equipment ratings, refer to the enclosed specification sheet for your product.

## Definition of Terms and Symbols

**The following symbols may be used in this manual:**

**DANGER**
Indicates an immediate hazardous situation, which, if not avoided, may result in death or serious injury.

**CAUTION**
Refers to hazards that could damage the instrument.

**NOTE**
Indicates tips, recommendations and important information. The notes simplify processes and contain additional information on particular operating steps.

**The following symbols may be found on the equipment described in this manual:**

This symbol on the unit indicates that high voltage may be present. Use standard safety precautions to avoid personal contact with this voltage.

This symbol on the unit indicates that the user should refer to the operating instructions located in the manual.

This symbol indicates safety, earth ground.

PCB工业监视和测量设备 - 中国RoHS2公布表

PCB Industrial Monitoring and Measuring Equipment - China RoHS 2 Disclosure Table

| 部件名称 | 有害物质 | | | | | |
|---|---|---|---|---|---|---|
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (Cr(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| 住房 | O | O | O | O | O | O |
| PCB板 | X | O | O | O | O | O |
| 电气连接器 | O | O | O | O | O | O |
| 压电晶体 | X | O | O | O | O | O |
| 环氧 | O | O | O | O | O | O |
| 铁氟龙 | O | O | O | O | O | O |
| 电子 | O | O | O | O | O | O |
| 厚膜基板 | O | O | X | O | O | O |
| 电线 | O | O | O | O | O | O |
| 电缆 | X | O | O | O | O | O |
| 塑料 | O | O | O | O | O | O |
| 焊接 | X | O | O | O | O | O |
| 铜合金/黄铜 | X | O | O | O | O | O |

本表格依据 SJ/T 11364 的规定编制。

O： 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

X： 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

铅是欧洲RoHS指令2011/65/ EU附件三和附件四目前由于允许的豁免。

CHINA RoHS COMPLIANCE

| Component Name | Hazardous Substances | | | | | |
|---|---|---|---|---|---|---|
| | **Lead (Pb)** | **Mercury (Hg)** | **Cadmium (Cd)** | **Chromium VI Compounds (Cr(VI))** | **Polybrominated Biphenyls (PBB)** | **Polybrominated Diphenyl Ethers (PBDE)** |
| Housing | O | O | O | O | O | O |
| PCB Board | X | O | O | O | O | O |
| Electrical Connectors | O | O | O | O | O | O |
| Piezoelectric Crystals | X | O | O | O | O | O |
| Epoxy | O | O | O | O | O | O |
| Teflon | O | O | O | O | O | O |
| Electronics | O | O | O | O | O | O |
| Thick Film Substrate | O | O | X | O | O | O |
| Wires | O | O | O | O | O | O |
| Cables | X | O | O | O | O | O |
| Plastic | O | O | O | O | O | O |
| Solder | X | O | O | O | O | O |
| Copper Alloy/Brass | X | O | O | O | O | O |

This table is prepared in accordance with the provisions of SJ/T 11364.

O: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: Indicates that said hazardous substance contained in at least one of the homogeneous materials for this part is above the limit requirement of GB/T 26572.
Lead is present due to allowed exemption in Annex III or Annex IV of the European RoHS Directive 2011/65/EU.

IMI SENSORS
A PCB PIEZOTRONICS DIV.

# Model 640/641/645/646 B Series Industrial 4-20mA Sensor

# Operating Guide with Enclosed Warranty Information


***3425 Walden Avenue, Depew, New York 14043-2495***

***Phone (716) 684-0003***

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***Toll Free Line 1-800-959-4IMI***



*MANUAL NUMBER: 25317*
*MANUAL REVISION: E*
*ECN NUMBER: 49766*

IMI SENSORS
A PCB PIEZOTRONICS DIV.

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# Introduction

The Model 640/641/645/646 B Series Industrial 4-20mA Sensors combine the capabilities of a piezoelectric vibration sensor and a 4-20mA vibration transmitter. The sensor outputs a 4-20mA signal that is proportional to the overall velocity or acceleration of the machinery. Ideal for monitoring the vibration of process equipment such as fans, motors and pumps, the output of the sensor is used for process control or predictive maintenance. There are many options in this series. Please refer to specific specification sheets for further details.

## ***General Features***

- Imbedded Piezoelectric Accelerometer for improved accuracy and frequency response.
- Vibration range can be in Acceleration or Velocity.
- Allows for continuous vibration monitoring of critical applications.
- Reduces sophisticated vibration analysis requirements.
- RV (Raw Vibration) option for conducting frequency analysis and machinery diagnostics.
- RVVO (Raw Vibration Velocity Output) option for conducting freq. analysis and machinery diagnosis.
- TO (Temperature Output) option via an independent 4-20mA loop.
- Readily interfaces to existing process control and predictive maintenance equipment.
- Rugged stainless steel construction for applications in harsh environments.
- Flexible design allows for various custom requirements.

## Dimension Drawing

Inch (mm)

# Operation and Wiring

## ***Standard Wiring***

The Model 640/641/645/646 B Series operates from a standard 2-Wire, 4-20mA loop. If using a loop powered unit, attach the positive (+) input from the power supply to Pin A or **Red** wire on the sensor and the negative (-) input from the power supply to Pin B or **Blue** Wire of the sensor.

***Figure 1 – wiring: loop powered***

***Figure 2 – wiring: loop powered/DC source***

If using a standard DC power supply, install either an ammeter and/or load resistor in line with the output, Pin B or **Blue** Wire.

The resistor will generate a DC voltage that is proportional to current by:

$$V = IR$$

*If R = 500 ohms and I = 6 mA, then V = 3 VDC*

**Note:**

- Resistor value must be less than: (Vsupply – 12) x 50.
- For integral cable sensors: RED wire is positive, BLUE wire is negative.

## ***Taking Measurements***

When measuring the current output from the unit, use the following formula to calculate the vibration level:

Vibration Output = (Measured Output – 4mA) x (Full Scale Vibration Output /16mA)

| ***Measured mA*** | **640BX0** | **640BX1** | **640BX2** |
|---|---|---|---|
| *4.00* | *0.0 ips, pk* | *0.0 ips, pk* | *0.0 ips, pk* |
| *8.00* | *0.125 ips, pk* | *0.25 ips, pk* | *0.5 ips, pk* |
| *12.0* | *0.25 ips, pk* | *0.5 ips, pk* | *1.0 ips, pk* |
| *15.75* | *0.37 ips, pk* | *0.73 ips, pk* | *1.47 ips, pk* |
| *20* | *0.5 ips, pk* | *1.0 ips, pk* | *2.0 ips, pk* |

| ***Measured mA*** | **641BX0** | **641BX1** | **641BX2** |
|---|---|---|---|
| *4.00* | *0.0 ips, rms* | *0.0 ips, rms* | *0.0 ips, rms* |
| *8.00* | *0.125 ips, rms* | *0.25 ips, rms* | *0.5 ips, rms* |
| *12.0* | *0.25 ips, rms* | *0.5 ips, rms* | *1.0 ips, rms* |
| *15.75* | *0.37 ips, rms* | *0.73 ips, rms* | *1.47 ips, rms* |
| *20* | *0.5 ips, rms* | *1.0 ips, rms* | *2.0 ips, rms* |

| ***Measured mA*** | **645** | ***646*** |
|---|---|---|
| *4.00* | *0.0 g rms* | *0.0 g rms* |
| *8.00* | *1.25 g rms* | *2.50 g rms* |
| *12.0* | *2.50 g rms* | *5.00 g rms* |
| *15.75* | *3.67 g rms* | *7.34 g rms* |
| *20* | *5.00 g rms* | *10.0 g rms* |

## ***RV Option***

The RV (raw vibration) option includes a 100mV/g ±20% additional output. The accelerometer frequency range is 1 Hz-1 kHz, maximum amplitude of 15 g-pk. Data collectors or analyzers can use this vibration signal for further analysis. This output is extended to the RVVO (Raw Vibration Velocity Output) option, which integrates the signal to a value of 100 mV/IPS (±20%).

***Figure 3 – RV and RVVO wiring***

For integral cable sensors:

| | |
|---|---|
| **RED** | **4-20mA Positive** |
| **BLACK** | **4-20mA Negative (same as green)** |
| **GREEN** | **–RV and RVVO negative (same as black)** |
| **WHITE** | **+RV and RVVO positive** |

**Note**:

-The RV and RVVO Signal Negative has to be isolated from any grounding. If this terminal is grounded, the 4-20mA loop will short, causing no output.

-The RV and RVVO output signal is ideally suited for use with portable battery powered data collectors or analyzers.

## ***TO Option***

The TO (Temperature Output) option includes an additional independent 4-20mA output for temperature measurement. The temperature range is from -40°C to 125°C with an overall accuracy of ±5%FSO. The imbedded temperature sensor monitors the environment internal to the sensor housing and is situated at approximately mid level.

***Figure 4 – TO wiring***

For integral cable sensors:

| | |
|---|---|
| **RED** | **4-20mA Vibration Positive** |
| **BLACK** | **4-20mA Vibration Negative** |
| **GREEN** | **4-20mA Temperature Negative** |
| **WHITE** | **4-20mA Temperature Positive** |

**Note:**

- The same power supply can be used for both 4-20mA loops. Connect both positive terminals directly to the power supply, then use the negative terminals for independent process loops.

# Installation

When choosing a mounting method, consider closely the advantages and disadvantages of each technique. Typical mounting types are stud, direct adhesive, adhesive mounting base and magnetic mounting base. Since the frequency response is limited to 1 kHz on the 640/641, any of the four methods can be used without seriously affecting the data values.  The mounting method might affect some of the 645/646 series because of the increased frequency response.

## ***Direct Adhesive Mount Procedure***

For restrictions of space or for convenience, most sensors (with the exception of integral stud models) can be adhesive-mounted directly to the machine surface.

**STEP 1** Prepare a smooth, flat surface. A minimum surface finish of 63 µin [0.0016 mm] generally works best.
**STEP 2** Place a small portion of adhesive on the underside of the sensor. Firmly press down on the top of the assembly to displace any adhesive. Be aware that excessive amounts of adhesive can make sensor removal difficult.

***Figure 5– direct adhesive mounting***

## ***Standard Stud Mount Procedure***

This mounting technique requires smooth, flat contact surfaces for proper operation and is recommended for permanent and/or secure installations. Stud mounting is also recommended when testing at high frequencies. **Note:** DO NOT attempt mounting on curved, rough or uneven sufaces, as the potential for misalignmen and limited contact surface may significantly reduce the senor's upeer operating frequnecy range.

***Figure 6– direct adhesive mounting***

| ***1/4-28 stud*** | ***1/4-28 Captive Screw-**** | |
|---|---|---|
| *A (in)* | *0.250* | *0.250* |
| *B (in)* | *0.350* | *0.350* |
| *Torque (ft-lb)* | *2 to 5* | *2 to 5* |

**STEP 1** First, prepare a smooth, flat mounting surface, and then drill and tap a mounting hole in the center of this area as shown in Figure 6. A precision-machines mounting surface with a minimum finish of 63 µin [0.0016 mm] is recommended. (If it is not possible to properly prepare the machine surface, consider using an adhesive mounting pad as a possible alternative.) Inspect the area, checking that there are no burrs or other foreign particles interfering with the contact surface.

**STEP 2** Wipe clean the mounting surface and spread on a light film of grease, oil or similar coupling fluid prior to installation.

***Figure 7– mounting surface lubrication.***

Adding a coupling fluid improves vibration transmissibiliy by filling small voids in the mounting surface and increasing the mounting stiffness. For semi-ermanent mounting, substitue epoxy or another type of adhesvie.

**STEP 3 HAND –** tighten the sensor/mounting stud to the machine, then secure the sensor with a torque wrench to the mounting surface by applying the recommended mounting torue ( see enclosed specification data sheet for proper mounting torque). It is important to use a toque wrench during this step. **Under-toruing the sensor may not adequately couple the device; over-torquing may result in stud failure and possible permanent damage.**

## ***Adhesive Stud Mount Procedure***

Adhesive mounting is often used for temporary installation or when the machine surface cannot be adequately prepared for stud mounting. Adhesives like hot glue or wax work well  for temporary mounts; two-part epoxies and quick –bonding gels provide a more permanent mount.

**Note:** Adhesively mounted sensors often exhibit a reduction in high-frequency range. Generally, smooth surfaces and stiff adhesvies provide the best frequency response.

This method involves attaching a base to the machine surface, then securing the snesor to the base. This alows for easy removal of the accelerometer.

**STEP 1** Prepare a smooth, flat mounting surface. A minimum surface finish of 63 µin [0.0016 mm] generally works best.

**STEP 2** Stud-mount the sensor to the appropriate adhesive mounting base according to the guidelines set forth in Steps 2 and 3 of the *Standard Stud Mount Procedure*.

**STEP 3** Place a small portion of adhesive on the underside of the mounting base. Firmly press down on the assembly to displace any extra adhesive remaining under the base.

***Figure 8– mounting base: adhesive installation***

## ***Magnetic Mount Procedure***

Magnetic mounting provides a convenient means for making portable measurements and is commonly used for machinery monitoring and other portable or tending applications.

**Note:** The correct magnet choice and an adequately prepared mounting surface is critical for obtaining reliable measurements, especially at high frequencies. Poot installations can cause as much as a 50% drop in the sensor frequency range.

***Not every magnet is suitable for all applications. For example, rare earth magnets are commonly used because of their high strength. Flat magners work well on smooth, flat surfaces, while dual-rail magnets are required for curved surfaces. In the case o non-magnetic or rough surfaces, it is recommended that the user first weld, epocy or otherwise adhere a stell mounting pad to the test surface. This provides a smooth and repeatable location for mounting.***

***Figure 9– magnet types***

**STEP 1** After choosing the correct magnet type, inspect the unit, verifying that the mounting surfaces are flat and smooth.

**STEP 2** Stud- mount the accelerometer to the appropriate magnet according to the guidelines set forth in Steps 2 and 3 of the Standard Stud Mount Procedure.

**STEP 3** Prepare a smooth, flat mounting surface. A minimum surface finish of 63 µin [0.0016 mm] generally works best. After cleaning the surface and checking for burrs, wipe on a light film of silicone grease, machine oil or similar-type coupling fluid.

**STEP 4** Mount the magnet/sensor assembly to the prepared test surface by gently ‘rocking” or “sliding” it into place.

**Note:** Magnetically mounting accelerometers carelessly as the potential to generate very high ( and very damaging) g levels. To prevent damage, install the assembly gently. If unsure, please contact the factory for assistance.

## Warning 1 – ESD sensitivity

***The power supply/signal conditioner should not be opened by anyone other than qualified service personnel.*** This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the safety precautions required to avoid injury.

## Warning 2 – ESD sensitivity

This equipment is designed with user safety in mind; however, the protection provided by the equipment may be impaired if the equipment is used in a manner not specified by PCB Piezotronics, Inc.

## Caution 1 – ESD sensitivity

***Cables can kill your equipment.*** High voltage electrostatic discharge (ESD) can damage electrical devices. Similar to a capacitor, a cable can hold a charge caused by triboelectric transfer, such as that which occurs in the following:

- *Laying on and moving across a rug,*
- *Any movement through air,*
- *The action of rolling out a cable, and/or*
- *Contact with a non-grounded person.*

***The solution for product safety:***

- *Connect the cables only with the AC power off.*
- *Temporarily "short" the end of the cable before attaching it to any signal input or output.*

## Caution 2 – ESD sensitivity

***ESD considerations should be made prior to performing any internal adjustments on the equipment.*** Any piece of electronic equipment is vulnerable to ESD when opened for adjustments. Internal adjustments should therefore be done ONLY at an ESD-safe work area. Many products have ESD protection, but the level of protection may be exceeded by extremely high voltage.

## Warranty

IMI instrumentation is warranted against defective material workmanship for 1 year unless otherwise expressly specified. Damage to instruments caused by incorrect power or misapplication, is not covered by warranty. *If there are any questions regarding power, intended application, or general usage, please consult with your local sales contact or distributor.* Batteries or expendable hardware items are not covered by warranty.

## Service

Because of the sophisticated nature of IMI instrumentation, field repair is typically **NOT** recommended and may void any warranty. If factory service is required, return the instrumentation according to the "Return Procedure" stated below. *A repair and/or replacement quotation will be provided prior to servicing at no charge.* Before returning the unit, please consult a factory IMI applications engineer concerning the situation as certain problems can often be corrected with simple on-site procedures.

## Return procedure

*To expedite returned instrumentation, contact a factory IMI applications engineer for RETURN MATERIAL AUTHORIZATION (RMA) NUMBER.* Please have information available such as model and serial number. Also, to insure efficient service, *provide a written description of the symptoms and problems with the equipment to a local sales representative or distributor, or contact IMI if none are located in your area.*

Customers outside the U.S. should consult their local IMI distributor for information on returning equipment. For exceptions, please contact that International Sales department at IMI to request shipping instructions and an RMA. For assistance, please call (716) 684-0003, or fax us at (716) 684-3823. You may also receive assistance via e-mail at **imi@pcb.com** or visit our website at **www.pcb.com**.

## Customer Service

IMI, a division of PCB Piezotronics, guarantees **Total Customer Satisfaction**. If, at any time, for any reason, you are not completely satisfied with any IMI product, IMI will repair, replace or exchange it at no charge. You may also choose to have your purchase price refunded.

IMI offers to all customers, at no charge, 24-hour phone support. This service makes product or application support available to our customers, day or night, seven days a week. When unforeseen problems or emergency situations arise, call the **IMI Hot Line at (716) 684-0003**, and an application specialist will assist you.

| Model Number 646B00 | 4-20 MA OUTPUT ACCELEROMETER | Revision: D<br>ECN #: 50453 |
|---|---|---|

| Performance | ENGLISH | SI | |
|---|---|---|---|
| Measurement Range | 0.0 to 10 g rms | 0.0 to 98.1 m/s² rms | [1] |
| Output | 4-20 mA | 4-20 mA | |
| Frequency Range(± 10 %) | 180 to 60 kcpm | 3 to 1 kHz | [2][3] |
| Broadband Resolution | 0.05 g rms | 0.49 m/s² rms | [4] |
| Non-Linearity | ± 1 % | ± 1 % | |
| **Environmental** | | | |
| Temperature Range | -40 to 185 °F | -40 to 85 °C | |
| Enclosure Rating | IP68 | IP68 | |
| **Electrical** | | | |
| Excitation Voltage | 12 to 30 VDC | 12 to 30 VDC | |
| Load Resistance | 50(Vs-12) Ohm | 50(Vs-12) Ohm | |
| Settling Time(within 2% of value) | < 15 sec | < 15 sec | |
| Electrical Isolation(Case) | > $10^8$ Ohm | > $10^8$ Ohm | |
| **Physical** | | | |
| Size (Hex x Height) | 1.0 in x 2.6 in | 25.4 mm x 66 mm | |
| Weight | 4.7 oz | 131 gm | |
| Mounting Thread | 1/4-28 UNF | No Metric Equivalent | |
| Mounting Torque | 3 to 5 ft-lb | 4 to 7 Nm | |
| Sensing Element | Ceramic | Ceramic | |
| Sensing Geometry | Shear | Shear | |
| Housing Material | Stainless Steel | Stainless Steel | |
| Sealing | Welded Hermetic | Welded Hermetic | |
| Electrical Connector | 2-Pin MIL-C-5015 | 2-Pin MIL-C-5015 | |
| Electrical Connection Position | Top | Top | |
| Electrical Connections(Pin A) | 4-20 mA Pos (+) | 4-20 mA Pos (+) | |
| Electrical Connections(Pin B) | 4-20 mA Neg (-) | 4-20 mA Neg (-) | |

CE[5]

All specifications are at room temperature unless otherwise specified.
In the interest of constant product improvement, we reserve the right to change specifications without notice.
ICP® is a registered trademark of PCB Piezotronics, Inc.

## OPTIONAL VERSIONS

Optional versions have identical specifications and accessories as listed for the standard model except where noted below. More than one option may be used.

**EX** - Hazardous Area Approval- contact factory for specific approvals

| | | |
|---|---|---|
| Hazardous Area Approval | DIV II, CL I, GRPS A-D, ExnL, AExnA, IIC T4 | DIV II, CL I, GRPS A-D, ExnL, AExnA, IIC T4 |
| Hazardous Area Approval | EEx ia IIC T4, -40°C ≤Ta ≤80°C, II 1 G | EEx ia IIC T4, -40°C ≤Ta ≤80°C, II 1 G |
| Hazardous Area Approval | EEx nL IIC T4, -40°C ≤Ta ≤80°C, II 3 G | EEx nL IIC T4, -40°C ≤Ta ≤80°C, II 3 G |
| Hazardous Area Approval | DIV I, CL I, II, III, GRPS A-G, Exia, AExia, IIC T4 | DIV I, CL I, II, III, GRPS A-G, Exia, AExia, IIC T4 |

**M** - Metric Mount
Supplied Accessory: Model M081A61 Mounting Stud 1/4-28 to M6 X 1 (1) replaces Model 081A40

**RV** - Buffered Analog Signal Output - 100 mV/g (±20%)

| | | |
|---|---|---|
| Electrical Connector | 3-Pin MIL-C-5015 | 3-Pin MIL-C-5015 |
| Electrical Connections(Pin A) | 4-20 mA Pos (+) | 4-20 mA Pos (+) |
| Electrical Connections(Pin B) | 4-20 mA Neg/Signal Output Neg | 4-20 mA Neg/Signal Output Neg |
| Electrical Connections(Pin C) | Signal Output Pos | Signal Output Pos |

## NOTES:

[1]Conversion Factor 1g = 9.81 m/s².
[2]Current will fluctuate at frequencies below 5 Hz.
[3]1Hz = 60 cpm (cycles per minute).
[4]Typical.
[5]See PCB Declaration of Conformance PS039 or PS053 for details.

