



Model EX640B70

**Intrinsically-safe vibration sensor, 4 to 20 mA output, 0 to 0.5 in/sec pk, 3 to 1k Hz, top exit,
terminal block with conduit elbow**

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	0	0	0	0	0	0
PCB板	X	0	0	0	0	0
电气连接器	0	0	0	0	0	0
压电晶体	X	0	0	0	0	0
环氧	0	0	0	0	0	0
铁氟龙	0	0	0	0	0	0
电子	0	0	0	0	0	0
厚膜基板	0	0	X	0	0	0
电线	0	0	0	0	0	0
电缆	X	0	0	0	0	0
塑料	0	0	0	0	0	0
焊接	X	0	0	0	0	0
铜合金/黄铜	X	0	0	0	0	0
本表格依据 SJ/T 11364 的规定编制。						
0：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.



Model 640/641/645/646 B7 Series Industrial 4-20mA Sensor



SENSORS AND INSTRUMENTATION FOR MACHINE CONDITION MONITORING

Operating Guide with Enclosed Warranty Information

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Toll Free Line 1-800-959-4IMI

MANUAL NUMBER: 28077
MANUAL REVISION: B
ECN NUMBER: 42851

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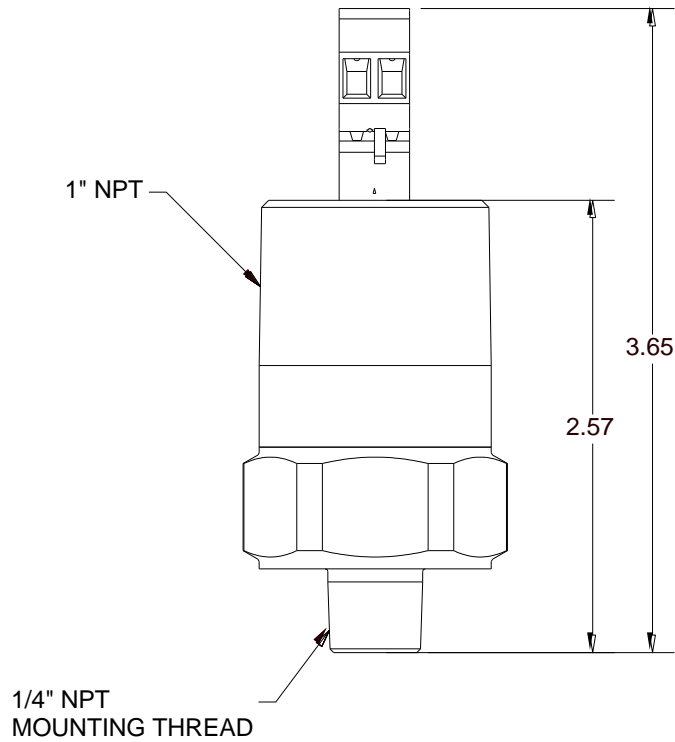
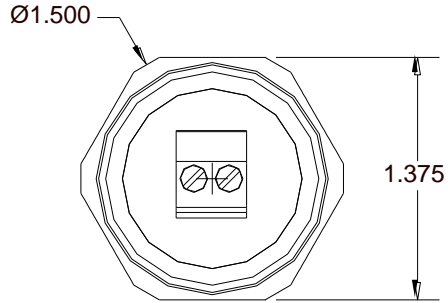
Introduction

The Model 640/641/645/646 B7 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.
- TO (Temperature Output) option via an independent 4-20mA loop.
- EP option includes an Explosion Proof capped elbow.
- 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 B7 Series uses plug-in type screw terminal connectors for all input and output connections and operate from a standard 2-wire, 4-20mA loop. Attach the positive (+) input from the power supply to Pin 2 and the negative (-) input from the power supply to Pin 3.

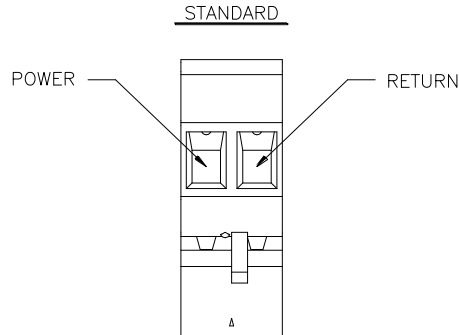


Figure 1 – wiring: standard connection

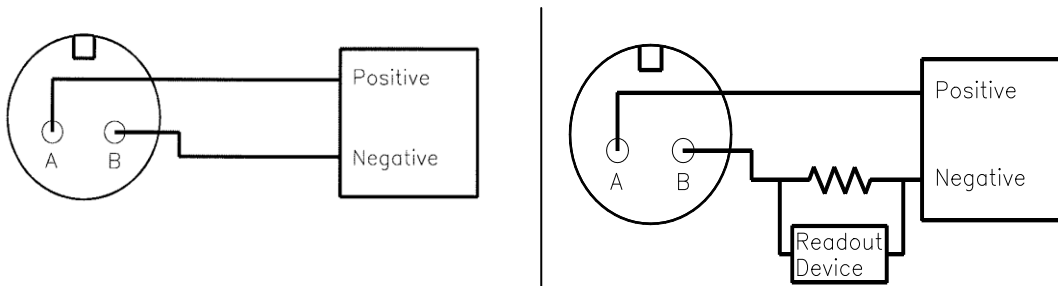


Figure 2 – wiring: loop powered

Figure 3 – wiring: loop powered/DC source

If using a standard DC power supply, install either an ammeter and/or load resistor in line with the return connection Pin 3.

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

$$V = IR$$

$$\text{If } R = 500\Omega \text{ and } I = 6\text{mA, then } V = 3\text{Vdc}$$

Note:

- Resistor value must be less than: $(V_{supply} - 12) \times 50$.

Taking Measurements

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

$$\text{Vibration Output} = (\text{Measured Output} - 4\text{mA}) \times (\text{Full Scale Vibration Output} / 16\text{mA})$$

<u>Measured mA</u>	<u>640BX0</u>	<u>640BX1</u>	<u>640BX2</u>
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

<u>Measured mA</u>	<u>641BX0</u>	<u>641BX1</u>	<u>641BX2</u>
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

<u>Measured mA</u>	<u>645</u>	<u>646</u>
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 $\pm 20\%$ 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.

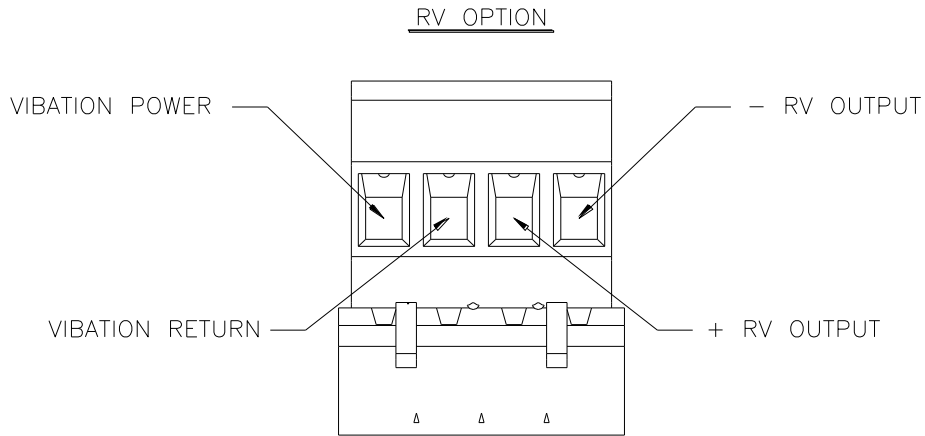


Figure 3 – RV wiring

Note:

- The Acceleration Signal Negative has to be isolated from any grounding. If this terminal is grounded, the 4-20mA loop will short, causing no output.
- The acceleration 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 $\pm 5\%$ FSO. The imbedded temperature sensor monitors the environment internal to the sensor housing and is situated at approximately mid level.

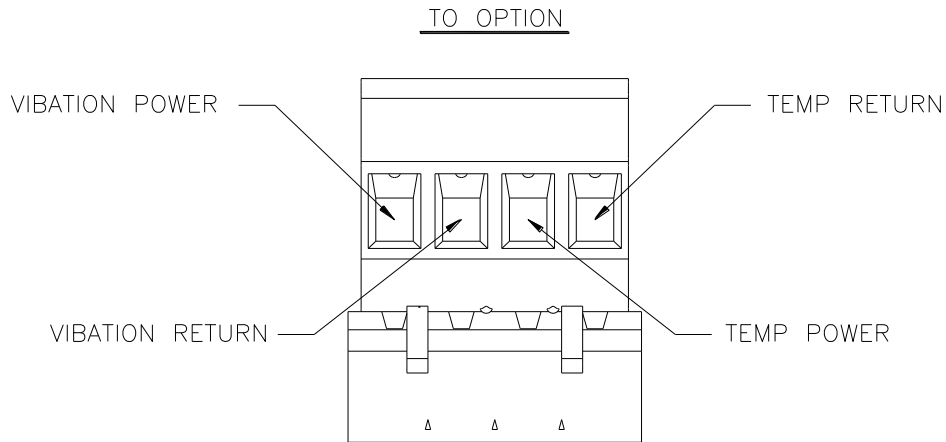


Figure 4 – TO wiring

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.

EP Option

The EP option includes an Explosion Proof capped elbow for applications in rigid or IMC conduit systems where space is limited and access is needed for pulling conductors or maintenance. Standard conduit hub size is 1"NPT.

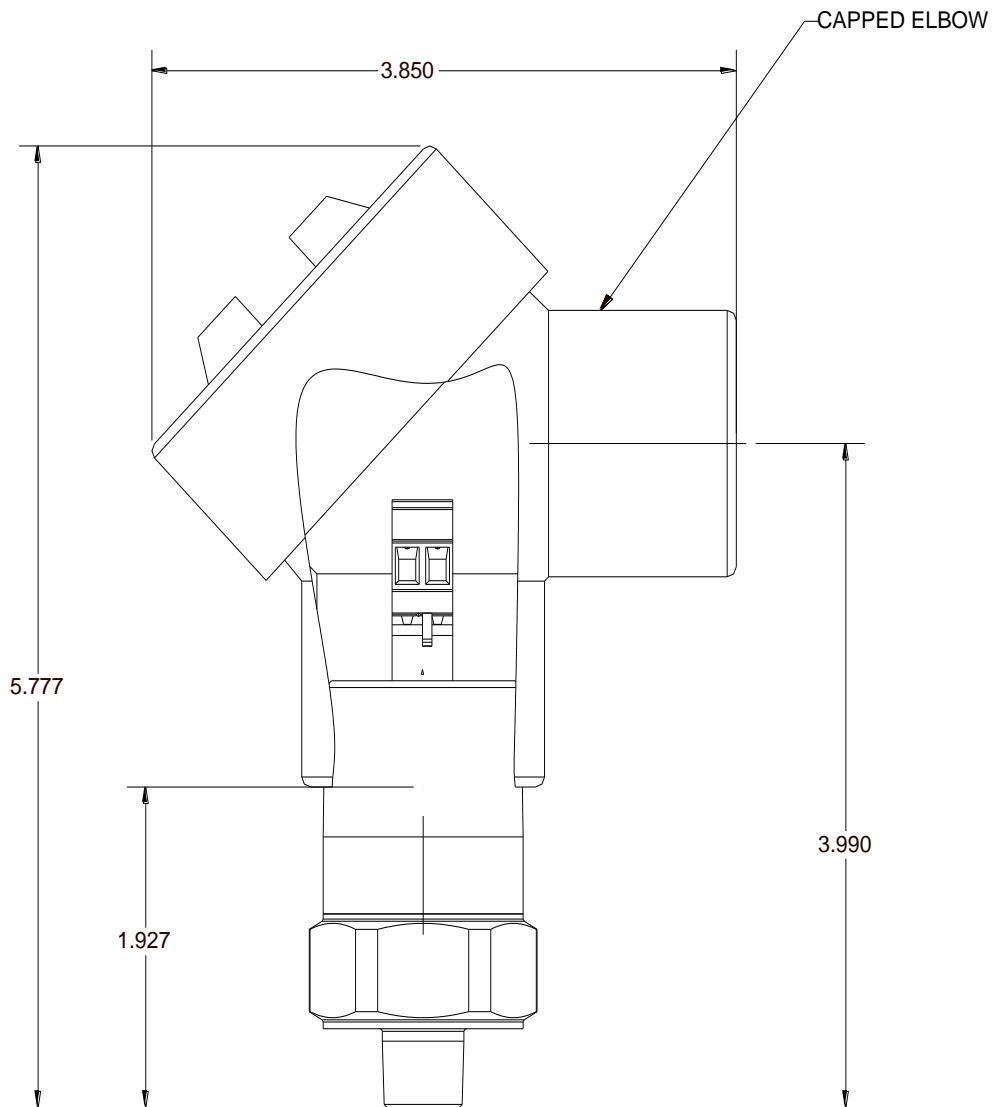


Figure 5 – EP option

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 PCB 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 and 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 and other 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 a 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 the 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 web site 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.



