



Manufacturer

TLV CO., LTD.

Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001



Instruction Manual

(Information for use in hazardous locations)

iTrapSensor Monitoring System
Repeater

iT5-ZB-RUN

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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.

Unauthorized reprinting or reproduction, in whole or in part, of this instruction manual or contents of the hardware/software of the product is strictly prohibited.

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.
	Indicates an urgent situation which poses a threat of death or serious injury
	Indicates that there is a potential threat of death or serious injury
	Indicates that there is a possibility of injury or equipment / product damage

General Precautions

	Do not disassemble or modify. Failure to observe this precaution could result in personal injury, electrocution, ignition or fire.
	Do not use the battery pack other than that specified. Failure to observe this precaution could result in failure, ignition, or 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.
	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.

Continued on the next page

 DANGER	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.
	Check to make sure that no wireless instrumentation other than the product is being used. Failure to observe this precaution could lead to interference of important transmissions or accidents.
	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.
 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.

Battery Pack Precautions

 DANGER	Do not apply heat to the battery pack or throw it into a fire. Failure to observe this precaution could result in leakage of the battery fluid, excessive heat generation, rupture or ignition.
	Do not disassemble the battery pack. Failure to observe this precaution could result in leakage of the battery fluid, excessive heat generation, rupture or ignition.
	Do not cause the battery pack to become wet by immersing in water, salt water or liquid chemicals. Failure to observe this precaution could result in leakage of the battery fluid, excessive heat generation, rupture or ignition.

Continued on the next page

 DANGER	Do not leave unit where it will be exposed to direct sunlight or in areas that will become very hot, such as interiors of cars, near heating equipment, etc. Failure to observe this precaution could result in leakage of the battery fluid, excessive heat generation, rupture or ignition. If fluid leaks from the battery pack and gets in the eyes, flush it out. There is a danger of loss of vision. Do not rub the eyes, and after immediately flushing out thoroughly with clean water, see a doctor.
 WARNING	Cease use of the battery pack immediately if the unit exhibits abnormal operation. If irregularities such as fluid leakage, an unusual smell, unusual heat generation, discoloration or deformation are noticed, cease use of the unit immediately. If use is continued under such conditions, excessive heat generation, ignition or rupture may result. If battery fluid leaks and comes into contact with the body, rinse immediately. There is danger of resultant damage to the skin. Immediately rinse any battery fluid off with clean water.
 CAUTION	When not intending to use for extended periods of time, remove the battery pack from the unit and store in a dry, cool, dark location. Failure to observe this precaution could result in fluid leakage, rust, deterioration in performance or a reduction in service life. Do not dispose of the battery pack with normal garbage. If at any time the battery pack becomes unusable, observe your company regulations for proper disposal in accordance with local laws. If proper disposal is impossible, insulate the contact terminals by covering them with tape and return them to a TLV office.

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.

Précautions générales

	Ne pas démonter ou modifier le produit. Le non-respect de cette règle peut entraîner des blessures, chocs électriques, brûlures, incendies.
	Ne pas utiliser d'autre bloc de batteries que celui indiqué. Cela pourrait entraîner une panne voir des blessures, inflammations ou explosions.
	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 ».

Suite à la page suivante

	Ce produit contient de l'aluminium. Ne pas soumettre au choc ni au frottement. Cela pourrait provoquer un incendie ou une explosion.
	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.
	Veiller vérifier qu'il n'y a pas d'autres appareils sans-fils utilisés dans la zone. Le non-respect de cette règle pourrait provoquer des interférences ou des 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, veuillez vous adresser au fabricant.
	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.
	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.

