172-65614MAF-04 (iT5-FF-SUN-FISCO) 14 February 2022

Instruction Manual

(Information for use in hazardous locations)

iTrapSensor Monitoring System
Surface Temperature/Ultrasound Sensor

iT5-FF-SUN-H/L-PF Series

For FISCO Field Device

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Introduction

Thank you for purchasing the TLV monitoring system, iT5.
When the product is delivered, before doing anything else, check the specifications and external appearance to make sure nothing is out of the ordinary. Also be sure to read this manual carefully before use and follow the instructions to be sure of using the product properly.
To ensure safe and correct use of this product, be sure to observe the safety precautions listed in this manual as they relate to installation, operation, maintenance and repair of the product. Please keep it in a safe place for future reference.
TLV accepts no responsibility for incorrect use of the product by the customer or any third-party, malfunction occurring during use, other defects and any damage caused by this product, excluding cases in which it is under obligation to pay reparations by law.
This product has undergone strict quality management and product inspection before being shipped from the factory. However, in the event of malfunction or defects, please contact your local TLV representative or the TLV customer service center.
This instruction manual and product are subject to modification without notice, for the purpose of improvement.

Safety Considerations

- Read this section carefully before use and be sure to follow the instructions.
- Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.
- The precautions listed in this manual are designed to ensure safety and prevent equipment damage and personal injury. For situations that may occur as a result of erroneous handling, three different types of cautionary items are used to indicate the degree of urgency and the scale of potential damage and danger: DANGER, WARNING and CAUTION.
- The three types of cautionary items above are very important for safety: be sure to observe all of them as they relate to installation, use, maintenance, and repair. Furthermore, TLV accepts no responsibility for any accidents or damage occurring as a result of failure to observe these precautions.

Symbols

	**Indicates a DANGER, WARNING or CAUTION item.**
DANGER	Indicates an urgent situation which poses a threat of death or serious injury
WARNING	Indicates that there is a potential threat of death or serious injury
CAUTION	Indicates that there is a possibility of injury or equipment/product damage

DANGER	**Do not disassemble or modify.** Failure to observe this precaution could result in personal injury, electrocution, ignition or fire.
	Do not wipe/rub the surfaces of this product with a dry cloth etc. There is the danger of electrostatically charging the unit, which may result in ignition or explosions, especially in hazardous locations.
	Do not use this product in hospitals or airplanes. Failure to observe this precaution could result in malfunction of medical equipment, instrumentation, etc.
	Ensure the specifications for the intrinsically safe structure of this product meet the requirements for installation in hazardous locations. Specifications for the intrinsically safe structure of this product are described in the "Specifications" section.
	Aluminum is used in this product. Do not expose the product to impact or friction. Exposure to impact or friction may result in ignition or accidental explosions.
	When installing or working at high elevations, take measures to ensure against dropping the product or parts. Failure to take such measures could result in personal injury if persons passing below are struck by a falling object, or other accidents.

Continued on the next page

DANGER	**The equipment contains non-metallic materials and that the user should consider the performance of these materials with respect to chemicals which may be present in the hazardous area. If in doubt, please contact the manufacturer.**
	In order to change from the normal communication mode to simulation mode, turn the TEST switch on, however do not operate the switch or use in hazardous areas when the TEST switch is on.
WARNING	**As this is an industrial product, it is not to be used on consumer applications nor in residential areas.**
	Do not substitute components, as this may impair the intrinsic safety of the product.
	Do not install this product on objects exceeding maximum allowable operating temperature. Overheating could result in damage to internal parts, excessive heat generation, rupture or ignition.
	Do not subject the unit to strong shocks or throw it against anything. Failure to observe this precaution could result in damage to internal parts, excessive heat generation, rupture, ignition or personal injury.
	Do not place device in microwave ovens or high-pressure vessels, or in the vicinity of electromagnetic devices. Such handling could result in excessive heat generation, smoke, damage to circuitry, battery fluid leakage, rupture or ignition.
CAUTION	**Do not allow any foreign matter to enter the unit. In areas with small foreign matter such as metal dust, use the product after taking measures to prevent foreign matter entering the unit.** Failure to observe this precaution could result in fire or malfunction.
	Do not let the unit become immersed in water. If liquid gets inside the unit, it may result in excessive heat generation, electrical shock or unit malfunction. Be mindful of the location of use and handling.

Règles de sécurité

- Lire attentivement cette section avant l'utilisation et respecter les instructions données.
- Tout installation, inspection, entretien, réparation, démontage, ajustement et ouverture/fermeture de vanne doit être fait uniquement par une personne formée à l'entretien.
- Les précautions reprises dans ce manuel ont pour but de garantir la sécurité et de prévenir tout dommage matériel et blessure humaine. Pour les situations potentiellement dangereuses qui pourraient survenir à la suite d'un maniement impropre, trois types de signaux sont utilisés pour indiquer le degré d'urgence et de dégât potentiel: DANGER, AVERTISSEMENT et ATTENTION.
- Les trois types de symboles énumérés ci-dessous sont très importants pour votre sécurité: n'oubliez pas de les respecter, car ils concernent aussi bien l'installation et l'utilisation que l'entretien et les réparations. D'autre part, TLV n'accepte aucune responsabilité pour tout accident ou dégât survenant à la suite d'un non-respect de ces précautions.

Symboles

	**Indique un signal DANGER, AVERTISSEMENT ou ATTENTION.**
	Indique une situation d'urgence avec risque de mort ou de blessure grave.
	Indique une situation pouvant entraîner la mort ou des blessures graves.
	Indique un risque de blessure ou de dégât matériel au produit et/ou aux installations.