3425 Walden Avenue, Depew, NY 14043-2495
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*ICP[®] is a registered trademark of PCB Group, Incorporated,
which uniquely identifies PCB sensors that incorporate built-in microelectronics.*

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电子	0	0	0	0	0	0
厚膜基板	0	0	X	0	0	0
电线	0	0	0	0	0	0
电缆	X	0	0	0	0	0
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CHINA RoHS COMPLIANCE

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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

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사용 지침 - EX64x 시리즈

모델(들)	진동 센서 - 유형: EX(M)64*****/M**, EXTO(M)64*****/M**, EXRV(M)64*****/M**
표시	<p>IMI ASSY in U.S.A. WWW.PCB.COM 1-800-959-4464 LCIE 05 ATEX 6154 X Ex ia IIC T4 Ga, II 1 G LCIE 05 ATEX 6155 X Ex ec IIC T4 Gc, II 3 G IECEx 17.0016X ia and ec</p>
서비스 시작	<p>모델 EX(M)64*****/M**, EXTO(M)64*****/M**, EXRV(M)64*****/M** 시리즈는 2선, 4-20mA 루프입니다. 전원 공급 장치의 양극(+) 입력을 센서의 양극 단자에 연결하고 전원 공급 장치의 음극(-) 입력을 음극 단자에 연결합니다. 표준 DC 전원 공급 장치를 사용하는 경우 센서의 음극 단자의 리턴 연결에 맞춰 전류계 및/또는 부하 저항을 설치합니다. 모델 EX(M)64*****/M**, EXTO(M)64*****/M**, EXRV(M)64*****/M** 시리즈에는 RV(원시 진동 출력)와 TO(온도 출력) 두 가지 옵션이 있습니다. RV 옵션은 데이터 수집기 또는 분석기를 사용하여 추가 분석에 사용할 수 있는 진동 신호를 제공합니다. TO 옵션은 센서의 온도에 비례하는 4-20mA 출력을 추가로 제공합니다.</p>
안전한 사용	<p>경고 1 - 전원 공급 장치/신호 조절기는 자격을 갖춘 서비스 담당자 외에는 누구도 열어서는 안 됩니다. 이 제품은 충격 위험을 인식하고 부상을 방지하는 데 필요한 안전 예방 조치를 숙지한 자격을 갖춘 사람이 사용하도록 설계되었습니다.</p> <p>경고 2 - 이 장비는 사용자 안전을 염두에 두고 설계되었지만, PCB Piezotronics, Inc.에서 지정하지 않은 방식으로 장비를 사용할 경우 장비가 제공하는 보호 기능이 손상될 수 있습니다.</p> <p>주의 1 - 케이블은 장비를 손상시킬 수 있습니다. 고전압 정전기 방전(ESD)은 전기 장치를 손상시킬 수 있습니다. 커패시터와 마찬가지로 케이블은 다음과 같은 삼중 전기 전달로 인한 전하를 보유할 수 있습니다:</p> <ul style="list-style-type: none"> ▪ 깔개 위에 누워 이동하는 행위, ▪ 공기를 통한 모든 움직임, ▪ 케이블을 굴리는 행위 및/또는 ▪ 접지되지 않은 사람과의 접촉. ▪ <p>제품 안전을 위한 PCB 솔루션:</p> <ul style="list-style-type: none"> ▪ AC 전원이 꺼진 상태에서만 케이블을 연결하세요. <p>케이블을 신호 입력 또는 출력에 연결하기 전에 케이블 끝을 일시적으로 "단락"시키십시오.</p> <p>주의 2 - 장비의 내부 조정을 수행하기 전에 ESD를 고려해야 합니다. 모든 전자 장비는 조정을 위해 열었을 때 ESD에 취약합니다. 따라서 내부 조정은 ESD 안전 작업장에서만 수행해야 합니다.</p>

	영역으로 이동합니다. 많은 제품이 ESD 보호 기능을 갖추고 있지만 매우 높은 전압으로 인해 보호 수준을 초과할 수 있습니다.
조립.	EX(M)64*****/M**, EXTO(M)64*****/M**, EXRV(M)64*****/M** 시리즈는 나사 단자가 있는 밀폐형 스테인리스 스틸 하우징이 있으며 조립이 필요하지 않습니다. 표준 장착 액세서리를 사용하여 모니터링 대상 기계에 장착하기만 하면 됩니다. 도관 버전 센서의 경우, 센서를 도관 엘보에 꼭 맞을 때까지 손으로 조입니다. 렌치를 사용하여 1/8~1/4바퀴 더 조입니다. 모든 배선을 나사 단자에 연결하고 도관 덮개가 단단히 고정될 때까지 손으로 조입니다. 렌치를 사용하여 1/8~1/4바퀴 더 조입니다. 손으로만 커버를 제거할 수 없는지 확인합니다.
해체	마운팅에서 분리하는 것 외에는 센서를 분해할 필요가 없습니다.
유지 관리	전기 커넥터, 하우징 및 장착 표면을 물리적 구성 재료에 해를 끼치지 않는 용액과 기술을 사용하여 청소하는 것과 같은 일상적인 유지 관리는 허용됩니다. 유지 및 보수와 관련하여 그 방법 및 주제 등 사용자와 제조자의 책임 한계가 있다.
서비스	PCB Piezotronics에서 제공하는 센서 및 관련 기기의 정교한 특성으로 인해 사용자 서비스 또는 수리는 권장되지 않으며, 시도할 경우 공장 보증이 무효화될 수 있습니다. 그러나 센서 및 관련 기기의 정기적인 보정은 측정 정확도 및 수집된 데이터에 대한 신뢰도를 높이는 데 도움이 되므로 권장됩니다.
수리	장비가 손상되거나 작동이 중단되는 경우, 수리를 위해 장비를 PCB Piezotronics에 반환해야 합니다. 사용자 서비스 또는 수리는 권장되지 않으며, 시도할 경우 공장 보증이 무효화될 수 있습니다.
설치	<p>개요: 센서를 장착해야만 서비스를 이용할 수 있습니다. 장착 방법을 선택할 때는 각 기술의 장단점을 면밀히 고려해야 합니다. 위치, 견고성, 진폭 범위, 접근성, 온도 및 휴대성과 같은 특성은 매우 중요합니다. 그러나 가장 중요하지만 종종 간과되는 고려 사항은 장착 기술이 가속도계의 고주파 성능에 미치는 영향입니다. 장착 방법에는 다음이 포함됩니다: 스탠드 마운트, 접착 마운트, 마그네틱 마운트, 핸드헬드 또는 프로브 팁 마운트.</p> <p>케이블: 모든 측정 시스템의 신뢰성과 정확도는 가장 약한 링크의 신뢰성과 정확도보다 나올 수 없으므로 케이블 설치와 케이블 상태에 대한 주의와 관심이 필수적입니다. 진동 측정의 특성상 모든 센서 케이블은 궁극적으로 피로가 쌓여 고장이 나게 됩니다. 올바른 설치 관행으로 케이블의 수명을 연장할 수 있지만, 케이블 고장 시 테스트를 계속할 수 있도록 예비 케이블을 준비해 두는 것이 좋습니다.</p> <p>Y-3 Killark t도관 허브 버전 센서에는 캡 엘보가 사용됩니다. 방폭기기 설치시 KS C IEC 60079-14를 따라야 한다</p>
조정	센서는 밀폐된 장치이므로 사용자가 조정할 수 없습니다. 그러나 측정 정확도와 수집된 데이터에 대한 신뢰를 구축하는 데 도움이 되므로 제조업체에서 센서를 정기적으로 보정하는 것이 좋습니다.
위험 구역(압력 완화 장치용)	해당 없음 - 압력 완화 장치가 아닙니다.
교육 지침	산업용 센서는 EN/IEC 60079-14 요구 사항에 따라 숙련된 전문가가 위험 지역에 설치해야 합니다.
안전 보호 범주에 대한 세부 정보	Ex ia 스파크의 에너지와 표면 온도를 안전한 수준으로 제한하는 "내재적 안전"입니다. Ex ec 아크, 스파크 또는 뜨거운 표면이 없는 "향상된 안전성"(인클로저 ≥ IP54)입니다. 적용되는 기준의 목록 및 개정 일자: 방호장치 안전인증 고시 2021-22호
엔티티 매개변수 및 한계(값)	<p>온도 범위: -40°C to +80°C</p> <p>IS (ia) 매개변수-</p> <p>EX(M)64**0**, EX(M)64**9**, Connector Version:</p>

	<p>Ui : 30V; Ii : 100mA; Pi : 1W; Ci : 0nF; Li : 121.1μH</p> <p><u>EX(M)64**1**/M**, EX(M)64**6**/M** Cable Version:</u> Ui : 30V; Ii : 100mA; Pi : 1W; Ci : 61nF; Li : 426.1μH</p> <p><u>EXTO(M)64**3**, EXTO(M)64**9** Connector Version :</u> Ui : 28V; Ii : 120mA; Pi : 1W; Ci : 0nF; Li : 122.2μH</p> <p><u>EXTO(M)64**1**/M**, EXTO(M) **6**/M**, Cable Version:</u> Ui : 28V; Ii : 120mA; Pi : 1W; Ci : 61nF; Li : 427.2μH</p> <p><u>EXRV(M) 64**0**, EXRV(M) 64**9** Connector Version:</u> Ui : 28V; Ii : 120mA; Pi : 1W; Ci : 25nF; Li : 121.1μH</p> <p><u>EXRV(M)64**1**/M**, EXRV(M) **6**/M**, Cable Version:</u> Ui : 28V; Ii : 120mA; Pi : 1W; Ci : 80nF; Li : 426.1μH</p> <p><u>EX(M) 64**7**,EX(M) 64**8** Series (Conduit Version):</u> Ui : 30V; Ii :100 mA; Pi : 1W; Ci : 0nF; Li : 121.1μH</p> <p><u>EXRV(M) 64**7**,EXRV(M) 64**8** Series (Conduit Version):</u> Ui : 30V; Ii : 120 mA; Pi : 1W; Ci : 25nF; Li : 121.1μH</p> <p>Ex (ec) Parameters – Umax = 30V, Pmax = 1W</p>
<p>특정 사용 조건</p>	<p>모든 유형의 보호용:</p> <ul style="list-style-type: none"> - 주변 작동 온도 범위: -40°C ~ +80°C. - 장비를 설치 장소에 장착할 때는 센서 금속 본체와 케이블 실드가 시스템 접지에 안정적으로 연결되어 있어야 합니다. - 장비는 제조업체의 사용 설명서에 따라 연결해야 합니다. <p>본질 안전 "ia" 유형의 보호에 대한 추가 특정 조건:</p> <ul style="list-style-type: none"> - 본질 안전 장비는 사용 목적에 맞게 인증된 관련 본질 안전 장치에만 연결해야 합니다. 사용. 이 연결은 IEC 60079-25 표준의 요구 사항을 준수해야 합니다. - 도관 엘보 캡이 장착된 장비의 경우: 사용자는 캡 엘보가 기계적 충격이나 마찰의 위험에 노출되지 않도록 해야 합니다. <p>안전성을 강화하기 위한 추가 조건 "EC" 유형의 보호:</p> <ul style="list-style-type: none"> - 장비는 최대 30V dc 및 1W를 공급하는 외부 전원 공급 장치에만 연결해야 합니다. - 장비에 대한 공급 단자에서 피크 정격 전압 값의 140%를 초과하지 않는 수준으로 설정된 과도 보호 기능이 제공되어야 합니다. - 커넥터가 있는 장비의 경우: 최종 사용자가 제공한 결합 커넥터는 EN/EC 60079-0의 모든 해당 조항을 준수해야 합니다.