Précautions concernant le bloc de batteries

 DANGER	Ne pas chauffer le bloc de batteries ou les jeter dans un feu. Le non-respect de cette précaution pourrait entraîner une fuite du liquide des batteries, provoquer une chaleur excessive, la rupture, l'inflammation. Ne pas démonter le bloc de batteries. Le non-respect de cette précaution peut faire fuir le liquide des batteries, générer une chaleur excessive, une rupture ou une inflammation. Ne pas mouiller l'appareil ou l'immerger dans de l'eau, de l'eau de mer ou des liquides chimiques. Le non-respect de cette consigne peut faire fuir le liquide des batteries, générer trop de chaleur, une rupture ou une inflammation. Ne pas laisser l'appareil dans la lumière du soleil ou des endroits chauffants comme l'intérieur de voitures ou près d'un chauffage. Le non-respect de cette précaution peut faire fuir le liquide des batteries, générer une chaleur excessive, une rupture ou une inflammation. Si du liquide fuit du bloc de batteries et entre en contact avec les yeux, rincer ces derniers. Il y a un risque de perte de la vision. Ne pas frotter les yeux. Rincez-les immédiatement avec de l'eau propre, puis consultez un médecin.
 AVERTISSEMENT	Cessez immédiatement d'utiliser le bloc de batteries si l'appareil montre des signes de fonctionnement anormal. Si vous remarquez une fuite de liquide, une odeur inhabituelle, une chaleur anormale, une décoloration ou une déformation, cessez immédiatement d'utiliser l'appareil. Si vous continuez à l'utiliser, cela peut causer une chaleur excessive, une rupture ou une inflammation. Si du liquide fuit des batteries et entre en contact avec le corps, rincez immédiatement. Il existe un risque de dégât à la peau. Rincez immédiatement tout liquide issu des batteries avec de l'eau propre.
 ATTENTION	En cas de non utilisation prolongée, retirez le bloc de batteries et conservez-le dans un endroit sec, frais et à l'abri de la lumière. Le non-respect de cette précaution peut causer des fuites de liquide, de la rouille, une moindre performance ou une durée de vie réduite. Ne pas jeter le bloc de batteries avec les déchets normaux. Lorsque le bloc de batteries devient inutilisable, veillez à vous en débarrasser en suivant les règles de votre société et les lois locales. S'il est impossible de le jeter de façon appropriée, isolez les bornes de contact en les couvrant avec une bande et renvoyez-les à TLV.

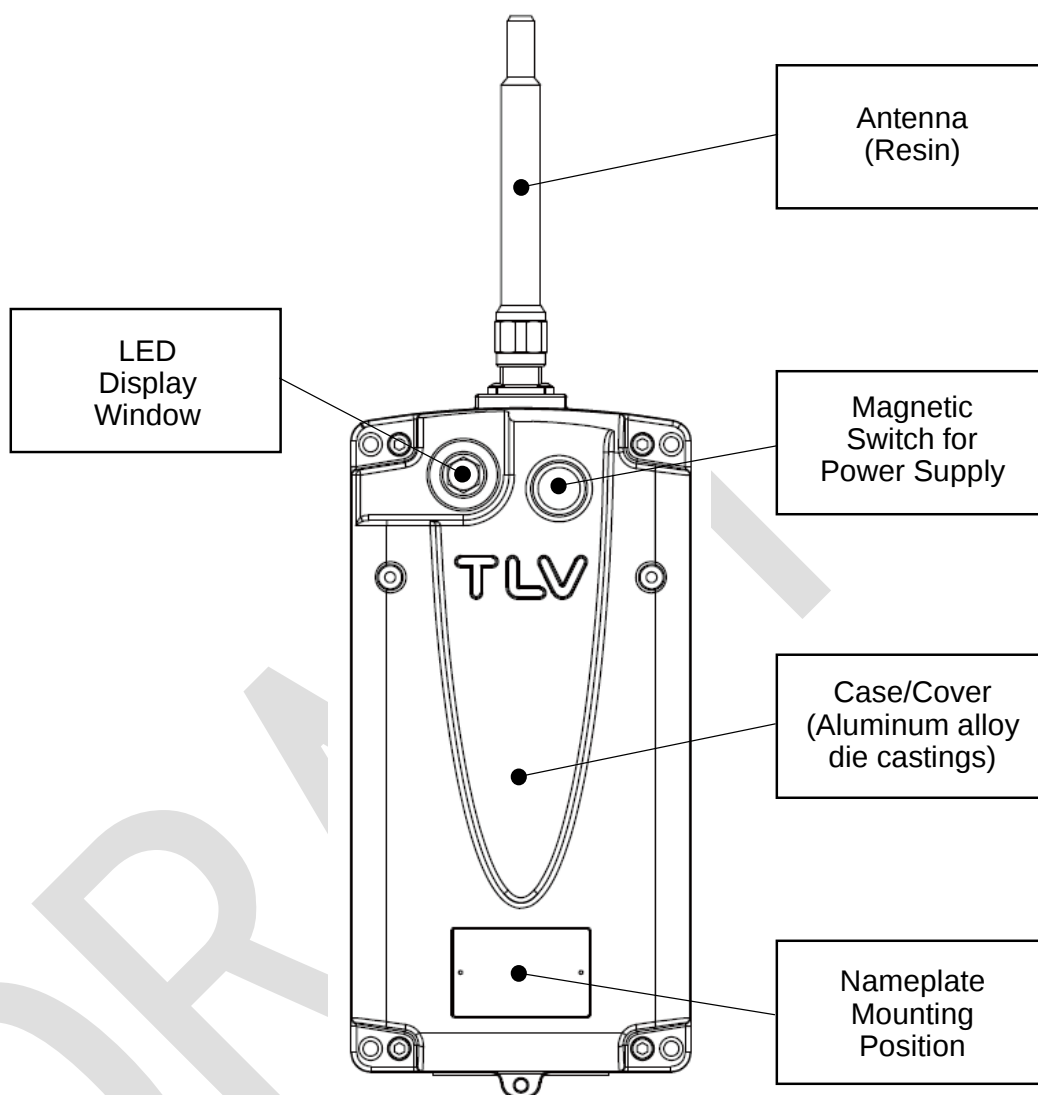
Conditions of safe use (Information for use in hazardous locations)