## SUPPLIED ACCESSORIES:

Model 081A40 Mounting Stud (1)
Model ICS-4 NIST-traceable single-axis amplitude response calibration from 0 cpm (0 Hz) to upper 10% frequency for 4 - 20 mA output vibration sensor (1)

| Entered: LK | Engineer: NJF | Sales: MC | Approved: NJF | Spec Number: |
|---|---|---|---|---|
| Date: 02/04/2020 | Date: 02/04/2020 | Date: 02/04/2020 | Date: 02/04/2020 | 27955 |

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**E-Mail: imi@pcb.com**

PCB PIEZOTRONICS INC
A PCB GROUP COMPANY

# ATEX Approved Sensors

Vibration Sensors (4-20mA)

(EX64XB Series)

**English**

This sensor has been approved for Hazardous Locations Directive 94/9/EC, Ex ia IIC T4 and Ex nL IIC T4.
For safe use:

- All applicable local electrical laws must be followed
- The apparatus must only be connected to a certified associated intrinsically safe equipment and this combination must be compatible as regards intrinsic safety rules.
- The electrical parameters of the associated intrinsically safe equipment must not exceed any of the following values:
  - Uo ≤30V, Io≤100mA, Po≤1W
- Ambient operating temperature range:
  - -40°C to +80°C

**Deutsch**

Die Sensoren der o. g. Serie wurden gemäß der EU-Richtlinie 94/9/EC, Ex ia IIC T4 und Ex nL IIC T4 ("Komponenten und Schutzsysteme für explosionsgefährdete Bereiche") zertifiziert.
Für den ordnungsgemäßen und sicheren Betrieb:

- müssen alle gültigen Gesetze und Vorschriften eingehalten werden
- darf der Transmitter ausschließlich an passendem, zugelassenem, eigensicherem Equipment angeschlossen werden und diese Kombination muss den Bestimmungen des Explosionsschutzes entsprechen
- dürfen die elektrischen Parameter des zugehörigen eigensicheren Equipments folgende Werte nicht überschreiten:
  - Uo ≤30V, Io≤100mA, Po≤1W
- Umgebungstemperaturbereich:
  - -40°C to +80°C

**Français**

Ce détecteur a été approuvé pour les Emplacements Hasardeux Directif 94/9/EC, Ex ia IIC T4 et Ex nL IIC T4.
Pour l'usage sûr :

- Toutes lois électriques, locales et applicables doivent être suivies
- L'appareil doit être seulement connecté à un équipement intrinsèquement sûr, associé et certifié et cette combinaison doit être compatible comme considère des mesures de sécurité intrinsèques.
- Les paramètres électriques de l'équipement intrinsèquement sûr associé ne doivent pas dépasser n'importe quel des valeurs suivantes :
  - Uo ≤30V, Io≤100mA, Po≤1W
- La gamme de température d'opération Ambiante :
  - -40°C to +80°C

**Italiano**

Questo sensore è stato approvato per le Posizioni Pericolose Direttivo 94/9/EC, Ex ia IIC T4 e Ex nL IIC T4.
Per l'uso sicuro:

- Tutte le leggi applicabili, locali elettriche devono essere seguite
- Il dispositivo deve essere soltanto collegato a un'apparecchiatura certificata, associata intrinsecamente sicura e questa combinazione deve essere compatibile considera come le regole di sicurezza intrinseche.
- I parametri elettrici dell'apparecchiatura associata intrinsecamente sicura non devono eccedere qualunque dei valori seguenti:
  - Uo ≤30V, Io≤100mA, Po≤1W
- la gamma di temperatura di funzionamento di Ambiente:
  - -40°C to +80°C

**Español**

Este sensor se ha aprobado para Ubicaciones Peligrosas Directivas 94/9/EC, Ex ia IIC T4 y Ex nL IIC T4.
Para el uso seguro:

- Todas leyes eléctricas, locales y aplicables se deben seguir
- El aparato debe sólo sea conectado a un equipo intrínsecamente seguro, asociado y certificado y esta combinación debe sercompatible considera como las reglas intrínsecas de la seguridad.
- Los parámetros eléctricos del equipo intrínsecamente seguro asociado no deben exceder cualquiera de los valores siguientes:
  - Uo ≤30V, Io≤100mA, Po≤1W
- Ell Ambiente que opera la gama de la temperatura:
  - -40°C to +80°C

**Русский**
Директивой 94/9/EC настоящий датчик разрешен к применению по категориям, Ex ia IIC T4 и Ex nL IIC T4.
Для безопасного использования:
- все правила электробезопасности дожны быть выполнены.
- датчик может быть подключен только к сертифицированному оборудованию и соединение должно соответствовать правилам электробезопасности.
- контактирующее с датчиком оборудование не дожно выходить за следующие предельные значения:
  - Uo ≤30V, Io≤100mA, Po≤1W
- Диапазон рабочих температур:
  - -40°C to +80°C

**Norsk**
Denne sensoren godkjenner for Farlige Plasseringer Direktiv 94/9/EC, Ex ia IIC T4 og Ex nL IIC T4.
For sikker bruk:
- Alle anvendelige lokale elektriske lover fulgt
- Apparatet koplet bare til et sertifisert tilknyttet indre sikkert utstyr og denne kombinasjonen er forenelig med hensyn til indre sikkerhetsregel.
- De elektriske parametrene av det tilknyttete indre sikkere utstyret overskrider ikke noe av de følgende verdiene:
  - Uo ≤30V, Io≤100mA, Po≤1W
- Omgivende betjeningsav temperaturrekkevidde:
  - -40°C to +80°C

**Nederlands**
Deze sensor is voor Gevaarlijke Locaties Leidinggevende 94/9/EC, Ex ia IIC T4 en Ex nL IIC T4 goedgekeurd worden.
Voor veilige gebruik:
- Alle toepasbare plaatselijke elektrische wetten moeten gevolgd worden
- Het apparaat moet enkel aan een gecertificeerde geassocieerde intrinsiek veilige uitrusting aangesloten worden en deze combinatie moet compatibel zijn als intrinsieke veiligheidsregels beschouwt.
- De elektrische parameters van de geassocieerde intrinsiek veilige uitrusting moeten enig van de volgende waarde niet overschrijden:
  - Uo ≤30V, Io≤100mA, Po≤1W
- Het omgevend bediening temperatuur bereik:
  - -40°C to +80°C

**Polski**
Ten sensor ma był uznany pod kątem Hazardowy Rozmieszczenia Kierujący 94/9/EC Ex ia IIC T4 i Ex nL IIC T4.
Pod kątem kasa używać :
- Wszystko stosowny miejscowy elektryczny Ławsk musi być nastąpił
- Ten aparat musi tylko być połączony wobec pewien poświadczony złączony wewnętrznie kasa wyposażenie i ten kombinacja musi być zgodny z co się tyczy wewnętrzny przepisy bezpieczeństwa.
- Ten elektryczny parametry od ten złączony wewnętrznie kasa wyposażenie musi nie przewyższać wszelki od ten kolejne wartość :
  - Uo ≤30V, Io≤100mA, Po≤1W
- Otaczający pracy temperatura rząd :
  - -40°C to +80°C

**Português**
Este sensor foi aprovado para a Diretiva 94/9/EC de Posições Arriscada, Ex ia IIC T4 e Ex nL IIC T4.
Para uso seguro:
- Todas as leis elétricas locais aplicáveis devem ser seguidas
- O aparelho só deve ser unido a um equipamento associado intrinsecamente seguro certificado e esta combinação deve ser compatível quanto a regras de segurança intrínsecas.
- Os parâmetros elétricos do equipamento associado intrinsecamente seguro não devem exceder nenhum dos valores seguintes:
  - Uo ≤30V, Io≤100mA, Po≤1W
- Variedade de temperatura operacional ambiente:
  - -40°C to +80°C

**Svensk**
Den här sensoren er blitt gillat för Riskabel Lokaliseringarna Direktiv 94/9/ EC Ex ia IIC T4 och Ex nL IIC T4.
För kassaskåp använda :
- All användbar lokal elektrisk lag måste bli följde efter
- Apparaten måste bara bli kopplet till en attesterat förbundet intrinsically kassaskåp utrustande och den här kombination måste bli förenlig vad angår intrinsic säkerhet reglerna.
- Den elektrisk paramenterna om förbundet intrinsically kassaskåp utrustande må inte överskrida någon av den följande värden :
  - Uo ≤30V, Io≤100mA, Po≤1W
- Omgivande opera- temperatur ställa i rad :
  - -40°C to +80°C

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27534

| REVISIONS | | | | | |
|---|---|---|---|---|---|
| ZONE | REV | DESCRIPTION | ECN | DATE | APP'D |
| | NR | RELEASED TO DRAFTING | | 10/7/05 | DM 10/05 |
| | A | UPDATE TO NEW STANDARD | 26680 | 6/21/07 | DM 6/07 |

**Schedule Drawing**

No modifications permitted without reference to the Notified Body

NO CHANGES WITHOUT CSA/LCIE APPROVAL

6 SHIELDS TO BE EARTHED AT BARRIER END.

5 THE INSTALLER SHALL INSURE THAT THE TRANSDUCER MOUNTING STRUCTURE IS AT THE SAME GROUNDING POTENTIAL AS THE BARRIER GROUND. TOTAL EARTH LOOP IMPEDANCE SHALL BE LESS THAN ONE OHM.

4 BARRIER WILL BE MOUNTED IN AN ENCLOSURE THE SUITABILITY OF WHICH WILL BE DETERMINED BY LOCAL AUTHORITIES.

3 ENTITY APPLICATION:

| Barrier | | I.S. Apparatus |
|---|---|---|
| Voc/Uo | ≤ | $V_{MAX}$ /Ui |
| Isc/Io | ≤ | $I_{MAX}$ /Ii |
| Ca/Co | > | Ci + $C_{CABLE}$ |
| La/Lo | > | Li + $L_{CABLE}$ |
| Po | ≤ | Pi (CENELEC ONLY) |

BARRIERS WITHIN THE SPECIFIED LIMITATIONS ARE PERMITTED.

ENTITY PARAMETERS (EX64XB1X–XXXXX, EX64XB6X–XXXXX):
Ui = 30 V
Ii = 100 mA
Pi = 1 W
Ci = 61 nF
Li = 306 uH

ENTITY PARAMETERS (EX64XB0X):
Ui = 30 V
Ii = 100 mA
Pi = 1 W
Ci = 0 nF
Li = 1.06 uH

CERTIFIED BY THE APPROPRIATE APPROVAL AUTHORITY FOR CONNECTION TO THE FOLLOWING AREAS:
ZONE 0
Exia IIC
AExia IIC
DIV 1
CLASS I, GROUPS A,B,C,D
CLASS II, GROUPS E,F,G
CLASS III
ZONE 0
Exia IIC

2. WIRING (EX64XB1X–XXXXX, EX64XB6X–XXXXX):
2 CONDUCTOR CABLE
.25 INCH (6.4MM) X 1000 FEET (305 METERS) MAX.
RED/PIN A (POWER)
BLUE/PIN B (RETURN)

THE –XXXX SPECIFIES THE CABLE LENGTH AND TERMINATION TYPE FOR METRIC LENGTHS, CABLE DESIGNATION IS MXXXXX

1. PART NO IS EX64XB0X OR EX64XB1X–XXXXX OR EX64XB6X–XXXXX

NOTES: UNLESS OTHERWISE SPECIFIED.

IMI
3425 Walden Av.
Depew, New York 14043
Certifié conforme à l'exécution
Signature: Nick Jordan
Date: 6/21/07

| UNLESS OTHERWISE SPECIFIED |
|---|
| DIMENSIONS ARE IN INCHES |
| DECIMALS X ± .05 |
| XX ± .01 |
| XXX ± .005 |
| ANGLES ±2 DEGREES |
| FILLETS AND RADII .003 – .005 |
| HEX DIMENSIONS ARE: |
| < 0.5 +.000 / –.003 |
| > 0.5 +.000 / –.005 |
| INTERNAL THREAD DEPTH MIN |
| REMOVE ALL BURRS |
| SHARP = R.000 – R.003 |
| DD016 REV. D 01/17/2003 |

CAUTION
ELECTROSTATIC DISCHARGE SENSITIVE

| | | | | | |
|---|---|---|---|---|---|
| DRAWN | MDF | 6/21/07 | MFG | JR | 6/21/07 |
| CHK'D | DM | 6/25/07 | ENGR | MJI | 6/21/07 |
| APP'D | NF | 6/21/07 | | | |

TITLE
CSA/LCIE APPROVAL
EX64BXX
INTERCONNECTION

PCB PIEZOTRONICS
3425 WALDEN AVE. DEPEW, NY 14043
(716) 684–0001 EMAIL: SALES@PCB.COM

| CODE IDENT. NO. | DWG. NO. |
|---|---|
| 52681 | 27534 |
| SCALE: NONE | SHEET 1 OF 2 |

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27534

| REVISIONS | | | | | |
|---|---|---|---|---|---|
| ZONE | REV | DESCRIPTION | ECN | DATE | APP'D |
| | | ---SEE SHEET ONE--- | | | OM 6/07 |

**Schedule Drawing**

No modifications permitted without reference to the Notified Body

NO CHANGES WITHOUT CSA/LCIE APPROVAL

7 ENTITY PARAMETERS (EX64XB1X–XXXXX, EX64XB6X–XXXXX):
Ui = 30 V
Ii = 100 mA
Pi = 1 W
Ci = 61 nF
Li = 306 uH

ENTITY PARAMETERS (EX64XB0X) :
Ui = 30 V
Ii = 100 mA
Pi = 1 W
Ci = 0
Li = 1.06 uH

6. FOR CANADIAN, ZONE 2 AND DIVISION 2 INSTALLATION, POWER SUPPLY MUST BE CSA CERTIFIED WITH ENTITY OUTPUT PARAMETERS ( SEE PAGE 1 NOTE 3 FOR POWER SUPPLY OUTPUT PARAMETERS ).
FOR U.S., DIVISION 2 AND ZONE 2 INSTALLATION, POWER SUPPLY MUST BE APPROVED BY NRTL WITH ENTITY OUTPUT PARAMETERS ( SEE PAGE 1 NOTE 3 FOR POWER SUPPLY OUTPUT PARAMETERS ).

5. MAXIMUM VOLTAGE OF POWER SUPPLY/SIGNAL CONDITIONER NEVER TO EXCEED 250 Vrms.

4. FOR GUIDANCE ON CANADIAN INSTALLATION, REFER TO CEC PART I.
FOR GUIDANCE ON U.S. INSTALLATION, INSTALL IN ACCORDANCE WITH NEC [ANSI/NFPA70] AND [ANSI/ISA RP12.6].

3. CERTIFIED BY THE APPROPRIATE APPROVAL AUTHORITY FOR CONNECTION TO THE FOLLOWING AREAS:
ZONE 2
ExnL IIC
AExnA IIC
DIV 2
CLASS I, GROUPS A,B,C,D
ZONE 2
ExnL IIC

2. WIRING (EX64XB1X–XXXXX, EX64XB6X–XXXXX):
2 CONDUCTOR CABLE
,25 INCH(6.4MM) X 1000 FEET (305 METERS) MAX.
RED/PIN A (POWER)
BLUE/PIN B (RETURN)

THE –XXXXX SPECIFIES THE CABLE LENGHT AND TERMINATION TYPE FOR METRIC LENGHTS, CABLE DESIGNATION IS MXXXXX

1. PART NO. IS EX64XB0X OR EX64XB1X–XXXXX OR EX64XB6X–XXXXX

NOTES: UNLESS OTHERWISE SPECIFIED.

IMI
3-125 Walden Av.
Depew, New York 14043
Certifié conforme à l'exécution
Signature: Date: 6/27/07

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
DECIMALS X ± .05
XX ± .01
XXX ± .005
ANGLES ±2 DEGREES
FILLETS AND RADII .003 – .005
HEX DIMENSIONS ARE:
< 0.5 +.000 / –.003
> 0.5 +.000 / –.005
INTERNAL THREAD DEPTH MIN
REMOVE ALL BURRS
SHARP = R.000 – R.003
DD016 REV. D 01/17/2003

CAUTION
ELECTROSTATIC DISCHARGE SENSITIVE

| | | | | | |
|---|---|---|---|---|---|
| DRAWN | mDF | 6/21/07 | MFG | JR | 6/21/07 |
| CHK'D | OM | 6/25/07 | ENGR | MJI | 6/21/07 |
| APP'D | NF | 6/21/07 | | | |

TITLE
CSA/LCIE APPROVAL
EX64BXX
INTERCONNECTION

PCB PIEZOTRONICS
3425 WALDEN AVE. DEPEW, NY 14043
(716) 684-0001 EMAIL: SALES@PCB.COM

CODE IDENT. NO. 52681
DWG. NO. 27534
SCALE: NONE
SHEET 2 OF 2

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27725

| REVISIONS | | | |
|---|---|---|---|
| REV | DESCRIPTION | ECN | APP'D |
| NR | RELEASED TO DRAFTING | | DM 9/04 |
| A | CHANGED "MILL" TO "MIL" | 26998 | ECB 8/07 |

# TOP VIEW OF CONNECTOR

| MODEL | DESCRIPTION |
|---|---|
| 646B02 | 0-10 g, 3Hz-10kHz |
| 646B01 | 0-10 g, 3Hz-5kHz |
| 646B00 | 0-10 g, 3Hz-1kHz |
| 645B02 | 0-5 g, 3Hz-10kHz |
| 645B01 | 0-5 g, 3Hz-5kHz |
| 645B00 | 0-5 g, 3Hz-1kHz |

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:

| DIMENSIONS IN INCHES | DIMENSIONS IN MILLIMETERS [ IN BRACKETS ] |
|---|---|
| DECIMALS XX ± .03 | DECIMALS X ± 0.8 |
| XXX ± .010 | XX ± 0.25 |
| ANGLES ± 2 DEGREES | ANGLES ± 2 DEGREES |
| FILLETS AND RADII .003 - .005 | FILLETS AND RADII [ 0.07 - 0.13 ] |

| | | | | | |
|---|---|---|---|---|---|
| DRAWN | MDF | 8/1/07 | MFG | JR | 8/1/07 |
| CHK'D | ECB | 8/07 | ENGR | MJI | 8/1/07 |
| APP'D | MJT | 8/1/07 | SALES | JJ | 8/1/07 |

TITLE

OUTLINE DRAWING
MODEL 645B0X, M, 646B0X, M
4-20 mA ACCELERATION TRANSMITTER

PCB PIEZOTRONICS INC
3425 WALDEN AVE. DEPEW, NY 14043
(716) 684-0001 E-MAIL: sales@pcb.com

CODE IDENT. NO. 52681 | DWG. NO. 27725

SCALE: FULL | SHEET 1 OF 1

# 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: Issue 0 (2018-07-11) |
| Status: | **Current** | Issue No: 1 | |
| Date of Issue: | 2023-02-28 | | |
| Applicant: | **PCB Piezotronics Inc.**<br>3245 Walden Avenue<br>Depew, New York 14043<br>**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<br>Ex ec IIC T4 Gc<br>*(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
L C I E

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

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
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**



Date of issue: 2023-02-28

Issue No: 1

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
FR/LCIE/ExTR17.0041/00
FR/LCIE/ExTR22.0086/00
US/ETL/ExTR22.0037/00

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



**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

## 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 |

***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

## 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.

# IECEx Certificate of Conformity

## 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)*

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:* 2018-07-11

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
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**



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**<br>Edition:6.0 | Explosive atmospheres - Part 0: General requirements |
| **IEC 60079-11 : 2011**<br>Edition:6.0 | Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i" |
| **IEC 60079-15 : 2010**<br>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

## 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:

EXTO640B3X
EXTO641B3X
EXTO645B3X
EXTO646B3X

EXTO640B1X
EXTO641B1X
EXTO645B1X
EXTO646B1X

EXTO640B6X
EXTO641B6X
EXTO645B6X
EXTO646B6X

EXTO642A3X
EXTO643A3X
EXTO647A3X
EXTO648A3X

EXTO642A1X
EXTO643A1X
EXTO647A1X
EXTO648A1X

EXTO642A6X
EXTO643A6X
EXTO647A6X
EXTO648A6X


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CERT-ATEX-FORM 14 Rev. 01

# ATTESTATION D'EXAMEN DE TYPE
# *TYPE EXAMINATION CERTIFICATE*

1 **Version : 03** **LCIE 05 ATEX 6155 X** **Issue : 03**

**Directive 2014/34/UE**

2 Appareil ou Système de Protection destiné à être utilisé en Atmosphères Explosibles

**Directive 2014/34/EU**

Equipment or Protective System Intended for use in Potentially Explosive Atmospheres

3 Produit :
**Capteurs de vibration**

Product :
**Vibration sensors**

**Type: EX(M)64*****/M**, EXTO(M)64*****/M**, EXRV(M)64*****/M****

4 Fabricant : Manufacturer :

**PCB Piezotronics Inc.**

5 Adresse : Address :

3425 Walden Avenue
Depew, New York 14043
États-Unis d'Amérique

6 Ce produit et ses variantes éventuelles acceptées sont décrits dans l'annexe de la présente attestation et dans les documents descriptifs cités en référence.

This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

7 Le LCIE certifie que ce produit est conforme aux Exigences Essentielles de Sécurité et de Santé pour la conception et la construction de produits destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la Directive.
Les résultats des vérifications et essais figurent dans le(s) rapport(s) confidentiel(s) N° :

LCIE certifies that product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
The examination and test results are recorded in confidential report(s) N°:

140596-682759 ; 162903-740871

8 Le respect des Exigences Essentielles de Sécurité et de Santé est assuré par la conformité à :

Compliance with the Essential Health and Safety Requirements has been assured by compliance with :

EN IEC 60079-0:2018
EN 60079-7:2015 + A1:2018

9 Le signe « X » lorsqu'il est placé à la suite du numéro de l'attestation, indique que cet appareil est soumis aux conditions particulières d'utilisation, mentionnées dans l'annexe de cette attestation.

If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

10 Cette Attestation d'Examen de Type concerne uniquement la conception et la construction du produit spécifié.
Des exigences supplémentaires de la directive sont applicables pour la fabrication et la fourniture du produit. Ces dernières ne sont pas couvertes par la présente attestation.

This Type Examination Certificate relates only to the design and construction of the specified product.
Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

11 Le marquage du produit est mentionné dans l'annexe de cette attestation.

The marking of the product is specified in the schedule to this certificate.

Fontenay-aux-Roses, le 28 février 2023

Responsable de Certification
Certification Officer
Julien Gauthier

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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## 12 DESCRIPTION DU PRODUIT

Ces capteurs de vibration ont un boîtier en acier inoxydable intégrant une électronique, complètement encapsulée dans un composé d'empotage, associée à un élément sensible (cristal piézoélectrique avec une valeur de capacité ≤ 700 pF).
La construction du boîtier métallique du capteur est entièrement soudée. La forme du boîtier diffère selon le modèle du capteur.

Les capteurs sont équipés d'un connecteur intégré ou d'un câble intégré (non armé ou armé). La longueur maximale du câble est de 305 m.
Le raccordement électrique peut également se faire via un bornier ou des conducteurs volants selon le modèle de capteur. Dans ce cas, le capteur de vibration est vissé, grâce à un filetage externe 1" NPT, dans un coude de conduit Y-3 (100-7094-90) de Killark procurant un degré de protection IP54.
Les capteurs de vibration fournissent en sortie un courant de 4-20 mA lorsqu'ils sont soumis à un mouvement mécanique.
Les produits avec option TO incluent une sortie 4-20mA supplémentaire indépendante pour la mesure de la température. Le capteur de température intégré surveille l'environnement interne au boîtier du capteur.
Les produits avec option RV fournissent en sortie une tension de 0-2,5 V c.a. et 2,5 V c.c. correspondant à la vibration brute de l'accéléromètre intégré.

## DESCRIPTION OF PRODUCT

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 model of the sensor.