	<p>EN/IEC 60079-0 및 EN/IEC 60079-7의 모든 해당 조항을 준수해야 합니다. EN/IEC 60079-0에 따른 최소 보호 등급 IP54가 보장되어야 합니다. 가 보장되어야 합니다. 전원이 공급된 상태에서 결합 커넥터를 연결하거나 분리해서는 안 됩니다. - 플라잉 리드가 있는 장비의 경우: 플라잉 리드는 충격으로부터 적절하게 보호되어야 하며, 적절하게 인증된 인증된 인클로저 또는 안전한 구역에서 중단되어야 합니다. 설치 시 리드에 당기는 힘이 가해지지 않도록 해야 합니다. - 캡 도관 엘보가 장착된 장비의 경우: 사용자는 IEC 60079-14의 설치 요구 사항을 준수하면서 캡 엘보의 엔트리에 "Ex e" 인증 엔트리 장치를 사용해야 합니다. 를 준수하면서 "Ex e" 인증 입력 장치를 사용해야 합니다. 캡형 도관 엘보를 열기 전에 장치를 공급 회로에서 분리하십시오. 캡이 씌워진 엘보에서 트랜스미터를 분해하는 것은 허용되지 않습니다.</p> <p>- 경고 - 전원이 공급된 상태에서 연결하거나 분리하지 마십시오.</p>
<p>시스템에 장착된 도구의 필수 특성(있는 경우).</p>	<p>해당 없음 - N/A - 시스템에 도구가 장착되어 있지 않습니다.</p>
<p>도면 및 다이어그램</p>	<p>27531, 27532, 30537, 64861, 64863, 64865, 32836,71909,71910,71907,71908</p>
<p>적용 가능한 표준</p>	<p>IEC 60079-0 (2017) Ed. 7 (with Corrigendum 1:2020), IEC 60079-11 (2011) Ed. 6 (with Corrigendum 1:2012), EN IEC 60079-0:2018, EN 60079-11:2012, IEC 60079-7 (2017) Ed. 5.1, EN 60079-7:2015 + A1:2018.</p>
<p>기타</p>	<p>LCIE 05 ATEX 6155 X ,LCIE 05 ATEX 6154 X, IECEx 17.0016X</p>

참고: 장비 또는 보호 시스템을 설명하는 문헌(예: 설명서 또는 마케팅 자료)은 안전 측면과 관련하여 지침과 모순되지 않아야 합니다.

INSTRUCTIONS FOR USE – EX64x Series

Model(s)	VIBRATIONS SENSORS – TYPE: EX(M)64*****/M**, EXTO(M)64*****/M**, EXRV(M)64*****/M**
Markings	<p>IMI ASSY in U.S.A. WWW.PCB.COM 1-800-959-4464 LCIE 05 ATEX 6154 X Ex ia IIC T4 Ga, II 1 G LCIE 05 ATEX 6155 X Ex ec IIC T4 Gc, II 3 G IECEX 17.0016X ia and ec</p>
Putting Into Service	<p>The Models EX(M)64*****/M**, EXTO(M)64*****/M**, EXRV(M)64*****/M** Series are a 2-wire, 4-20mA loop. Attach the positive (+) input from the power supply to positive terminal of the sensor and the negative (-) input from the power supply to negative terminal. If using a standard DC power supply, install either an ammeter and/or load resistor in line with the return connection of negative terminal of the sensor.</p> <p>The Models EX(M)64*****/M**, EXTO(M)64*****/M**, EXRV(M)64*****/M** Series come with two options RV(Raw Vibration output) and TO(Temperature output). The RV option provides a vibration signal, which can be used for further analysis using Data collectors or analyzers. The TO option provides an additional 4-20mA output, whose output is proportional to the temperature of the sensor.</p>
Safe Use	<p>Warning 1 - <i>The power supply/signal conditioner should not be opened by anyone other than qualified service personnel.</i> This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the safety precautions required to avoid injury.</p> <p>Warning 2 - 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.</p> <p>Caution 1 - <i>Cables can kill your equipment.</i> 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:</p> <ul style="list-style-type: none"> ▪ <i>Laying on and moving across a rug,</i> ▪ <i>Any movement through air,</i> ▪ <i>The action of rolling out a cable, and/or</i> ▪ <i>Contact with a non-grounded person.</i> <p>The PCB solution for product safety:</p> <ul style="list-style-type: none"> ▪ Connect the cables only with the AC power off. <p>Temporarily “short” the end of the cable before attaching it to any signal input or output.</p> <p>Caution 2 - 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.</p>
Assembling	The EX(M)64*****/M**, EXTO(M)64*****/M**, EXRV(M)64*****/M** Series have a sealed stainless steel housing, with a screw terminal, and do not require any assembly. Only mounting to the machine being

	monitored using standard mounting accessories. For conduit version sensors, hand tighten the sensor to the conduit elbow until snug. Using a wrench, tighten an extra 1/8 to 1/4 turn. Attach all wiring to the screw terminals and hand tighten the conduit cover until snug. Using a wrench, tighten an extra 1/8 to 1/4 turn. Make sure the cover cannot be removed using hands only.
Dismantling	Other than removal from the mounting, there is no disassembly of the sensor required to take it out of service.
Maintenance	Routine maintenance, such as the cleaning of electrical connectors, housings, and mounting surfaces with solutions and techniques that will not harm the physical material of construction, is acceptable.
Servicing	Due to the sophisticated nature of the sensors and associated instrumentation provided by PCB Piezotronics, user servicing or repair is not recommended and, if attempted, may void the factory warranty. However, routine calibration of sensors and associated instrumentation is recommended as this helps build confidence in measurement accuracy and acquired data.
Repair	In the event that equipment becomes damaged or ceases to operate, arrangements should be made to return the equipment to PCB Piezotronics for repair. User servicing or repair is not recommended and, if attempted, may void the factory warranty.
Installation	<p>Overview: Sensor must be mounted in order to be put into service. When choosing a mounting method, consider closely both the advantages and disadvantages of each technique. Characteristics like location, ruggedness, amplitude range, accessibility, temperature, and portability are extremely critical. However, the most important and often overlooked consideration is the effect the mounting technique has on the high-frequency performance of the accelerometer. Mounting methods include: Stud mount, adhesive mount, magnetic mount, handheld, or probe tip mount.</p> <p>Cabling: Care and attention to cable installation and cable condition is essential as the reliability and accuracy of any measurement system is no better than that of its weakest link. Due to the nature of vibration measurements, all sensor cables will ultimately fatigue and fail. Good installation practice will extend the life of a cable, however, it is highly recommended to keep spare cables on hand to enable continuation of the test in the event of a cable failure.</p> <p>Y-3 Killark capped elbow is utilized on the conduit hub version sensor.</p>
Adjustment	The sensor is a sealed device and no user adjustments are possible. However, routine calibration of sensors by the manufacturer is recommended as this helps build confidence in measurement accuracy and acquired data.
Danger Areas (for pressure-relief devices)	N/A – not a pressure relief device.
Training Instructions	Industrial sensors must be installed in Hazardous Locations by trained professionals according to EN/IEC 60079-14 requirements.
Details on Safety of Protection Category	Ex ia is “intrinsic safety”, which limits the energy of sparks and surface temperatures to safe levels Ex ec is “Increased safety” no arcs, sparks or hot surfaces (enclosure ≥ IP54)
Entity Parameters and Limits (Values)	<p>Temperature Range: -40°C to +80°C</p> <p>IS (ia) Parameters –</p> <p><u>EX(M)64**0**, EX(M)64**9**, Connector Version:</u> Ui : 30V; Ii : 100mA; Pi : 1W; Ci: 0nF; Li : 121.1μH</p> <p><u>EX(M)64**1**/M**, EX(M)64**6**/M** Cable Version:</u> Ui : 30V; Ii : 100mA; Pi : 1W; Ci: 61nF; Li : 426.1μH</p>

	<p><u>EXTO(M)64**3**, EXTO(M)64**9** Connector Version :</u> Ui : 28V; Ii : 120mA; Pi : 1W; Ci: 0nF; Li : 122.2μH</p> <p><u>EXTO(M)64**1**/M**, EXTO(M)64**6**/M**, Cable Version:</u> Ui : 28V; Ii : 120mA; Pi : 1W; Ci: 61nF; Li : 427.2μH</p> <p><u>EXRV(M) 64**0**, EXRV(M) 64**9** Connector Version:</u> Ui : 28V; Ii : 120mA; Pi : 1W; Ci: 25nF; Li : 121.1μH</p> <p><u>EXRV(M)64**1**/M**, EXRV(M) **6**/M**, Cable Version:</u> Ui : 28V; Ii : 120mA; Pi : 1W; Ci: 80nF; Li : 426.1μH</p> <p><u>EX(M) 64**7**,EX(M) 64**8** Series (Conduit Version):</u> Ui : 30V; Ii :100 mA; Pi : 1W; Ci : 0nF; Li : 121.1μH</p> <p><u>EXRV(M) 64**7**,EXRV(M) 64**8** Series (Conduit Version):</u> Ui : 30V; Ii : 120 mA; Pi : 1W; Ci: 25nF; Li : 121.1μH</p> <p>Ex (ec) Parameters – Umax = 30V, Pmax = 1W</p>
<p>Specific Conditions of Use</p>	<p><i>For all types of protection:</i></p> <ul style="list-style-type: none"> • 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. <p><i>Additionally specific condition(s) for intrinsic safety “ia” type of protection:</i></p> <ul style="list-style-type: none"> • 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. <p><i>Additionally specific condition(s) for increased safety “ec” type of protection:</i></p> <ul style="list-style-type: none"> • 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 EN/IEC 60079-0 and EN/IEC 60079-7 for a zone 2 application. A minimum degree of protection IP54 according to EN/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
Essential Characteristics of tools fitted to the system (if any).	N/A – No tools are fitted to the system.
Drawings and Diagrams	27531, 27532, 30537, 64861, 64863, 64865, 32836,71909,71910,71907,71908
Applicable Standards	IEC 60079-0 (2017) Ed. 7 (with Corrigendum 1:2020), IEC 60079-11 (2011) Ed. 6 (with Corrigendum 1:2012), EN IEC 60079-0:2018, EN 60079-11:2012, IEC 60079-7 (2017) Ed. 5.1, EN 60079-7:2015 + A1:2018.
Other	LCIE 05 ATEX 6155 X ,LCIE 05 ATEX 6154 X, IECEx 17.0016X

Note: Literature (such as the manual or marketing materials) describing the equipment or protective system must not contradict the instructions with regard to safety aspects.



Model EX640B70

**Intrinsically-safe vibration sensor, 4 to 20 mA output, 0 to 0.5 in/sec pk, 3 to 1k Hz, top exit,
terminal block with conduit elbow**

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	0	0	0	0	0	0
PCB板	X	0	0	0	0	0
电气连接器	0	0	0	0	0	0
压电晶体	X	0	0	0	0	0
环氧	0	0	0	0	0	0
铁氟龙	0	0	0	0	0	0
电子	0	0	0	0	0	0
厚膜基板	0	0	X	0	0	0
电线	0	0	0	0	0	0
电缆	X	0	0	0	0	0
塑料	0	0	0	0	0	0
焊接	X	0	0	0	0	0
铜合金/黄铜	X	0	0	0	0	0
本表格依据 SJ/T 11364 的规定编制。						
0：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.

Model Number
EX640B70

LOOP POWERED, CURRENT OUTPUT, INDUSTRIAL VIBRATION SENSOR

Revision: C
ECN #: 27692

	<u>ENGLISH</u>	<u>SI</u>	
Performance			
Measurement Range	0.0 to 0.5 in/s pk	0.0 to 12.7 mm/s pk	[1]
Output	4-20 mA	4-20 mA	
Frequency Range(± 3 dB)	180 to 60,000 cpm	3 to 1000 Hz	[2][3]
Broadband Resolution	0.005 in/s pk	0.13 mm/s pk	[4]
Non-Linearity	± 1 %	± 1 %	
Environmental			
Temperature Range	-40 to 176 °F	-40 to 80 °C	
Electrical			
Excitation Voltage	12 to 30 VDC	12 to 30 VDC	
Settling Time(within 2% of value)	<15 sec	<15 sec	
Electrical Isolation(Case)	>10 ⁸ ohm	>10 ⁸ ohm	
Physical			
Size (Hex x Height)	3.85 in x 5.52 in	98 mm x 140 mm	
Weight	1.2 lb	544 gm	
Mounting Thread	1/4 NPT	Not Applicable	
Sensing Element	Ceramic	Ceramic	
Sensing Geometry	Shear	Shear	
Housing Material	Stainless Steel	Stainless Steel	
Electrical Connector	Removable Screw Terminals	Removable Screw Terminals	
Electrical Connection Position	Top	Top	
Electrical Connections(Tab 1)	4-20 mA Pos (+)	4-20 mA Pos (+)	
Electrical Connections(Tab 2)	4-20 mA Neg (-)	4-20 mA Neg (-)	
Screw Terminal Wire Size	12-24 AWG	3.0 - .2mm ²	

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 - ATEX or ATEX and CSA Hazardous Area Approval		
Hazardous Area Approval	DIV II, CL I, GRPS A-D, ExnA, AExnA, IIC T4	DIV II, CL I, GRPS A-D, ExnA, AExnA, IIC T4
Hazardous Area Approval	Ex ia IIC T4, -40°C≤Tas80°C, II 1 G	Ex ia IIC T4, -40°C≤Tas80°C, II 1 G
Hazardous Area Approval	Ex nA IIC T4, -40°C≤Tas80°C, C, II 3 G	Ex nA IIC T4, -40°C≤Tas80°C, 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

RV - Buffered Analog Signal Output - 100 mV/g (±20%)		
Electrical Connector	Removable Screw Terminals	Removable Screw Terminals
Electrical Connections(Tab 1)	4-20 mA Pos (+)	4-20 mA Pos (+)
Electrical Connections(Tab 2)	4-20 mA Neg (-)	4-20 mA Neg (-)
Electrical Connections(Tab 3)	Signal Output Pos	Signal Output Pos
Electrical Connections(Tab 4)	Signal Output Neg	Signal Output Neg

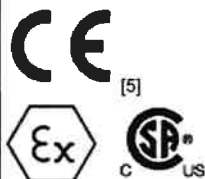
NOTES:

- [1] Conversion Factor 1 in/sec = 0.0254 m/sec.
- [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 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: <i>LU</i>	Engineer: <i>MJD</i>	Sales: <i>MPN</i>	Approved: <i>NJ</i>	Spec Number:
Date: <i>11-18-07</i>	Date: <i>11-12-07</i>	Date: <i>11-12-07</i>	Date: <i>11-20-07</i>	32577



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 Group, Inc.