- 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.

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 boîtier 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.

Part Names



Installation



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.



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.

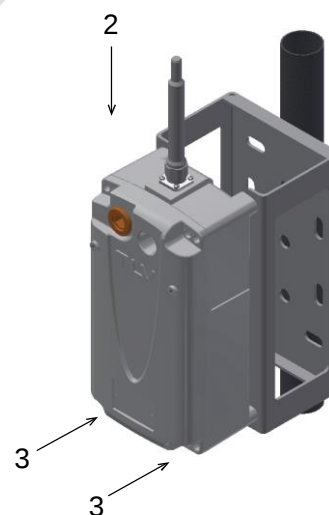
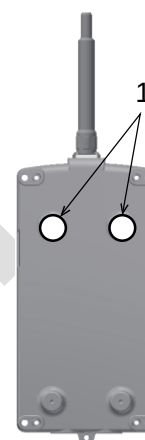
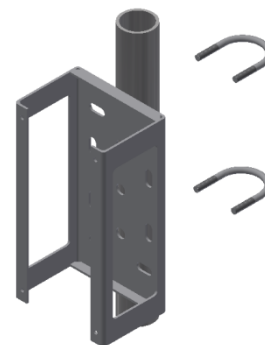
Cet appareil contient des matériaux non-métalliques. L'utilisateur doit prendre en considération les interactions possibles de ces matériaux avec des produits chimiques dans une zone dangereuse. Pour tous renseignements complémentaires, veuillez vous adresser au fabricant.