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 include a 0-2.5 V a.c. and 2.5 V d.c. output that corresponds to raw vibration from the imbedded accelerometer.

| Type de l'équipement<br>*Type of the equipment* | Configuration |
|---|---|
| EX(M)64**0**,<br>EX(M)64**9** | Avec connecteur intégré<br>*with integral connector* |
| EX(M)64**1**/M**,<br>EX(M)64**6**/M** | Avec cable intégré<br>*with integral cable* |
| EXTO(M)64**3**,<br>EXTO(M)64**9** | Avec sortie température et connecteur<br>*with Temperature Output and connector* |
| EXTO(M)64**1**/M**,<br>EXTO(M)64**6**/M** | Avec sortie température et câble intégré<br>*with Temperature Output and integral cable* |
| EXRV(M)64**0**,<br>EXRV(M)64**9** | Avec sortie vibration brute et connecteur<br>*with Raw Vibration Output and connector* |
| EXRV(M)64**1**/M**,<br>EXRV(M)64**6**/M** | Avec sortie vibration brute et câble intégré<br>*with Raw Vibration Output and integral cable* |
| EX(M)64**7**,<br>EX(M)64**8** | Avec conducteurs volants ou bornier + coude de conduit<br>*with flying leads or terminal block + capped conduit elbow* |
| EXRV(M)64**7**<br>EXRV(M)64**8** | Avec sortie vibration brute et conducteurs volants ou bornier + coude de conduit<br>*with Raw Vibration Output and flying leads or terminal block + capped conduit elbow* |

## CARACTERISTIQUES

Tension maximum d'entrée $U_{max}$ : 30 V d.c.
Puissance maximale $P_{max}$ : 1 W

## RATINGS

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

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**DETAIL DE LA GAMME** | **RANGE DETAILS**

| EX | * | 64 | * | * | * | * | * | / | M | * | * |
|---|---|---|---|---|---|---|---|---|---|---|---|

Deux caractères optionnels pour désigner le type de terminaison du câble

Trois à six chiffres optionnels utilisant xxx-xx pour désigner la longueur en pieds-pouces ou mètres-centimètres avec M dans la colonne précédente

Longueur de câble métrique en option

Modificateur de longueur de câble en option

Pour M uniquement ; Un nombre (01 à 999) qui désigne un numéro de modèle spécial avec une sensibilité, une plage de mesure, une plage de fréquence, une longueur de câble et une terminaison de câble personnalisés. Peut inclure d'ajouter le logo du client et le numéro de modèle en plus du modèle et du logo PCB.

Un chiffre ou une lettre 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, M qui désigne la plage de mesure et le filtrage
M = Spécial client

Un chiffre 0, 1, 3, 6, 7, 8 ou 9 qui désigne le type de connecteur
0 = Pour connecteur MIL-C-5015 à 2 broches ou MIL-C-5015 à 3 broches si option RV
1 = Pour câble intégral gainé en polyuréthane
3 = Pour connecteur MIL-C-26482 à 4 broches pour option TO
6 = Câble intégral armé gainé en polyuréthane
7 = Bornier pour capteur version coude coiffé de conduit
8 = Conducteurs volants pour capteur version coude coiffé de conduit
9 = Pour connecteur M12 4/5 broches

Une lettre de A à Z pour indiquer le niveau de révision du modèle

Un chiffre 0, 1, 2, 3, 4, 5, 6, 7 ou 8 qui indique le type de capteur et la plage de mesure de sortie
0 = Pour les configurations Sortie par le haut ou Coude de conduit avec plage de mesure en in/sec crête
1 = Pour les configurations Sortie par le haut ou Coude de conduit avec plage de mesure en in/sec valeur efficace
2 = Pour les configurations Sortie sur le côté avec plage de mesure en in/sec crête
3 = Pour les configurations Sortie sur le côté avec plage de mesure en in/sec valeur efficace
4 = Réservé pour un futur emplacement de sortie et plage de mesure
5 = Pour les configurations Sortie par le haut ou Coude de conduit avec plage de mesure de 0 à 5 g valeur efficace
6 = Pour les configurations Sortie par le haut ou Coude de conduit avec plage de mesure de 0 à 10 g valeur efficace
7 = Pour les configurations Sortie sur le côté avec plage de mesure de 0 à 5 g valeur efficace
8 = Pour les configurations Sortie sur le côté avec plage de mesure de 0 à 10 g valeur efficace

Famille de capteurs de la série 64

Une ou plusieurs options de capteur
M = Monture métrique
TO = Sortie Température
RV = Sortie Vibration brute

Type de produit :
EX = ATEX/IECEx Produit

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**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

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## MARQUAGE

Le marquage du produit doit comprendre :

Marquage complet :
PCB Piezotronics Inc. ou IMI Sensors ou IMI
Adresse : ...
Type : ... (1)
Numéro de fabrication : ...
Année de fabrication : ...
Ex II 3 G
Ex ec IIC T4 Gc
LCIE 05 ATEX 6155 X

-40 °C ≤ $T_{amb}$ ≤ +80 °C

AVERTISSEMENT – NE PAS CONNECTER OU DECONNECTER SOUS TENSION

Marquage réduit :
PCB Piezotronics Inc. ou IMI Sensors ou IMI
Type : ... (1)
N° de fabrication : ...
Année de fabrication : ...
Ex II 3 G
Ex ec IIC T4 Gc
$T_a$ = 80 °C
LCIE 05 ATEX 6155 X

(1) Voir le détail de la gamme ci-dessus

L'appareil doit également comporter le marquage normalement prévu par les normes de construction qui le concernent sous la responsabilité du fabricant.

## 13 CONDITIONS PARTICULIERES D'UTILISATION

a. Gamme de température ambiante de fonctionnement : -40 °C à +80 °C.

b. L'appareil doit uniquement être connecté à une source externe délivrant au maximum une tension de 30 V d.c. et une puissance de 1 Watt.

c. La protection contre les transitoires doit être fournie à un niveau défini ne dépassant pas 140 % de la valeur de crête de la tension assignée aux bornes d'alimentation vers l'appareil.

d. Le montage du capteur dans une installation doit être effectué de telle sorte que le corps métallique du capteur et le blindage du câble soient reliés de manière fiable à la terre du système.

## MARKING

The marking of the product shall include the following :

Full marking:
PCB Piezotronics Inc. or IMI Sensors or IMI
Address : ...
Type : ... (1)
Serial number : ...
Year of construction : ...
Ex II 3 G
Ex ec IIC T4 Gc
LCIE 05 ATEX 6155 X

-40 °C ≤ $T_{amb}$ ≤ +80 °C

WARNING – DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED

Reduced marking:
PCB Piezotronics Inc. or IMI Sensors or IMI
Type : ... (1)
Serial number : ...
Year of construction : ...
Ex II 3 G
Ex ec IIC T4 Gc
$T_a$ = 80 °C
LCIE 05 ATEX 6155 X

(1) See the Range Details above

The equipment shall also bear the usual marking required by the product standards applying to such equipment under the manufacturer responsibility.

## SPECIFIC CONDITIONS OF USE

Ambient operating temperature range:
-40 °C up to +80 °C.

The transducer shall be connected to an external power supply delivering a maximum of 30 V d.c. and 1 W.

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 device.

The mounting of the sensor in an installation must be carried out in such a way that the sensor metallic body and cable shield are reliably connected to the system earth.

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CERT-ATEX-FORM 05 Rev. 05

e. Pour les capteurs avec connecteur intégré :
Le connecteur mâle ou femelle homologue fourni par l'utilisateur final doit être conforme à toutes les clauses applicables des normes EN 60079-0 et EN 60079-7. Un degré de protection IP54 minimum selon la norme IEC 60079-0 doit être assuré.
Le connecteur homologue ne doit pas être connecté ou déconnecté sous tension.

For sensor with integral connector:
The mating connector provided by the end user shall be in accordance with all applicable clauses of EN 60079-0 and EN 60079-7 for a zone 2 application. A minimum degree of protection IP54 according to EN 60079-0 shall be ensured.

The mating connector shall not be connected or disconnected when energized.

f. Pour les capteurs avec conducteurs volants :
Les conducteurs volants doivent être convenablement protégés contre les chocs et doivent être connectés dans une enveloppe dûment certifiée ou dans une zone sûre. L'installation doit garantir qu'aucune force de traction ne sera appliquée aux conducteurs.

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.

g. Pour les capteurs avec coude de conduit:
L'utilisateur devra utiliser un dispositif d'entrée certifié « Ex e » à l'entrée du coude tout en respectant les exigences d'installation de la norme EN 60079-14.
Déconnecter le capteur du circuit d'alimentation avant d'ouvrir le coude de conduit.
Le démontage du capteur de son coude de conduit n'est pas autorisé.

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 EN 60079-14.
Disconnect the device from supply circuit before opening the capped conduit elbow.
The disassembling of the sensor from its capped elbow is not allowed.

h. AVERTISSEMENT – NE PAS CONNECTER OU DECONNECTER SOUS TENSION

WARNING – DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED

i. L'équipement doit être connecté conformément aux instructions du fabricant.

The equipment must be connected according to the instructions of the manufacturer.

## 14 EXIGENCES ESSENTIELLES DE SANTE ET DE SECURITE

Couvertes par les normes listées au point 8.

## ESSENTIAL HEALTH AND SAFETY REQUIREMENTS

Covered by standards listed at 8.

## 15 DOCUMENTS DESCRIPTIFS

## DESCRIPTIVE DOCUMENTS

| N° | Description | Reference | Rev. | Date | Page(s) |
|---|---|---|---|---|---|
| 1. | Technical file | 64777 | A | 2023-01-26 | 49 |
| 2. | Instructions For Use | 32836 | -- | -- | -- |

## 16 INFORMATIONS COMPLEMENTAIRES

**Essais individuels**

Conformément au paragraphe 7.1 de la norme EN 60079-7, chaque produit fabriqué doit être soumis à un essai de rigidité diélectrique à 500 V c.a. pendant 1 minute. Alternativement, le test peut être effectué à 600 V c.a. pendant 100 ms. Aucun claquage ne doit se produire.

## ADDITIONAL INFORMATIONS

**Routine tests**

In accordance with clause 7.1 of standard EN 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.

## 17 DETAILS DES MODIFICATIONS DE L'ATTESTATION

Version 00 : Version initiale.
2005-12-07

## DETAILS OF CERTIFICATE CHANGES

Issue 00: Initial issue.

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Version 01 : 2007-08-02

- Mise à jour normative selon les normes EN 60079-0:2006 et EN 60079-15:2005.

Version 02 : 2018-07-11

- Mise à jour normative selon les normes EN 60079-0:2012 + A11:2013 et EN 60079-15:2010.
- Distinction entre le nom du fabricant (PCB Piezotronics Inc.) et le nom de la marque commerciale (IMI Sensors ou IMI).
- Mise à jour de la nomenclature des modèles.

Version 03 :

- Mise à jour normative selon les normes EN IEC 60079-0:2018 et EN 60079-7:2015 + A1:2018.
- Mise à jour de la désignation du type pour notamment introduire les capteurs « Modifiés » (M) sur demande spéciale du client (aucun impact sur les modes de protection).
- Mise à jour des conditions particulières d'utilisation.

Issue 01:

- Normative update according to EN 60079-0:2006 and EN 60079-15:2005 standards.

Issue 02:

- Normative update according to EN 60079-0:2012+A11:2013 and EN 60079-15:2010 standards.
- Distinction between the name of the manufacturer (PCB Piezotronics Inc.) and the trademark (IMI Sensors or IMI).
- Update of the nomenclature of the models.

Issue 03:

- Normative update according to EN IEC 60079-0:2018 and EN 60079-7:2015 + A1:2018.
- Update of the type designation to notably introduce "Modified" sensors (M) for customer special request (no impact on the types of protection).
- Update of Specific Conditions of Use.

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# ATTESTATION D'EXAMEN UE DE TYPE
# *EU TYPE EXAMINATION CERTIFICATE*

1 **Version : 02** **LCIE 05 ATEX 6154 X** **Issue : 02**

| | | |
|---|---|---|
| | **Directive 2014/34/UE** | **Directive 2014/34/EU** |
| 2 | Appareil ou Système de Protection destiné à être utilisé en Atmosphères Explosibles | Equipment or Protective System Intended for use in Potentially Explosive Atmospheres |
| 3 | Produit :<br>**Transmetteurs de vibration** | Product :<br>**Vibration transmitters** |

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

| | | |
|---|---|---|
| 4 | Fabricant : | Manufacturer : |
| | **PCB Piezotronics Inc.** | |
| 5 | Adresse : | Address : |
| | 3425 Walden Avenue<br>DEPEW, NY 14043<br>UNITED STATES of AMERICA | |
| 6 | Ce produit et ses variantes éventuelles acceptées sont décrits dans l'annexe de la présente attestation et dans les documents descriptifs cités en référence. | This product any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to. |
| 7 | Le LCIE, Organisme Notifié sous la référence 0081 conformément à l'article 17 de la directive 2014/34/UE du Parlement européen et du Conseil du 26 février 2014, certifie que ce produit est conforme aux Exigences Essentielles de Sécurité et de Santé pour la conception et la construction de produits destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la Directive.<br>Les résultats des vérifications et essais figurent dans le(s) rapport(s) confidentiel(s) N° : | LCIE, Notified Body number 0081 in accordance with article 17 of the Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014 certifies that product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive.<br>The examination and test results are recorded in confidential report(s) N°: |
| | 140596-682756 | |
| 8 | Le respect des Exigences Essentielles de Sécurité et de Santé est assuré par la conformité à : | Compliance with the Essential Health and Safety Requirements has been assured by compliance with : |
| | EN 60079-0:2012+A11:2013,<br>EN 60079-11:2012 | |
| 9 | Le signe « X » lorsqu'il est placé à la suite du numéro de l'attestation, indique que cet appareil est soumis aux conditions particulières d'utilisation, mentionnées dans l'annexe de cette attestation. | If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate. |
| 10 | Cette Attestation d'Examen UE de Type concerne uniquement la conception et la construction du poduit spécifié.<br>Des exigences supplémentaires de la directive sont applicables pour la fabrication et la fourniture du produit. Ces dernières ne sont pas couvertes par la présente attestation. | This EU Type Examination Certificate relates only to the design and construction of the specified product.<br>Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate. |
| 11 | Le marquage du produit est mentionné dans l'annexe de cette attestation. | The marking of the product is specified in the schedule to this certificate. |

Fontenay-aux-Roses, le 11 juillet 2018

Responsable de Certification
Certification Officer
Julien Gauthier

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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92260 Fontenay-aux-Roses
FRANCE

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## 12 DESCRIPTION DU PRODUIT

L'appareil est un transmetteur de vibration intégrant un cristal piézoélectrique, un traitement électronique du signal et un connecteur ou un câble intégré ou des fils volants pour l'interface externe. Le signal délivré est un courant de sortie dans la plage 4-20mA correspondant au niveau de vibration.
Les appareils de type EXTO sont équipés d'un capteur de température intégré. L'appareil, type EXRV, délivre une sortie de vibration brute dans la plage 0-2.5VAC

Les boitiers des têtes de capteur sont réalisés en acier inoxydable de plusieurs formes, en fonction du type. Les connexions externes peuvent être effectuées par connecteur ou câble blindé (305 m de longueur maximum) ou fils volants selon le type.

Equipement disponible en version métrique (type avec M)

## DESCRIPTION OF PRODUCT

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 in the range 0-2.5VAC

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 (305m maximum length) or flying leads depending on the type.

Apparatus is available in metric version (type with M).

## DETAIL DE LA GAMME

## RANGE DETAILS

| Types et caractéristiques / *Types and characteristics* |
|---|
| EX(M)64xA0y, EX(M)64xB0y avec connecteur / *with connector.* |
| EX(M)64xA1y, EX(M)64xA6y, EX(M)64xB1y, EX(M)64xB6y avec câble / *with cable.* |
| EXTO(M)64xA3y, EXTO(M)64xB3y avec capteur de température et connecteur / *with temperature sensor and connector.* |
| EXTO(M)64xA1y, EXTO(M)64xA6y, EXTO(M)64xB1y, EXTO(M)64xB6y avec capteur de température et câble / *with temperature sensor and cable.* |
| EXRV(M)64xA0y, EXRV(M)64xB0y avec sortie vibration brute et connecteur / *with raw vibration output and connector.* |
| EXRV(M)64xA1y, EXRV(M)64xA6y, EXRV(M)64xB1y, EXRV(M)64xB6y avec sortie vibration brute et câble / *with raw vibration output and cable.* |
| EX(M)64xB7y avec fils volants / *with flying leads.* |
| EXTO(M)64xB7y avec capteur de température et fils volants / *with temperature sensor and flying leads.* |
| EXRV(M)64xB7y avec sortie vibration brute et fils volants / *with raw vibration output and flying leads.* |
| Note: la lettre M indique un équipement en version métrique. Les lettres x et y sont des variables du type (valeurs de 0 à 9). |
| *Note: M letter indicates apparatus in metric version. Letters x and y are variable digits of the type (values between 0 and 9).* |

Paramètres électriques :

Electrical parameters :

| Type / *Type* | Paramètres de SI / *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 |

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## MARQUAGE

Le marquage du produit doit comprendre :

Marquage complet :
PCB Piezotronics Inc. ou IMI Sensors ou IMI
Adresse : ...
Type : ...
N° de fabrication : ...
Année de fabrication : ...
Ex II 1 G
Ex ia IIC T4 Ga
LCIE 05 ATEX 6154 X
-40°C ≤ $T_{amb}$ ≤ +80°C
$U_i$ : ...V, $I_i$ : ...mA, $P_i$ : ...W, $C_i$ :...nF, $L_i$ :... µF
(complété suivant le modèle)

Marquage réduit :
PCB Piezotronics Inc. ou IMI Sensors ou IMI
Type : ...
N° de fabrication : ...
Année de fabrication : ...
Ex II 1 G
Ex ia IIC T4 Ga, Ta = 80°C
LCIE 05 ATEX 6154 X

L'appareil doit également comporter le marquage normalement prévu par les normes de construction qui le concernent sous la responsabilité du fabricant.

## MARKING

The marking of the product shall include the following :

Full marking :
PCB Piezotronics Inc. or IMI Sensors or IMI
Address: ...
Type : ...
Serial number: ...
Year of construction: ...
Ex II 1 G
Ex ia IIC T4 Ga
LCIE 05 ATEX 6154 X
-40°C ≤ $T_{amb}$ ≤ +80°C
$U_i$ : ...V, $I_i$ : ...mA, $P_i$ : ...W, $C_i$ : ...nF, $L_i$ : ...µF
(completed following the model)

Reduced marking :
PCB Piezotronics Inc. or IMI Sensors or IMI
Type : ...
Serial number: ...
Year of construction: ...
Ex II 1 G
Ex ia IIC T4 Ga, Ta = 80°C
LCIE 05 ATEX 6154 X

The equipment shall also bear the usual marking required by the product standards applying to such equipment under the manufacturer responsibility.

## 13 CONDITIONS PARTICULIERES D'UTILISATION

a. Plage de température ambiante : -40°C à +80°C.

b. Les matériels de sécurité intrinsèque ne doivent être raccordés qu'à des matériels associés de sécurité intrinsèque certifiés pour l'usage considéré. Cette association doit répondre aux exigences de la norme EN 60079-25.

c. Le montage du produit dans une installation doit être effectué de telle sorte que le corps métallique du capteur et le blindage du câble soient reliés de manière fiable à la terre du système.

d. L'appareil doit être raccordé conformément au manuel d'instruction.

## SPECIFIC CONDITIONS OF USE

Ambient temperature range: -40°C to +80°C.

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 EN 60079-25.

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.

## 14 EXIGENCES ESSENTIELLES DE SANTE ET DE SECURITE

Couvertes par les normes listées au point 8.

## ESSENTIAL HEALTH AND SAFETY REQUIREMENTS

Covered by standards listed at 8.

## 15 DOCUMENTS DESCRIPTIFS

## DESCRIPTIVE DOCUMENTS

| N° | Description | Reference | Rev. | Date | Page(s) |
|---|---|---|---|---|---|
| 1. | Notice d'instructions / *Instructions notice* | 32836 | - | - | 3 |
| 2. | Dossier technique / *Technical file* | 64777 | NR | 2018/06/28 | 42 |

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## 16 INFORMATIONS COMPLEMENTAIRES

**Essais individuels**

Néant.

**Conditions de certification**

Les détenteurs d'attestations d'examen UE de type doivent également satisfaire les exigences de contrôle de production telles que définies à l'article 13 de la Directive 2014/34/UE.

## ADDITIONAL INFORMATIONS

**Routine tests**

None.

**Conditions of certification**

Holders of UE type examination certificates are also required to comply with the production control requirements defined in article 13 of Directive 2014/34/UE.

## 17 DETAILS DES MODIFICATIONS

Version 00 : 2005/12/07 — Version initiale.

Version 01 : 2007/08/02 — Mise à jour normative suivant les normes EN 60079-0 (2006) et EN 60079-11 (2007).

Version 02 :
- Mise à jour normative suivant les normes EN 60079-0:2012+A11:2013 et EN 60079-11 :2012.
- Modification des paramètres de sécurité intrinsèque.
- Distinction entre le nom du fabricant (PCB Piezotronics Inc) et le nom de la marque commerciale (IMI Sensors ou IMI).
- Mise à jour de la nomenclature des modèles.

## DETAILS OF CHANGES

Issue 00: 2005/12/07 — Initial issue.

Issue 01: 2007/08/02 — Normative update according to EN 60079-0 (2006) and EN 60079-11 (2007) standards.

Issue 02:
- Normative update according to EN 60079-0:2012+A11:2013 and EN 60079-11:2012 standards.
- Modification of intrinsic safety parameters.
- Distinction between the name of manufacturer (PCB Piezotronics Inc.) and the name of trademark (IMI Sensors or IMI).
- Update of the nomenclature of the models.

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1 **AVENANT D'ATTESTATION D'EXAMEN CE DE TYPE**

2 **Appareil ou système de protection** destiné à être utilisé en atmosphères explosibles **(Directive 94/9/CE)**

3 Numéro de l'avenant :
**LCIE 05 ATEX 6154 X / 01**

4 Appareil ou système de protection :
Capteurs de vibration
Type : EX64..., EXTO64..., EXVR64...

5 Demandeur : I.M.I.

15 **DESCRIPTION DE L'AVENANT**
Mise à jour normative selon les normes EN 60079-0 (2006) et EN 60079-11 (2007).

Les résultats des vérifications et essais figurent dans le rapport confidentiel N° 60058689/559760

Paramètres spécifiques du ou des modes de protection concerné(s) :
Inchangés

Le marquage doit être modifié comme suit :
Ex ia IIC T4

16 **DOCUMENTS DESCRIPTIFS**

Dossier de certification N° 27866 Rév. A du 27/06/2007.
Ce dossier comprend 18 rubriques (37 pages).
Dossier de certification N° 28770 Rév. A du 27/06/2007.
Ce dossier comprend 12 rubriques (28 pages).

