Use and Disclosure of Data
Information contained herein is classified as EAR99 under the U.S. Export Administration Regulations. Export, reexport or diversion contrary to U.S. law is prohibited.

Overview

⚠️ CAUTION
Cautions identify a potential hazard, which if not avoided, may result in minor or moderate injury. This category can also warn you of unsafe practices, or conditions that may cause property damage.

⚠️ WARNING
Warnings identify a potentially hazardous condition, which if not avoided, could result in death or serious injury.

⚠️ DANGER
DANGER – limited to the most extreme situations to identify an imminent hazard, which if not avoided, will result in death or serious injury.

<table>
<thead>
<tr>
<th>Hazard Symbols</th>
<th>Symboles de sécurité</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cautions</strong></td>
<td>Ce symbole signale l’existence d’instructions importantes relatives au produit dans ce manuel.</td>
</tr>
<tr>
<td></td>
<td>Ce symbole signale la présence d’un danger d’électrocution.</td>
</tr>
<tr>
<td></td>
<td>Risque de pincement. Ces symboles vous avertir que les mains ou les doigts seront blessés sérieusement si vous les mettez entre les éléments en mouvement du mécanisme près de ces symboles</td>
</tr>
<tr>
<td><strong>Warnings</strong></td>
<td>Das Ausrufezeichen in Dreieck ist ein Warnzeichen, das Sie darauf aufmerksam macht, daß wichtige Anleitungen zu diesem Handbuch gehören.</td>
</tr>
<tr>
<td></td>
<td>Der gepfeilte Blitz im Dreieck ist ein Warnzeichen, das Sie vor “gefährlichen Spannungen” im Inneren des Produkts warnt.</td>
</tr>
<tr>
<td></td>
<td>Vorsicht Quetschgefahr! Dieses Symbol warnt vor einer unmittelbar drohenden Verletzungsgefahr für Finger und Hände, wenn diese zwischen die beweglichen Teile des gekennzeichneten Gerätes geraten.</td>
</tr>
</tbody>
</table>

Hazard Symbols (Continued)

Before installing, operating, or maintaining this equipment, it is imperative that all hazards and preventive measures are fully understood. While specific hazards may vary according to location and application, take heed in the following general warnings:

1. The exclamation point within the triangle is a warning sign alerting you of important instructions in the instrument’s technical reference manual.
2. The lightning flash and arrowhead within the triangle is a warning sign alerting you of “dangerous voltage” inside the product.
3. Pinch point. These symbols warn you that your fingers or hands will be seriously injured if you place them between the moving parts of the mechanism near these symbols.
Before installing, operating, or maintaining this equipment, it is imperative that all hazards and preventive measures are fully understood. While specific hazards may vary according to location and application, take heed of the following general TIENet™ 360 LaserFlow™ Velocity Sensor warnings:

- **WARNING**
  Avoid hazardous practices! If you use this instrument in any way not specified in this manual, the protection provided by the instrument may be impaired.

- **WARNING**
  Caution: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

- **WARNING**
  If lowering the LaserFlow from above ground, ensure that it does not become dislodged while being lowered, possibly endangering any personnel who may still be below ground.

- **Note**
  This product is often installed in confined spaces. Some examples of confined spaces are manholes, pipelines, digesters, and storage tanks. These spaces may become hazardous environments that can prove fatal for those unprepared. These spaces are governed by OSHA 1910.146 and require a permit before entering.

Technical assistance for the Teledyne ISCO TIENet® LaserFlow EX® Velocity Sensor can be obtained from:

**Teledyne ISCO**
4700 Superior St.
Lincoln NE 68504

Phone: (800) 228-4373 or (402) 464-0231
Fax: (402) 465-3022
E-mail: IscoService@teledyne.com or Iscoeps@teledyne.com
Installation in Hazardous Locations

Read all labels carefully before installing the equipment!

The Laserflow Ex device is ATEX-approved for use in potentially explosive atmospheres when specific conditions are met, as described in this section in reference to “X” Marking.

The LaserFlow Ex is Group II, Category 1G equipment for use in gas hazard zones 0, 1, and 2 (European standards), or Class I Division 1 (North American standards).