	**Ne pas démonter ou modifier le produit.** Le non-respect de cette règle peut entrainer des blessures, chocs électriques, brûlures, incendies.
	Ne pas frotter/essuyer la surface du produit avec un chiffon sec. Il y a un risque de charger en électricité statique l'appareil. Cela peut provoquer un incendie ou une explosion, particulièrement dans des zones dangereuses.
	Ne pas utiliser ce produit dans un hôpital ou un avion. Le non-respect de cette règle pourrait provoquer le dysfonctionnement d'équipements médicaux, d'instrumentations, etc.
	Assurez-vous que les spécifications à sécurité intrinsèque de ce produit répondent aux exigences pour l'installation dans des zones dangereuses. Les spécifications à sécurité intrinsèque de ce produit sont décrites dans la section « Spécifications ».****
	Ce produit contient de l'aluminium. Ne pas soumettre au choc ni au frottement. Cela pourrait provoquer un incendie ou une explosion.

Suite à la page suivante

⚠ DANGER	**Lors de l'installation ou de l'utilisation dans des lieux en hauteur, prenez des mesures pour éviter de laisser tomber le produit ou des pièces.** Le non-respect de cette règle pourrait entraîner des blessures si des personnes passaient en dessous et étaient attentes par un objet tombant ou autres accidents.
	Cet appareil contient des matériaux non-métalliques. L'utilisateur doit prendre en considération les interactions possibles de ces matériaux avec des produits chimiques dans une zone dangereuse. Pour tous renseignements complémentaires, veillez vous adresser au fabricant.
	Pour passer du mode de transmission normal au mode simulation, actionnez l'interrupteur TEST. Ne pas actionner l'interrupteur ou utiliser l'appareil en mode simulation dans une zone dangereuse.
⚠ AVERTISSEMENT	**Comme il s'agit d'un produit industriel, il ne doit pas être utilisé pour des applications grand public ni dans les zones résidentielles.**
	Ne pas remplacer les composants du produit, au risque de compromettre sa sécurité intrinsèque.
	Ne pas installer le produit sur des objets dépassant la température maximum admissible d'opération. Une surchauffe pourrait entraîner des dommages aux pièces internes, générer une chaleur excessive, une rupture ou une inflammation.
	Ne pas soumettre l'appareil à des chocs violents ni le projeter. Le non-respect de cette précaution pourrait entraîner des dommages aux pièces internes, provoquer une chaleur excessive, la rupture, l'inflammation ou des blessures.
	Ne pas placer l'appareil dans un four à micro-onde ou un récipient sous haute pression, ni à proximité de dispositifs électromagnétiques. Cela pourrait entraîner une génération excessive de chaleur, de la fumée, des dégâts aux circuits, des fuites de liquide de la batterie, une rupture ou une inflammation.
⚠ ATTENTION	**Faire en sorte qu'aucun corps étranger ne pénètre dans l'appareil. Dans les zones avec des particules fines telles que la poussière métallique, prendre des mesures pour éviter que les corps étrangers ne pénètrent dans l'appareil.** Le non-respect de cette précaution pourrait entraîner un incendie ou un dysfonctionnement.
	Ne pas immerger l'équipement dans l'eau. Si un liquide pénètre dans l'appareil, cela peut entraîner une chaleur excessive, un choc électrique ou un dysfonctionnement. Prêter toujours attention au lieu où vous manipulez l'appareil.

Conditions of safe use (Information for use in hazardous locations)

- Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. This is particularly important if the equipment is installed in a zone 0 or Division 1 location. In addition, the equipment shall only be cleaned with a damp cloth.
- The enclosure is manufactured from aluminum alloy. In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered during installation, particularly if the equipment is installed in a zone 0 or Division 1 location.
- Maximum ambient temperature is different depending on measuring surface temperature and model type. Read ambient temperature range in specification chart carefully before use.

Conditions d'utilisation sans danger (information pour l'utilisation du produit dans des zones dangereuses)

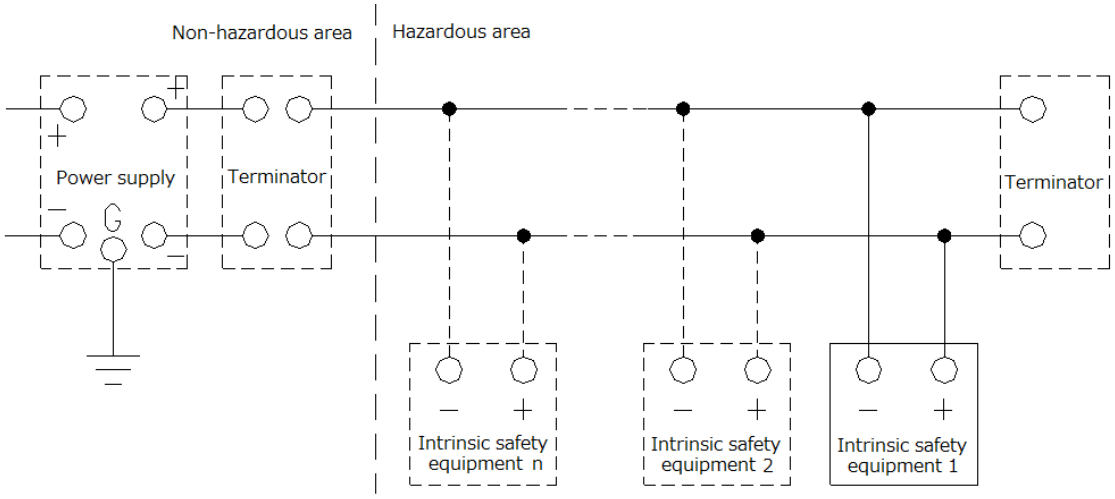
- Dans certaines situations extrêmes, les pièces non métalliques intégrées dans cet équipement peuvent générer un niveau de charge électrostatique capable de provoquer des inflammations. Par conséquent, l'équipement ne doit pas être installé dans un lieu où les conditions externes sont propices à l'accumulation de charges électrostatiques ; en particulier, si l'équipement est installé dans une zone 0 ou un espace classé division 1. De plus, l'équipement ne doit être nettoyé qu'avec un chiffon humide.
- Le boitier de l'équipement est constitué d'alliage d'aluminium. Dans certains cas, des chocs et des frictions causant des étincelles peuvent provoquer des inflammations. Cela doit être pris en compte lors de l'installation, en particulier si l'équipement est installé dans une zone 0 ou un espace classé division 1.
- La température ambiante maximale dépend de la mesure de la température superficielle et du modèle. Lisez attentivement la plage de température ambiante utilisable dans le tableau de spécifications avant utilisation.