17 **CONDITIONS SPECIALES POUR UNE UTILISATION SURE**
Inchangées

18 **EXIGENCES ESSENTIELLES DE SECURITE ET DE SANTE**
Conformité aux normes européennes EN 60079-0 (2006) et EN 60079-11 (2007).

19 **VERIFICATIONS ET ESSAIS INDIVIDUELS**
Néant

1 **SUPPLEMENTARY EC TYPE EXAMINATION CERTIFICATE**

2 **Equipment or protective system** intended for use in potentially explosive atmospheres **(Directive 94/9/EC)**

3 Supplementary certificate number :
**LCIE 05 ATEX 6154 X / 01**

4 Equipment or protective system :
Vibration sensors
Type : EX64..., EXTO64..., EXVR64...

5 Applicant : I.M.I.

15 **DESCRIPTION OF THE SUPPLEMENTARY CERTIFICATE**
Normative update according to EN 60079-0 (2006) and EN 60079-11 (2007) standards.

The examination and test results are recorded in confidential report N° 60058689/559760

Specific parameters of the mode(s) of protection concerned:

Unchanged

The marking shall be modified as follows :
Ex ia IIC T4

16 **DESCRIPTIVE DOCUMENTS**

Certification file N° 27866 Rev. A dated 27/06/2007.
This file includes 18 items (37 pages).
Certification file N° 28770 Rév. A dated 27/06/2007.
This file includes 12 items (28 pages).

17 **SPECIAL CONDITIONS FOR SAFE USE**

Unchanged

18 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS**

Conformity to the European standards EN 60079-0 (2006) and EN 60079-11 (2007).

19 **ROUTINE VERIFICATIONS AND TESTS**
None

Fontenay-aux-Roses, le 2 août 2007

Le responsable de certification ATEX
ATEX certification manager

NOTIFIED BODY 0081 ORGANISME NOTIFIE

Henri CERVELLO

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LCIE
Laboratoire Central
des Industries Electriques
Une société de Bureau Veritas

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France

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Société Anonyme
au capital de 15 745 984 €
RCS Nanterre B 408 363 174

L C I E

1 **ATTESTATION D'EXAMEN CE DE TYPE**

2 Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles
**Directive 94/9/CE**

3 Numéro de l'attestation d'examen CE de type
**LCIE 05 ATEX 6154 X**

4 Appareil ou système de protection :
Capteurs de vibrations
Type : EX64...,EXTO64...,EXRV64 (voir page suivante)

5 Demandeur : I.M.I. (Industrial Monitoring Instrumentation)

6 Adresse : A PCB PIEZOTRONICS DIVISION
3425 Walden Avenue
Depew, New York 14043
U.S.A.

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées est décrit dans l'annexe de la présente attestation et dans les documents descriptifs cités en annexe.

8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles en ce qui concerne la sécurité et la santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive. Les vérifications et épreuves figurent dans nos rapports confidentiels n° 60040901/540946/1.

9 Le respect des exigences essentielles en ce qui concerne la sécurité et la santé est assuré par la conformité aux documents suivants :
-EN 50014 (1997) + amendements 1 et 2,
-EN 50020 (2002).

10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que ce matériel ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 Cette attestation d'examen CE de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à la directive 94/9/CE.
Des exigences supplémentaires de cette directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection.

12 Le marquage de l'appareil ou du système de protection devra comporter, entre autres indications utiles, les mentions suivantes :
Ex II 1 G
EEx ia IIC T4

Fontenay-aux-Roses, le 7 décembre 2005

1 **EC TYPE EXAMINATION CERTIFICATE**

2 Equipment or protective system intended for use in potentially explosive atmospheres
**Directive 94/9/EC**

3 EC type Examination Certificate number
**LCIE 05 ATEX 6154 X**

4 Equipment or protective system :
Vibration sensors
Type : EX64...,EXTO64...,EXRV64... (see following page)

5 Applicant : I.M.I. (Industrial Monitoring Instrumentation)

6 Address : A PCB PIEZOTRONICS DIVISION
3425 Walden Avenue
Depew, New York 14043
U.S.A.

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 LCIE, notified body number 0081 in accordance with article 9 of the Directive 94/9/EC of the European Parliament and Council of 23 March 1994. certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmospheres, given in Annex II of the Directive.
The examination and test results are recorded in confidential reports n° 60040901/540946/1.

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with :

-EN 50014 (1997) + amendments 1 and 2,
-EN 50020 (2002).

10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC Type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with the Directive 94/9/EC.
Further requirements of the Directive applies to the manufacture and supply of this equipment or protective system.

12 The marking of the equipment or protective system shall include the following :

Ex II 1 G
EEx ia IIC T4

Le Directeur de l'organisme certificateur
Manager of the certification body

Henri CERVELLO
Timbre sec / Dry seal



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RCS Nanterre B 408 363 174

(A1) **ANNEXE**

(A2) **ATTESTATION D'EXAMEN CE DE TYPE**

**LCIE 05 ATEX 6154 X**

(A3) Description de l'équipement ou du système de protection :

Capteurs de vibrations
Type : EX64...,EXTO64...,EXRV64

Ce capteur est composé d'un ensemble piezo-cristal, d'une carte électronique et d'un connecteur ou un câble intégré.

Modèles concernés :
EX64xB0y, EX64xB1y, EX64xB6y
EXTO64xB3y, EXTO64xB1y, EXTO64xB6y,
EXRV64xB0y,EXRV64xB1y,EXRV64xB6y,
EX64xB7y,EXTO64xB7y,EXRV64xB7y
EX64xA0y,EX64xA1y,EX64xA6y,
EXTO64xA3y,EXTO64xA1y,EXTO64xA6y,
EXRV64xA0y,EXRV64xA1y,EXRV64xA6y

Le marquage est le suivant :

I.M.I. Adresse : ...
Type : EX... (1)
N° de fabrication : ... Année de fabrication : ...
Ex II 1 G EEx ia IIC T4
LCIE 05 ATEX 6154 X
T.amb. : – 40°C à + 80°C

(1) Suivant le modèle

Le marquage CE est accompagné du numéro d'identification de l'organisme notifié responsable de la surveillance du système approuvé de qualité (0081 pour le LCIE).

Le matériel devra également comporter le marquage normalement prévu par les normes de construction du matériel électrique concerné.

Paramètres électriques relatifs à la sécurité :

(A1) **SCHEDULE**

(A2) **EC TYPE EXAMINATION CERTIFICATE**

**LCIE 05 ATEX 6154 X**

(A3) Description of Equipment or Protective System :

Vibration sensors
Type : EX64...,EXTO64...,EXRV64

This apparatus is made of a piezo-crystal assembly, an electronic board and a connector or an integrated cable.

Models concerned :
EX64xB0y, EX64xB1y, EX64xB6y
EXTO64xB3y, EXTO64xB1y, EXTO64xB6y,
EXRV64xB0y,EXRV64xB1y,EXRV64xB6y,
EX64xB7y,EXTO64xB7y,EXRV64xB7y
EX64xA0y,EX64xA1y,EX64xA6y,
EXTO64xA3y,EXTO64xA1y,EXTO64xA6y,
EXRV64xA0y,EXRV64xA1y,EXRV64xA6y

Marking is as follow :

I.M.I. Address : ...
Type : EX... (1)
Serial number : ... Year of manufacturing : ...
Ex II 1 G EEx ia IIC T4
LCIE 05 ATEX 6154 X
T.amb. : – 40°C to + 80°C

(1) According to the model

The CE marking shall be accompanied by the identification number of the notified body responsible for surveillance of the approved quality system (0081 for LCIE).

The equipment must also bear the usual marking required by the manufacturing standards applying to such equipments.

Electrical parameters relative to safety :

| Modèle / Model | Ui (V) | Ii (mA) | Pi (W) | Ci (nF) | Li (µH) |
|---|---|---|---|---|---|
| EX64xA0x, EX64xB0y | 30 | 100 | 1 | 0 | 1,06 |
| EX64xA1y, EX64xA6y, EX64xB1y, EX64xB6y | 30 | 100 | 1 | 61 | 306 |
| EXTO64xA3y, EXTO64xB3y | 28 | 120 | 1 | 0 | 1,06 |
| EXTO64xA1y, EXTO64xA6y, EXTO64xB1y, EXTO64xB6y | 28 | 120 | 1 | 61 | 306 |
| EXRV64xA0y, EXRV64xB0y | 28 | 120 | 1 | 0 | 121,06 |
| EXRV64xA1y, EXRV64xA6y, EXRV64xB1y, EXRV64xB6y | 28 | 120 | 1 | 61 | 426 |
| EX64xB7y | 30 | 100 | 1 | 0 | 1,06 |
| EXTO64xB7y, EXRV64xB7y | 30 | 120 | 1 | 0 | 1,06 |



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1Eg

I.B-v1

(A1) **ANNEXE**

(A2) **ATTESTATION D'EXAMEN CE DE TYPE**

**LCIE 05 ATEX 6154 X (suite)**

(A4) Documents descriptifs :

Dossier technique N° 28770 Rév. NR du 10/10/2005.
Ce document comporte 12 rubriques (28 pages).

Dossier technique N° 27866 Rév. NR du 10/10/2005.
Ce document comporte 18 rubriques (37 pages).

(A5) Conditions spéciales pour une utilisation sûre :

Ce matériel est un appareil de sécurité intrinsèque, il peut être placé en atmosphère explosible.
Le matériel ne doit être raccordé qu'à un matériel associé de sécurité intrinsèque certifié et cette association doit être compatible du point de vue sécurité intrinsèque (voir paramètres électriques au paragraphe (A3)).
Température ambiante d'utilisation : - 40°C à + 80°C.

(A6) Exigences essentielles en ce qui concerne la sécurité et la santé :

Conformité aux normes européennes EN 50014 (1997 + amendements 1 et 2) et EN 50020 (2002).

Vérifications et épreuves individuelles :

L'appareil est dispensé d'épreuve individuelle.

(A1) **SCHEDULE**

(A2) **EC TYPE EXAMINATION CERTIFICATE**

**LCIE 05 ATEX 6154 X (continued)**

(A4) Descriptive documents :

Technical file No. 28770 Rev. NR dated 10/10/2005.
This file includes 12 items (28 pages).

Technical file No. 27866 Rev. NR dated 10/10/2005.
This file includes 18 items (37 pages).

(A5) Special conditions for safe use :

This equipment is an intrinsically safe apparatus, it can be mounted in explosive atmosphere.
The apparatus must be only connected to a certified associated intrinsically safe equipment and this combination must be compatible regarding intrinsic safety rules (see electrical parameters clause (A3)).
Operating ambient temperature : - 40°C to + 80°C.

(A6) Essential Health and Safety Requirements :

Conformity to the European standards EN 50014 (1997 + amendments 1 and 2) and EN 50020 (2002).

Individual examinations and tests :

The equipment is not submitted to routine test.



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LB-01

LCIE

To: IMI

Fontenay-aux-Roses, le 27 JUIN 2001

N/Réf. : MLi/SFe/ ENV 9183
Affaire suivie par Monsieur Michel EQUI
Tél. : 33-(1) 40.95.62.63
Fax : 33-(1) 40.95.89.37

IMI
A division of PCB Piezotronics INC.
3425 Walden Avenue, Depew, New York
14043 USA

For the attention of
A l'attention de Mr. Nick FULCINITI

SUBJECT: Modification of the Certificate of Conformity

**OBJET** : MODIFICATION DU CERTIFICAT DE CONFORMITÉ LCIE 01.E6029 X.

Messieurs,

Following your above-referenced request, we request that you please find attached the document modified accordingly.

Comme suite à votre demande ci-dessus référencée, nous vous prions de bien vouloir trouver ci-joint le document dûment modifié.

We wish you receipt in good condition and we remind you that the retention of Modified documents, in your possession, is your responsibility.

Nous vous en souhaitons bonne réception et vous rappelons que la gestion des documents modifiés, en votre possession, est de votre responsabilité.

"We extend, Sirs, the extension of our best wishes"

Veuillez agréer, Messieurs, l'expression de nos sentiments distingués.

Le secrétariat

Delatouche

Ginette DELATOUCHE

COPY with Translation in red ink

John Couture
02 July 2001

L30330/Env/S87

Fontenay-aux-Roses, le 27 JUIN 2001

N/Réf. : MLi/SFe/ ENV 9183
Affaire suivie par Monsieur Michel EQUI
Tél. : 33-(1) 40.95.62.63
Fax : 33-(1) 40.95.89.37

IMI
A division of PCB Piezotronics INC.
3425 Walden Avenue, Depew, New York
14043 USA

A l'attention de Mr. Nick FULCINITI

**OBJET** : MODIFICATION DU CERTIFICAT DE CONFORMITÉ LCIE 01.E6029 X.

Messieurs,

Comme suite à votre demande ci-dessus référencée, nous vous prions de bien vouloir trouver ci-joint le document dûment modifié.

Nous vous en souhaitons bonne réception et vous rappelons que la gestion des documents modifiés, en votre possession, est de votre responsabilité.

Veuillez agréer, Messieurs, l'expression de nos sentiments distingués.

Le secrétariat

Delatouche

Ginette DELATOUCHE

L30330/Env/S87

## MATÉRIEL OU SYSTÈME ÉLECTRIQUE POUR ATMOSPHÈRES EXPLOSIVES

(1) **CERTIFICAT DE CONFORMITÉ**

(2) **LCIE 01.E6029 X**

(3) Le présent certificat est délivré pour :

Capteurs de vibrations
Types : EX64 ...

(4) construit et soumis à la certification par :

IMI
PCB PIEZOTRONICS INC.
3425 Walden Avenue, Depew, New York
14043 USA

(5) Ce matériel ou système électrique et ses variantes éventuelles acceptées sont décrits dans l'annexe du présent certificat et dans les documents descriptifs qui y sont mentionnés.

(6) Le LCIE, organisme notifié conformément à l'article 14 de la directive du Conseil des communautés européennes 76/117/CEE du 18 décembre 1975,

- certifie que ce matériel électrique est conforme aux normes européennes harmonisées :
. EN 50014 (1992) NF EN 50014 (1993)
. EN 50020 (1994) NF EN 50020 (1995)

et qu'il a subi avec succès les vérifications et épreuves de type prescrites par ces normes,

- certifie avoir établi un procès-verbal confidentiel de ces vérifications et épreuves.

(7) Le code de ce matériel électrique est :

EEx ia IIC T4

(10) Par le marquage du matériel livré, le fournisseur atteste, sous sa propre responsabilité, que ce matériel est conforme aux documents descriptifs cités dans l'annexe du présent certificat et qu'il a subi avec succès les vérifications et épreuves individuelles prescrites par les normes européennes harmonisées mentionnées au point (6) ci-dessus.

(11) Le matériel électrique livré est autorisé à porter la marque distinctive communautaire définie dans l'annexe II de la directive 79/196/CEE du 6 février 1979. Cette marque figure sur la première page du présent certificat ; elle doit être apposée sur le matériel électrique de manière à être visible, lisible et durable.

(12) Le signe X lorsqu'il est placé à la suite du numéro du certificat de conformité indique que ce matériel électrique est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe du présent certificat.

## ELECTRICAL EQUIPMENT OR SYSTEM FOR EXPLOSIVE ATMOSPHERE

(1) **CERTIFICATE OF CONFORMITY**

(2) **LCIE 01.E6029 X**

(3) The present certificate is issued for :

Vibrations sensors
Types : EX64 ...

(4) manufactured and submitted for certification by :

IMI
PCB PIEZOTRONICS INC.
3425 Walden Avenue, Depew, New York
14043 USA

(5) This electrical equipment or system and any accepted variations thereof are specified in the annex to this certificate and in the descriptive documents therein referred to.

(6) LCIE, as an approved certification body in accordance with article 14 of the European Communities Council Directive 76/117/EEC of December 18, 1975,

- certifies that it has fully satisfied the type examination and test requirements of these standards,
. EN 50014 (1992) NF EN 50014 (1993)
. EN 50020 (1994) NF EN 50020 (1995)

and that it has fully satisfied the type examination and test requirements of these standards,

- certifies that a confidential test report has been completed on these type examinations and tests.

(7) The code of this electrical equipment is :

EEx ia IIC T4

(10) By marking the electrical equipment supplied, the manufacturer attests on his own reponsability that this electrical equipment complies with the descriptive documents referred to in the annex to this certificate and that it has fully satisfied individual examinations and tests required by the harmonized European standards specified in (6) above :

(11) The electrical equipment supplied is authorized to display the distinctive European Community mark specified in annex II of the directive 79/196/CEE of February 6, 1979. The mark appears at the top of this certificate. It must be applied to the electrical equipment so as to be visible, legible and permanent.

(12) When an X appears after the certificate number, special conditions applied to the electrical equipment for its safe use. These are specified in the annex to this certificate.

(13-14) Fontenay-aux-Roses, le 30 mai 2001

Le Directeur de l'organisme certificateur
Manager of the certification body

Timbre sec/dry seal

**Par délégation**
**Michel BRÉNON**
**Directeur adjoint**
**à la Certification**

(7) Code : EEx ia IIC T4



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LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES

Société anonyme à Directoire et Conseil de surveillance au capital de 103 592 000 Francs - RCS Nanterre B 408 363 174

Siège social : 33, avenue du Général Leclerc - F 92260 Fontenay-aux-Roses - Tél. : +33 (0)1 40 95 60 60

(9) **CERTIFICAT DE CONFORMITÉ**
**LCIE 01.E6029 X**

**ANNEXE**

(A1) DÉSIGNATION DU MATÉRIEL OU SYSTÈME ÉLECTRIQUE CERTIFIÉ :

Capteurs de vibrations
Types : EX64 ...

(A2) DESCRIPTION DU MATÉRIEL OU SYSTÈME ÉLECTRIQUE CERTIFIÉ :

La matériel est composé d'un ensemble piezo-cristal, d'une carte électronique et d'un connecteur ou d'un câble intégré.
Connecteur :
Types : EX64xA00, EX64xA01 et EX64xA02
Câble intégré (305 m) :
Types : EX64xA10, EX64xA11 et EX64xA12
EX64xA60, EX64xA61 et EX64xA62

(A3) DOCUMENTS DESCRIPTIFS :

Dossier de certification n° 220490 Rév. 0 du 13/04/2001.
Ce dossier comprend 19 rubriques (83 pages).

(A4) PARAMÈTRES SPÉCIFIQUES DU OU DES MODES DE PROTECTION CONCERNÉS :

(9) **CERTIFICATE OF CONFORMITY**
**LCIE 01.E6029 X**

**SCHEDULE**

(A1) NAME OF THE CERTIFIED ELECTRICAL EQUIPMENT OR SYSTEM :

Vibrations sensors
Types : EX64 ...

(A2) DESCRIPTION OF THE CERTIFIED ELECTRICAL EQUIPMENT OR SYSTEM :

The apparatus is formed of a piezo-crystal assembly, an electronic board and a connector or an integral cable.
Connector :
Types : EX64xA00, EX64xA01 and EX64xA02
Integral cable (305 m) :
Types : EX64xA10, EX64xA11 and EX64xA12
EX64xA60, EX64xA61 and EX64xA62

(A3) DESCRIPTIVE DOCUMENTS :

Certification file n° 220490 Rev.0 dated 13/04/2001.
This file included 19 items (83 pages).

(A4) SPECIFIC PARAMETERS OF THE MODE(S) OF PROTECTION CONCERNED :

Types : EX64xA0x :
Ui ≤ 28 V ; Ii ≤ 93 mA ; Pi ≤ 1 W ; Ci = 0 ; Li = 0
Types : EX64xA1x et/and EX64xA6x (305 m de câble/305 m of Cable)
Ui ≤ 28 V ; Ii ≤ 93 mA ; Pi ≤ 1 W ; Ci ≤ 61 nF ; Li ≤ 0,305 mH

(A5) MARQUAGE DU MATÉRIEL CERTIFIÉ :

Le marquage doit être visible, lisible et durable ; il doit comporter les indications suivantes :

IMI
Type : EX64xAxx (1)
n° de fabrication : ...
EEx ia IIC T4
LCIE 01.E6029 X

(1) Complété par le modèle.

Le matériel devra également comporter le marquage normalement prévu par les normes de construction du matériel électrique concerné.

(A6) VÉRIFICATIONS ET ÉPREUVES INDIVIDUELLES :

Néant.

(A7) CONDITIONS SPÉCIALES POUR UNE UTILISATION SÛRE :

Le matériel est un appareil à sécurité intrinsèque, il peut être placé en atmosphères explosibles.
Le matériel ne doit être raccordé qu'à un matériel associé de sécurité intrinsèque certifié et cette association doit être compatible du point de vue de la sécurité intrinsèque.
Les caractéristiques électriques du matériel associé de sécurité intrinsèque ne doivent excéder aucune des valeurs suivantes :
Uo ≤ 28 V, Io ≤ 93 mA, Po ≤ 1 W
Température ambiante d'utilisation : - 40 °C à + 80 °C.

(A5) MARKING OF THE CERTIFIED EQUIPMENT :

The marking must be visible, legible and permanent, and must include the following information :

IMI
Type : EX64xAxx (1)
Serial number :...
EEx ia IIC T4
LCIE 01.E6029 X

(1) Completed by the model.

The equipment must also carry the usual marking required by the manufacturing standards applying to such equipments.

(A6) INDIVIDUAL EXAMINATIONS AND TESTS :

None.

(A7) SPECIAL CONDITIONS FOR SAFE USE :

The equipment is an intrinsically safe apparatus, it can be mounted in explosive atmosphere.
The apparatus must be only connected to a certified associated intrinsically safe equipment and this combinaison must be compatible as regards intrinsic safety rules.
The electrical parameters of the associated intrinsically safe equipment must not exceed any of the following values :
Uo ≤ 28 V, Io ≤ 93 mA, Po ≤ 1 W
Ambient operating temperature : - 40 °C to + 80 °C.