The braid-drain lead depicted in Figure 2-1 is normally bonded to earth through the Signature connector case terminals or conduit. The mounting bracket used with the LaserFlow Ex should be installed such that there is a conductive path from the LaserFlow Ex case to earth. The internal circuitry utilizes a ground connection to the conductive case.

Installation must be performed only by trained, qualified personnel.

Barriers or isolators required for certifiable safe installation are the responsibility of the user. Refer to the control drawings provided in Figures 2-9.

⚠️ CAUTION

Use only non-sparking metal for US mounting hardware. Check with local authorities.

⚠️ WARNING

The mounting bracket is a potential isolated charge carrier. For classified hazardous locations, refer to section 12.2.4 and local authorities for installation requirements.

⚠️ WARNING

Do not coil the sensor cable; this will form an inductor and create a hazard. The cable should be kept as short as is practical. If necessary, use a serpentine loop (see figure at left) instead.

Important Information Regarding “X” Marking

The ATEX labeling on the serial tag of the LaserFlow Ex device includes a number ending in “X.” The X marking indicates that there are specific conditions that must be met in order for the equipment to comply with intrinsic safety requirements. Refer to Figure 2-1 on the following page.

These specific conditions are as follows:

- The cable must be terminated in a manner suitable for the zone of installation.
- The physical spacing between the exposed ends of each insulated wire lead, and earth ground and other IS circuits, must be such that the equipment is isolated up to 500V, and to 1500V for non-IS circuitry.
**Electrical Requirements**

Always refer to the electrical values listed at the bottom of the LaserFlow Ex serial tag when connecting associated apparatus (i.e., power supply, network interface, etc.).

This labeling indicates the maximum input voltage (Uᵢ), maximum input current (Iᵢ), and maximum power (Pᵢ) that can be present at the specified terminals without invalidating intrinsic safety.

The power supply parameter allowances must exceed maximum internal capacitance (Cᵢ) and the maximum internal inductance-to-resistance ratio (Lᵢ/Rᵢ) of the LaserFlow Ex device and cable. These parameters are established on the control drawing Figure 2-1.

**Ambient Environment**

Installation in designated hazardous areas must fall within temperature range of -10 to +60°C, as specified on the serial tag labeling.

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**DANGER**

The LaserFlow Ex MUST be installed in accordance with control drawing, in Figure 1 thru Figure 3 in this document, and in accordance with the requirements of the authority that has jurisdiction for the installation of equipment in hazardous areas at your specific installation site.

The certified control drawing details the only approved method of installing the LaserFlow Ex. Where specific ISCO part numbers appear, they represent the only approved equipment certified to be used with the LaserFlow Ex. Any equipment substitutions or installations not specifically detailed on the control drawing will automatically void the intrinsically safe certification of the LaserFlow Ex and could result in fire or explosion!

---

*Figure 1* Wiring diagram

Spacing between bare wires and other wiring, circuitry, and earth ground, shall enable isolation to 500V.

Anti-Static Grounding Protection
7. Associated apparatus must be installed in accordance with its manufacturer’s control drawing. Article 504 of the National Electrical Code (ANSI/NFPA 70) for installations in the United States, or Part II of the Canadian Electrical Code for installations in Canada, or IEC 60079-14 for installations in the United States, or Section 18 of the Canadian Electrical Code for installations in Canada, or EN 60079-14, or other local installation codes, as applicable.

8. The capacitance and inductance values of the integral sensor cable are based on 1046, 47, and 47uhm.

9. Associated apparatus must be installed in accordance with its manufacturer’s control drawing. Article 504 of the National Electrical Code (ANSI/NFPA 70) for installations in the United States, or Part II of the Canadian Electrical Code for installations in Canada, or IEC 60079-14 for installations in the United States, or Section 18 of the Canadian Electrical Code for installations in Canada, or EN 60079-14, or other local installation codes, as applicable.

10. When required by the manufacturer’s control drawing, the associated apparatus must be connected to a suitable ground electrode as specified in the National Electrical Code (ANSI/NFPA 70), the Canadian Electrical Code, or IEC 60079-14, or EN 60079-14, or other local installation codes, as applicable.