IMI SENSORS
A PCB PIEZOTRONICS DIV.
3425 Walden Avenue, Depew, NY 14043

Phone: 800-959-4464
Fax: 716-684-3823
E-Mail: imi@pcb.com

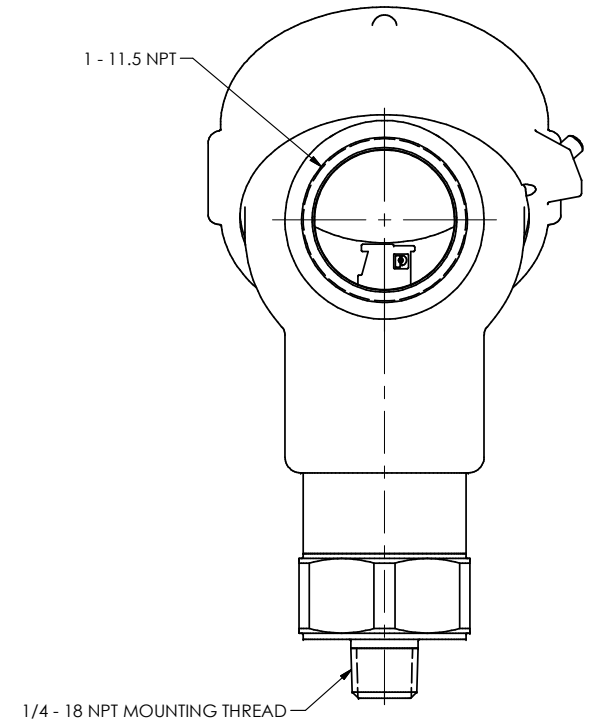
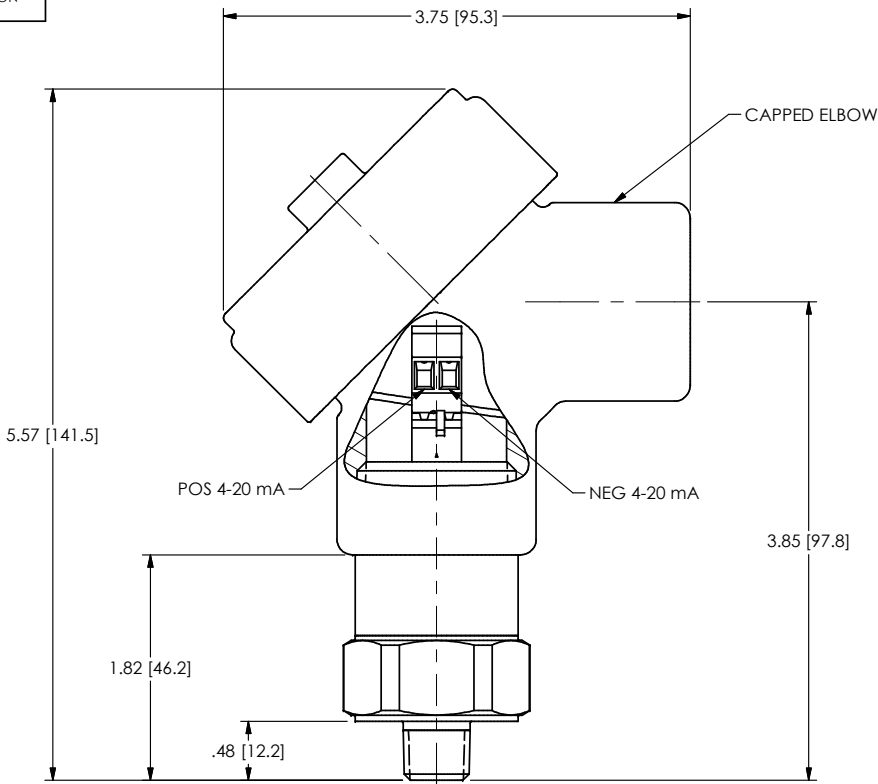
28148

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RELATED DRAWING

NO MODIFICATIONS PERMITTED WITHOUT THE APPROVAL OF THE AUTHORIZED PERSON

REVISIONS		
REV	DESCRIPTION	DIN
E	ADDED DIMENSION FOR STUD LENGTH, UPDATED DIMS	49796



UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		DRAWN		CHECKED		ENGINEER		 3425 WALDEN AVE. DEPEW, NY 14043 (716) 684-0001 E-MAIL: sales@pcb.com	
DIMENSIONS IN INCHES	DIMENSIONS IN MILLIMETERS [IN BRACKETS]	NJF	08/01/19	ECB	08/01/19	BAM	08/01/19		
DECIMALS XX ±.03 XXX ±.010	DECIMALS X ± 0.8 XX ± 0.25	TITLE OUTLINE DRAWING MODEL EP64XB7X, EX64XB7X 4-20 mA VELOCITY SENSOR						CODE IDENT. NO. 52681	DWG. NO. 28148
ANGLES ± 2 DEGREES	ANGLES ± 2 DEGREES							SCALE: .75X	SHEET 1 OF 1
FILLETS AND RADII .003 - .005	FILLETS AND RADII 0.07 - 0.13								

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.

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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.

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- 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

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**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.

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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	0	0	0	0	0	0
PCB板	X	0	0	0	0	0
电气连接器	0	0	0	0	0	0
压电晶体	X	0	0	0	0	0
环氧	0	0	0	0	0	0
铁氟龙	0	0	0	0	0	0
电子	0	0	0	0	0	0
厚膜基板	0	0	X	0	0	0
电线	0	0	0	0	0	0
电缆	X	0	0	0	0	0
塑料	0	0	0	0	0	0
焊接	X	0	0	0	0	0
铜合金/黄铜	X	0	0	0	0	0
本表格依据 SJ/T 11364 的规定编制。						
0：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.

71909

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SCHEDULE DRAWING

NO MODIFICATIONS PERMITTED WITHOUT REFERENCE TO THE NOTIFIED BODY

REVISIONS		
REV	DESCRIPTION	DIN
NR	RELEASED TO DRAFTING	49620

7 THE TERMINAL BLOCK ALLOWS THE CONNECTION OF CONDUCTOR CROSS SECTION OF 0.2-2.5mm², STRIPPED TO 7mm MAX., WITH TIGHTENING TORQUE 0.5 Nm TO 0.6 Nm

6 Y-3 KILLARK (100-7094-90) CAPPED ELBOW. ALL CONDUIT AND JUNCTION BOXES MUST MEET THE INSTALLATION METHOD AS REQUIRED BY THE APPLICATION AND LOCAL GOVERNING AGENCY. THE USER SHALL ENSURE THAT THE CAPPED ELBOW IS NOT EXPOSED TO ANY RISK OF MECHANICAL IMPACT OR FRICTION.

5 SHIELDS TO BE EARTHED AT BARRIER END

4 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.

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

2 ENTITY APPLICATION:

BARRIER	I.S. APPARATUS
Voc/Uo ≤	V _{MAX} /U _i
Isc/Io ≤	I _{MAX} /I _i
Ca/Co >	C _i + C _{CABLE}
La/Lo >	L _i + L _{CABLE}
Po ≤	P _i (CENELEC ONLY)

BARRIERS WITHIN THE SPECIFIED LIMITATIONS ARE PERMITTED

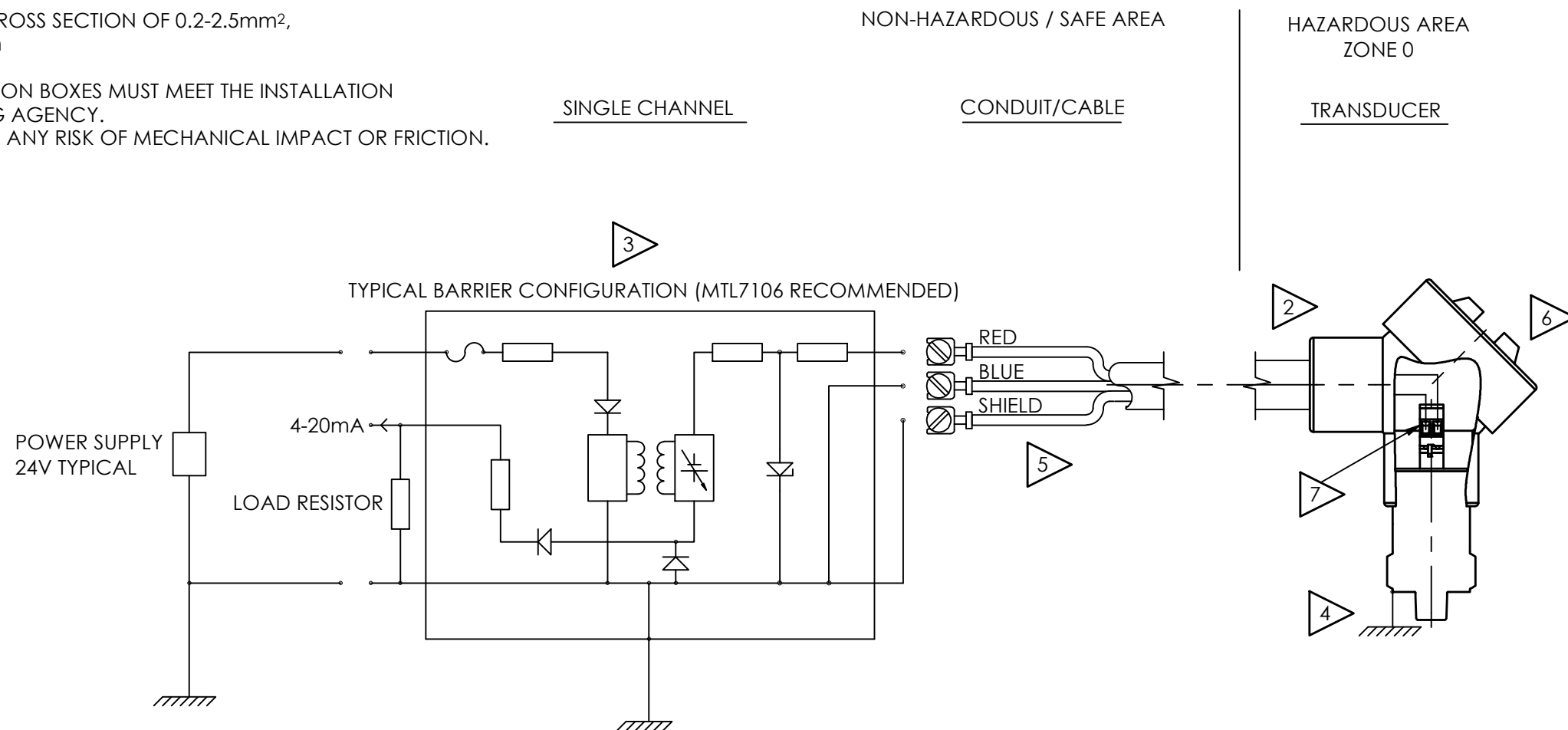
ENTITY PARAMETERS (CONDUIT/CAPPED ELBOW):

- U_i = 30V
- I_i = 100mA
- P_i = 1W
- C_i = 0 nF
- L_i = 121.1 μH

CERTIFIED BY THE APPROPRIATE APPROVAL AUTHORITY FOR CONNECTION TO THE FOLLOWING AREAS:

ZONE 0
Exia IIC T4 G_a, T_a = 80°C

- 1.) WIRING
RED/PIN A (POWER)
BLUE/PIN B (RETURN)



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMALS X ± .05 XX ± .01 XXX ± .005 XXXX ± .0005
ANGLES ± 2 DEGREES FILLETS AND RADII .003 - .005
HEX DIMENSIONS ARE: ≤ .5 + .000 / - .003 > .5 + .000 / - .005
INTERNAL THREAD DEPTH MIN. REMOVE ALL BURRS SHARP = R.000 - R.003