Intrinsic Safety Specifications

This instrument complies with the “Constructional Requirements for Electrical Equipment for Explosive Atmospheres” (Japan) as an “Intrinsically safe explosion-proof structure” and has been fitted with a nameplate describing the required specifications for intrinsic safety.
Check these specifications, and use the instrument accordingly.

Operation

This monitoring system sensor (surface temperature/ultrasound sensor) connects via FOUNDATION™ Fieldbus.
This instrument periodically measures the ultrasonic vibration and surface temperature of steam traps mounted on steam-using equipment in industrial environments and, and transmits the data to the fieldbus.
The following figure shows the common connection method when connecting the sensor via to Fieldbus.



Fieldbus connection diagram

Assembly and Disassembly

In order to maintain intrinsic safety and waterproof performance, do not assemble or disassemble the instrument. Contact TLV for inquiries related to maintenance.

Control Drawing (UL/cUL)

Ambient temperature range and Max. measurement temperature.

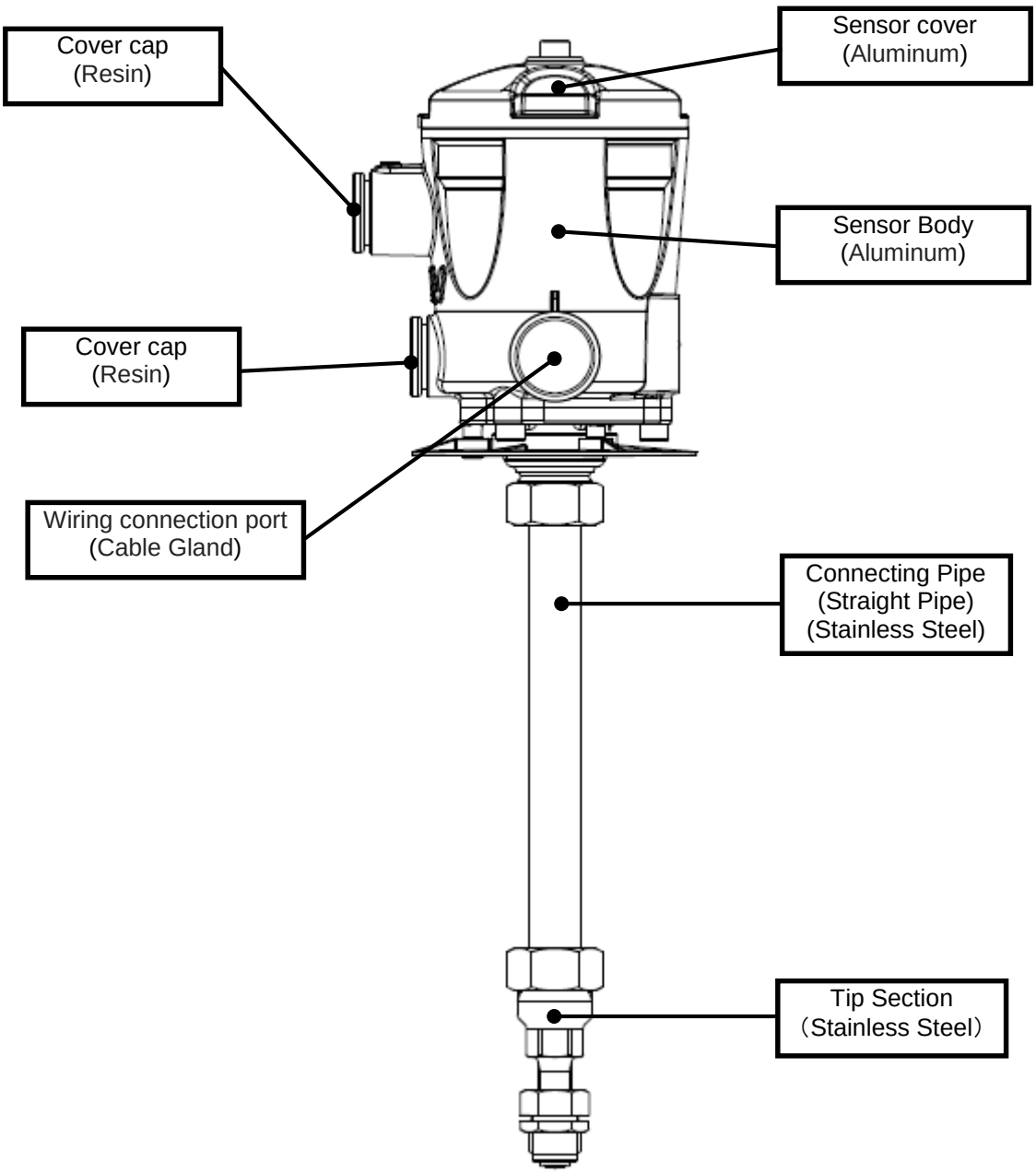
Maximum Measurement Temperature	iT5-FF-SUN-L: 250℃(482℉) iT5-FF-SUN-H: 400℃(752℉)	
Ambient Temperature Range	If the measurement temperature exceeds 135℃(275℉), the maximum permitted equipment ambient temperature is reduced as below.	
	Measurement Temp. Tm	Max. permissible ambient temp.
	iT5-FF-SUN-L	
	-40℃ ≤ Tm < 135℃ (-40℉ ≤ Tm < 275℉)	80℃ (176℉)
	135℃ ≤ Tm < 200℃ (275℉ ≤ Tm < 392℉)	75℃ (167℉)
	200℃ ≤ Tm ≤250℃ (392℉ ≤ Tm ≤482℉)	67℃ (152℉)
	iT5-FF-SUN-H	
	-40℃ ≤ Tm < 135℃ (-40℉ ≤ Tm < 275℉)	80℃ (176℉)
	135℃ ≤ Tm < 200℃ (275℉ ≤ Tm < 392℉)	75℃ (167℉)
	200℃ ≤ Tm <300℃ (392℉ ≤ Tm <572℉)	67℃ (152℉)
	300℃ ≤ Tm ≤ 400℃ (572℉ ≤ Tm ≤ 752℉)	62℃ (143℉)