11. The LaserFlow Ex does not provide 500V isolation between chassis and circuit ground.

12. The LaserFlow Ex must be connected only to the associated apparatus as certified by the manufacturer.

13. The LaserFlow Ex must be connected only to the associated apparatus as certified by the manufacturer.

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Teledyne ISCO  teledyneisco.com  217G01234
4700 Superior St. Lincoln NE 68504, USA
TYPE TIENet 360 LaserFlow Ex Sensor
PART NO. 604864XXX  YYYY METER PER DWG 604862086
INTRINSICALLY SAFE / SÉCURITÉ INTRINSEE
WHEN INSTALLED PER DRAWING 604862090

H 1 G Ex ia i op is IIB T4 Ga
DEMKO 18 ATEX 2106X

Class I, Division 1, Groups C-D, T4 Exia
Class I, Zone 0, AEx ia op is IIB T4 Ga

10°C < Tamb < +60°C
Ex ia op is IIB T4 Ga  IECEx UL 18.0106X

E491934 U=13.2V I=2.00A P=2.50W C=2.85uF Li/Re=19uH/ohm

NOTE: THIS FILE WAS CREATED IN ADOBE ILLUSTRATOR.

NOTES:
1. THE 310 AND 350EX SENSORS MUST ONLY BE INSTALLED USING THE INTEGRATED TIENET CABLE.
DECLARATION OF CONFORMITY

2014/34/EU - The ATEX Directive
2011/65/EU - The RoHS Directive

Manufacturer’s Name: Teledyne Isco, Inc.
Manufacturer’s Address: 4700 Superior, Lincoln, Nebraska 68504 USA
Mailing Address: P.O. Box 82531, Lincoln, NE 68501

Equipment Type/Environment: Laboratory Equipment for Light Industrial/Commercial Environments:
The 360 LaserFlow Ex is a flow sensor connecting to a water flow-monitoring instrument. The devices are intended for indoor/outdoor operation in ambient temperature range of -10C to +60C.

Trade Name/Model No: TIENet 360 LaserFlow Ex Sensor
Year of Issue: 2019

Provisions of the Directive fulfilled by the Equipment: Ex ia op is IIB T4 Ga (-10C < Tamb < +60C)
IP68 (self-certified; submerged 9 meters for 72 hours)

Notified Body for EC-Type Examination: UL LLC, 333 Pfingsten Rd, Northbrook, IL 60062 USA

EU-type Examination Certificate: TIENet 360 LaserFlow Ex Sensor: DEMKO 18 ATEX 2105X Rev. 0 Issued March 11, 2019

Notified Body for Production: UL LLC, 333 Pfingsten Rd, Northbrook, IL 60062 USA


Other Standards and Specifications used:
EN61326-1:2013 EMC Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use
EN60529:1992/A2:2013 Degrees of Protection Provided by Enclosure;
Self Certified as IP-68 by submersion in water at 3meters for 72Hrs.

Group1, Class A

I, the undersigned, hereby declare that the design of the equipment specified above conforms to the above Directive(s) and Standards as of March 21, 2019.

USA Representative:

Samuel C. Ramey
Director of Engineering
Teledyne Isco
4700 Superior Street
Lincoln, Nebraska 68504
Phone: (402)-464-0231
FAX: (402)-465-3799

60-4362-110 Rev A
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<th>PBDE (PBDE)</th>
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</table>

**Products with Hazardous Substances or Elements in the Product**

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在ST/标准规定的限量要求以下。
O: Represent the concentration of the hazardous substance in this component’s any homogeneous pieces is lower than the ST/standard limitation.

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出ST/标准规定的限量要求。
X: Represent the concentration of the hazardous substance in this component’s at least one homogeneous piece is higher than the ST/standard limitation.

(Manufacturer may give technical reasons to the “X”marks)

环保使用期由经验确定。

The Environmentally Friendly Use Period (EFUP) was determined through experience.

生产日期被编码在系列号码中。前三位数字为生产年(207 代表 2007 年)。随后的一个字母代表月份：
A 为一月，B 为二月，等等。

The date of Manufacture is in code within the serial number. The first three numbers are the year of manufacture (207 is year 2007) followed by a letter for the month. "A" is January; "B" is February and so on.