DRAWN	CHECKED	ENGINEER
NJF 01/14/22	NJF 01/14/22	GGG 01/14/22
TITLE APPROVAL EX(M)64****/M** CONDUIT HUB VERSION INTERCONNECTION		

PCB PIEZOTRONICS™
3425 WALDEN AVE. DEPEW, NY 14043
(716) 684-0002 E-MAIL: sales@pcb.com

CODE IDENT. NO. 52681	DWG. NO. 71909
SCALE: NONE	SHEET 1 OF 2

71909

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SCHEDULE DRAWING
NO MODIFICATIONS PERMITTED WITHOUT REFERENCE TO THE NOTIFIED BODY

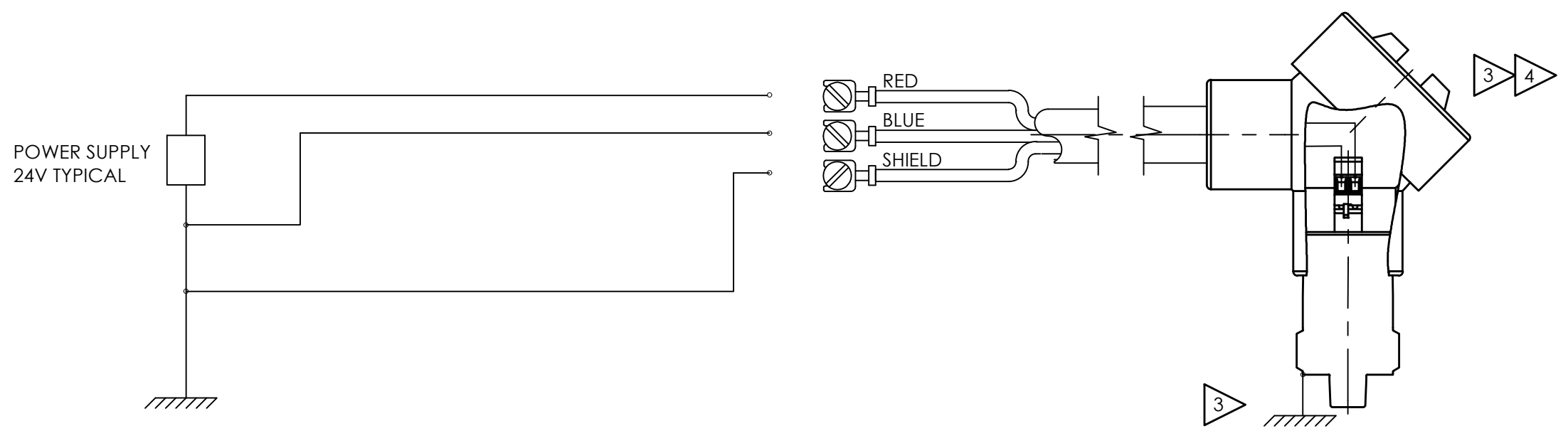
REVISIONS		
REV	DESCRIPTION	DIN
	-SEE SHEET 1-	

NON-HAZARDOUS / SAFE AREA OR ZONE 2

POWER SUPPLY/
SIGNAL CONDITIONER

CONDUIT/CABLE

TRANSDUCER



5.) **⚠** DO NOT DISCONNECT WHEN HAZARDOUS LOCATION IS PRESENT

4 **▶** Y-3 KILLARK (100-7094-90) CAPPED ELBOW. SENSOR MUST BE INSTALLED IN A SUITABLE ENCLOSURE, ACCEPTABLE TO THE LOCAL INSPECTION AUTHORITY HAVING JURISDICTION

3 **▶** SENSOR MUST BE MOUNTED DIRECTLY ON A CONDUCTIVE STRUCTURE, WHICH IS VERIFIED TO BE CONNECTED TO SUPPLY SOURCE GROUND. OTHERWISE, USE CORTEM CONDUIT JUNCTION BOX PART NUMBER SB-36 OR EQUIVALENT CONTAINING INTEGRAL GROUND SCREW CONNECTED TO SUPPLY SOURCE GROUND

2.) CERTIFIED BY THE APPROPRIATE APPROVAL AUTHORITY FOR CONNECTION TO THE FOLLOWING AREAS:

ZONE 2
Exec IIC T4 Gc, Ta = 80°C

1.) WIRING
RED/PIN A (POWER)
BLUE/PIN B (RETURN)

UNLESS OTHERWISE SPECIFIED	
DIMENSIONS ARE IN INCHES	
DECIMALS	X ± .05
	XX ± .01
	XXX ± .005
	XXXX ± .0005
ANGLES ± 2 DEGREES	
FILLETS AND RADII .003 - .005	
HEX DIMENSIONS ARE:	
	≤ .5 + .000 / - .003
	> .5 + .000 / - .005
INTERNAL THREAD DEPTH MIN.	
REMOVE ALL BURRS	
SHARP = R.000 - R.003	



DRAWN		CHECKED		ENGINEER	
NJF	01/14/22	NJF	01/14/22	GGG	01/14/22
TITLE					
APPROVAL EX(M)64****/M**					
CONDUIT HUB VERSION INTERCONNECTION					

PCB PIEZOTRONICS™
3425 WALDEN AVE. DEPEW, NY 14043
(716) 684-0002 E-MAIL: sales@pcb.com

CODE IDENT. NO. 52681	DWG. NO. 71909
SCALE: NONE	SHEET 2 OF 2

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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

7 PCB P/N 100-7094-90 OR EQUIVALENT. ALL CONDUIT AND JUNCTION BOXES MUST MEET THE CLASS, DIVISION, GROUP, AND INSTALLATION METHOD AS REQUIRED BY THE APPLICATION AND LOCAL GOVERNING AGENCY.

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
$V_{oc}/U_o \leq V_{MAX}/U_i$	
$I_{sc}/I_o \leq I_{MAX}/I_i$	
$C_a/C_o > C_i + C_{CABLE}$	
$L_a/L_o > L_i + L_{CABLE}$	
$P_o \leq P_i$ (GENELEC ONLY)	

BARRIERS WITHIN THE SPECIFIED LIMITATIONS ARE PERMITTED.

ENTITY PARAMETERS (EX64XB7X-XXXXX):

$U_i = 30$ V
$I_i = 100$ mA
$P_i = 1$ W
$C_i = 61$ nF
$L_i = 306$ uH

ENTITY PARAMETERS (EX64XB7X):

$U_i = 30$ V
$I_i = 100$ mA
$P_i = 1$ W
$C_i = 0$
$L_i = 1.06$ 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 (EX64XB7X-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 EX64XB7X OR EX64XB7X-XXXXX

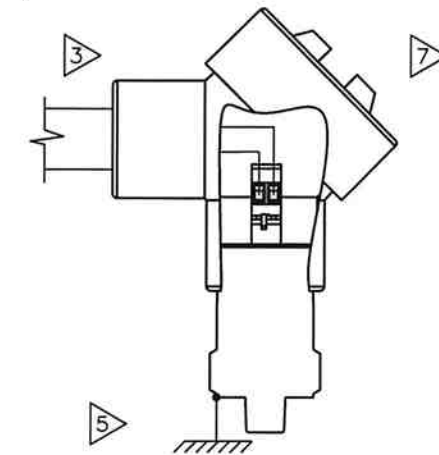
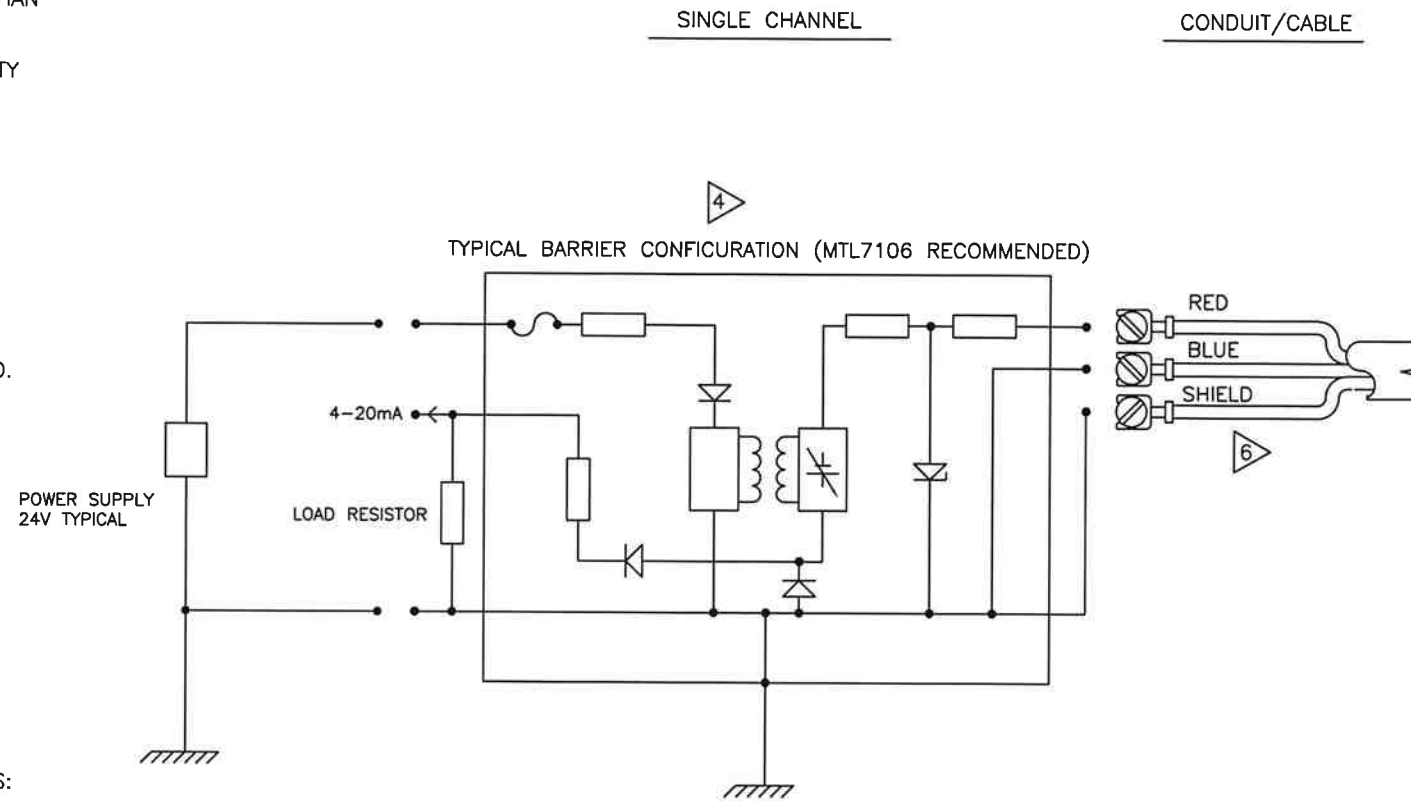
NOTES: UNLESS OTHERWISE SPECIFIED.