(FISCO model) This instrument is constructed as follows.

E-E551-SYS-FISCO(02)-UL

Maintenance

Please make sure that there is no damage of each part shown in the figure below.
If corruption is found, please contact immediately our company.



Installation

⚠DANGER

Ensure the specifications for the intrinsically safe structure of this product meet the requirements for installation in hazardous locations.
Specifications for the intrinsically safe structure of this product are described in the "Specifications" section.

Aluminum is used in this product, therefore do not expose the product to impact or friction.
Exposure to impact or friction may result in ignition or accidental explosions.

Do not wipe/rub the surfaces of this product with a dry cloth etc.
There is the danger of electrostatically charging the unit, which may result in ignition or explosions, especially in hazardous locations.

The equipment contains non-metallic materials and that the user should consider the performance of these materials with respect to chemicals which may be present in the hazardous area. If in doubt, please contact the manufacturer.

⚠DANGER

Assurez-vous que les spécifications à sécurité intrinsèque de ce produit répondent aux exigences pour l'installation dans des zones dangereuses.
Les spécifications à sécurité intrinsèque de ce produit sont décrites dans la section « Spécifications ».

Ce produit contient de l'aluminium. Ne pas soumettre au choc ni au frottement. Cela pourrait provoquer un incendie ou une explosion.

Ne pas frotter/essuyer la surface du produit avec un chiffon sec.
Il y a un risque de charger en électricité statique l'appareil. Cela peut provoquer un incendie ou une explosion, particulièrement dans des zones dangereuses.

Cet appareil contient des matériaux non-métalliques. L'utilisateur doit prendre en considération les interactions possibles de ces matériaux avec des produits chimiques dans une zone dangereuse. Pour tous renseignements complémentaires, veillez vous adresser au fabricant.

NOTE: Install in accordance with National Electric Code, Canadian Electrical Code or other applicable Local Codes.

Installing the sensor on iTrap

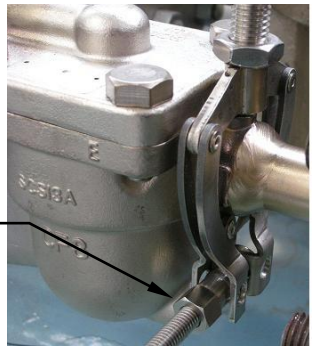
1. Remove the plug from the sensor mounting seat on the iTrap body or sensor mounting socket.
2. Place the sensor mounting union into the sensor mounting seat and tighten it to the proper torque. (Torque: 20 N•m (15 lbf•ft))

   -Check the base of the sensor mounting seat, and remove any dirt or foreign matter if present.

   -Lift the locknut as far as possible while placing the sensor tip into the seat, then tighten the sensor mounting union.
   If the locknut is not lifted properly, the tip of the sensor (the sensing part) may not touch the base of the sensor mounting seat.
3. Tighten the locknut making sure it is firmly secured.

Installing the sensor on non-iTraps

1. Temporarily secure the mounting bracket to the inlet side of the trap.
2. Screw the sensor tip into the threaded portion of the mounting bracket and adjust the installation height.
3. Secure the mounting bracket by tightening the clamp nut on the lower part of the mounting bracket. (Torque: 8 N•m (6 lbf•ft))



Wiring

⚠ DANGER

Ensure the specifications for the intrinsically safe structure of this product meet the necessary intrinsically safe requirements for the installation location. Specifications for the intrinsically safe structure of this product are described in the "Specifications" section.

In order to change from the normal communication mode to simulation mode, turn the TEST switch on, however do not operate the switch or use in hazardous areas when the TEST switch is on.

⚠ DANGER

Assurez-vous que les spécifications à sécurité intrinsèque de ce produit répondent aux exigences pour l'installation dans des zones dangereuses. Les spécifications à sécurité intrinsèque de ce produit sont décrites dans la section « Spécifications ».

Pour passer du mode de transmission normal au mode simulation, actionnez l'interrupteur TEST. Ne pas actionner l'interrupteur ou utiliser l'appareil en mode simulation dans une zone dangereuse.

Refer to the “System Engineering Guidelines (AG-181) Ver 3.2.1” issued by the Fieldbus Foundation for details of FOUNDATION™ Fieldbus.

1. Usage of the instrument in combination with a barrier (power supply)

This instrument has two intrinsic safety specifications (intrinsically safe ia IIC and ib IIC), and the usability of barriers (power supplies) depends on their respective specifications.

Use a barrier (power supply) with intrinsic safety that matches the following table.

			Barrier (power supply)			
			ia		ib	
			IIC	IIB	IIC	IIB
This instrument	ia	IIC	**Usable**	Prohibited	Prohibited	Prohibited
	ib	IIC	**Usable**	Prohibited	**Usable**	Prohibited

2. Cable to be used

Single-twisted pair stranded tinned copper cables that are individually shielded and overall shielded (Type A), 0.8 mm^2 (#18 AWG) are recommended.

If the ambient temperature is greater than or equal to 60 °C (140 °F), use heat-resistant wire rated at 80 °C (176 °F) or more.

3. Wiring construction

Isolate the wiring from other cables to prevent any effect on intrinsic safety and measurement performance from contact with other cables or electromagnetic induction, etc.

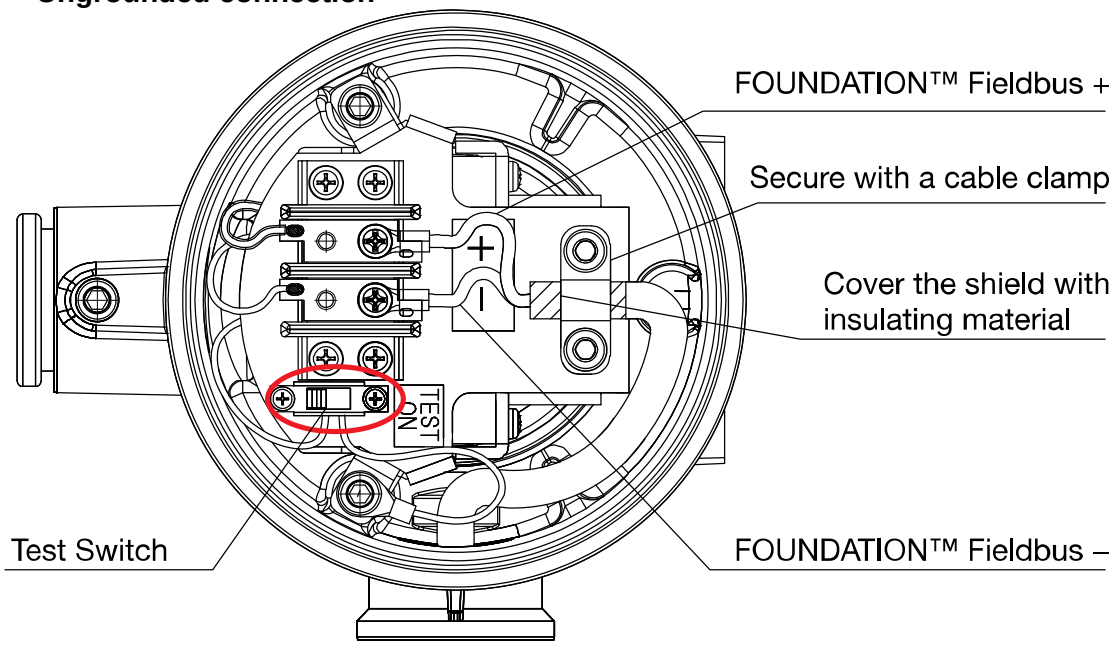
If necessary, use a protective metal tube or duct.

The wiring connection port is fitted with a $G^1/_2$ (CTG-16) cable gland. Ensure an air-tight connection.

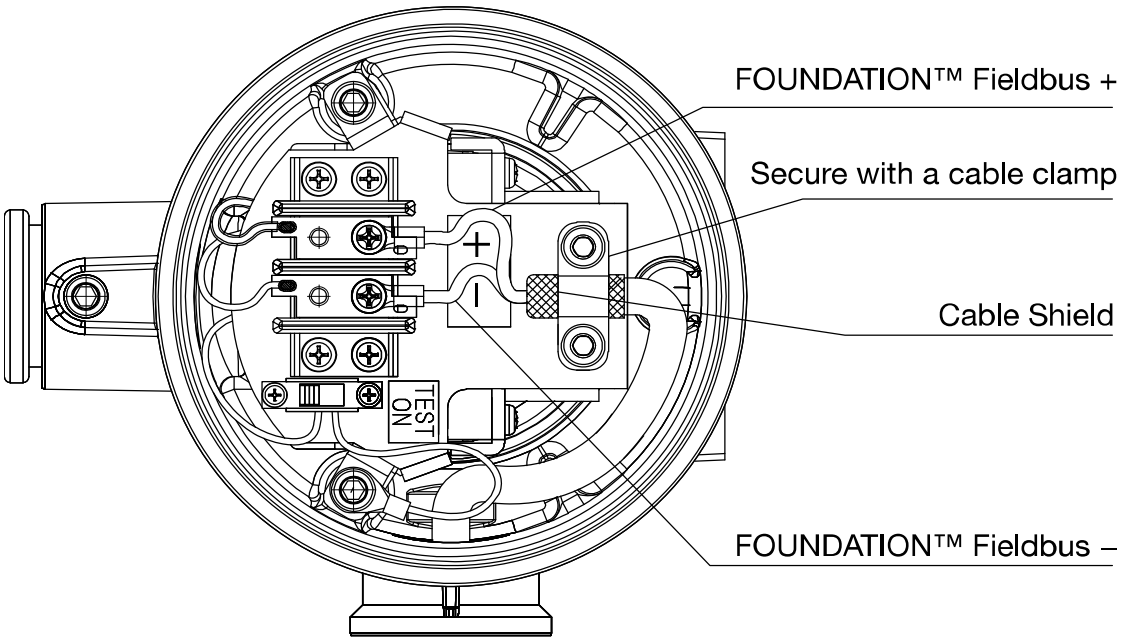
4. Terminal connection

Connect terminals as in the figure below.