05.01

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PCB PIEZOTRONICS
MTS SYSTEMS CORPORATION

# SIL Declaration of Conformity

Functional safety according to IEC 61508

Manufacturer: PCB Piezotronics
3425 Walden Avenue
Depew, NY 14043 USA

PCB Piezotronics declares as manufacturer, that the vibration transmitters:

- 640 Series – (XX)640yzzz/aaa
- 641 Series – (XX)641yzzz/aaa
- 642 Series – (XX)642yzzz/aaa
- 643 Series – (XX)643yzzz/aaa
- 645 Series – (XX)645yzzz/aaa
- 646 Series – (XX)646yzzz/aaa
- 647 Series – (XX)647yzzz/aaa
- 648 Series – (XX)648yzzz/aaa

(XX) Options include one or more of the following:

EX – Approved for Hazardous Locations
HT – High Temperature (257°F, 125°C)
M – Metric Mounting Hardware
RV – Dual Output (4-20 Vibration/Analog Acceleration)
RVVO – Dual Output (4-20 Vibration/Analog Velocity)
TO – Dual Output (Vibration/Temperature)

Note: "yzzz" completes the model, "aaa" indicates cable length (if applicable)

Is hardware suitable for use in safety-instrumented systems according to IEC 61508, if the safety instructions and the following parameters are observed:

| **Parameter** | **64x Series – Connector or integral Cable*** | **64x Series - Terminal Block or Flying Leads*** |
|---|---|---|
| SIL | 2 | 2 |
| Proof Test Interval (Annual) | 8,760 h | 8,760 h |
| Device Type | B | B |
| HFT | 0 | 0 |
| SFF | 86.27% | 86.12% |
| $PFD_{AV}$[1] | $1.255 \times 10^{-3}$ | $1.299 \times 10^{-3}$ |
| $\lambda_{du} \times 10^{-6}$ | 0.3348 | 0.3469 |
| SIL Capability (Low Demand Mode) | 2 | 2 |
| SIL Capability (Continuous Demand Mode) | 2 | 2 |
| MTTF[2] | 24.4 y | 24.4 y |

1. The value comply with SIL 2 according to ISA S84.01
2. According to Siemens SN29500 and Proven in Use data

* With or without EX, HT, M, RV, RVVO, or TO Option(s)

The PCB sensor hardware is suitable for inclusion in Safety Instrumented Systems (SIS) that are designed using IEC 61511 (for the process industry sector), IEC 62061 (safety of machinery), EN 50129 (railway applications), and ISO 26262 (automotive industry).

Note: The use of SIL Hardware in specific safety standard application may apply different number of sequences or definitions to those in IEC 61508.

July 3, 2019

PCB Piezotronics Authorized Representative:

Carrie Termin
Regulatory Affairs and Product Certification Specialist

PCB Piezotronics, Inc. Corporate SEAL 1996 New York

**PCB PIEZOTRONICS, INC. — CORPORATE HEADQUARTERS**
3425 Walden Avenue, Depew, New York 14043-2495 USA
Phone: 716-684-0001 Fax: 716-684-0987
E-mail: info@pcb.com
Web site: www.pcb.com

**AS9100 and ISO9001 Certified**
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# INTERTEK ASSURANCE SAFETY INTEGRITY LEVEL SUMMARY REPORT

## PCB SIL SENSOR RATING

**CLIENT NAME**
PCB Piezotronics, Inc.
3425 Walden Ave
Depew, NY 14043-2417

**REPORT NO**
103685042CSLT-001

**COMPILED BY**
Ashton D. Hainge, CFSP, PMP

**PROJECT NAME**
G103685042

**DATE**
16 November 2018

# PCB FUNCTIONAL SAFETY SIL SUMMARY AND RESULTS

## Summary

This summary report details results of the reliability analysis performed on the PCB Piezotronics 4-20 mA Output Velocity Sensor and 4-20 mA Output Acceleration Sensor model 64XYZZ Series. These results are based the following PCB Piezotronics documentation. Design changes from this documentation package would need to be evaluated for the impact on reliability characteristics.

1. Electrical schematic 23927-B
2. Electrical schematic 24297-E
3. BOM 21459-01-L
4. BOM 24297-01-209-100-G
5. Manual 640BXX

Reliability calculations were conducted at the component and circuit level using the methodology outlined in MIL-HDKB-217F. Product level failure parameters were then calculated in accordance the functional safety approach of IEC 61508-1:2010, IEC 61508-2:2010, IEC 61508-6:2010, and IEC 61508-7:2010.

## Results

The results from the FMEA are given below for the 4-20 mA Output Velocity Sensor and 4-20 mA Output Acceleration Sensor model 64XYZZ:

| Name | Circular Connector | Terminal Block |
|---|---|---|
| Architecture | 1oo1 | 1oo1 |
| Proof test interval (Annual) | 8,760 h | 8,760 h |
| $PFD_{avg}$ | $1.255 \times 10^{-3}$ | $1.299 \times 10^{-3}$ |
| SFF | 86.27% | 86.12% |
| HFT | 0 | 0 |
| SIL Capability (Low Demand Mode) | 2 | 2 |
| SIL Capability (Continuous Demand Mode) | 2 | 2 |
| Architecture | 1oo1 | 1oo1 |

**PCB Sensor Product Meets SIL 2 Capability**

| Name | | Results* |
|---|---|---|
| Safe Detected failure rate | $\lambda_{SD} \times 10^{-6}$ | 0.4937 (0.5117) |
| Safe Undetected failure rate | $\lambda_{SU} \times 10^{-6}$ | 0.3291 (0.3411) |
| Dangerous Detected failure rate | $\lambda_{DD} \times 10^{-6}$ | 1.2813 (1.2993) |
| Dangerous Undetected failure rate | $\lambda_{DU} \times 10^{-6}$ | 0.3348 (0.3468) |
| Average frequency of a dangerous failure on demand | $PFH \times 10^{-6}$ | 1255.0477 (1299.0000) |

**Type B components: 64XYZZ Series (includes EX64XYZZ Series)**

The safety relevant parameter $PFD_{avg}$ is in compliance with the corresponding requirements for SIL 2 according to IEC 61508[1].

The safety relevant parameters HFT and SFF are in compliance with the corresponding requirements for SIL 1 according to IEC 61508.

The user should consider, that the hardware fault tolerance of all inspected devices is zero and that a single fault can lead to a dangerous failure.

Senior Consultant,

Ashton Hainge, Intertek
CFSP, PMP

*Note: Values are for Circular/Cylindrical connectors. Values for Terminal Block connectors are given in parenthesis.

[1] The assessment results described in this report only refer to the safety-related parameters PFD avg, HFT, and SFF according to IEC 61508.

This report does not make any statements, that the manufacturer meets all other requirements of the above cited standards for hardware, software, documentation, management of functional safety, verification, and validation.

This report does not imply that the examined pressure sensors have been certified for functional safety by the assessor according to IEC 61508 or any other standards.

The sensors are only one part of a complete safety function. It is at the responsibility of the end-user to prepare and to apply an extensive reliability model, that brings out the complete safety function and that meets all requirements of the claimed SIL level according to IEC 61508.

# ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ

# СЕРТИФИКАТ СООТВЕТСТВИЯ

ЕАС

№ ЕАЭС RU C-US.AA87.B.00217/19

Серия RU № 0124866

**ОРГАН ПО СЕРТИФИКАЦИИ** Орган по сертификации взрывозащищенного и рудничного оборудования (ОС ЦСВЭ) Общества с ограниченной ответственностью «Центр по сертификации взрывозащищенного и рудничного оборудования» (ООО «НАНИО ЦСВЭ»). Адрес места нахождения юридического лица: Россия, 140004, Московская область, Люберецкий район, город Люберцы, поселок ВУГИ, АО «Завод «ЭКОМАШ», литера В, Объект 6, этаж 3, офис 26. Адрес места осуществления деятельности в области аккредитации: Россия, 140004, Московская область, Люберецкий район, город Люберцы, поселок ВУГИ, АО «Завод «ЭКОМАШ», Литера В, Объект 6, этаж 3, офисы 26/3, 26/4, 26/5, 27/6, 30/1, 32. Аттестат № RA.RU.11AA87 от 20.07.2015 г. Телефон: +7 (495) 558-83-53, +7 (495) 558-82-44. Адрес электронной почты: ccve@ccve.ru

**ЗАЯВИТЕЛЬ** Общество с ограниченной ответственностью «Альфатех».
Адрес места нахождения юридического лица: Россия, 125009, Москва, Малый Гнездниковский переулок, дом № 12, помещение I, комната 4. Адрес места осуществления деятельности: Россия, 127495, Москва, Долгопрудненское шоссе, дом № 3, Технопарк «Физтехпарк». ОГРН: 1167746393792. Телефон: +7 (495) 642-49-14. Адрес электронной почты: info@alphatechgroup.ru

**ИЗГОТОВИТЕЛЬ** PCB Piezotronics, Inc
Адрес места нахождения юридического лица и адрес места осуществления деятельности по изготовлению продукции: 3425 Walden Av., Depew, NY 14043, США

**ПРОДУКЦИЯ** Пьезоэлектрические преобразователи, вибропереключатели, предусилители с Ex-маркировкой согласно приложению (см. бланки №№ 0621345, 0621346, 0621347). Документы, в соответствии с которыми изготовлены изделия – см. приложение, бланк № 0621344. Серийный выпуск.

**КОД ТН ВЭД ЕАЭС** 9031 80 3800, 9026 20 2000, 8517 69 9000

**СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ**
ТР ТС 012/2011 «О безопасности оборудования для работы во взрывоопасных средах».

**СЕРТИФИКАТ СООТВЕТСТВИЯ ВЫДАН НА ОСНОВАНИИ**
Протокола испытаний № 235.2019-Т от 11.09.2019 Испытательной лаборатории технических устройств Автономной некоммерческой организации «Национальный испытательный и научно-исследовательский институт оборудования для взрывоопасных сред» ИЛ Ex ТУ (аттестат № РОСС RU.0001.21МШ19 от 16.10.2015); Акта анализа состояния производства № 35-А/19 от 14.03.2019 Органа по сертификации взрывозащищенного и рудничного оборудования (ОС ЦСВЭ) Общества с ограниченной ответственностью «Центр по сертификации взрывозащищенного и рудничного оборудования» (ООО «НАНИО ЦСВЭ») (аттестат № RA.RU.11AA87 выдан 20.07.2015); Документов, представленных заявителем в качестве доказательства соответствия продукции требованиям ТР ТС 012/2011 (см. приложение, бланк № 0621344). Схема сертификации – 1с.

**ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ**
Перечень стандартов, применяемых на добровольной основе для соблюдения требований ТР ТС 012/2011 (см. приложение, бланк № 0621344). Условия и срок хранения указаны в эксплуатационной документации. Назначенный срок службы – 10 лет.

**СРОК ДЕЙСТВИЯ С** 13.09.2019 **ПО** 12.09.2024
**ВКЛЮЧИТЕЛЬНО**

Руководитель (уполномоченное лицо) органа по сертификации (подпись) Залогин Александр Сергеевич (Ф.И.О.)

М.П.

Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы)) (подпись) Рафалович Борис Александрович (Ф.И.О.)

АО «Опцион», Москва, 2018 г., «Б». Лицензия № 05-05-09/003 ФНС РФ, ГЗ № 861. Тел.: (495) 726-47-42, www.opcion.ru

ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ

# ПРИЛОЖЕНИЕ

## К СЕРТИФИКАТУ СООТВЕТСТВИЯ № ЕАЭС RU C-US.AA87.B.00217/19 Лист 1

Серия RU № 0621344

### I. ПЕРЕЧЕНЬ СТАНДАРТОВ, ПРИМЕНЯЕМЫХ НА ДОБРОВОЛЬНОЙ ОСНОВЕ ДЛЯ СОБЛЮДЕНИЯ ТРЕБОВАНИЙ ТР ТС 012/2011 «О БЕЗОПАСНОСТИ ОБОРУДОВАНИЯ ДЛЯ РАБОТЫ ВО ВЗРЫВООПАСНЫХ СРЕДАХ»

| Обозначение стандартов | Наименование стандартов |
|---|---|
| ГОСТ 31610.0-2014 (IEC 60079-0:2011) | Взрывоопасные среды. Часть 0. Оборудование. Общие требования |
| ГОСТ IEC 60079-1-2011 | Взрывоопасные среды. Часть 1. Оборудование с видом взрывозащиты «взрывонепроницаемые оболочки «d» |
| ГОСТ 31610.11-2014 (IEC 60079-11:2011) | Взрывоопасные среды. Часть 11. Оборудование с видом взрывозащиты «искробезопасная электрическая цепь «i» |
| ГОСТ 31610.15-2012/МЭК 60079-15:2005 | Электрооборудование для взрывоопасных газовых сред. Часть 15. Конструкция, испытания и маркировка электрооборудования с видом защиты «n» |

### II. ДОКУМЕНТЫ, ПРЕДСТАВЛЕННЫЕ ЗАЯВИТЕЛЕМ В КАЧЕСТВЕ ДОКАЗАТЕЛЬСТВА СООТВЕТСТВИЯ ПРОДУКЦИИ ТРЕБОВАНИЯМ ТР ТС 012/2011

Руководства по эксплуатации: № 750119 от 23.01.19, № 830119 от 23.01.19, № 940219 от 07.02.19, № 630119 от 22.01.19, № 610119 от 22.01.19, № 910219 от 07.02.19, № 950219 от 08.02.19, № 970219 от 08.02.19.
Технические файлы: № 54202 от 02.02.2017, № 54204 от 02.02.2017, № 22438 С от 19.07.2012, № 62501 от 06.10.2016, № 33699 от 16.06.2016, № 56178 от 01.07.2016, № 70893 от 24.07.2019, № 54707 от 10.08.2016, № 48813 от 06.01.2011
Чертежи: № 47912 от 31.03.2017, № 49038 от 31.03.2017.
Перечень стандартов см. п. I.

### III. ДОКУМЕНТЫ, В СООТВЕТСТВИИ С КОТОРЫМИ ИЗГОТОВЛЕНА ПРОДУКЦИЯ

Технические файлы: № 54202 от 02.02.2017, № 54204 от 02.02.2017, № 22438 С от 19.07.2012, № 62501 от 06.10.2016, № 33699 от 16.06.2016, № 56178 от 01.07.2016, № 70893 от 24.07.2019, № 54707 от 10.08.2016, № 48813 от 06.01.2011
Чертежи: № 47912 от 31.03.2017, № 49038 от 31.03.2017

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ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ

# ПРИЛОЖЕНИЕ

## К СЕРТИФИКАТУ СООТВЕТСТВИЯ № ЕАЭС RU C-US.AA87.B.00217/19 Лист 2

Серия RU № 0621345

### 1. НАЗНАЧЕНИЕ И ОБЛАСТЬ ПРИМЕНЕНИЯ

Пьезоэлектрические преобразователи (далее – преобразователи) предназначены для контроля параметров вибрации, динамического давления и преобразования их в электрический сигнал.

Виброперeключатели предназначены для контроля уровня вибрации и защиты оборудования от повышенной вибрации.

Предусилители предназначены для преобразования зарядового сигнала в вольтовый.

Область применения - взрывоопасные зоны помещений и наружных установок согласно Ex-маркировке, ГОСТ IEC 60079-14-2013, регламентирующих применение во взрывоопасных средах.

### 2. СТРУКТУРНОЕ ОБОЗНАЧЕНИЕ

2.1. Преобразователи 176XYY/MZZZ-AA
X = от A до Z ревизия продукта, не влияющая на взрывозащиту
YY = от 01 до 99 для индикации вариантов монтажа, диафрагмы, кабелей или разъемов
M = опционально для указания метрической длины кабеля
ZZZ = от 001 до 999 опционально для указания длины кабеля в футах: (не более 200 футов) или метрах: (не более 61 м)
AA = от 01 до 99 опционально для указания дробной длины кабеля в дюймах или сантиметрах, не влияющей на взрывозащиту
2.2. Преобразователи 351abcd
a – ревизия продукта, может быть: A,B,C,D,E,F,G,H,I,J,K,L или M, не влияющая на взрывозащиту
b – первая цифра вариации продукта, может быть: 0,1,2,3,4,5,6,7,8 или 9, не влияющая на взрывозащиту
c – вторая цифра вариации продукта, может быть: 0,1,2,3,4,5,6,7,8 или 9, не влияющая на взрывозащиту
d– третья цифра вариации продукта, может быть: 0,1,2,3,4,5,6,7,8,9 или отсутствует, не влияющая на взрывозащиту
2.3 Преобразователи EX(TO)(M)602yzzz1aaa, EX(TO)(M)603yzzz/aaa, EX(TO)(M)606yzzz/aaa, EX(T0)(M)607yzzz/aaa, EX(TO)(M)608yzzz/aaa, EX(M)637XYYYZ, (M)638XYYYZ
XX = TO (с температурным выходом), M (с метрической резьбой),
y = одна буква от A до Z , не влияющая на взрывозащиту
zzz = две или три цифры от 00 до 999, не влияющие на взрывозащиту
aaa = длина кабеля и/или тип разъема
2.4 Предусилители EX682XYYY
X – ревизия продукта (A,B ... M), не влияющая на взрывозащиту
YYY: параметры фильтрации, усиления, частотная характеристика, ... (от 1 до 999), не влияющие на взрывозащиту
2.5. Преобразователи EX(RV)(TO)(M)64xyxx, EX(RV)(TO)(M)649yxx, EX (RV)(TO) (M)686yxx
XX = M (с метрической резьбой), TO (с температурным выходом), RV (с доп. вольтовым выходом).
Буквы x являются переменными цифрами (значения от 0 до 9), не влияющими на взрывозащиту
y = одна буква от A до Z, не влияющая на взрывозащиту
2.6 Преобразователи EX (XX) 622yzzz / aaa, EX (XX) 623yzzz / aaa, EX (XX) 625yzzz / aaa , EX (XX) 628yzzz / aaa
XX = HT (Высокотемпературная версия), M (с метрической резьбой), TO (с температурным выходом), VO (с выходом по скорости).
y = одна буква от A до Z, не влияющая на взрывозащиту
zzz = две или три цифры от 00 до 999, не влияющие на взрывозащиту
aaa = длина кабеля и/или тип разъема
2.7 Виброперeключатели 685yxx
Буквы x являются переменными цифрами (значения от 0 до 9), не влияющими на взрывозащиту
y = одна буква от A до Z, не влияющая на взрывозащиту

Руководитель (уполномоченное лицо) органа по сертификации _____ (подпись) **Залогин Александр Сергеевич** (Ф.И.О.)

М.П.

Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы)) _____ (подпись) **Рафалович Борис Александрович** (Ф.И.О.)

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ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ

# ПРИЛОЖЕНИЕ

## К СЕРТИФИКАТУ СООТВЕТСТВИЯ № ЕАЭС RU C-US.AA87.B.00217/19 Лист 3

Серия RU № 0621346

### 3. ОСНОВНЫЕ ТЕХНИЧЕСКИЕ ДАННЫЕ

| | |
|---|---|
| 3.1. Ex-маркировка:<br>преобразователей 176XYY/MZZ-AA | 0Ex ia IIC T660°C…T6 Ga X |
| преобразователей 351abcd | 0Ex ia IIC T4 Ga X |
| виброперeключателей 685yxx | 1Ex d IIB+$H_2$ T4 Gb |
| преобразователей EX(TO)(M)602yzzz1aaa, EX(TO)(M)603yzzz/aaa, EX(TO)(M)606yzzz/aaa, EX(T0)(M)607yzzz/aaa, EX(TO)(M)608yzzz/aaa | 2Ex nA IIC T4 Gc X<br>или<br>0Ex ia IIC T4 Ga X |
| преобразователей EX(M)637XYYYZ, (M)638XYYYZ | 0Ex ia IIC T4 Ga X<br>или<br>2Ex nA IIC T4 Gc X |
| предусилителей EX682XYYY | 0Ex ia IIC T4 Ga X<br>или<br>2Ex nA IIC T4 Gc X |
| EX(RV)(TO)(M)64xyxx, EX(RV)(TO)(M)649yxx, EX (RV)(TO) (M)686yxx | 1Ex d IIC T4 Gb X<br>или<br>1Ex d IIC T3 Gb X |
| преобразователей EX (XX) 622yzzz / aaa, EX (XX) 623yzzz / aaa, EX (XX) 625yzzz / aaa , EX (XX) 628yzzz / aaa | 2Ex nA IIC T4 Gc X |
| 3.2. Диапазон температур окружающей среды, $^0$C,<br>преобразователей 176XYY/MZZ-AA<br>преобразователей 351abcd<br>виброперeключателей 685yxx<br>преобразователей EX(TO)(M)602yzzz1aaa, EX(TO)(M)603yzzz/aaa, EX(TO)(M)606yzzz/aaa, EX(T0)(M)607yzzz/aaa, EX(TO)(M)608yzzz/aaa<br>преобразователей EX(M)637XYYYZ, (M)638XYYYZ<br>предусилителей EX682XYYY<br>преобразователей EX(RV)(TO)(M)64xyxx, EX(RV)(TO)(M)649yxx, EX (RV)(TO) (M)686yxx<br>преобразователей EX (XX) 622yzzz / aaa, EX (XX) 623yzzz / aaa, EX (XX) 625yzzz / aaa , EX (XX) 628yzzz / aaa | <br>от -70 до 650<br>от -196 до 121<br>от -25 до 60<br>от -54 до 121<br>от -196 до 121<br>от -40 до 85<br>от – 20 до 80<br>от -54 до 121 |

3.3. Входные искробезопасные электрические параметры преобразователей, предусилителей:

| Модель | $U_i$, В | $I_i$, мА | $P_i$, Вт | $C_i$, нФ | $L_i$, мГн |
|---|---|---|---|---|---|
| преобразователей 176XYY/MZZ-AA | 30 | 300 | 1 | 5 | 0,5 |
| преобразователей 351abcd | 28 | 200 | 1,2 | 61 | 305 мкГн |
| преобразователей EX(TO)(M)602yzzz1aaa, EX(TO)(M)603yzzz/aaa, EX(TO)(M)606yzzz/aaa, EX(T0)(M)607yzzz/aaa, EX(TO)(M)608yzzz/aaa | 28 | 200 | 1 | 16,2 или 77,2 (с кабелем) | пренебрежимо мала или 305 мкГн (с учетом кабеля 305м) |
| преобразователей EX(M)637XYYYZ, (M)638XYYYZ | 28 | 93 | 0,65 | 6,5 | пренебрежимо мала |
| предусилителей EX682XYYY | 28 | 100 | 0,7 | пренебрежимо мала | пренебрежимо мала |

Руководитель (уполномоченное лицо) органа по сертификации (подпись) Залогин Александр Сергеевич (Ф.И.О.)

М.П.

Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы)) (подпись) Рафалович Борис Александрович (Ф.И.О.)

АО «Опцион», Москва, 2018 г., «Б». Лицензия № 05-05-09/003 ФНС РФ. ТЗ № 861. Тел.: (495) 726-47-42, www.opcion.ru

# ПРИЛОЖЕНИЕ

## К СЕРТИФИКАТУ СООТВЕТСТВИЯ № ЕАЭС RU C-US.AA87.B.00217/19 Лист 4

Серия RU № 0621347

3.4. Электрические параметры:

3.4.1 виброперeключателей 685yxx

| | |
|---|---|
| Напряжение питания, В | 85-245 (AC), 24 (DC) |
| Максимальный ток, мА | 150 |

3.4.2 преобразователей EX(TO)(M)602yzzz/aaa, EX(TO)(M)603yzzz/aaa, EX(TO)(M)606yzzz/aaa, EX(T0)(M)607yzzz/aaa, EX(TO)(M)608yzzz/aaa , EX (XX) 622yzzz / aaa, EX (XX), 623yzzz / aaa, EX (XX) 625yzzz / aaa, EX (XX) 628yzzz / aaa с Ex-маркировкой 2Ex nA IIC T4 Gc X:

| | |
|---|---|
| Напряжение питания, В | 28 |
| Максимальный ток, мА | 200 |
| Мощность, Вт | 1 |

3.4.3 преобразователей EX(M)637XYYYZ, (M)638XYYYZ

| | |
|---|---|
| Напряжение питания, В | 18 – 28 |
| Максимальный ток, мА | 1,6 – 20 |
| Мощность, Вт | 0,5 |

3.4.4 Предусилителей EX682XYYY

| | |
|---|---|
| Напряжение питания, В | 22 – 28 |
| Максимальный ток, мА | 3,1 – 4,1 |
| Мощность, Вт | 0,1 |

3.4.5 преобразователей EX(RV)(TO)(M)64xyxx, EX(RV)(TO)(M)649yxx, EX (RV)(TO) (M)686yxx

| | |
|---|---|
| Напряжение питания, В | 18 – 30 |
| Максимальный ток, мА | 1,6 – 20 |
| Мощность, Вт | 0,5 |

## 4. ОПИСАНИЕ КОНСТРУКЦИИ И СРЕДСТВ ОБЕСПЕЧЕНИЯ ВЗРЫВОЗАЩИЩЕННОСТИ

Преобразователи состоят из герметичного цилиндрического металлического корпуса, в котором размещается печатная плата и пьезокристаллический элемент. Сборка подключается к разъему или встроенному кабелю. На наружной поверхности корпуса преобразователя нанесена маркировка.

Виброперeключатели серии 685yxx выполнены в металлическом корпусе, внутри которого размещена электронная плата. На наружной поверхности корпуса нанесена маркировка.

Предусилители серии EX682XYYY выполнены в прямоугольном пластиковом корпусе с креплением на DIN рейку. Внутри корпуса размещена электронная плата. На корпусе размещен съемный клеммный блок. На наружной поверхности корпуса нанесена маркировка.

Подробное описание конструкции приведено в Руководствах по эксплуатации №750119 от 23.01.19, №830119 от 23.01.19, №940219 от 07.02.19, №630119 от 22.01.19, №610119 от 22.01.19, №910219 от 07.02.19, №950219 от 08.02.19, №970219 от 08.02.19

**Взрывозащищенность** преобразователей, виброперeключателей и предусилителей обеспечивается выполнением требований: ГОСТ 31610.15-2012/МЭК 60079-15:2005, ГОСТ 31610.0-2014 (IEC 60079-0:2011), ГОСТ IEC 60079-1-2011, ГОСТ 31610.11-2014 (IEC 60079-11:2011), в соответствии с Ex-маркировкой.

## 5. МАРКИРОВКА

**Маркировка**, наносимая на преобразователи, виброперeключатели и предусилители, включает следующие данные:

- товарный знак или наименование предприятия-изготовителя;
- серийный номер или номер партии;
- диапазон значений температур окружающей среды при эксплуатации;
- Ex-маркировку;
- специальный знак взрывобезопасности;
- наименование центра по сертификации и номер сертификата;
- предупредительные надписи;
- искробезопасные параметры

и другие данные, которые изготовитель должен отразить в маркировке, в соответствии с требованиями нормативной и технической документации.

## 6. СПЕЦИАЛЬНЫЕ УСЛОВИЯ ПРИМЕНЕНИЯ

5.1 Знак X, стоящий после Ex-маркировки, означает, что при эксплуатации преобразователей, виброперeключателей, предусилителей необходимо соблюдать следующие специальные условия:

- преобразователи, виброперeключатели, предусилители должны быть подключены к сертифицированному на соответствие требованиям ТР ТС 012/2011 источнику питания с соответствующей областью применения.

5.2 Свободные концы постоянно подсоединенного кабеля должны подключаться в сертифицированной на соответствие требованиям ТР ТС 012/2011 соединительной коробке или вне взрывоопасной зоны.

**Специальные условия применения, обозначенные знаком X, отражены в сопроводительной документации, подлежащей обязательной поставке в комплекте с каждым изделием.**

**Внесение изменений в конструкцию изделий возможно только по согласованию с ОС ЦСВЭ в соответствии с требованиями ТР ТС 012/2011.**

**Руководитель (уполномоченное лицо) органа по сертификации** (подпись) **Залогин Александр Сергеевич** (Ф.И.О.)

**М.П.**

**Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы))** (подпись) **Рафалович Борис Александрович** (Ф.И.О.)

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# *EU Declaration of Conformity PS053*

***In Accordance with ISO/IEC 17050***

**Manufacturer:**
PCB Piezotronics, Inc.
3425 Walden Avenue
Depew, New York 14043
USA

**Authorized European Representative:**
PCB Piezotronics Europe GmbH
Porschestrasse 20-30
41836 Hückelhoven
Germany

**Certifies that type of equipment:** **Vibration Sensor(s)**

**Whose Product Models Include:** **EX64…, EXTO64…, EXRV64… Series**

**This declaration is applicable to all Vibration Sensor(s) of the above series which have the CE & (EX) ATEX mark on their data sheets and where those data sheets refer to this declaration of conformity. The data sheets for all model numbers referenced above, which include the CE & (EX) ATEX mark on such data sheets and refer to this Declaration of Conformity are hereby incorporated by reference into this Declaration.**

| | | |
|---|---|---|
| **Conform to the following EU Directive(s) when installed per product documentation:** | 2014/30/EU | EMC Directive |
| | 2011/65/EU w/2015/863/EU | RoHS Directive |
| | 2014/34/EU | ATEX Directive |

## Harmonized Standards to which Conformity is Declared:

| | | |
|---|---|---|
| **Harmonized Standards** | EN 61326-1:2013 | Electrical Equipment for Measurement, Control and Laboratory Use- EMC requirements - Part 1: General requirements |
| | EN 61326-2-3: 2013 | Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning |
| | EN 61010-1:2010<br>EN 61010-1:2010/A1:2019/AC:2019-04<br>EN 61010-1:2010/A1:2019 | Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements |
| | EN 60079-0:2018 | General Explosive Atmosphere |
| | EN 60079-11: 2012 | Intrinsic safe, i |
| | EN IEC 63000:2018 | Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances (IEC 63000:2018) |
| **Emissions Test Standards** | EN 55011:2016,<br>EN 55011:2016/A1:2017<br>EN 55011:2016/A11:2020 | Industrial, scientific and medical (ISM) radio frequency equipment-Electromagnetic disturbance characteristics- Limits and methods of Measurement Class B |
| **Other Standards Applied (non-OJEU)** | EN 61000-4-2:2001 | Electromagnetic compatibility (EMC)–Part 4–2: Testing and measuring techniques–Electrostatic discharge immunity test |
| | EN 61000-4-3:2006 | Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test |

| | | |
|---|---|---|
| **Immunity Test Standards** | EN 61000-4-4:2004 | Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test |
| | EN 61000-4-5:2005 | Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test |
| | EN 61000-4-6:2006 | Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields |
| | EN 61000-4-8:2001 | Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test |
| **Test Reports** | EMC Reports<br>Safety Reports | GM29045c<br>GM29046s |
| **EC Type Examination** | ATEX Certification | LCIE 05 ATEX 6154 X<br>Ex ia IIC T4, II 1G |
| **Voluntary Certification** | Supplemental ATEX Certification | LCIE 05 ATEX 6155 X<br>Ex nL IIC T4<br>Ex nA IIC T4 (for EX64xB7y, EXTO64xB7y, and EXRV64xB7y) |
| **Notified Body Name** | | Laboratoire Central des Industries Electriques (0081) |
| **Notified Body's Address** | | **FONTENAY-AUX-ROSES (Head Office)**<br>33, avenue du Général Leclerc<br>FR- 92260 Fontenay-aux-Roses<br>Tel. : + 33 1 40 95 60 60<br>Fax : + 33 1 40 95 86 56 |

*I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) Standard(s)*

**Place:** Depew, NY **Date:** 03/26/2023

Signature: W. Willard

Name: Wendy Willard

Title: Regulatory Affairs and Product Certification Specialist

# ATTESTATION D'EXAMEN DE TYPE

# *TYPE EXAMINATION CERTIFICATE*

1 **Version : 03** **LCIE 05 ATEX 6155 X** **Issue : 03**

| | | |
|---|---|---|
| | **Directive 2014/34/UE** | **Directive 2014/34/EU** |
| 2 | Appareil ou Système de Protection destiné à être utilisé en Atmosphères Explosibles | Equipment or Protective System Intended for use in Potentially Explosive Atmospheres |
| 3 | Produit :<br>**Capteurs de vibration** | Product :<br>**Vibration sensors** |

**Type: EX(M)64*****/M**, EXTO(M)64*****/M**, EXRV(M)64*****/M****

| | | |
|---|---|---|
| 4 | Fabricant : | Manufacturer : |
| | **PCB Piezotronics Inc.** | |
| 5 | Adresse : | Address : |
| | 3425 Walden Avenue<br>Depew, New York 14043<br>États-Unis d'Amérique | |
| 6 | Ce produit et ses variantes éventuelles acceptées sont décrits dans l'annexe de la présente attestation et dans les documents descriptifs cités en référence. | This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to. |
| 7 | Le LCIE certifie que ce produit est conforme aux Exigences Essentielles de Sécurité et de Santé pour la conception et la construction de produits destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la Directive.<br>Les résultats des vérifications et essais figurent dans le(s) rapport(s) confidentiel(s) N° : | LCIE certifies that product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive.<br>The examination and test results are recorded in confidential report(s) N°: |
| | 140596-682759 ; 162903-740871 | |
| 8 | Le respect des Exigences Essentielles de Sécurité et de Santé est assuré par la conformité à : | Compliance with the Essential Health and Safety Requirements has been assured by compliance with : |
| | EN IEC 60079-0:2018<br>EN 60079-7:2015 + A1:2018 | |
| 9 | Le signe « X » lorsqu'il est placé à la suite du numéro de l'attestation, indique que cet appareil est soumis aux conditions particulières d'utilisation, mentionnées dans l'annexe de cette attestation. | If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate. |
| 10 | Cette Attestation d'Examen de Type concerne uniquement la conception et la construction du produit spécifié.<br>Des exigences supplémentaires de la directive sont applicables pour la fabrication et la fourniture du produit. Ces dernières ne sont pas couvertes par la présente attestation. | This Type Examination Certificate relates only to the design and construction of the specified product.<br>Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate. |
| 11 | Le marquage du produit est mentionné dans l'annexe de cette attestation. | The marking of the product is specified in the schedule to this certificate. |

Fontenay-aux-Roses, le 28 février 2023

Responsable de Certification
Certification Officer
Julien Gauthier

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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## 12 DESCRIPTION DU PRODUIT

Ces capteurs de vibration ont un boîtier en acier inoxydable intégrant une électronique, complètement encapsulée dans un composé d'empotage, associée à un élément sensible (cristal piézoélectrique avec une valeur de capacité ≤ 700 pF).
La construction du boîtier métallique du capteur est entièrement soudée. La forme du boîtier diffère selon le modèle du capteur.

Les capteurs sont équipés d'un connecteur intégré ou d'un câble intégré (non armé ou armé). La longueur maximale du câble est de 305 m.
Le raccordement électrique peut également se faire via un bornier ou des conducteurs volants selon le modèle de capteur. Dans ce cas, le capteur de vibration est vissé, grâce à un filetage externe 1" NPT, dans un coude de conduit Y-3 (100-7094-90) de Killark procurant un degré de protection IP54.
Les capteurs de vibration fournissent en sortie un courant de 4-20 mA lorsqu'ils sont soumis à un mouvement mécanique.
Les produits avec option TO incluent une sortie 4-20mA supplémentaire indépendante pour la mesure de la température. Le capteur de température intégré surveille l'environnement interne au boîtier du capteur.
Les produits avec option RV fournissent en sortie une tension de 0-2,5 V c.a. et 2,5 V c.c. correspondant à la vibration brute de l'accéléromètre intégré.

## DESCRIPTION OF PRODUCT

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 model of the sensor.

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 include a 0-2.5 V a.c. and 2.5 V d.c. output that corresponds to raw vibration from the imbedded accelerometer.

| Type de l'équipement<br>*Type of the equipment* | Configuration |
|---|---|
| EX(M)64**0**,<br>EX(M)64**9** | Avec connecteur intégré<br>*with integral connector* |
| EX(M)64**1**/M**,<br>EX(M)64**6**/M** | Avec cable intégré<br>*with integral cable* |
| EXTO(M)64**3**,<br>EXTO(M)64**9** | Avec sortie température et connecteur<br>*with Temperature Output and connector* |
| EXTO(M)64**1**/M**,<br>EXTO(M)64**6**/M** | Avec sortie température et câble intégré<br>*with Temperature Output and integral cable* |
| EXRV(M)64**0**,<br>EXRV(M)64**9** | Avec sortie vibration brute et connecteur<br>*with Raw Vibration Output and connector* |
| EXRV(M)64**1**/M**,<br>EXRV(M)64**6**/M** | Avec sortie vibration brute et câble intégré<br>*with Raw Vibration Output and integral cable* |
| EX(M)64**7**,<br>EX(M)64**8** | Avec conducteurs volants ou bornier + coude de conduit<br>*with flying leads or terminal block + capped conduit elbow* |
| EXRV(M)64**7**<br>EXRV(M)64**8** | Avec sortie vibration brute et conducteurs volants ou bornier + coude de conduit<br>*with Raw Vibration Output and flying leads or terminal block + capped conduit elbow* |

## CARACTERISTIQUES

Tension maximum d'entrée $U_{max}$ : 30 V d.c.
Puissance maximale $P_{max}$ : 1 W

## RATINGS

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

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**DETAIL DE LA GAMME** | **RANGE DETAILS**

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

Deux caractères optionnels pour désigner le type de terminaison du câble

Trois à six chiffres optionnels utilisant xxx-xx pour désigner la longueur en pieds-pouces ou mètres-centimètres avec M dans la colonne précédente

Longueur de câble métrique en option

Modificateur de longueur de câble en option

Pour M uniquement ; Un nombre (01 à 999) qui désigne un numéro de modèle spécial avec une sensibilité, une plage de mesure, une plage de fréquence, une longueur de câble et une terminaison de câble personnalisés. Peut inclure d'ajouter le logo du client et le numéro de modèle en plus du modèle et du logo PCB.

Un chiffre ou une lettre 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, M qui désigne la plage de mesure et le filtrage
M = Spécial client

Un chiffre 0, 1, 3, 6, 7, 8 ou 9 qui désigne le type de connecteur
0 = Pour connecteur MIL-C-5015 à 2 broches ou MIL-C-5015 à 3 broches si option RV
1 = Pour câble intégral gainé en polyuréthane
3 = Pour connecteur MIL-C-26482 à 4 broches pour option TO
6 = Câble intégral armé gainé en polyuréthane
7 = Bornier pour capteur version coude coiffé de conduit
8 = Conducteurs volants pour capteur version coude coiffé de conduit
9 = Pour connecteur M12 4/5 broches

Une lettre de A à Z pour indiquer le niveau de révision du modèle

Un chiffre 0, 1, 2, 3, 4, 5, 6, 7 ou 8 qui indique le type de capteur et la plage de mesure de sortie
0 = Pour les configurations Sortie par le haut ou Coude de conduit avec plage de mesure en in/sec crête
1 = Pour les configurations Sortie par le haut ou Coude de conduit avec plage de mesure en in/sec valeur efficace
2 = Pour les configurations Sortie sur le côté avec plage de mesure en in/sec crête
3 = Pour les configurations Sortie sur le côté avec plage de mesure en in/sec valeur efficace
4 = Réservé pour un futur emplacement de sortie et plage de mesure
5 = Pour les configurations Sortie par le haut ou Coude de conduit avec plage de mesure de 0 à 5 g valeur efficace
6 = Pour les configurations Sortie par le haut ou Coude de conduit avec plage de mesure de 0 à 10 g valeur efficace
7 = Pour les configurations Sortie sur le côté avec plage de mesure de 0 à 5 g valeur efficace
8 = Pour les configurations Sortie sur le côté avec plage de mesure de 0 à 10 g valeur efficace

Famille de capteurs de la série 64

Une ou plusieurs options de capteur
M = Monture métrique
TO = Sortie Température
RV = Sortie Vibration brute

Type de produit :
EX = ATEX/IECEx Produit

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**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

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## MARQUAGE

Le marquage du produit doit comprendre :

Marquage complet :
PCB Piezotronics Inc. ou IMI Sensors ou IMI
Adresse : ...
Type : ... (1)
Numéro de fabrication : ...
Année de fabrication : ...
Ex II 3 G
Ex ec IIC T4 Gc
LCIE 05 ATEX 6155 X

-40 °C ≤ $T_{amb}$ ≤ +80 °C

AVERTISSEMENT – NE PAS CONNECTER OU DECONNECTER SOUS TENSION

Marquage réduit :
PCB Piezotronics Inc. ou IMI Sensors ou IMI
Type : ... (1)
N° de fabrication : ...
Année de fabrication : ...
Ex II 3 G
Ex ec IIC T4 Gc
$T_a$ = 80 °C
LCIE 05 ATEX 6155 X

(1) Voir le détail de la gamme ci-dessus

L'appareil doit également comporter le marquage normalement prévu par les normes de construction qui le concernent sous la responsabilité du fabricant.

## MARKING

The marking of the product shall include the following :

Full marking:
PCB Piezotronics Inc. or IMI Sensors or IMI
Address : ...
Type : ... (1)
Serial number : ...
Year of construction : ...
Ex II 3 G
Ex ec IIC T4 Gc
LCIE 05 ATEX 6155 X

-40 °C ≤ $T_{amb}$ ≤ +80 °C

WARNING – DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED

Reduced marking:
PCB Piezotronics Inc. or IMI Sensors or IMI
Type : ... (1)
Serial number : ...
Year of construction : ...
Ex II 3 G
Ex ec IIC T4 Gc
$T_a$ = 80 °C
LCIE 05 ATEX 6155 X

(1) See the Range Details above

The equipment shall also bear the usual marking required by the product standards applying to such equipment under the manufacturer responsibility.

## 13 CONDITIONS PARTICULIERES D'UTILISATION

a. Gamme de température ambiante de fonctionnement : -40 °C à +80 °C.

b. L'appareil doit uniquement être connecté à une source externe délivrant au maximum une tension de 30 V d.c. et une puissance de 1 Watt.

c. La protection contre les transitoires doit être fournie à un niveau défini ne dépassant pas 140 % de la valeur de crête de la tension assignée aux bornes d'alimentation vers l'appareil.

d. Le montage du capteur dans une installation doit être effectué de telle sorte que le corps métallique du capteur et le blindage du câble soient reliés de manière fiable à la terre du système.

## SPECIFIC CONDITIONS OF USE

Ambient operating temperature range:
-40 °C up to +80 °C.

The transducer shall be connected to an external power supply delivering a maximum of 30 V d.c. and 1 W.

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 device.

The mounting of the sensor in an installation must be carried out in such a way that the sensor metallic body and cable shield are reliably connected to the system earth.

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CERT-ATEX-FORM 05 Rev. 05

e. Pour les capteurs avec connecteur intégré :
Le connecteur mâle ou femelle homologue fourni par l'utilisateur final doit être conforme à toutes les clauses applicables des normes EN 60079-0 et EN 60079-7. Un degré de protection IP54 minimum selon la norme IEC 60079-0 doit être assuré.
Le connecteur homologue ne doit pas être connecté ou déconnecté sous tension.

For sensor with integral connector:
The mating connector provided by the end user shall be in accordance with all applicable clauses of EN 60079-0 and EN 60079-7 for a zone 2 application. A minimum degree of protection IP54 according to EN 60079-0 shall be ensured.

The mating connector shall not be connected or disconnected when energized.

f. Pour les capteurs avec conducteurs volants :
Les conducteurs volants doivent être convenablement protégés contre les chocs et doivent être connectés dans une enveloppe dûment certifiée ou dans une zone sûre. L'installation doit garantir qu'aucune force de traction ne sera appliquée aux conducteurs.

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.

g. Pour les capteurs avec coude de conduit:
L'utilisateur devra utiliser un dispositif d'entrée certifié « Ex e » à l'entrée du coude tout en respectant les exigences d'installation de la norme EN 60079-14.
Déconnecter le capteur du circuit d'alimentation avant d'ouvrir le coude de conduit.
Le démontage du capteur de son coude de conduit n'est pas autorisé.

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 EN 60079-14.
Disconnect the device from supply circuit before opening the capped conduit elbow.
The disassembling of the sensor from its capped elbow is not allowed.

h. AVERTISSEMENT – NE PAS CONNECTER OU DECONNECTER SOUS TENSION

WARNING – DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED

i. L'équipement doit être connecté conformément aux instructions du fabricant.

The equipment must be connected according to the instructions of the manufacturer.

## 14 EXIGENCES ESSENTIELLES DE SANTE ET DE SECURITE

Couvertes par les normes listées au point 8.

## ESSENTIAL HEALTH AND SAFETY REQUIREMENTS

Covered by standards listed at 8.

## 15 DOCUMENTS DESCRIPTIFS

## DESCRIPTIVE DOCUMENTS

| N° | Description | Reference | Rev. | Date | Page(s) |
|---|---|---|---|---|---|
| 1. | Technical file | 64777 | A | 2023-01-26 | 49 |
| 2. | Instructions For Use | 32836 | -- | -- | -- |

## 16 INFORMATIONS COMPLEMENTAIRES

**Essais individuels**

Conformément au paragraphe 7.1 de la norme EN 60079-7, chaque produit fabriqué doit être soumis à un essai de rigidité diélectrique à 500 V c.a. pendant 1 minute. Alternativement, le test peut être effectué à 600 V c.a. pendant 100 ms. Aucun claquage ne doit se produire.

## ADDITIONAL INFORMATIONS

**Routine tests**

In accordance with clause 7.1 of standard EN 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.

## 17 DETAILS DES MODIFICATIONS DE L'ATTESTATION

Version 00 : Version initiale.
2005-12-07

## DETAILS OF CERTIFICATE CHANGES

Issue 00: Initial issue.

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Version 01 : 2007-08-02

- Mise à jour normative selon les normes EN 60079-0:2006 et EN 60079-15:2005.

Version 02 : 2018-07-11

- Mise à jour normative selon les normes EN 60079-0:2012 + A11:2013 et EN 60079-15:2010.
- Distinction entre le nom du fabricant (PCB Piezotronics Inc.) et le nom de la marque commerciale (IMI Sensors ou IMI).
- Mise à jour de la nomenclature des modèles.

Version 03 :

- Mise à jour normative selon les normes EN IEC 60079-0:2018 et EN 60079-7:2015 + A1:2018.
- Mise à jour de la désignation du type pour notamment introduire les capteurs « Modifiés » (M) sur demande spéciale du client (aucun impact sur les modes de protection).
- Mise à jour des conditions particulières d'utilisation.