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

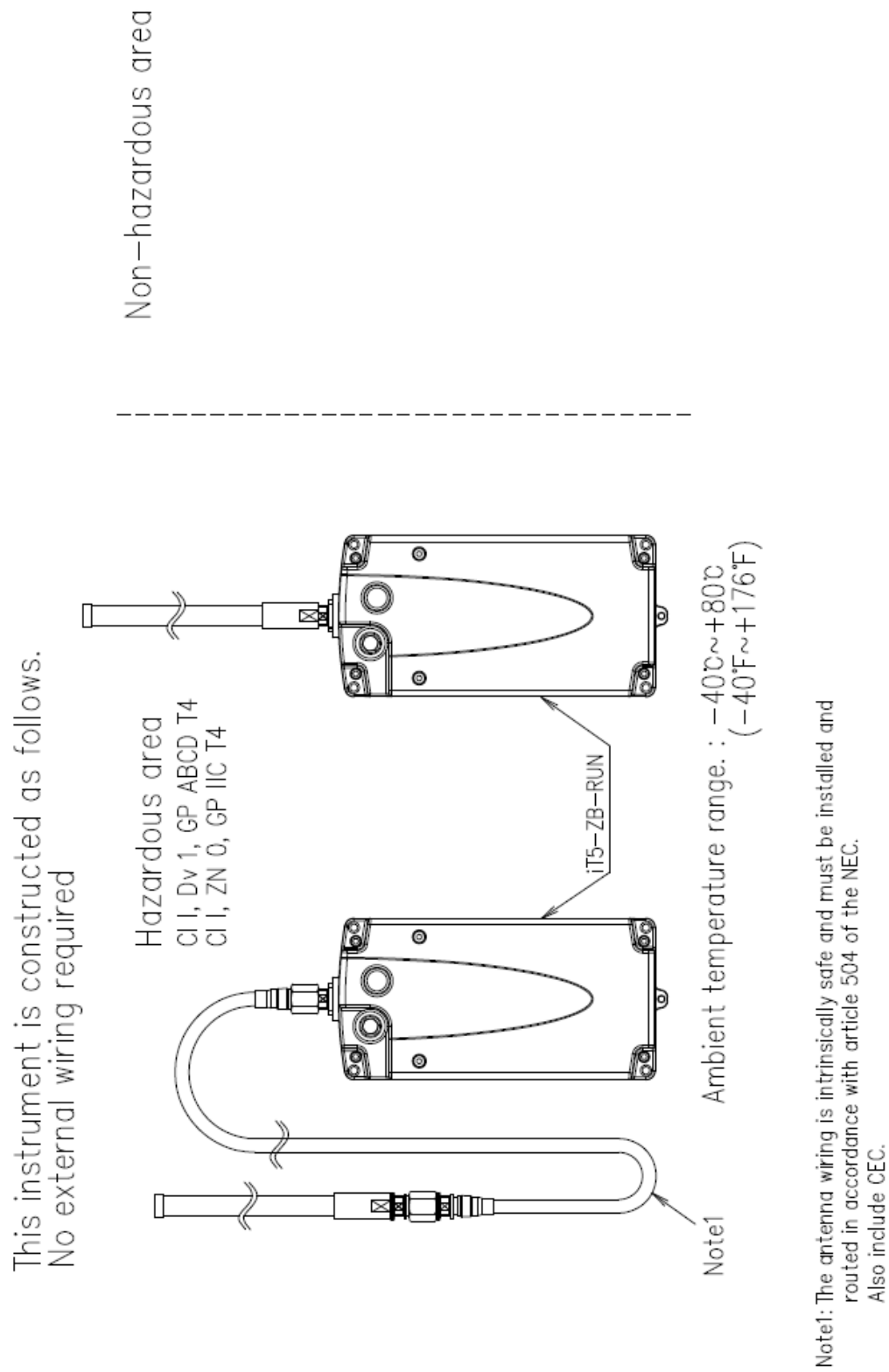
Repeater Installation

1. Fix the repeater mount to the structure with U bolts.
The repeater mount can be installed on either vertical / horizontal structures.
2. Fix the repeater to the repeater mount.
 - 1) Screw two bolts with spacers to the top of the rear side of the repeater.
 - 2) Insert the repeater into the repeater mount using the two bolts.
 - 3) Fix the repeater to the repeater mount by the two bolts.
Tighten the two bolts from the bottom of the front side of the repeater.

NOTE: Use bolts and spacers supplied by TLV.



Control Drawing (UL/cUL)



E-E548-SYS(01)-UL

Replacing the Battery Pack



Do not disassemble the battery pack.

Failure to observe this precaution could result in leakage of the battery fluid, excessive heat generation, rupture or ignition.

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 battery pack can be replaced in hazardous locations.



Ne pas démonter le bloc de batteries.

Le non-respect de cette précaution peut faire fuir le liquide des batteries, générer une chaleur excessive, une rupture ou une inflammation.

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.



Le bloc de batteries peut être changé dans des zones dangereuses.

1. Loosen four screws on the repeater to remove the cover.

Hexagon socket head cap screws



2. The repeater is equipped with two battery packs, however they should be replaced one by one. First remove the screws from each corner of the battery pack to be replaced.



3. Twist the knob by hand, so that the flat side of the knob faces the battery pack to be replaced.



Flat Side

4. Pull the battery pack out from the body.



5. Insert a new battery pack and mount it by following the removal procedure in reverse.
 - a) Insert the battery pack and press until a click is felt.
 - b) Twist the knob back to the original position so that the flat side faces the opposite direction from the antenna.
 - c) Secure the battery pack with four screws.
6. Remove four screws from the other battery pack. Twist the knob by hand so the flat side of the knob faces the battery pack to be replaced. Perform steps 4 and 5.