Ungrounded connection

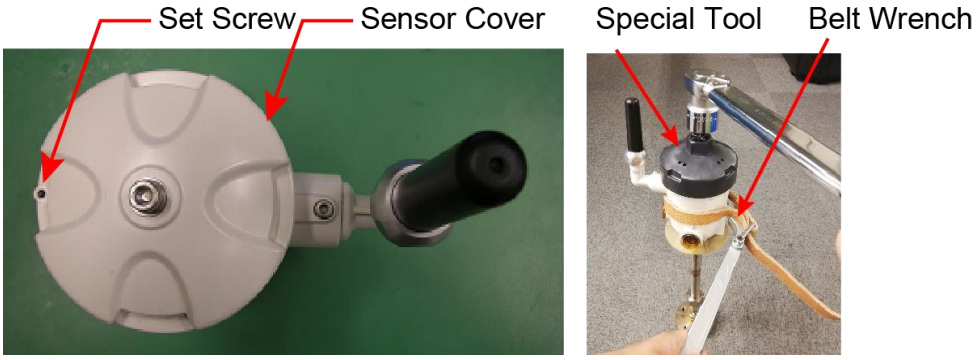


Grounded connection



5. Opening/Closing the sensor cover

Make sure to use the special tool (sold separately) to open/close the IS sensor cover.
Select a belt wrench with a belt width of 20 mm ($^{13}/_{16}$ in) or less, including 90 mm ($3^{9}/_{16}$ in) in the range of use.
Loosen the set screw and remove the sensor cover with a special tool.
After installing the sensor cover using the special tool (tightening torque: 15 N･m (11 lbf･ft)), tighten the set screw.



Adjustment

This instrument has been calibrated at the factory. No adjustments are required when installing.

Calibration

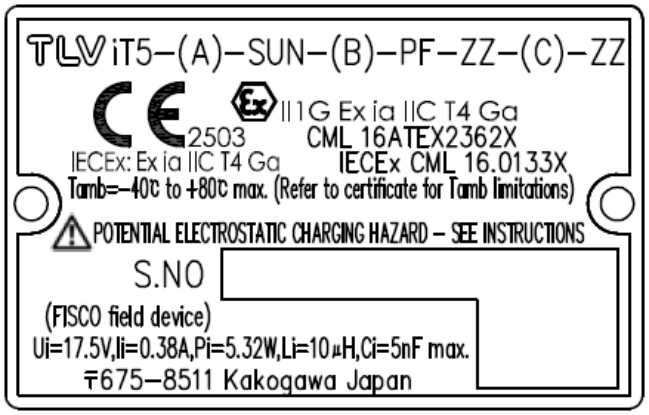
Although this product is thoroughly inspected before shipping, periodic calibration is recommended according to the installation environment to ensure the quality of measurement.
Frequency: Annual inspection is recommended. However, requirements may vary depending on the installation environment, therefore inspection guidelines should be set by the purchaser
Calibration can only be performed with special equipment at TLV's factory.
Contact your local TLV representative or your regional TLV office for details.

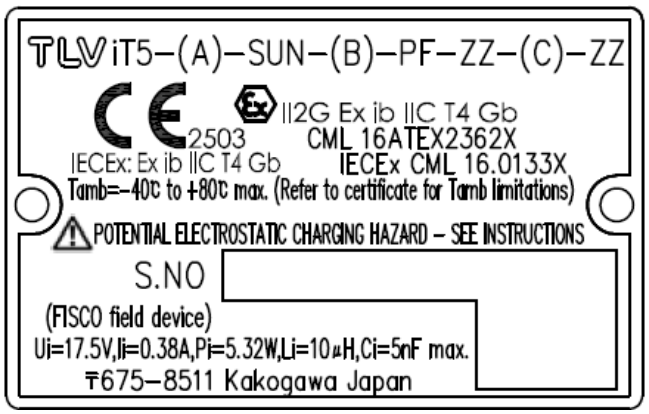
Specifications

<table>
<tr><td>Type</td><td colspan="3">iTrapSensor Monitoring System – Sensor</td></tr>
<tr><td>Model</td><td colspan="3">iT5-FF-SUN-*-PF</td></tr>
<tr><td>Classification Markings of Hazardous Locations</td><td colspan="3">
ATEX: CE 2776 Ⓔx II 1 G Ex ia IIC T4 Ga
CE 2776 Ⓔx II 2 G Ex ib IIC T4 Gb
(Certificate No.: CML 16ATEX2362X)
UL/cUL: Class I, Division 1, Groups A, B, C and D
Class I, Zone 0, AEx ia IIC T4
Ex ia IIC T4
Class I, Zone 1, AEx ib IIC T4
Ex ib IIC T4
(File No.: E160655)
IECEx: Ex ia IIC T4 Ga
Ex ib IIC T4 Gb
(Certificate No.: IECEx CML 16.0133X)
<table>
<tr><td>Mark for certified electrical equipment</td><td>Ex</td><td>—</td></tr>
<tr><td rowspan="2">Type of Protection</td><td>ia</td><td>Intrinsically safe structure
(can be used in especially hazardous locations)</td></tr>
<tr><td>ib</td><td>Intrinsically safe structure
(cannot be used in especially hazardous locations)</td></tr>
<tr><td>Applicable Gas Groups</td><td>IIC</td><td>Applicable to gases (Hydrogen, Acetylene, etc.) with minimum ignition current ratio is less than 0.45.</td></tr>
<tr><td>Temperature Class</td><td>T4</td><td>Applicable when maximum surface temperature of the unit is 130 °C (266 °F) and gas ignition temperature is 135 °C (275 °F) or more.</td></tr>
<tr><td rowspan="2">EPL
(Equipment protection Level)</td><td>Ga</td><td>This equipment can be used in Zone 0.</td></tr>
<tr><td>Gb</td><td>This equipment can be used in Zone 1
But it cannot be used in Zone 0.</td></tr>
</table>
</td></tr>
<tr><td>Applicable Standards</td><td colspan="3">
ATEX:
• EN 60079-0:2018
• EN 60079-11:2012
UL/cUL:
• UL 913 STANDARD FOR INTRINSICALLY SAFE APPARATUS AND ASSOCIATED APPARATUS FOR USE IN CLASS I, II, III, DIVISION 1, HAZARDOUS (CLASSIFIED) LOCATIONS – Edition 8UL 60079-0 EXPLOSIVE ATMOSPHERES – PART 0: EQUIPMENT – GENERAL REQUIREMENTS – Edition 6
• UL 60079-11 EXPLOSIVE ATMOSPHERES – PART 11: EQUIPMENT PROTECTION BY INTRINSIC SAFETY 'I' – Edition 6
• UL 61010-1 SAFETY REQUIREMENTS FOR ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL, AND LABORATORY USE – PART 1: GENERAL REQUIREMENTS – Edition 3
• CSA C22.2 NO. 60079-0 EXPLOSIVE ATMOSPHERES – PART 0: EQUIPMENT – GENERAL REQUIREMENTS – Edition 3
• CSA C22.2 NO. 60079-11:14 EXPLOSIVE ATMOSPHERES – PART 11: EQUIPMENT PROTECTION BY INTRINSIC SAFETY 'I' – Edition 2
• CSA C22.2 NO. 61010-1 SAFETY REQUIREMENTS FOR ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL, AND LABORATORY USE - PART 1: GENERAL REQUIREMENTS – Edition 3
IECEx:
• IEC 60079-0:2011, Edition 6
• IEC 60079-11:2011, Edition 6
</td></tr>
</table>

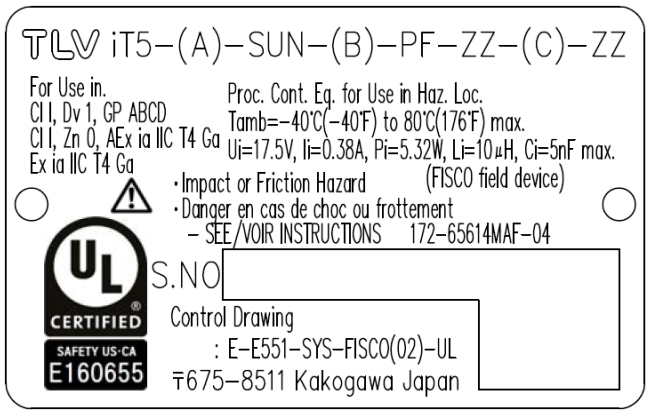
Continued on the next page

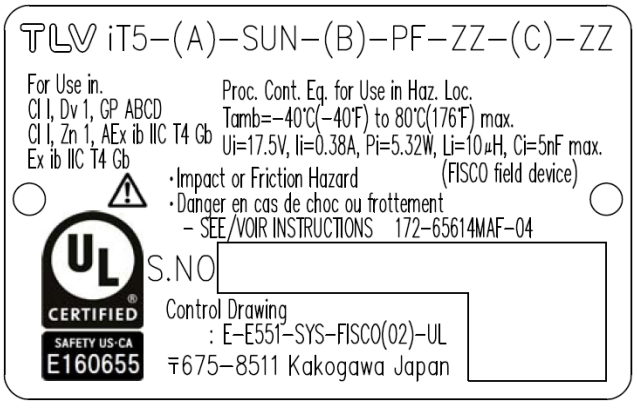
Nameplate	**ATEX/IECEx:**



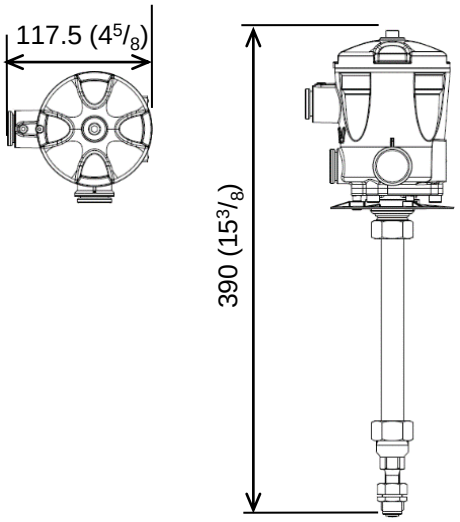


UL/cUL:





Continued on the next page

<table>
<tr><td>Rating</td><td colspan="2">Power circuit Allowable voltage : 17.5 V
Allowable current : 380 mA
Allowable Power : 5.32 W
Internal inductance: 10uH, Internal capacitance: 5nF</td></tr>
<tr><td>Enclosures</td><td colspan="2">IP67 (Evaluation for intrinsic safety rating is carried out under IP20)</td></tr>
<tr><td>Maximum Measurement Temperature</td><td colspan="2">iT5-FF-SUN-L-PF-ZZ-*-ZZ (See note below) : 250 °C (482 °F)
iT5-FF-SUN-H-PF-ZZ-*-ZZ (See to note below) : 400 °C (752 °F)</td></tr>
<tr><td rowspan="13">Ambient Temperature Range</td><td colspan="2">If the measurement temperature exceeds 135 °C (275 °F), the maximum permitted equipment ambient temperature is reduced as follows.</td></tr>
<tr><td>Measurement Temp. Tm</td><td>Max. permissible ambient temp.</td></tr>
<tr><td colspan="2">iT5-FF-SUN-L-PF-ZZ-*-ZZ</td></tr>
<tr><td>-40 °C ≤ Tm < 135 °C
(-40 °F ≤ Tm < 275 °F)</td><td>80 °C
(176 °F)</td></tr>
<tr><td>135 °C ≤ Tm < 200 °C
(275 °F ≤ Tm < 392 °F)</td><td>75 °C
(167 °F)</td></tr>
<tr><td>200 °C ≤ Tm ≤ 250 °C
(392 °F ≤ Tm ≤ 482°F)</td><td>67 °C
(152 °F)</td></tr>
<tr><td colspan="2">iT5-FF-SUN-H-PF-ZZ-*-ZZ</td></tr>
<tr><td>-40 °C ≤ Tm < 135 °C
(-40 °F ≤ Tm < 275 °F)</td><td>80 °C
(176 °F)</td></tr>
<tr><td>135 °C ≤ Tm < 200 °C
(275 °F ≤ Tm < 392 °F)</td><td>75 °C
(167 °F)</td></tr>
<tr><td>200 °C ≤ Tm < 300 °C
(392 °F ≤ Tm < 572 °F)</td><td>67 °C
(152 °F)</td></tr>
<tr><td>300 °C ≤ Tm ≤ 400 °C
(572 °F ≤ Tm ≤ 752 °F)</td><td>62 °C
(143 °F)</td></tr>
<tr><td>Material</td><td colspan="2">Sensor body / Sensor cover: Aluminum alloy die castings (ADC3, SG100A)
Tip Section: Stainless Steel (SUS304)
Heat Shield Plate: Heat-resistant Resin (Polyetheretherketone (PEEK))</td></tr>
<tr><td>Dimensions</td><td colspan="2">(Unit: mm (in))
 
</td></tr>
<tr><td>Weight</td><td colspan="2">Approx. 1,200 g (2.7 lb)</td></tr>
</table>

Note: Regarding symbols for connecting pipes:

Connecting pipe	S: 150 mm (6 in) Straight pipe F: 150 mm (6 in) Flexible pipe (Optional)

TLV EXPRESS LIMITED WARRANTY

Subject to the limitations set forth below, TLV CO., LTD., a Japanese corporation ("**TLV**"), warrants that products which are sold by it, TLV International Inc. ("**TII**") or one of its group companies excluding TLV Corporation (a corporation of the United States of America), (hereinafter the "**Products**") are designed and manufactured by TLV, conform to the specifications published by TLV for the corresponding part numbers (the "**Specifications**") and are free from defective workmanship and materials. The party from whom the Products were purchased shall be known hereinafter as the "**Seller**". With regard to products or components manufactured by unrelated third parties (the "**Components**"), TLV provides no warranty other than the warranty from the third party manufacturer(s), if any.

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This warranty does not cover defects or failures caused by:

1. improper shipping, installation, use, handling, etc., by persons other than TLV, TII or TLV group company personnel, or service representatives authorized by TLV; or
2. dirt, scale or rust, etc.; or
3. improper disassembly and reassembly, or inadequate inspection and maintenance by persons other than TLV or TLV group company personnel, or service representatives authorized by TLV; or
4. disasters or forces of nature or Acts of God; or
5. abuse, abnormal use, accidents or any other cause beyond the control of TLV, TII or TLV group companies; or
6. improper storage, maintenance or repair; or
7. operation of the Products not in accordance with instructions issued with the Products or with accepted industry practices; or
8. use for a purpose or in a manner for which the Products were not intended; or
9. use of the Products in a manner inconsistent with the Specifications; or
10. use of the Products with Hazardous Fluids (fluids other than steam, air, water, nitrogen, carbon dioxide and inert gases (helium, neon, argon, krypton, xenon and radon)); or
11. failure to follow the instructions contained in the TLV Instruction Manual for the Product.

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This warranty is effective for a period of one (1) year after delivery of Products to the first end user. Notwithstanding the foregoing, asserting a claim under this warranty must be brought within three (3) years after the date of delivery to the initial buyer if not sold initially to the first end user.

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THE EXCLUSIVE REMEDY UNDER THIS WARRANTY, UNDER ANY EXPRESS WARRANTY OR UNDER ANY IMPLIED WARRANTIES NOT NEGATED HEREBY (INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE), IS **REPLACEMENT**; PROVIDED: (a) THE CLAIMED DEFECT IS REPORTED TO THE SELLER IN WRITING WITHIN THE WARRANTY PERIOD, INCLUDING A DETAILED WRITTEN DESCRIPTION OF THE CLAIMED DEFECT AND HOW AND WHEN THE CLAIMED DEFECTIVE PRODUCT WAS USED; AND (b) THE CLAIMED DEFECTIVE PRODUCT AND A COPY OF THE PURCHASE INVOICE IS RETURNED TO THE SELLER, FREIGHT AND TRANSPORTATION COSTS PREPAID, UNDER A RETURN MATERIAL AUTHORIZATION

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Exclusion of Other Warranties

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED.

Severability

Any provision of this warranty which is invalid, prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such invalidity, prohibition or unenforceability without invalidating the remaining provisions hereof, and any such invalidity, prohibition or unenforceability in any such jurisdiction shall not invalidate or render unenforceable such provision in any other jurisdiction.

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