NON-HAZARDOUS / SAFE AREA

HAZARDOUS AREA
DIV 1
ZONE 0

TRANSUCER

OR
PN EX64XB7X
PN EX64XB7X-XXXXX



IMI
3425 Walden Av.
Depew, New York 14043
Certifié conforme à l'exécution
Signature: *[Signature]* 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	+0.00 / -.003
> 0.5	+0.00 / -.005
INTERNAL THREAD DEPTH MIN	
REMOVE ALL BURRS	
SHARP = R.000 - R.003	
DD016 REV. D 01/17/2003	



DRAWN	<i>[Signature]</i>	6/21/07	MFG	JR	6/21/07
CHK'D	<i>[Signature]</i>	6/25/07	ENGR	MJI	6/21/07
APP'D	NF	6/21/07			

TITLE
CSA/LCIE APPROVAL
EX64XB7X
INTERCONNECTION

PCB PIEZOTRONICS

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

CODE IDENT. NO. 52681
DWG. NO. 28766

SCALE: NONE SHEET 1 OF 2

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REVISIONS					
ZONE	REV	DESCRIPTION	ECN	DATE	APP'D
		---SEE SHEET ONE---			DMG/e

Schedule Drawing
No modifications permitted without reference to the Notified Body

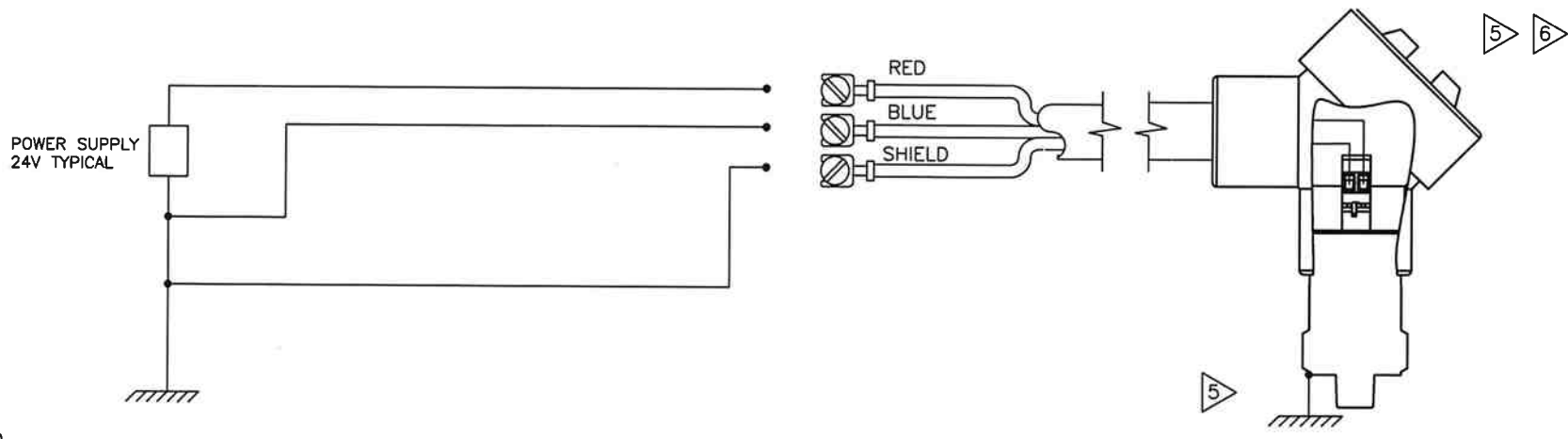
NON-HAZARDOUS / SAFE AREA
OR DIV 2 / ZONE 2

POWER SUPPLY/
SIGNAL CONDITIONER

CONDUIT/CABLE

TRANSDUCER

PN EX64XB7X
OR
PN EX64XB7X-XXXXX



6. PCB P/N 100-7094-90 OR EQUIVALENT. SENSOR MUST BE INSTALLED IN A SUITABLE ENCLOSURE, ACCEPTABLE TO THE LOCAL INSPECTION AUTHORITY HAVING JURISDICTION. SENSOR CASE MUST BE BONDED TO GROUND ACCORDING TO SECTION 18-182 OF THE CEC, PART 1 AND ACCORDING TO ARTICLE 501.16 OF THE NEC AS APPLICABLE.
5. SENSOR MUST BE MOUNTED DIRECTLY ON A CONDUCTIVE STRUCTURE, WHICH IS VERIFIED TO BE CONNECTED TO SUPPLY SOURCE GROUND. OTHERWISE, USE CORTEM CONDUIT JUNCTION BOX PART NUMBER SB-36 OR EQUIVALENT CONTAINING INTEGRAL GROUND SCREW CONNECTED TO SUPPLY SOURCE GROUND.
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
 ExnA IIC
 AExnA IIC
 DIV 2
 CLASS I, GROUPS A,B,C,D
 ZONE 2
 ExnA IIC
2. WIRING (EX64XB7X-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 LENGTH AND TERMINATION TYPE FOR METRIC LENGTHS, CABLE DESIGNATION IS MXXXXX
1. PART NO. IS EX64XB7X OR EX64XB7X-XXXXX
- NOTES: UNLESS OTHERWISE SPECIFIED.

NO CHANGES WITHOUT CSA/LCIE APPROVAL

WARNING - EXPLOSION HAZARD
DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS

IME
3425 Walden Av.
Depew, New York 14043
Certifié conforme à l'exécution
Signature: *[Signature]* 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



DRAWN	<i>msc</i>	6/21/07	MFG	JR	6/21/07
CHK'D	<i>dm</i>	6/25/07	ENGR	MJI	6/21/07
APP'D	NF	6/21/07			

TITLE
CSA/LCIE APPROVAL
EX64XB7X
INTERCONNECTION

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

CODE IDENT. NO. 52681	DWG. NO. 28766
SCALE: NONE SHEET 2 OF 2	



제2023-061666-01-1호

안전인증서

PCB Piezotronics Inc.

3245 Walden Avenue, Depew New York 14043, United states of America

위 사업장에서 제조하는 아래의 품목이 「산업안전보건법」 제84조 및 같은 법 시행규칙 제110조제1항에 따른 안전인증 심사 결과 안전·보건기준에 적합하므로 안전인증표시의 사용을 인증합니다.

품 목

Vibration Sensors

형식·모델(용량·등급) / 인증번호

EX(*)64*****/M**(Ex ec IIC T4 Gc) / 23-KA4BO-0597X

인증기준

고용노동부고시 제2021-22호

인증조건

1. 제조공장

·본 인증서는 '3245 Walden Avenue, Depew New York 14043, United states of America'에서 생산하는 제품에 한함.

2. 제품개요

- 제품개요: 당 기기는 스테인리스 외함의 안전증 방폭구조의 진동 센서임.
- 제품정격: 30 Vdc, 1 W
- 센서 출력
 - M, TO 옵션: (4-20) mA,
 - RV 옵션: (0 - 2.5) Vac, 2.5 Vdc
- 사용주위온도: $-40\text{ }^{\circ}\text{C} \leq T_a \leq +80\text{ }^{\circ}\text{C}$

3. 인증범위: 본 인증서는 아래의 형식번호를 갖는 제품에 한하여 유효함.

·EX(a)64**(b)**/M**

(a) 센서 옵션: M, TO, RV
(b) 커넥터 유형: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, M
* 방폭성능에 영향을 끼치지 않는 요소

4. 안전한 사용을 위한 조건

·관련 IECEx 인증서(IECEx LCIE 17.0016X issue No.1) 3 페이지 SPECIFIC CONDITIONS OF USE 참조

5. 인증(변경)사항: 없음.

6. 그 밖의 사항

- 안전인증품의 품질관리, 확인심사 수검, 변경사항 신고 등 인증 받은 자의 의무 준수
- 본 안전인증서는 반드시 관련 IECEx 인증서(IECEx LCIE 17.0016X issue No.1)와 함께 사용할 것.

2023년 11월 30일

한국산업기술시험원장



안전인증을 받은 자의 유의사항

[Notification for recipient (certification holder)]

1. 본 인증서는 기재된 사업장에서 생산된 제품으로서 적용된 안전인증기준에 적합한 경우에 한하여 유효합니다. (This certificate is valid only when the product is suitable for the applied safety certification criteria and is manufactured from the manufacturing location that is stipulated on this certificate)
2. 안전인증을 받은 자가 다음 각 호의 어느 하나에 해당하면 인증정지 및 취소의 사유가 됩니다. (If a person who has received safety certification falls under any of the following subclause, this safety certification may be suspended or cancelled)
 - 1) 거짓이나 그 밖의 부정한 방법으로 안전인증을 받은 경우 (In case of being certified in false or other improper ways)
 - 2) 안전인증을 받은 안전인증대상 기계기구등의 안전에 관한 성능 등이 안전인증기준에 맞지 아니하게 된 경우 (In the case that the properties of the product for which safety certification has been received are not suitable for the safety certification criteria)
 - 3) 정당한 사유 없이 확인심사를 거부, 기피 또는 방해하는 경우 (In case of refusing, avoiding or disturbing regular surveillance audit without a justifiable reason)
3. 다음과 같은 사유가 발생할 경우에는 안전인증기관에 안전인증 변경 신청을 하여 안전인증서를 재교부 받아야 합니다. (In the case of the following subclauses, the revision of the safety certification shall be applied to the safety certification body and the safety certificate shall be reissued)
 - 1) 인증서의 분실 또는 훼손 (Losses or damages to this certificate)
 - 2) 제조자, 주소, 인증조건 등 인증서 기재사항의 변경 (Changes of stated items in the certificate such as manufacturer's name, manufacturer's address, certification conditions, etc)
4. 안전인증을 받은 자는 다음 사항을 이행해야 합니다. (The recipient of safety certificate (certification holder) shall comply with the following subclauses)
 - 1) 안전인증표시 등 인증요건의 유지관리 (Maintenance control of the certification requirements such as a safety certification mark)
 - 2) 안전인증을 받기 이전 또는 정지, 취소된 이후 생산된 제품에 안전인증표시를 하면 법에 의거 처벌을 받게 됩니다. (It will be punished by the ACT if the safety certification mark is used before issue of the safety certification or after suspension or cancellation of the safety certification)
5. 안전인증을 받은 자는 산업안전보건법 제84조제4항 및 동법 시행규칙 제111조에 따라 정기적인 확인심사를 받아야 합니다. (The recipient of the safety certification (certification holder) shall receive a regular surveillance audit under Paragraph 4 of Article 84 of OCCUPATIONAL SAFETY AND HEALTH ACT and Article 111 of ENFORCEMENT ORDINANCE in the same ACT)

연락처(Contact information) : 서울 사무소(Seoul office) Tel +82-2-860-1540, Fax +82-2-860-1549
E-mail: dkim@ktl.re.kr, Homepage: www.ktl.re.kr



제2023-061668-01-1호

안전인증서

PCB Piezotronics Inc.

3245 Walden Avenue, Depew New York 14043, United states of America

위 사업장에서 제조하는 아래의 품목이 「산업안전보건법」 제84조 및 같은 법 시행규칙 제110조제1항에 따른 안전인증 심사 결과 안전·보건기준에 적합하므로 안전인증표시의 사용을 인증합니다.

품 목

Vibration Sensors

형식·모델(용량·등급) / 인증번호

EX(M)64*****(Ex ia IIC T4 Ga) / 23-KA4BO-0599X

인증기준

고용노동부고시 제2021-22호

인증조건

1. 제조공장

·본 인증서는 '3245 Walden Avenue, Depew New York 14043, United states of America'에서 생산하는 제품에 한함.

2. 제품개요

- 제품개요: 당 기기는 스테인리스 외함 및 도관 연결 방식의 본질안전 방폭구조의 진동 센서임.
- 본질안전을 위한 파라미터: $U_i = 30\text{ V}$, $I_i = 100\text{ mA}$, $P_i = 1\text{ W}$, $C_i = 0\text{ }\mu\text{F}$, $L_i = 121.1\text{ }\mu\text{H}$
- 센서 출력: (4 - 20) mA
- 사용주위온도: $-40\text{ }^\circ\text{C} \leq T_a \leq +80\text{ }^\circ\text{C}$

3. 인증범위: 본 인증서는 아래의 형식번호를 갖는 제품에 한하여 유효함.

·EX(M)64**(a)**

(a) 커넥터 유형: 7, 8
* 방폭성능에 영향을 끼치지 않는 요소

4. 안전한 사용을 위한 조건

·관련 IECEx 인증서(IECEx LCIE 17.0016X issue No.1) 3 페이지 SPECIFIC CONDITIONS OF USE 참조

5. 인증(변경)사항: 없음.

6. 그 밖의 사항

- 안전인증품의 품질관리, 확인심사 수검, 변경사항 신고 등 인증 받은 자의 의무 준수
- 본 안전인증서는 반드시 관련 IECEx 인증서(IECEx LCIE 17.0016X issue No.1)와 함께 사용할 것.

2023년 11월 30일

한국산업기술시험원장



안전인증을 받은 자의 유의사항 [Notification for recipient (certification holder)]

1. 본 인증서는 기재된 사업장에서 생산된 제품으로서 적용된 안전인증기준에 적합한 경우에 한하여 유효합니다. (This certificate is valid only when the product is suitable for the applied safety certification criteria and is manufactured from the manufacturing location that is stipulated on this certificate)
2. 안전인증을 받은 자가 다음 각 호의 어느 하나에 해당하면 인증정지 및 취소의 사유가 됩니다. (If a person who has received safety certification falls under any of the following subclause, this safety certification may be suspended or cancelled)
 - 1) 거짓이나 그 밖의 부정한 방법으로 안전인증을 받은 경우 (In case of being certified in false or other improper ways)
 - 2) 안전인증을 받은 안전인증대상 기계기구등의 안전에 관한 성능 등이 안전인증기준에 맞지 아니하게 된 경우 (In the case that the properties of the product for which safety certification has been received are not suitable for the safety certification criteria)
 - 3) 정당한 사유 없이 확인심사를 거부, 기피 또는 방해하는 경우 (In case of refusing, avoiding or disturbing regular surveillance audit without a justifiable reason)
3. 다음과 같은 사유가 발생할 경우에는 안전인증기관에 안전인증 변경 신청을 하여 안전인증서를 재교부 받아야 합니다. (In the case of the following subclauses, the revision of the safety certification shall be applied to the safety certification body and the safety certificate shall be reissued)
 - 1) 인증서의 분실 또는 훼손 (Losses or damages to this certificate)
 - 2) 제조자, 주소, 인증조건 등 인증서 기재사항의 변경 (Changes of stated items in the certificate such as manufacturer's name, manufacturer's address, certification conditions, etc)
4. 안전인증을 받은 자는 다음 사항을 이행해야 합니다. (The recipient of safety certificate (certification holder) shall comply with the following subclauses)
 - 1) 안전인증표시 등 인증요건의 유지관리 (Maintenance control of the certification requirements such as a safety certification mark)
 - 2) 안전인증을 받기 이전 또는 정지, 취소된 이후 생산된 제품에 안전인증표시를 하면 법에 의거 처벌을 받게 됩니다. (It will be punished by the ACT if the safety certification mark is used before issue of the safety certification or after suspension or cancellation of the safety certification)
5. 안전인증을 받은 자는 산업안전보건법 제84조제4항 및 동법 시행규칙 제111조에 따라 정기적인 확인심사를 받아야 합니다. (The recipient of the safety certification (certification holder) shall receive a regular surveillance audit under Paragraph 4 of Article 84 of OCCUPATIONAL SAFETY AND HEALTH ACT and Article 111 of ENFORCEMENT ORDINANCE in the same ACT)

연락처(Contact information) : 서울 사무소(Seoul office) Tel +82-2-860-1540, Fax +82-2-860-1549
E-mail: dkim@ktl.re.kr, Homepage: www.ktl.re.kr



СЕРТИФИКАТ СООТВЕТСТВИЯ

№ 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 Гнезниковский 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 TU (аттестат № РОСС RU.0001.21MШ19 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.)

Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы))

(подпись)

М.П. Рафалович Борис Александрович

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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 «п»

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

Руководитель (уполномоченное
лицо) органа по сертификации

(подпись)

Эксперт (эксперт-аудитор)
(эксперты (эксперты-аудиторы))

(подпись)



Залогин Александр Сергеевич
(Ф.И.О.)

М.П.

Рафалович Борис Александрович
(Ф.И.О.)

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.

Вибропереключатели 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 176ХУУ/МZZZ-АА

X = от А до Z ревизия продукта, не влияющая на взрывозащиту

УУ = 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: А,В,С,Д,Е,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)602yzzz/aaa, EX(TO)(M)603yzzz/aaa, EX(TO)(M)606yzzz/aaa, EX(TO)(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 А 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 (А,В ... М), 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)64хухх, EX(RV)(TO)(M)649ухх, EX (RV)(TO) (M)686ухх

XX = M (с метрической резьбой), TO (с температурным выходом), RV (с доп. вольтовым выходом).

Буквы х являются переменными цифрами (значения от 0 до 9), не влияющими на взрывозащиту

y = одна буква от А 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 А 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 Вибропереключатели 685ухх

Буквы х являются переменными цифрами (значения от 0 до 9), не влияющими на взрывозащиту

y = одна буква от А до Z, не влияющая на взрывозащиту

Руководитель (уполномоченное лицо) органа по сертификации

(подпись)

Залогин Александр Сергеевич (Ф.И.О.)

Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы))

(подпись)

Рафалович Борис Александрович (Ф.И.О.)

ПРИЛОЖЕНИЕ

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

Серия **RU** № **0621346**

3. ОСНОВНЫЕ ТЕХНИЧЕСКИЕ ДАННЫЕ

3.1. Ех-маркировка: преобразователей 176XYU/MZZ-AA	0Ex ia IIC T660°C...T6 Ga X
преобразователей 351abcd	0Ex ia IIC T4 Ga X
вибропереключателей 685yxx	1Ex d IIB+H ₂ T4 Gb
преобразователей EX(TO)(M)602yzzz1aaa, EX(TO)(M)603yzzz/aaa, EX(TO)(M)606yzzz/aaa, EX(TO)(M)607yzzz/aaa, EX(TO)(M)608yzzz/aaa	2Ex nA IIC T4 Gc X или 0Ex ia IIC T4 Ga X
преобразователей EX(M)637XYUZY, (M)638XYUZY	0Ex ia IIC T4 Ga X или 2Ex nA IIC T4 Gc X
предусилителей EX682XYUZY	0Ex ia IIC T4 Ga X или 2Ex nA IIC T4 Gc X
EX(RV)(TO)(M)64хyxx, EX(RV)(TO)(M)649yxx, EX (RV)(TO) (M)686yxx	1Ex d IIC T4 Gb X или 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, °C, преобразователей 176XYU/MZZ-AA	от -70 до 650
преобразователей 351abcd	от -196 до 121
вибропереключателей 685yxx	от -25 до 60
преобразователей EX(TO)(M)602yzzz1aaa, EX(TO)(M)603yzzz/aaa, EX(TO)(M)606yzzz/aaa, EX(TO)(M)607yzzz/aaa, EX(TO)(M)608yzzz/aaa	от -54 до 121
преобразователей EX(M)637XYUZY, (M)638XYUZY	от -196 до 121
предусилителей EX682XYUZY	от -40 до 85
преобразователей EX(RV)(TO)(M)64хyxx, EX(RV)(TO)(M)649yxx, EX (RV)(TO) (M)686yxx	от -20 до 80
преобразователей EX (XX) 622yzzz / aaa, EX (XX) 623yzzz / aaa, EX (XX) 625yzzz / aaa , EX (XX) 628yzzz / aaa	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 176XYU/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(TO)(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)637XYUZY, (M)638XYUZY	28	93	0,65	6,5	пренебрежимо мала
предусилителей EX682XYUZY	28	100	0,7	пренебрежимо мала	пренебрежимо мала

Руководитель (уполномоченное
лицо) органа по сертификации

(подпись)

Эксперт (эксперт-аудитор)
(эксперты (эксперты-аудиторы))

(подпись)

Залогин Александр Сергеевич

(Ф.И.О.)

М.П. Рафалович Борис Александрович

(Ф.И.О.)

ПРИЛОЖЕНИЕ

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

Серия RU № 0621347

3.4. Электрические параметры:

3.4.1 вибропереключателей 685ухх

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

3.4.2 преобразователей EX(TO)(M)602yzzz/aaa, EX(TO)(M)603yzzz/aaa, EX(TO)(M)606yzzz/aaa, EX(TO)(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, mA 200
Мощность, Вт 1

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

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

3.4.4 Предусилителей EX682XYYY

Напряжение питания, В 22 – 28
Максимальный ток, mA 3,1 – 4,1
Мощность, Вт 0,1

3.4.5 преобразователей EX(RV)(TO)(M)64уххх, EX(RV)(TO)(M)649ухх, EX (RV)(TO) (M)686ухх

Напряжение питания, В 18 – 30
Максимальный ток, mA 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.

Вибропереключатели серии 685ухх 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, вибропереключателей 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, вибропереключатели 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, вибропереключателей, предусилителей необходимо соблюдать следующие специальные условия:

- преобразователи, вибропереключатели, 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

Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы))

(подпись)

(подпись)



Залогин Александр Сергеевич

(ф.и.о.)

М.П. Рафалович Борис Александрович

(ф.и.о.)



ATTESTATION D'EXAMEN UE DE TYPE

EU TYPE EXAMINATION CERTIFICATE



1 Version : 02

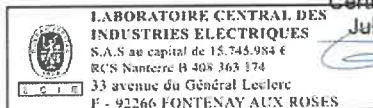
LCIE 05 ATEX 6154 X

Issue : 02

- | | |
|---|--|
| <p>2 Appareil ou Système de Protection destiné à être utilisé en Atmosphères Explosibles</p> <p>3 Produit :
Transmetteurs de vibration</p> <p>4 Fabricant :</p> <p>5 Adresse :</p> <p>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.</p> <p>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.
Les résultats des vérifications et essais figurent dans le(s) rapport(s) confidentiel(s) N° :</p> <p>8 Le respect des Exigences Essentielles de Sécurité et de Santé est assuré par la conformité à :</p> <p>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.</p> <p>10 Cette Attestation d'Examen UE 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.</p> <p>11 Le marquage du produit est mentionné dans l'annexe de cette attestation.</p> | <p>Equipment or Protective System Intended for use in Potentially Explosive Atmospheres</p> <p>Product :
Vibration transmitters</p> <p>Manufacturer :
PCB Piezotronics Inc.</p> <p>Address :
3425 Walden Avenue
DEPEW, NY 14043
UNITED STATES of AMERICA</p> <p>This product any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.</p> <p>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.
The examination and test results are recorded in confidential report(s) N°:</p> <p>140596-682756</p> <p>Compliance with the Essential Health and Safety Requirements has been assured by compliance with :</p> <p>EN 60079-0:2012+A11:2013,
EN 60079-11:2012</p> <p>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.</p> <p>This EU 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.</p> <p>The marking of the product is specified in the schedule to this certificate.</p> |
|---|--|

Fontenay-aux-Roses, le 11 juillet 2018

Responsable de Certification
Certification Officer



Julien Gauthier
(Signature)

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LCIE

Laboratoire Central des Industries Electriques
Une société de Bureau Veritas

33 Avenue du Général Leclerc
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 boîtiers 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.

Équipement 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

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 : ...

⊕ 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 : ...

⊕ 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.

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.

14 EXIGENCES ÉSSÉNTIELLES DE SANTE ET DE SECURITE

Couvertes par les normes listées au point 8.

15 DOCUMENTS DESCRIPTIFS

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

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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: ...

⊕ 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: ...

⊕ 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.

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.

ESSENTIAL HEALTH AND SAFETY REQUIREMENTS

Covered by standards listed at 8.

DESCRIPTIVE DOCUMENTS



ATTESTATION D'EXAMEN UE DE TYPE - ANNEXE

EU TYPE EXAMINATION CERTIFICATE - SCHEDULE

1 Version : 02

LCIE 05 ATEX 6154 X

Issue : 02

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.

17 DETAILS DES MODIFICATIONS

Version 00 : Version initiale.
2005/12/07

Version 01 : Mise à jour normative suivant les normes EN 2007/08/02 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.

ADDITIONAL INFORMATION

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.

DETAILS OF CHANGES

Issue 00: Initial issue.
2005/12/07

Issue 01: 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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LCIE

Laboratoire Central des Industries Electriques
Une société de Bureau Veritas

33 Avenue du Général Leclerc
92260 Fontenay-aux-Roses
FRANCE

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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:



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



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, 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

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

Carrie Termin 05/25/17



CTD011

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 (XX) Options include one or more of the following:
 - 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
- 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 x 10 ⁻³	1.299 x 10 ⁻³
λ _{du} x 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 HEADQUARTERS

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

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**AS9100 and ISO9001 Certified
ISO17025 Accredited**

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

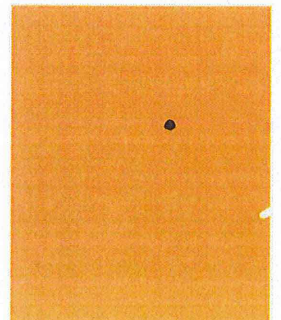
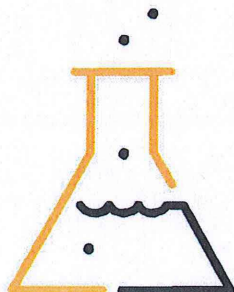
Ashton D. Hainge, CFSP, PMP

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	1001	1001
Proof test interval (Annual)	8,760 h	8,760 h
PFD _{avg}	1.255x10 ⁻³	1.299x10 ⁻³
SFF	86.27%	86.12%
HFT	0	0
SIL Capability (Low Demand Mode)	2	2
SIL Capability (Continuous Demand Mode)	2	2
Architecture	1001	1001

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 61508¹.

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.