Issue 01:

- Normative update according to EN 60079-0:2006 and EN 60079-15:2005 standards.

Issue 02:

- Normative update according to EN 60079-0:2012+A11:2013 and EN 60079-15:2010 standards.
- Distinction between the name of the manufacturer (PCB Piezotronics Inc.) and the trademark (IMI Sensors or IMI).
- Update of the nomenclature of the models.

Issue 03:

- Normative update according to EN IEC 60079-0:2018 and EN 60079-7:2015 + A1:2018.
- Update of the type designation to notably introduce "Modified" sensors (M) for customer special request (no impact on the types of protection).
- Update of Specific Conditions of Use.

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# ATTESTATION D'EXAMEN DE TYPE
## *TYPE EXAMINATION CERTIFICATE*

1 **Version : 02** **LCIE 05 ATEX 6155 X** **Issue : 02**

| | | |
|---|---|---|
| | **Directive 2014/34/UE** | **Directive 2014/34/EU** |
| 2 | Appareil ou Système de Protection destiné à être utilisé en Atmosphères Explosibles | Equipment or Protective System Intended for use in Potentially Explosive Atmospheres |
| 3 | Produit :<br>**Transmetteurs de vibration** | Product :<br>**Vibration transmitters** |

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

| | | |
|---|---|---|
| 4 | Fabricant : | Manufacturer : |
| | **PCB Piezotronics Inc.** | |
| 5 | Adresse : | Address : |
| | 3425 Walden Avenue<br>DEPEW, NY 14043<br>UNITED STATES of AMERICA | |
| 6 | Ce produit et ses variantes éventuelles acceptées sont décrits dans l'annexe de la présente attestation et dans les documents descriptifs cités en référence. | This product any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to. |
| 7 | Le LCIE certifie que ce produit est conforme aux Exigences Essentielles de Sécurité et de Santé pour la conception et la construction de produits destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la Directive.<br>Les résultats des vérifications et essais figurent dans le(s) rapport(s) confidentiel(s) N° : | LCIE certifies that product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive.<br>The examination and test results are recorded in confidential report(s) N°: |
| | 140596-682759 | |
| 8 | Le respect des Exigences Essentielles de Sécurité et de Santé est assuré par la conformité à : | Compliance with the Essential Health and Safety Requirements has been assured by compliance with : |
| | EN 60079-0:2012+A11:2013,<br>EN 60079-15:2010 | |
| 9 | Le signe « X » lorsqu'il est placé à la suite du numéro de l'attestation, indique que cet appareil est soumis aux conditions particulières d'utilisation, mentionnées dans l'annexe de cette attestation. | If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate. |
| 10 | Cette Attestation d'Examen de Type concerne uniquement la conception et la construction du produit spécifié.<br>Des exigences supplémentaires de la directive sont applicables pour la fabrication et la fourniture du produit. Ces dernières ne sont pas couvertes par la présente attestation. | This Type Examination Certificate relates only to the design and construction of the specified product.<br>Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate. |
| 11 | Le marquage du produit est mentionné dans l'annexe de cette attestation. | The marking of the product is specified in the schedule to this certificate. |

Fontenay-aux-Roses, le 11 juillet 2018

Responsable de Certification
Certification Officer
Julien Gauthier

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES
S.A.S au capital de 15.745.984 €
RCS Nanterre B 408 363 174
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## 12 DESCRIPTION DU PRODUIT

L'appareil est un transmetteur de vibration intégrant un cristal piézoélectrique, un traitement électronique du signal et un connecteur ou un câble intégré ou des fils volants pour l'interface externe. Le signal délivré est un courant de sortie dans la plage 4-20mA correspondant au niveau de vibration.

Les appareils de type EXTO sont équipés d'un capteur de température intégré. L'appareil, type EXRV, délivre une sortie de vibration brute dans la plage 0-2.5VAC

Les boitiers des têtes de capteur sont réalisés en acier inoxydable de plusieurs formes, en fonction du type. Les connexions externes peuvent être effectuées par connecteur ou câble blindé ou fils volants selon le type.

Equipement disponible en version métrique (type avec M).

Paramètres électriques :

Tension maximum d'entrée $U_{max}$ : 30V
Puissance maximum $P_{max}$ : 1W

## DESCRIPTION OF PRODUCT

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 in the range 0-2.5VAC

Sensor heads are made of stainless steel housings with several shapes, depending on the type. External connections can be done by connector or shield cable or flying leads depending on the type.

Apparatus is available in metric version (type with M).

Electrical parameters:

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

## DETAIL DE LA GAMME / RANGE DETAILS

| Types et caractéristiques / *Types and characteristics* |
|---|
| EX(M)64xA0y, EX(M)64xB0y avec connecteur / *with connector.* |
| EX(M)64xA1y, EX(M)64xA6y, EX(M)64xB1y, EX(M)64xB6y avec câble / *with cable.* |
| EXTO(M)64xA3y, EXTO(M)64xB3y avec capteur de température et Connecteur / *with temperature sensor and connector.* |
| EXTO(M)64xA1y, EXTO(M)64xA6y, EXTO(M)64xB1y, EXTO(M)64xB6y avec capteur de température et câble / *with temperature sensor and cable.* |
| EXRV(M)64xA0y, EXRV(M)64xB0y avec sortie vibration brute et connecteur / *with raw vibration output and connector.* |
| EXRV(M)64xA1y, EXRV(M)64xA6y, EXRV(M)64xB1y, EXRV(M)64xB6y avec sortie vibration brute et câble / *with raw vibration output and cable.* |
| EX(M)64xB7y avec fils volants / *with flying leads.* |
| EXTO(M)64xB7y avec capteur de température et fils volants / *with temperature sensor and flying leads.* |
| EXRV(M)64xB7y avec sortie vibration brute et fils volants / *with raw vibration output and flying leads.* |
| Note: la lettre M indique un équipement en version métrique. Les lettres x et y sont des variables du type (valeurs de 0 à 9). |
| *Note: M letter indicates apparatus in metric version. Letters x and y are variable digits of the type (values between 0 and 9).* |

## MARQUAGE

Le marquage du produit doit comprendre :

Marquage complet :

PCB Piezotronics Inc. ou IMI Sensors ou IMI
Adresse : ...
Type : ...
Numéro de fabrication : ...
Année de fabrication : ...
Ex II 3 G
Ex nA IIC T4 Gc
LCIE 05 ATEX 6155 X
-40°C ≤ Tamb ≤ +80°C
AVERTISSEMENT – NE PAS SEPARER SOUS TENSION

## MARKING

The marking of the product shall include the following :

Full marking :

PCB Piezotronics Inc. or IMI Sensors or IMI
Address: ...
Type : ...
Serial number: ...
Year of construction: ...
Ex II 3 G
Ex nA IIC T4 Gc
LCIE 05 ATEX 6155 X
-40°C ≤ Tamb ≤ +80°C
WARNING – DO NOT SEPARATE WHEN ENERGIZED

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92260 Fontenay-aux-Roses
FRANCE
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## MARQUAGE (suite)

Le marquage du produit doit comprendre :

Marquage réduit :

PCB Piezotronics Inc. ou IMI Sensors ou IMI
Type : ...
N° de fabrication : ...
Année de fabrication : ...
Ex II 3 G
Ex nA IIC T4 Gc, Ta = 80°C
LCIE 05 ATEX 6155 X

L'appareil doit également comporter le marquage normalement prévu par les normes de construction qui le concernent sous la responsabilité du fabricant.

## MARKING (continued)

The marking of the product shall include the following :

Reduced marking :

PCB Piezotronics Inc. or IMI Sensors or IMI
Type : ...
Serial number: ...
Year of construction: ...
Ex II 3 G
Ex nA IIC T4 Gc, Ta = 80°C
LCIE 05 ATEX 6155 X

The equipment shall also bear the usual marking required by the product standards applying to such equipment under the manufacturer responsibility.

## 13 CONDITIONS PARTICULIERES D'UTILISATION

a. Plage de température ambiante : -40°C à +80°C.

b. L'appareil doit être connecté uniquement à une source externe de tension maximum 30V et de puissance maximum 1W.

c. Le montage du produit dans une installation doit être effectué de telle sorte que le corps métallique du capteur et le blindage du câble soient reliés de manière fiable à la terre du système.

d. Pour l'installation finale, l'utilisateur devra prendre toutes les précautions nécessaires pour maintenir un degré de protection minimum IP54 de la connexion du capteur lors de son raccordement selon les préconisations de la norme EN 60079-14.

e. L'appareil doit être raccordé conformément au manuel d'instruction.

f. AVERTISSEMENT – NE PAS SEPARER SOUS TENSION

## SPECIFIC CONDITIONS OF USE

Ambient temperature range: -40°C to +80°C.

The equipment must only be connected to an external source with 30V maximum voltage and maximum power 1W.

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.

For final installation, the user shall take all necessary precautions to maintain the minimum degree of protection IP54 of the sensor connection when connected according to the requirements of EN 60079-14 standard.

The apparatus must be connected according to instruction manual.

WARNING – DO NOT SEPARATE WHEN ENERGIZED

## 14 EXIGENCES ESSENTIELLES DE SANTE ET DE SECURITE

Couvertes par les normes listées au point 8.

## ESSENTIAL HEALTH AND SAFETY REQUIREMENTS

Covered by standards listed at 8.

## 15 DOCUMENTS DESCRIPTIFS / DESCRIPTIVE DOCUMENTS

| N° | Description | Reference | Rev. | Date | Page(s) |
|---|---|---|---|---|---|
| 1. | Notice d'instructions / *Instructions notice* | 32836 | - | - | 3 |
| 2. | Dossier technique / *Technical file* | 64777 | NR | 2018/06/28 | 42 |

## 16 INFORMATIONS COMPLEMENTAIRES

**Essais individuels**

Chaque appareil doit être soumis au test de rigidité diélectrique suivant le paragraphe 23.2.1 de la norme EN 60079-15:2010. La tension de test doit être appliquée entre les signaux électriques actifs et l'enveloppe.

## ADDITIONAL INFORMATIONS

**Routine tests**

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

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## 16 INFORMATIONS COMPLEMENTAIRES (suite)

En accord avec l'Article 41 de la Directive 2014/34/UE, les attestations d'examen de type mentionnant la Directive 94/9/CE émises avant la date d'application de la Directive 2014/34/UE (20 avril 2016) peuvent être considérées comme émises en accord avec la Directive 2014/34/UE. Les nouvelles versions de ces attestations peuvent conserver le numéro de l'attestation d'origine émise avant le 20 avril 2016.

## ADDITIONAL INFORMATIONS (continued)

In accordance with Article 41 of Directive 2014/34/EU, Type Examination Certificates referring to Directive 94/9/EC that were in existence prior to the date of application of Directive 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. New issues of such certificates may continue to bear the original certificate number issued prior to 20 April 2016.

## 17 DETAILS DES MODIFICATIONS

Version 00 : 2005/12/07 — Version initiale

Version 01 : 2007/08/02 — Mise à jour normative suivant les normes EN 60079-0 : 2006 et EN 60079-15 : 2005.

Version 02 :
- Mise à jour normative suivant les normes EN 60079-0:2012+A11:2013 et EN 60079-15 :2010,
- Distinction entre le nom du fabricant (PCB Piezotronics Inc) et le nom de la marque commerciale (IMI Sensors ou IMI),
- Mise à jour de la nomenclature des modèles.

## DETAILS OF CHANGES

Issue 00: 2005/12/07 — Initial issue.

Issue 01: 2007/08/02 — Normative update according to EN 60079-0: 2006 and EN 60079-15: 2005 standards.

Issue 02:
- Normative update according to EN 60079-0:2012+A11:2013 and EN 60079-15:2010 standards,
- Distinction between the name of manufacturer (PCB Piezotronics Inc.) and the trademark (IMI Sensors or IMI),
- Update of the nomenclature of the models.

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1 **AVENANT D'ATTESTATION D'EXAMEN CE DE TYPE**

2 **Appareil ou système de protection** destiné à être utilisé en atmosphères explosibles **(Directive 94/9/CE)**

3 Numéro de l'avenant :
**LCIE 05 ATEX 6155 X / 01**

4 Appareil ou système de protection :
Capteurs de vibration
Type : EX64..., EXTO64..., EXVR64...

5 Demandeur : I.M.I.

15 **DESCRIPTION DE L'AVENANT**
Mise à jour normative selon les normes EN 60079-0 (2006) et EN 60079-15 (2005).

Les résultats des vérifications et essais figurent dans le rapport confidentiel N° 60058689/559762

Paramètres spécifiques du ou des modes de protection concerné(s) :
Inchangés

Le marquage doit être modifié comme suit :
Ex nL IIC T4
Ex nA IIC T4 *(pour EX64xB7y, EXTO64xB7y, EXRV64xB7y)*

16 **DOCUMENTS DESCRIPTIFS**

Dossier de certification N° 27867 Rév. A du 27/06/2007.
Ce dossier comprend 18 rubriques (37 pages).
Dossier de certification N° 28771 Rév. A du 27/06/2007.
Ce dossier comprend 12 rubriques (28 pages).

17 **CONDITIONS SPECIALES POUR UNE UTILISATION SURE**
Inchangées

18 **EXIGENCES ESSENTIELLES DE SECURITE ET DE SANTE**
Conformité aux normes européennes EN 60079-0 (2006) et EN 60079-15 (2005).

19 **VERIFICATIONS ET ESSAIS INDIVIDUELS**
Néant

1 **SUPPLEMENTARY EC TYPE EXAMINATION CERTIFICATE**

2 **Equipment or protective system** intended for use in potentially explosive atmospheres **(Directive 94/9/EC)**

3 Supplementary certificate number :
**LCIE 05 ATEX 6155 X / 01**

4 Equipment or protective system :
Vibration sensors
Type : EX64..., EXTO64..., EXVR64...

5 Applicant : I.M.I.

15 **DESCRIPTION OF THE SUPPLEMENTARY CERTIFICATE**
Normative update according to EN 60079-0 (2006) and EN 60079-15 (2005) standards.

The examination and test results are recorded in confidential report N° 60058689/559762

Specific parameters of the mode(s) of protection concerned:

Unchanged

The marking shall be modified as follows :
Ex nL IIC T4
Ex nA IIC T4 *(for EX64xB7y, EXTO64xB7y, EXRV64xB7y)*

16 **DESCRIPTIVE DOCUMENTS**

Certification file N° 27867 Rev. A dated 27/06/2007.
This file includes 18 items (37 pages).
Certification file N° 28771 Rév. A dated 27/06/2007.
This file includes 12 items (28 pages).

17 **SPECIAL CONDITIONS FOR SAFE USE**

Unchanged

18 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS**

Conformity to the European standards EN 60079-0 (2006) and EN 60079-15 (2005).

19 **ROUTINE VERIFICATIONS AND TESTS**
None

Fontenay-aux-Roses, le 2 août 2007

Le responsable de certification ATEX
ATEX certification manager

NOTIFIED BODY 0081 ORGANISME NOTIFIE

Henri CERVELLO

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RCS Nanterre B 408 363 174

1 **ATTESTATION D'EXAMEN DE TYPE**

2 Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles
**Directive 94/9/CE**

3 Numéro de l'attestation d'examen de type
**LCIE 05 ATEX 6155 X**

4 Appareil ou système de protection :
Capteurs de vibrations
Type : EX64...,EXTO64...,EXRV64 (voir page suivante)

5 Demandeur : I.M.I. (Industrial Monitoring Instrumentation)

6 Adresse : A PCB PIEZOTRONICS DIVISION
3425 Walden Avenue
Depew, New York 14043
U.S.A.

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées est décrit dans l'annexe de la présente attestation et dans les documents descriptifs cités en annexe.

8 Le LCIE certifie que cet appareil ou système de protection est conforme aux exigences essentielles en ce qui concerne la sécurité et la santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive. Les vérifications et épreuves figurent dans nos rapports confidentiels n° 60040901/540946/2.

9 Le respect des exigences essentielles en ce qui concerne la sécurité et la santé est assuré par la conformité aux documents suivants :

-EN 50021 (1999)

10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que ce matériel ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 Cette attestation d'examen de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à la directive 94/9/CE.
Des exigences supplémentaires de cette directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection.

12 Le marquage de l'appareil ou du système de protection devra comporter, entre autres indications utiles, les mentions suivantes :
Ex II 3 G
EEx nL ou nA IIC T4

Fontenay-aux-Roses, le 7 décembre 2005

1 **TYPE EXAMINATION CERTIFICATE**

2 Equipment or protective system intended for use in potentially explosive atmospheres
**Directive 94/9/EC**

3 Type Examination Certificate number
**LCIE 05 ATEX 6155 X**

4 Equipment or protective system :
Vibration sensors
Type : EX64...,EXTO64...,EXRV64... (see following page)

5 Applicant : I.M.I. (Industrial Monitoring Instrumentation)

6 Address : A PCB PIEZOTRONICS DIVISION
3425 Walden Avenue
Depew, New York 14043
U.S.A.

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 LCIE certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmospheres, given in Annex II of the Directive. The examination and test results are recorded in confidential reports n° 60040901/540946/2.

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with :

-EN 50021 (1999)

10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with the Directive 94/9/EC.
Further requirements of the Directive applies to the manufacture and supply of this equipment or protective system.

12 The marking of the equipment or protective system shall include the following :

Ex II 3 G
EEx nL or nA IIC T4

Le Directeur de l'organisme certificateur
Manager of the certification body

Henri CERVELLO
Timbre sec / Dry seal



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(A1) **ANNEXE**

(A2) **ATTESTATION D'EXAMEN DE TYPE**

**LCIE 05 ATEX 6155 X**

(A3) Description de l'équipement ou du système de protection :

Capteurs de vibrations
Type : EX64...,EXTO64...,EXRV64

Ce capteur est composé d'un ensemble piezo-cristal, d'une carte électronique et d'un connecteur ou un câble intégré.

Modèles concernés :
EX64xB0y, EX64xB1y, EX64xB6y
EXTO64xB3y, EXTO64xB1y, EXTO64xB6y,
EXRV64xB0y,EXRV64xB1y,EXRV64xB6y,
EX64xB7y,EXTO64xB7y,EXRV64xB7y
EX64xA0y,EX64xA1y,EX64xA6y,
EXTO64xA3y,EXTO64xA1y,EXTO64xA6y,
EXRV64xA0y,EXRV64xA1y,EXRV64xA6y

Le marquage est le suivant :

I.M.I. Adresse : ...
Type : EX... (1)
N° de fabrication : ... Année de fabrication : ...
Ex II 3 G
EEx nL IIC T4
EEx nA IIC T4 (types EX64xB7y,EXTO64xB7y,EXRV64xB7y)
LCIE 05 ATEX 6155 X
T.amb. : – 40°C à + 80°C

(1) Suivant le modèle

Le matériel devra également comporter le marquage normalement prévu par les normes de construction du matériel électrique concerné.

Paramètres électriques relatifs à la sécurité :

(A1) **SCHEDULE**

(A2) **TYPE EXAMINATION CERTIFICATE**

**LCIE 05 ATEX 6155 X**

(A3) Description of Equipment or Protective System :

Vibration sensors
Type : EX64...,EXTO64...,EXRV64

This apparatus is made of a piezo-crystal assembly, an electronic board and a connector or an integrated cable.

Models concerned :
EX64xB0y, EX64xB1y, EX64xB6y
EXTO64xB3y, EXTO64xB1y, EXTO64xB6y,
EXRV64xB0y,EXRV64xB1y,EXRV64xB6y,
EX64xB7y,EXTO64xB7y,EXRV64xB7y
EX64xA0y,EX64xA1y,EX64xA6y,
EXTO64xA3y,EXTO64xA1y,EXTO64xA6y,
EXRV64xA0y,EXRV64xA1y,EXRV64xA6y

Marking is as follow :

I.M.I. Address : ...
Type : EX... (1)
Serial number : ... Year of manufacturing : ...
Ex II 3 G
EEx nL IIC T4
EEx nA IIC T4 (types EX64xB7y,EXTO64xB7y,EXRV64xB7y)
LCIE 05 ATEX 6155 X
T.amb. : – 40°C to + 80°C

(1) According to the model

The equipment must also bear the usual marking required by the manufacturing standards applying to such equipments.

Electrical parameters relative to safety :

| Modèle / Model | Ui (V) | Ii (mA) | Pi (W) | Ci (nF) | Li (µH) |
|---|---|---|---|---|---|
| EX64xA0x, EX64xB0y | 30 | 100 | 1 | 0 | 1,06 |
| EX64xA1y, EX64xA6y, EX64xB1y, EX64xB6y | 30 | 100 | 1 | 61 | 306 |
| EXTO64xA3y, EXTO64xB3y | 28 | 120 | 1 | 0 | 1,06 |
| EXTO64xA1y, EXTO64xA6y, EXTO64xB1y, EXTO64xB6y | 28 | 120 | 1 | 61 | 306 |
| EXRV64xA0y, EXRV64xB0y | 28 | 120 | 1 | 0 | 121,06 |
| EXRV64xA1y, EXRV64xA6y, EXRV64xB1y, EXRV64xB6y | 28 | 120 | 1 | 61 | 426 |
| EX64xB7y | 12 à/to 30 | | | | |
| EXTO64xB7y, EXRV64xB7y | 12 à/to 30 | | | | |



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(A1) **ANNEXE**

(A2) **ATTESTATION D'EXAMEN DE TYPE**

**LCIE 05 ATEX 6155 X (suite)**

(A4) Documents descriptifs :

Dossier technique N° 28771 Rév. NR du 10/10/2005.
Ce document comporte 12 rubriques (28 pages).

Dossier technique N° 27867 Rév. NR du 10/10/2005.
Ce document comporte 18 rubriques (37 pages).

(A5) Conditions spéciales pour une utilisation sûre :

Les paramètres électriques d'alimentation ne doivent pas excéder les valeurs mentionnées au paragraphe (A3).

Température ambiante d'utilisation : - 40°C à + 80°C.

(A6) Exigences essentielles en ce qui concerne la sécurité et la santé :

Conformité au norme européenne EN 50021 (1999).

Vérifications et épreuves individuelles :

L'appareil est dispensé d'épreuve individuelle.

(A1) **SCHEDULE**

(A2) **TYPE EXAMINATION CERTIFICATE**

**LCIE 05 ATEX 6155 X (continued)**

(A4) Descriptive documents :

Technical file No. 28771 Rev. NR dated 10/10/2005.
This file includes 12 items (28 pages).

Technical file No. 27867 Rev. NR dated 10/10/2005.
This file includes 18 items (37 pages).

(A5) Special conditions for safe use :

The supply electrical parameters shall not exceed the values mentioned in paragraph (A3).

Operating ambient temperature : - 40°C to + 80°C.

(A6) Essential Health and Safety Requirements :

Conformity to the European standard EN 50021 (1999).

Individual examinations and tests :

The equipment is not submitted to routine test.



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# Certificate of Compliance

**Certificate:** 1632187

**Master Contract:** 184981

**Project:** 80014642

**Date Issued:** 2019-11-26

**Issued To:** **PCB Piezotronics**
**3425 Walden Ave**
**Depew, New York, 14043**
**United States**

**Attention: Carrie Termin**

**Issued by:** Jignesh Dabhi
Jignesh Dabhi

C US

**PRODUCTS**
**CLASS 2258 04** - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations
**CLASS 2258 84** - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations - CERTIFIED TO U.S. STANDARDS

**Class I, Div. 1, Groups A, B, C and D; Class II, Div. 1, Groups E, F and G; Class III, Div 1:**
**Exia IIC T4:**
**AEx ia IIC T4:**

Models EX64xB0y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 27534; Temp Code T4 @ Max Ambient 80 Deg C.

Models 9842VCRT Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 36576; Temp Code T4 @ Max Ambient 80 Deg C.
Models EX64xB1y and EX64xB6y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 61 nF, Li = 306 µH; when installed per installation Dwg 27534; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXTO64xB3y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 27536; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXTO64xB1y and EXTO64xB6y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 61 nF, Li = 306 μH; when installed per installation Dwg 27536; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXRV64xB0y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 0, Li = 121.06 uH; when installed per installation Dwg 30538; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXRV64xB1y and EXRV64xB6y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 61 nF, Li = 426 μH; when installed per installation Dwg 30538; Temp Code T4 @ Max Ambient 80 Deg C.

Models EX64xB7y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 28766; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXTO64xB7y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 28767; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXRV64xB7y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 29987; Temp Code T4 @ Max Ambient 80 Deg C.

Note: The "x" in the model code may be a 0 to 9, which denotes variations in frequency response range of the sensors. The "y" in the model code may be a 0 to 9, which denotes variations in sensor sensitivity.

Models EX64xA0y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 27535; Temp Code T4 @ Max Ambient 80 Deg C.

Models 9942VCRT Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 36578; Temp Code T4 @ Max Ambient 80 Deg C.

Models EX64xA1y and EX64xA6y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 61 nF, Li = 306 μH; when installed per installation Dwg 27535; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXTO64xA3y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 27537; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXTO64xA1y and EXTO64xA6y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 61 nF, Li = 306 μH; when installed per installation Dwg 27537; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXRV64xA0y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 0, Li = 121.06 uH; when installed per installation Dwg 30540; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXRV64xA1y and EXRV64xA6y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 61 nF, Li = 426 μH; when installed per installation Dwg 30540; Temp Code T4 @ Max Ambient 80 Deg C.

Models CS64xB9yVibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per Dwg 56140; Temp Code T4 @ Max Ambient 80 Deg C.

Note: The "x" in the model code may be a 0 to 9, which denotes variations in frequency response range of the sensors. The "y" in the model code may be a 0 to 9, which denotes variations in sensor sensitivity.

## APPLICABLE REQUIREMENTS

| | | |
|---|---|---|
| CAN/CSA-C22.2 No. 0-M91 | - | General Requirements – Canadian Electrical Code, Part II |
| C22.2 No. 142-M1987 (R2009) | - | Process Control Equipment |
| CAN/CSA-C22.2 No. 157-92 (R2012) | - | Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations |
| UL 913 (7th Ed.) | - | Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II and III, Division 1, Hazardous Locations |
| UL 916 (4th Ed.) | - | Energy Management Equipment |
| CAN/CSA-E60079-0:07 | - | Electrical apparatus for explosive gas atmospheres - Part 0: General Requirements |
| CAN/CSA-E60079-11:02 | - | Electrical apparatus for explosive gas atmospheres - Part 11: Intrinsic Safety "i" |
| ANSI/UL 60079-0:05 | - | Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements |
| ANSI/UL 60079-11:07 | - | Electrical apparatus for Explosive Gas Atmospheres - Part 11: Intrinsic Safety "i" |

**CLASS 2258 03** - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non-Incendive Systems - For Hazardous Locations
**CLASS 2258 83** - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non-Incendive Systems - For Hazardous Locations - CERTIFIED TO U.S. STANDARDS

**Ex nL IICT4:**
**AEx nA IICT4:**
**Class I, Div. 2, Groups A, B, C, D:**

Models EX64xB0y Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 27534; Temp Code T4 @ Max Ambient 80 Deg C.

Models 9842VCRT Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 36576; Temp Code T4 @ Max Ambient 80 Deg C.
Models EX64xB1y and EX64xB6y Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 61 nF, Li = 306 µH; when installed per installation Dwg 27534; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXTO64xB3y Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 27536; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXTO64xB1y and EXTO64xB6y Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 61 nF, Li = 306 µH; when installed per installation Dwg 27536; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXRV64xB0y Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 0, Li = 121.06 uH; when installed per installation Dwg 30538; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXRV64xB1y and EXRV64xB6y Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 61 nF, Li = 426 µH; when installed per installation Dwg 30538; Temp Code T4 @ Max Ambient 80 Deg C.

Notes:
1. Sensor case must be bonded to ground according to Section 18-182 of the CEC, Part 1.
2. The "x" in the model code may be a 0 to 9, which denotes variations in frequency response range of the sensors. The "y" in the model code may be a 0 to 9, which denotes variations in sensor sensitivity.

Models EX64xA0y Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 27535; Temp Code T4 @ Max Ambient 80 Deg C.

Models 9942VCRT Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 36578; Temp Code T4 @ Max Ambient 80 Deg C.

Models EX64xA1y and EX64xA6y Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 61 nF, Li = 306 µH; when installed per installation Dwg 27535; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXTO64xA3y Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per installation Dwg 27537; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXTO64xA1y and EXTO64xA6y Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 61 nF, Li = 306 µH; when installed per installation Dwg 27537; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXRV64xA0y Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 0, Li = 121.06 uH; when installed per installation Dwg 30540; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXRV64xA1y and EXRV64xA6y Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 28V, Ii (I max) = 120mA, Pi = 1W, Ci = 61 nF, Li = 426 μH; when installed per installation Dwg 30540; Temp Code T4 @ Max Ambient 80 Deg C.

Models CS64xB9y Vibration Sensors, input rated 28V dc max, 20mA; non-incendive with entity parameters of: Ui (V max) = 30V, Ii (I max) = 100mA, Pi = 1W, Ci = 0, Li = 1.06 uH; when installed per Dwg 56140; Temp Code T4 @ Max Ambient 80 Deg C.

Notes:

1. For Canadian Installations, senor case must be bonded to ground according to Section 18-182 of the CEC, Part 1.
2. For US Installations, sensor case must be bonded to ground according to Article 501.16 of the NEC.
3. The "x" in the model code may be a 0 to 9, which denotes variations in frequency response range of the sensors. The "y" in the model code may be a 0 to 9, which denotes variations in sensor sensitivity.

**APPLICABLE REQUIREMENTS**

| | | |
|---|---|---|
| CAN/CSA-C22.2 No. 0-M91 | - | General Requirements – Canadian Electrical Code, Part II |
| C22.2 No. 142-M1987 (R2009) | - | Process Control Equipment |
| C22.2 No. 213-M1987 (R2008) | - | Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations |
| UL 916 (4th Ed.) | - | Energy Management Equipment |
| UL 1604 (3rd Ed.) | - | Electrical Equipment for Use in Class I and II, Division 2; Class III Hazardous (Classified) Locations |
| ANSI/ISA 12.12.01-2000 | - | Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations |
| CAN/CSA-E60079-15:02 | - | Electrical apparatus for explosive gas atmospheres - Part 15: Type of Protection "n" |
| ANSI/UL 60079-15:02 | - | Electrical apparatus for Explosive Gas Atmospheres - Part 15: Type of Protection "n" |

**CLASS 2258 02** - PROCESS CONTROL EQUIPMENT - For Hazardous Locations
**CLASS 2258 82** - PROCESS CONTROL EQUIPMENT – For Hazardous Locations - CERTIFIED TO U.S. STANDARDS

**Ex nA IICT4:**
**AEx nA IIC T4:**
**Class I, Div. 2, Groups A, B, C, D:**

Models EX64xB7y Vibration Sensors, input rated 28V dc max, 20mA; suitable for use in Class I, Div. 2 or Class I, Zone 2 locations, when installed per installation Dwg 28766; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXTO64xB7y Vibration Sensors, input rated 28V dc max, 20mA; suitable for use in Class I, Div. 2 or Class I, Zone 2 locations, when installed per installation Dwg 28766; Temp Code T4 @ Max Ambient 80 Deg C.

Models EXRV64xB7y Vibration Sensors, input rated 28V dc max, 20mA; suitable for use in Class I, Div. 2 or Class I, Zone 2 locations, when installed per installation Dwg 28766; Temp Code T4 @ Max Ambient 80 Deg C.

Models CS64xB9y Vibration Sensors, input rated 28V dc max, 20mA; suitable for use in Class I, Div. 2 or Class I, Zone 2 locations, when installed per installation Dwg 56140; Temp Code T4 @ Max Ambient 80 Deg C.

Notes:

1. Sensor must be installed in a suitable enclosure, acceptable to the local inspection authority having jurisdiction.
2. The "x" in the model code may be a 0 to 9, which denotes variations in frequency response range of the sensors. The "y" in the model code may be a 0 to 9, which denotes variations in sensor sensitivity.

**APPLICABLE REQUIREMENTS**

| | | |
|---|---|---|
| CAN/CSA-C22.2 No. 0-M91 | - | General Requirements – Canadian Electrical Code, Part II |
| C22.2 No. 142-M1987(R2009) | - | Process Control Equipment |
| C22.2 No. 213-M1987(R2008) | - | Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations |
| UL 916 (4th Ed.) | - | Energy Management Equipment |
| UL 1604 (3rd Ed.) | - | Electrical Equipment for Use in Class I and II, Division 2; Class III Hazardous (Classified) Locations |
| ANSI/ISA 12.12.01-2000 | - | Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations |
| CAN/CSA-E60079-15:02 | - | Electrical apparatus for explosive gas atmospheres - Part 15: Type of Protection "n" |
| ANSI/UL 60079-15:02 | - | Electrical apparatus for Explosive Gas Atmospheres - Part 15: Type of Protection "n" |

**CLASS 2258 04** - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations
**CLASS 2258 84** - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations - CERTIFIED TO U.S. STANDARDS

**Ex ia IIC; AEx ia IIC; Class I, Div. 1, Groups A, B, C and D; Class II, Div. 1, Groups E, F and G; Class III; $T_{amb}$: -40C to 121C; Tcode: T3C**

Models EXHT(M)64x (with connector or integral cable), Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe when installed per installation drawing 71991 (sheet 1);

Models EXHTTO(M)64x (with connector or integral cable), Vibration and Temperature Sensors, input rated 28V dc max, 20mA; intrinsically safe when installed per installation drawing 72010 (sheet 1);

Models EXHT(M)64x (with conduit connection), Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe when installed per installation drawing 71993 (sheet 1);

Models EXHTTO(M)64x (with conduit connection), Vibration and Temperature Sensors, input rated 28V dc max, 20mA; intrinsically safe when installed per installation drawing 72068 (sheet 1);

**Ex ic IIC; AEx ic IIC; Class I Division 2 Groups A, B, C and D; $T_{amb}$: -40C to 121C; Tcode: T3C**

Models EXHT(M)64x (with connector or integral cable), Vibration Sensors, input rated 28V dc max, 20mA; suitable for use in Class I, Div. 2/ Zone 2 (Ex ic) locations when per installation drawing 71991 (sheet 2);

Models EXHTTO(M)64x (with connector or integral cable), Vibration and Temperature Sensors, input rated 28V dc max, 20mA; suitable for use in Class I, Div. 2/ Zone 2(Ex ic) locations when per installation drawing 72010 (sheet 2);

Notes:

1. Sensor must be installed in a suitable enclosure, acceptable to the local inspection authority having jurisdiction.
2. The "x" is a series of letters and numbers in the model for different variations including variation in frequency response, top cable entry, side cable entry and other differences not critical to certification.
3. M in the model number is optional and to include Metric threading adapters instead of English threading adapters

**CLASS 2258 02** - PROCESS CONTROL EQUIPMENT - For Hazardous Locations
**CLASS 2258 82** - PROCESS CONTROL EQUIPMENT – For Hazardous Locations - CERTIFIED TO U.S. STANDARDS

**Class I Division 2 Groups A, B, C and D; $T_{amb}$: -40C to 121C; Tcode: T3C**

Models EXHT(M)64x (with conduit connection), Vibration Sensors, input rated 28V dc max, 20mA; Suitable for Class I Division 2 when installed per installation drawing 71993 (sheet 2).

Models EXHTTO(M)64x (with conduit connection), Vibration and Temperature Sensors, input rated 28V dc max, 20mA; Suitable for Class I Division 2 when installed per installation drawing 72068 (sheet 2).

1. Sensor must be installed in a suitable enclosure, acceptable to the local inspection authority having jurisdiction.
2. The "x" is a series of letters and numbers in the model for different variations including variation in frequency response, top cable entry, side cable entry and other differences not critical to certification.
3. M in the model number is optional and to include Metric threading adapters instead of English threading adapters

## APPLICABLE REQUIREMENTS

| | | |
|---|---|---|
| CSA C22.2 No. 61010-1-12/ ANSI/ISA 61010-1 3rd Ed. (R2017) | - | Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 1: General requirements |
| CSA C22.2 No. 213 2017/ UL 121201 9th Ed. | - | Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations |
| CSA C22.2 No 60079-0:2019 | - | Explosive Atmospheres-Part 0: Equipment-General requirements |
| CSA C22.2 No 60079-11:2014 | - | Explosive atmospheres — Part 11: Equipment protection by intrinsic safety "i" |
| UL 60079-0: 2019 | | Standard for Safety – Explosive Atmospheres – Part 0: Equipment – General Requirements, Ed. 6 |
| UL 60079-11:2014 | | Standard for Safety – Explosive Atmospheres – Part 11: Equipment Protection by Intrinsic Safety "I", Ed. 6 |

## MARKINGS

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.
- Products certified for Canada shall have all Caution and Warning markings in both English and French.

Additional bilingual markings not covered by the product standard(s) may be required by the Authorities Having Jurisdiction. It is the responsibility of the manufacturer to provide and apply these additional markings, where applicable, in accordance with the requirements of those authorities.

The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only.

Markings are etched directly into the Sensor enclosure body. The following marking details appear:

I.S. models

- CSA Monogram with C US Indicator
- Submittor Identification
- Model Number
- Serial Number, Date Code or Month and Year of Manufacture
- Electrical Rating
- Hazardous Location Designation- As per Product Section
- Applicable Temperature Code
- Applicable Ambient temperature range
- For EXHT and EXHTTO series: DC symbol: ⎓
- Certificate # reference (ie. 2005 1632187 X)
- Reference to Installation Drawing

Div. 2 Non-Incendive models

- CSA Monogram with C US indicator.
- Submittor Identification
- Model Number
- Serial Number, Date Code or Month and Year of Manufacture
- Electrical Rating
- Hazardous Location Designation: As per Product Section
- Applicable Temperature Code
- Applicable Ambient temperature range
- For EXHT and EXHTTO series: DC symbol " ⎓ " and Reference to Installation Drawing
- Certificate # reference (ie. 2005 1632187 X)

Div. 2 Non-arcing models (.....B7x, EXHT and EXHTTO series)

- CSA Monogram with C US indicator.
- Submittor Identification
- Model Number
- Serial Number, Date Code or Month and Year of Manufacture
- Electrical Rating
- Hazardous Location Designation: As per Product Section
- Applicable Temperature Code
- Applicable Ambient temperature range
- For EXHT and EXHTTO series: DC symbol " ⎓ "
- Certificate # reference (ie. 2005 1632187 X)
- Caution: re. Disconnection of circuits (appears on referenced Installation Drawing).

EXHT and EXHTTO series models must be accompanied by documentation containing the following information.

General:

Technical specifications, product operation, service and instructions for use.

Equipment Ratings:

This includes equipment supply, description of I/O connections, duty cycle and operating environmental conditions.

1. Pollution degree 4;
2. Electrical Ratings: 24VDC, 20mA
3. Temperature (ambient): -40°C to 121°C
4. Hazardous location ratings

CSA GROUP™

# *Supplement to Certificate of Compliance*

**Certificate:** 1632187 **Master Contract:** 184981

***The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.***

## Product Certification History

| Project | Date | Description |
|---|---|---|
| 80014642 | 2019-11-26 | Evaluation for update of report 1632187 (last update 70051763) to include High Temperature option.<br><br>Quote assumes that maximum two versions of similar schematics are needed to be assessed. Quote includes one temperature test. Only the new model will be assessed with the latest applicable standards.<br><br>Any other testing that may be required to accomplish the reassessment will be quoted separately if necessary. |
| 000070051763 | 2016-03-22 | Update to Existing Report Certificate 1632187; Report 2655913. Expansion of the "x" and "y" variable digits. |
| 0002655913 | 2013-09-26 | Update to include new Model CS64xB9y Vibration Sensors. |
| 0002108819 | 2008-11-26 | Update to cover revisions to numerous drawings. |
| 0001920106 | 2007-06-06 | Update to cover minor revisions to circuitry and to related drawings. |
| 0001878614 | 2007-01-31 | Update to cover addition of models 9842VCRT and 9942VCRT. |
| 0001632187 | 2005-11-03 | 640 Series Vibration Sensors for Hazardous Locations |

IMI SENSORS
A PCB PIEZOTRONICS DIV.

1 **EXAMINATION CERTIFICATE**

2 **Component Intended for use in Potentially Explosive Atmospheres meeting ATEX Directive 2014/34/EU**

3 **Examination Certificate Number: CTD011 X to be used in conjunction with the Type Examination Certificate LCIE 05 ATEX 6154 X, Issue: 01**

4 **Apparatus**: Models EX64xA0y, EXM64xA0y, EX64xB0y, and EXM64xB0y Series
EXRV64xA0y, EXRVM64xA0y, EXRV64xB0y, and EXRVM64xB0y Series
EXTO64xA3y, EXTOM64xA3y, EXTO64xB3y, and EXTOM64xB3y Series
EX64xA1y, EXM64xA1y, EXTO64xA1y, EXRV64xA1y, EXTOM64xA1y, and EXRVM64xA1y Series
EX64xB1y, EXM64xB1y, EXTO64xB1y, EXRV64xB1y, EXTOM64xB1y, and EXRVM64xB1y Series
EX64xA6y, EXM64xA6y, EXTO64xA6y, EXRV64xA6y, EXTOM64xA6y, and EXRVM64xA6y Series
EX64xB6y, EXM64xB6y, EXTO64xB6y, EXRV64xB6y, EXTOM64xB6y, and EXRVM64xB6y Series
EX64xB7y, EXTO64xB7y, and EXRV64xB7y Series

The "x" and "y" represent a single digit from 0-9 representing model number and connector type

5 **Manufacturer**: IMI Sensors, a Division of PCB Piezotronics

6 **Address**: 3425 Walden Avenue, Depew, New York, 14043

7 This apparatus and any acceptable variation are specified in the schedule in this certificate and all pertinent documents referenced.

8 IMI Sensors certifies that this component has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of components intended to form part of Category 3 equipment intended for use in potentially explosive atmospheres given in Annex II to European Union Directive 2014/34/EU of February 2014. This certificate is based on LCIE confidential report(s) n° 60058689/559760 and 60040901/540946/1, for the above models certified to Equipment Group II Category 1 Gas Group.

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012+A11:2013
EN 60079-11:2012

10 The apparatus may be connected to other ATEX certified equipment, as long as it meets the parameters of the system.

11 This Examination Certificate relates only to the design and construction of this specified equipment in accordance to Directive 2014/34/EU

**12** Equipment will be marked per previous approvals:

CE 0344 Ex II 1G

This Certificate implies that the equipment can also be used in:

Ex II 3D

This certificate may only be reproduced in its entirety, without any change, schedule included.

13 **Schedule**

14 **Certificate Number CTD011 X**

15 **Description of component**

4-20 mA VELOCITY SENSOR:

Type: Models EX64xA0y, EXM64xA0y, EX64xB0y, and EXM64xB0y Series
EXRV64xA0y, EXRVM64xA0y, EXRV64xB0y, and EXRVM64xB0y Series
EXTO64xA3y, EXTOM64xA3y, EXTO64xB3y, and EXTOM64xB3y Series
EX64xA1y, EXM64xA1y, EXTO64xA1y, EXRV64xA1y, EXTOM64xA1y, and EXRVM64xA1y Series
EX64xB1y, EXM64xB1y, EXTO64xB1y, EXRV64xB1y, EXTOM64xB1y, and EXRVM64xB1y Series
EX64xA6y, EXM64xA6y, EXTO64xA6y, EXRV64xA6y, EXTOM64xA6y, and EXRVM64xA6y Series
EX64xB6y, EXM64xB6y, EXTO64xB6y, EXRV64xB6y, EXTOM64xB6y, and EXRVM64xB6y Series
EX64xB7y, EXTO64xB7y, and EXRV64xB7y Series

This apparatus is made of a piezo-crystal assembly, an electronic board and a connector or an integral cable.

Electrical Parameters Relative to Safety

| **Model** ("M" – Metric versions included) | Ui (V) | Ii (mA) | Pi (W) | Ci (nF) | Li (μH) |
|---|---|---|---|---|---|
| EX64xA0x, EX64xB0y | 30 | 100 | 1 | 0 | 1,06 |
| EX64xA1y, EX64xA6y, EX64xB1y, EX64xB6y | 30 | 100 | 1 | 61 | 360 |
| EXTO64xA3y, EXTO64xB3y | 28 | 120 | 1 | 0 | 1,06 |
| EXTO64xA1y, EXTO64xA6y, EXTO64xB1y, EXTO64B6y | 28 | 120 | 1 | 61 | 306 |
| EXRV64xA0y, EXRV64xB0y | 28 | 120 | 1 | 0 | 121,06 |
| EXRV64xA1y, EXRV64xA6y, EXRV64xB1y, EXRV64xB6y | 28 | 120 | 1 | 61 | 426 |
| EX64xB7y | 30 | 100 | 1 | 0 | 1,06 |
| EXTO64xB7y, EXRV64xB7y | 30 | 120 | 1 | 0 | 1,06 |

16 **Descriptive Documents**:
Technical Files No. 27866, 27867

17 **Special Conditions for Safe Use**:
The supply electrical parameters shall not exceed the values mentioned in the table above.

18 **Essential Health and Safety Requirements**
All relevant Essential Health and Safety Requirements are covered by the standards listed in item 9.

Carrie Termin 05/25/17

Carrie Termin
Quality Engineer
On Behalf of IMI Sensors, a Division of PCB Piezotronics

PCB Piezotronics Inc. Corporate SEAL 1996 New York

CTD011