7. Replace the packing on the cover and coat surfaces with grease.



8. Make sure that both of the battery packs are securely mounted, then place the cover back on the repeater and secure it with four screws. (Torque: 1.5 N•m (1.1 lbf•ft))

Refer to the iT5-ZB Battery Replacement Procedure for detailed information including battery disposal methods. Follow local regulations when disposing of used battery packs.

DRAFT

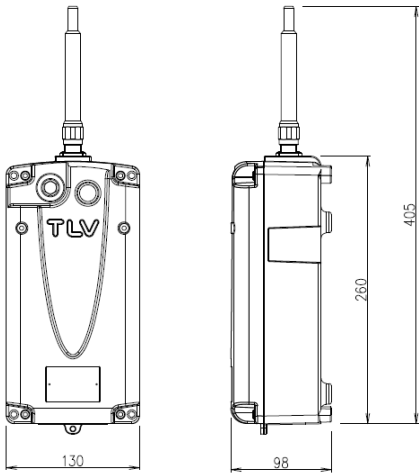
Specifications

Type	iTrapSensor Monitoring System – Repeater		
Model	iT5-ZB-RUN		
Classification Markings of Hazardous Locations	ATEX: C  ₂₇₇₆ Ex II 1 G Ex ia IIC T4 Ga (Certificate No.: CML 16ATEX2361X)		
	UL/cUL: Class I, Division 1, Groups A, B, C and D Class I, Zone 0, AEx ia IIC T4 Ex ia IIC T4 (File No.: E160655)		
	IECEx: Ex ia IIC T4 Ga (Certificate No.: IECEx CML 16.0132X)		
	Mark for certified electrical equipment	Ex	—
	Type of Protection	ia	Intrinsically safe structure (can be used in especially hazardous locations)
	Applicable Gas Groups	IIC	Applicable to gases (Hydrogen, Acetylene, etc.) with minimum ignition current ratio is less than 0.45.
	Temperature Classification	T4	Applicable when maximum surface temperature of the unit is 130 °C (266 °F) and gas ignition temperature is 135 °C (275 °F) or more.
EPL (Equipment Protection Level)	Ga	This equipment can be used in Zone 0.	
Applicable Standards	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 8 • UL 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		

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Nameplate	ATEX/IECEX: TLV iT5-ZB-RUN-Z-(A)-ZZ-Z-(B)   II 1 G Ex ia IIC T4 Ga CML 16ATEX2361X IECEX: Ex ia IIC T4 Ga IECEX CML 16.0132X Tamb=-40°C to +80°C maximum Battery pack : iT5-ZB-RU-BP-(A) S.NO. WARNING: POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE INSTRUCTIONS 〒675-8511 Kakogawa Japan UL/cUL: TLV iT5-ZB-RUN-Z-(A)-ZZ-Z-(B) For Use in... CI I, Dv 1, GP ABCD CI I, Zn 0, AEx ia IIC T4 Ga Ex ia IIC T4 Ga Proc. Cont. Eq. for Use in Haz. Loc. Tamb=-40°C(-40°F) to 80°C(176°F) max. Control Drawing : E-E548-SYS(01)-UL Battery pack : iT5-ZB-RU-BP-(A) • Impact or Friction Hazard • Danger en cas de choc ou frottement - SEE/VOIR INSTRUCTIONS 172-65657MAF-02  S.NO. 〒675-8511 Kakogawa Japan
Power Source	Battery Pack Lithium thionyl chloride battery Rated Voltage: 3.6 V Rated Capacity: 76 Ah × 2
Enclosures	IP67 (Evaluation for intrinsic safety rating is carried out under IP20)
Ambient Temperature Range	-20 to 80 °C (-4 to 176 °F)
Wireless Module	TELEC:  018-150057 FCC ID: H3RTZRR1001 IC: 7221A-TZRR1001 Frequency Band: 2.405 GHz to 2.480 GHz RF Power Output: 10 mW/MHz Transmitting Range: Approximately 600 m (656 yd) (line of sight)
Material	Case/Cover: Aluminum alloy die castings (ADC3, SG100A) Antenna: Resin

Continued on the next page

Dimensions	 (Unit: mm)
Weight	Approx. 3 kg (6.6 lb) (including battery packs)

FCC and IC Statement

This device complies with Part 15 of the Federal Communications Commission (FCC) rules and Industry Canada (IC) RSS-210. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Ce dispositif est conforme à la norme RSS 210 d'Industrie Canada. L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes :

- (1) il ne doit pas produire de brouillage et
- (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

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.

Exceptions to Warranty

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.

Duration of Warranty

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.

ANY IMPLIED WARRANTIES NOT NEGATED HEREBY WHICH MAY ARISE BY OPERATION OF LAW, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ANY EXPRESS WARRANTIES NOT NEGATED HEREBY, ARE GIVEN SOLELY TO THE INITIAL BUYER AND ARE LIMITED IN DURATION TO ONE (1) YEAR FROM THE DATE OF SHIPMENT BY THE SELLER.

Exclusive Remedy

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 AND

TRACKING NUMBER ISSUED BY THE SELLER. ALL LABOR COSTS, SHIPPING COSTS, AND TRANSPORTATION COSTS ASSOCIATED WITH THE RETURN OR REPLACEMENT OF THE CLAIMED DEFECTIVE PRODUCT ARE SOLELY THE RESPONSIBILITY OF BUYER OR THE FIRST END USER. THE SELLER RESERVES THE RIGHT TO INSPECT ON THE FIRST END USER'S SITE ANY PRODUCTS CLAIMED TO BE DEFECTIVE BEFORE ISSUING A RETURN MATERIAL AUTHORIZATION. SHOULD SUCH INSPECTION REVEAL, IN THE SELLER'S REASONABLE DISCRETION, THAT THE CLAIMED DEFECT IS NOT COVERED BY THIS WARRANTY, THE PARTY ASSERTING THIS WARRANTY SHALL PAY THE SELLER FOR THE TIME AND EXPENSES RELATED TO SUCH ON-SITE INSPECTION.

Exclusion of Consequential and Incidental Damages

IT IS SPECIFICALLY ACKNOWLEDGED THAT THIS WARRANTY, ANY OTHER EXPRESS WARRANTY NOT NEGATED HEREBY, AND ANY IMPLIED WARRANTY NOT NEGATED HEREBY, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, DO NOT COVER, AND NEITHER TLV, TII NOR ITS TLV GROUP COMPANIES WILL IN ANY EVENT BE LIABLE FOR, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO LOST PROFITS, THE COST OF DISASSEMBLY AND SHIPMENT OF THE DEFECTIVE PRODUCT, INJURY TO OTHER PROPERTY, DAMAGE TO BUYER'S OR THE FIRST END USER'S PRODUCT, DAMAGE TO BUYER'S OR THE FIRST END USER'S PROCESSES, LOSS OF USE, OR OTHER COMMERCIAL LOSSES. WHERE, DUE TO OPERATION OF LAW, CONSEQUENTIAL AND INCIDENTAL DAMAGES UNDER THIS WARRANTY, UNDER ANY OTHER EXPRESS WARRANTY NOT NEGATED HEREBY OR UNDER ANY IMPLIED WARRANTY NOT NEGATED HEREBY (INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) CANNOT BE EXCLUDED, SUCH DAMAGES ARE EXPRESSLY LIMITED IN AMOUNT TO THE PURCHASE PRICE OF THE DEFECTIVE PRODUCT. THIS EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES, AND THE PROVISION OF THIS WARRANTY LIMITING REMEDIES HEREUNDER TO REPLACEMENT, ARE INDEPENDENT PROVISIONS, AND ANY DETERMINATION THAT THE LIMITATION OF REMEDIES FAILS OF ITS ESSENTIAL PURPOSE OR ANY OTHER DETERMINATION THAT EITHER OF THE ABOVE REMEDIES IS UNENFORCEABLE, SHALL NOT BE CONSTRUED TO MAKE THE OTHER PROVISIONS UNENFORCEABLE.

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.

Service

For Service or Technical Assistance: Contact your TLV representative or your regional TLV office.

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