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 2011/65/EU w/2015/863/EU 2014/34/EU	EMC Directive RoHS Directive ATEX Directive
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Harmonized Standards to which Conformity is Declared:

Harmonized Standards	EN 61326-1:2013 EN 61326-2-3: 2013 EN 61010-1:2010 EN 61010-1:2010/A1:2019/AC:2019-04 EN 61010-1:2010/A1:2019 EN 60079-0:2018 EN 60079-11: 2012 EN IEC 63000:2018	Electrical Equipment for Measurement, Control and Laboratory Use- EMC requirements - Part 1: General requirements 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 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements General Explosive Atmosphere Intrinsic safe, i 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, EN 55011:2016/A1:2017 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 EN 61000-4-3:2006	Electromagnetic compatibility (EMC)–Part 4–2: Testing and measuring techniques– Electrostatic discharge immunity test 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 EN 61000-4-5:2005 EN 61000-4-6:2006 EN 61000-4-8:2001	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test
Test Reports	EMC Reports Safety Reports	GM29045c GM29046s
EC Type Examination	ATEX Certification	LCIE 05 ATEX 6154 X Ex ia IIC T4, II 1G
Voluntary Certification	Supplemental ATEX Certification	LCIE 05 ATEX 6155 X Ex nL IIC T4 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) 33, avenue du Général Leclerc FR- 92260 Fontenay-aux-Roses Tel. : + 33 1 40 95 60 60 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:



Name: Wendy Willard

Title: Regulatory Affairs and Product Certification Specialist



LCIE

ATTESTATION D'EXAMEN DE TYPE TYPE EXAMINATION CERTIFICATE



1 Version : 03

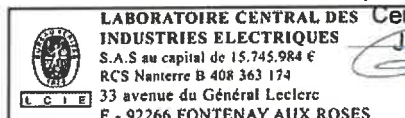
LCIE 05 ATEX 6155 X

Issue : 03

- | | |
|---|---|
| <p>2 Appareil ou Système de Protection destiné à être utilisé en Atmosphères Explosibles</p> <p>3 Produit :
Capteurs de vibration</p> <p>4 Fabricant :</p> <p>5 Adresse :</p> <p>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.</p> <p>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° :</p> <p>8 Le respect des Exigences Essentielles de Sécurité et de Santé est assuré par la conformité à :</p> <p>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.</p> <p>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.</p> <p>11 Le marquage du produit est mentionné dans l'annexe de cette attestation.</p> | <p>Equipment or Protective System Intended for use in Potentially Explosive Atmospheres</p> <p>Product :
Vibration sensors</p> <p>Manufacturer :
PCB Piezotronics Inc.</p> <p>Address :
3425 Walden Avenue
Depew, New York 14043
États-Unis d'Amérique</p> <p>This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.</p> <p>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</p> <p>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</p> <p>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.</p> <p>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.</p> <p>The marking of the product is specified in the schedule to this certificate.</p> |
|---|---|

Fontenay-aux-Roses, le 28 février 2023

Responsable de Certification



Certification Officer
Julien Gauthier



ATTESTATION D'EXAMEN DE TYPE - ANNEXE

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

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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CERT-ATEX-FORM 05 Rev. 05



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DETAIL DE LA GAMME

RANGE DETAILS

EX	*	64	*	*	*	*	*	/	M	*	*	
<p>Deux caractères optionnels pour désigner le type de terminaison du câble</p> <p>Trois à six chiffres optionnels utilisant xxx-xx pour désigner la longueur en pieds-pouces ou mètres-centimètres avec M dans la colonne précédente</p> <p>Longueur de câble métrique en option</p> <p>Modificateur de longueur de câble en option</p> <p>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.</p> <p>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</p> <p>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</p> <p>Une lettre de A à Z pour indiquer le niveau de révision du modèle</p> <p>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 = Réserve 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</p> <p>Famille de capteurs de la série 64</p> <p>Une ou plusieurs options de capteur M = Monture métrique TO = Sortie Température RV = Sortie Vibration brute</p> <p>Type de produit : EX = ATEX/IECEX Produit</p>												



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EX	*	64	*	*	*	*	*	/	M	*	*	
<p style="margin-left: 150px;">Optional Two characters to designate cable termination type</p> <p style="margin-left: 150px;">Optional Three to six digits using xxx-xx to designate length in feet-inches or meters-centimeters with M in previous column</p> <p style="margin-left: 150px;">Optional Metric Cable Length</p> <p style="margin-left: 150px;">Optional Cable length modifier</p> <p style="margin-left: 150px;">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.</p> <p style="margin-left: 150px;">A number or letter 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, M which designates measurement range and filtering M = Customer special</p> <p style="margin-left: 150px;">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</p> <p style="margin-left: 150px;">One letter A to Z to denote model revision level</p> <p style="margin-left: 150px;">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</p> <p style="margin-left: 150px;">64 Series Family of sensors</p> <p style="margin-left: 150px;">One or more Sensor Options: M = Metric Mount TO = Temperature Output RV = Raw Vibration Output</p> <p style="margin-left: 150px;">Product Type : EX = ATEX/IECEX Product</p>												

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 : ...

⊕ II 3 G

Ex ec IIC T4 Gc

LCIE 05 ATEX 6155 X

$-40\text{ °C} \leq T_{\text{amb}} \leq +80\text{ °C}$

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 : ...

⊕ II 3 G

Ex ec IIC T4 Gc

$T_a = 80\text{ °C}$

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⁽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

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

⊕ II 3 G

Ex ec IIC T4 Gc

LCIE 05 ATEX 6155 X

$-40\text{ °C} \leq T_{\text{amb}} \leq +80\text{ °C}$

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 : ...

⊕ II 3 G

Ex ec IIC T4 Gc

$T_a = 80\text{ °C}$

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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- 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.
- 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.
- 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.
- h. AVERTISSEMENT – NE PAS CONNECTER OU DECONNECTER SOUS TENSION
- i. L'équipement doit être connecté conformément aux instructions du fabricant.

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.

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 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.

WARNING – DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED

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

14 EXIGENCES ESSENTIELLES DE SANTE ET DE SECURITE

ESSENTIAL HEALTH AND SAFETY REQUIREMENTS

Couvertes par les normes listées au point 8.

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

ADDITIONAL INFORMATION

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.

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

DETAILS OF CERTIFICATE CHANGES

Version 00 : Version initiale.
2005-12-07

Issue 00: Initial issue.



ATTESTATION D'EXAMEN DE TYPE - ANNEXE

TYPE EXAMINATION CERTIFICATE - SCHEDULE

1 Version : 03

LCIE 05 ATEX 6155 X

Issue : 03

Version 01 :
2007-08-02

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

Issue 01: • Normative update according to EN 60079-0:2006 and EN 60079-15:2005 standards.

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.

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.

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 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.



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

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: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 0, L_i = 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: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 0, L_i = 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: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 61 nF, L_i = 306 uH; 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 0, L_i = 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 61 nF, L_i = 306 μ H; 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 0, L_i = 121.06 μ H; 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 61 nF, L_i = 426 μ H; 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: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 0, L_i = 1.06 μ H; 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 0, L_i = 1.06 μ H; 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 0, L_i = 1.06 μ H; 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: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 0, L_i = 1.06 μ H; 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: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 0, L_i = 1.06 μ H; 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: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 61 nF, L_i = 306 μ H; 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 0, L_i = 1.06 μ H; 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 61 nF, L_i = 306 μ H; 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 0, L_i = 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 61 nF, L_i = 426 uH; when installed per installation Dwg 30540; Temp Code T4 @ Max Ambient 80 Deg C.

Models CS64xB9y Vibration Sensors, input rated 28V dc max, 20mA; intrinsically safe with entity parameters of: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 0, L_i = 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 (7 th Ed.) | - Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II and III, Division 1, Hazardous Locations |
| UL 916 (4 th 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: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 0, L_i = 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: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 0, L_i = 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: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 61 nF, L_i = 306 μ H; 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 0, L_i = 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 61 nF, L_i = 306 μ H; 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 0, L_i = 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 61 nF, L_i = 426 μ H; 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: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 0, L_i = 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: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 0, L_i = 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: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 61 nF, L_i = 306 μ H; 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 0, L_i = 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 61 nF, L_i = 306 μ H; 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 0, L_i = 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: U_i (V max) = 28V, I_i (I max) = 120mA, P_i = 1W, C_i = 61 nF, L_i = 426 μ H; 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: U_i (V max) = 30V, I_i (I max) = 100mA, P_i = 1W, C_i = 0, L_i = 1.06 uH; when installed per Dwg 56140; Temp Code T4 @ Max Ambient 80 Deg C.

Notes:

1. For Canadian Installations, sensor 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 (4 th Ed.)	-	Energy Management Equipment
UL 1604 (3 rd 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 (4 th Ed.) | - | Energy Management Equipment |
| UL 1604 (3 rd 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
- Submitter 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.
- Submitter 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.
- Submitter 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



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	<p>Evaluation for update of report 1632187 (last update 70051763) to include High Temperature option.</p> <p>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.</p> <p>Any other testing that may be required to accomplish the reassessment will be quoted separately if necessary.</p>
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



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

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

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

Approved for issue on behalf of the IECEX
Certification Body:

Julien GAUTHIER

Position:

Certification Officer

Signature:
(for printed version)



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**

Page 2 of 4

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
US/ETL/ExTR22.0037/00

FR/LCIE/ExTR17.0041/00

FR/LCIE/ExTR22.0086/00

Quality Assessment Report:

NL/DEK/QAR14.0004/06



IECEX Certificate of Conformity

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

Page 3 of 4

Date of issue: **2023-02-28**

Issue No: 1

EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

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

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

The vibration sensors provide a 4-20mA current output when subjected to mechanical motion.

The products with TO (Temperature Output) option includes an additional independent 4-20mA output for temperature measurement. The imbedded temperature sensor monitors the environment internal to the sensor housing.

The products with RV option includes a 0-2.5 V a.c. and 2.5 V d.c. output that corresponds to raw vibration from the imbedded accelerometer.

Range details: Refer to the Annex

Ratings: Refer to the Annex

SPECIFIC CONDITIONS OF USE: YES as shown below:

Refer to the Annex for full Specific Conditions of Use.



IECEX Certificate of Conformity

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

Page 4 of 4

Date of issue: 2023-02-28

Issue No: 1

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Issue 1:

- Normative update according to IEC 60079-0 Ed. 7.0 and IEC 60079-7 Ed. 5.1.
- Update of the Range details to introduce "modified" sensors (M) for customer special request (no impact on the types of protection).
- Update of the name of the applicant/manufactureur.
- Update of Specific Conditions of Use.

Annex:

[Annex 01 to Certificate IECEx LCIE 17.0016X issue 1.pdf](#)



Annex 01 to Certificate IECEx LCIE 17.0016X issue 1



MARKING

Complete marking:

PCB Piezotronics Inc. or IMI Sensors or IMI

Address: ...

Type: EX(M)64****/M** or EXTO(M)64****/M** or EXRV(M)64****/M** ⁽¹⁾

Serial number: ...

Year of construction: ...

Ex ia IIC T4 Ga

Ex ec IIC T4 Gc

-40 °C ≤ T_{amb} ≤ +80 °C

IECEx LCIE 17.0016X

For Intrinsic safety "ia" type of protection only:

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



Annex 01 to Certificate IECEX LCIE 17.0016X issue 1



L C I E

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	*	*	
<p style="text-align: right;">Optional Two characters to designate cable termination type</p> <p style="text-align: right;">Optional Three to six digits using xxx-xx to designate length in feet-inches or meters-centimeters with M in previous column</p> <p style="text-align: right;">Optional Metric Cable Length</p> <p style="text-align: right;">Optional Cable length modifier</p> <p>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.</p> <p>A number or letter 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, M which designates measurement range and filtering M = Customer special</p> <p>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</p> <p style="text-align: right;">One letter A to Z to denote model revision level</p> <p>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</p> <p style="text-align: right;">64 Series Family of sensors</p> <p>One or more Sensor Options: M = Metric Mount TO = Temperature Output RV = Raw Vibration Output</p> <p>Product Type : EX = ATEX/IECEX Product</p>												



Annex 01 to Certificate IECEX LCIE 17.0016X issue 1



FULL CONDITIONS OF CERTIFICATION

For all types of protection:

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

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

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

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

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

ROUTINE TESTS

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



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** Page 1 of 3

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 attachment full marking)

Approved for issue on behalf of the IECEx
Certification Body:

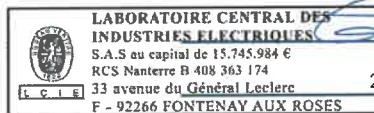
Julien GAUTHIER

Position:

Certification Officer

Signature:
(for printed version)

Date:



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** Page 2 of 3
Manufacturer: **IMI, a division of PCB Piezotronics**
3425 Walden Avenue
DEPEW, NY 14043
United States of America

Additional Manufacturing location(s):

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

STANDARDS:

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

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

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

TEST & ASSESSMENT REPORTS:

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

Test Report:

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

Quality Assessment Report:

NL/DEK/QAR14.0004/03



IECEX Certificate of Conformity

Certificate No: IECEx LCIE 17.0016X

Issue No: 0

Date of Issue: 2018-07-11

Page 3 of 3

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Functional description:

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

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

Apparatus, type EXRV, delivers raw vibration output in 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 attachment 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 precautions to maintain the minimum degree of protection IP54 of the sensor connection when connected according to the requirements of IEC 60079-14 requirements.
- WARNING - DO NOT SEPARATE WHEN ENERGIZED.

Annex:

LCIE 17.0016X - Issue 00 - Annex 01.pdf



Annex 01 to Certificate IECEX LCIE 17.0016X issue 00



MARKING

Full marking :

PCB Piezotronics Inc. or IMI Sensors or IMI
 Address: ...
 Type: ...
 Serial number: ...
 Year of construction: ...
 Ex ia IIC T4 Ga
 Ex nA IIC T4 Gc
 $-40^{\circ}\text{C} \leq \text{Tamb} \leq +80^{\circ}\text{C}$
 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

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:

