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INSTRUCTION MANUAL




RIU Series



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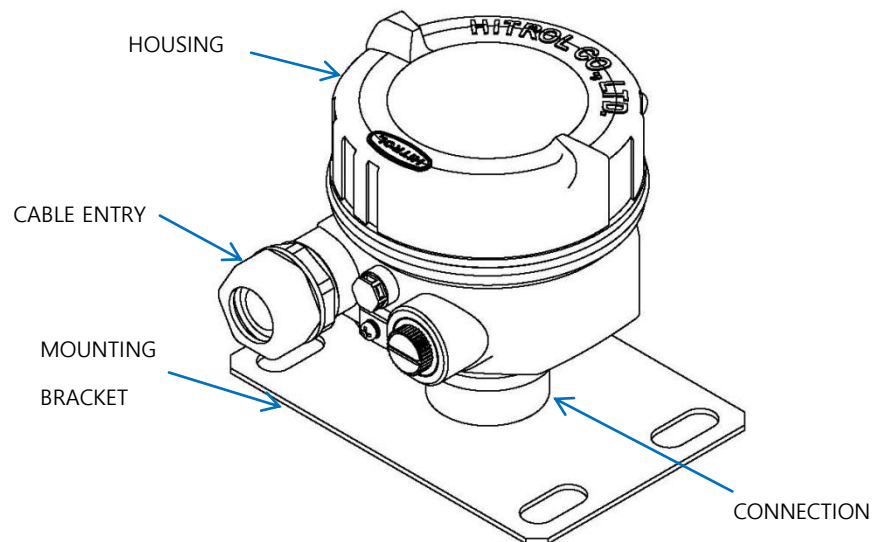
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Overview RIU-Series is a display unit, which receives a resistance signal from a Resistance Type of Level Transmitter, converts this resistance value to current output of DC 4~20mA, and displays it. RIU-Series have a function to check and adjust a setting using laptop through UART Communication port.

- Characteristics**
- Digital Operating System based on 16 Bit Microprocessor
 - Various Display Type
 - Easy adjustment, stable operating and convenient maintenance using key buttons.
 - High Accuracy ($\pm 0.2\%$ F.S)
 - Fine-adjustment of current signals suitable for field operation
 - Intuitive operation and monitoring function using USB port on laptop
 - View and Rotation function according to user setting
 - Ex-proof type available

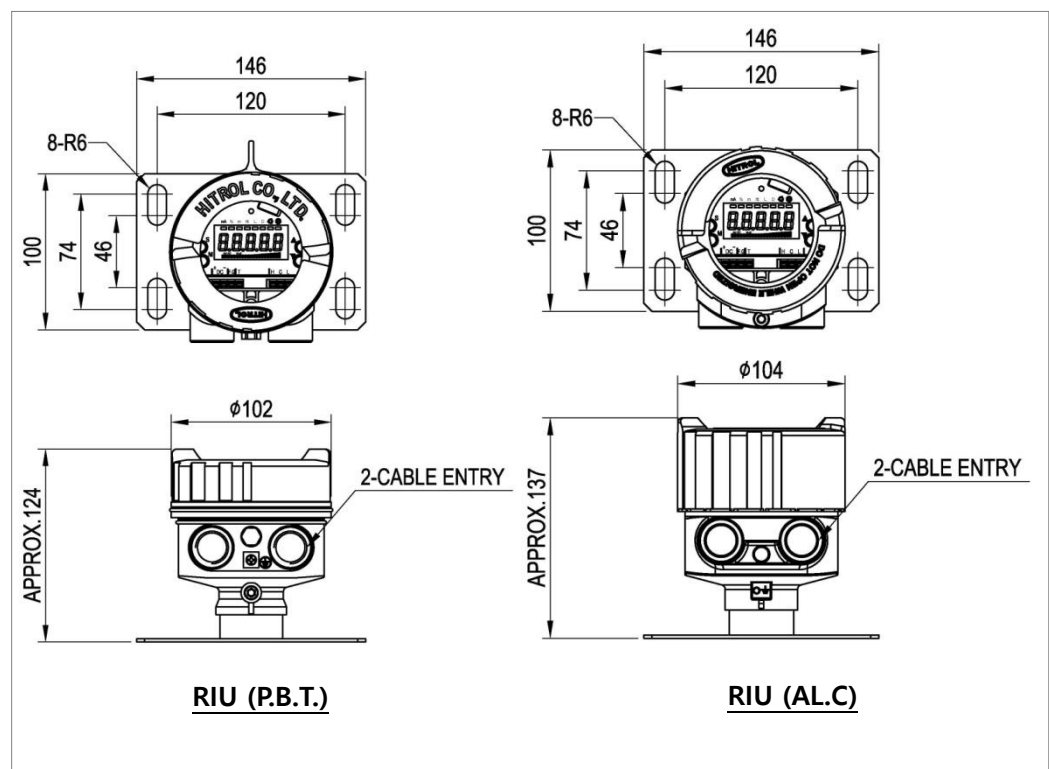
Operating Principles and Composition RIU-Series is a digital display unit which is used with a resistance type level transmitter. It receives a resistance signal from the level transmitter, stores and calculates it based on a microprocessor, and enables to check the level of medium in the tank with visual and DC 4~20mA current signal according to the setting by the user.

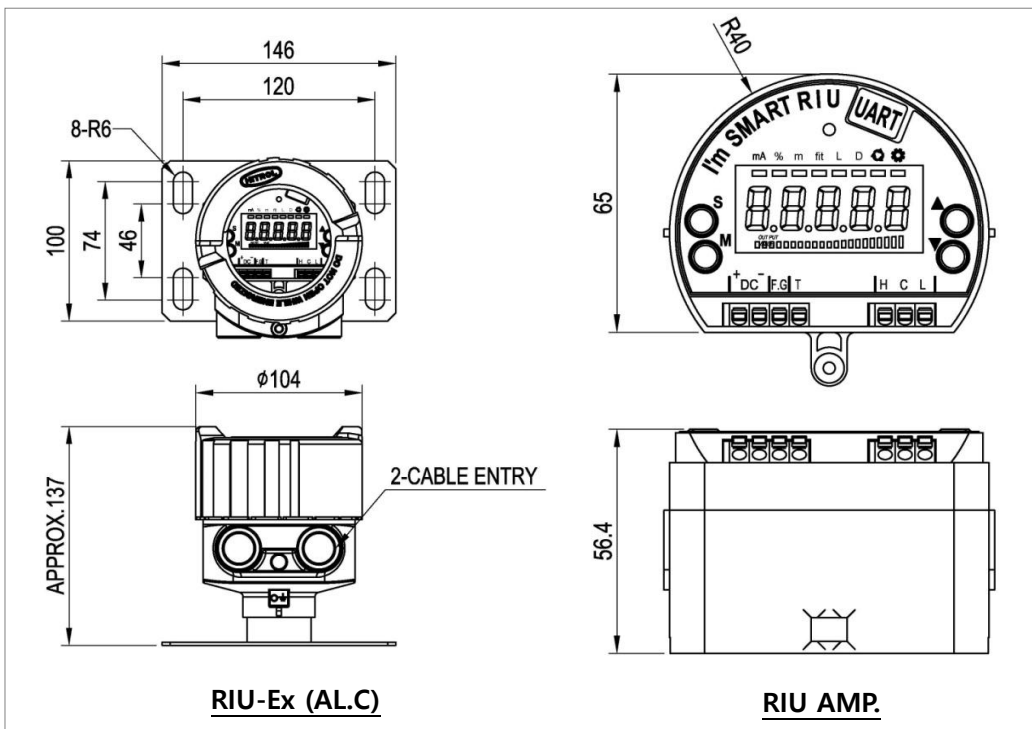


Specification

Model	RIU (Standard)	RIU-Ex (Explosion-Proof)
Enclosure	Weather Proof (IP65/IP66)	Ex d IIC T6 (IP65)
Material	P.B.T. / ALC	ALC
Mounting	Local	
Microprocessor	16Bit Microprocessor	
Combination Unit	2Wire DC4~20mA Resistance Type Level Transmitter	
Display	mA, %, m, ft, Level, Distance	
Supply Voltage	DC+17V ~ +40V @ Typ.+24V	
Output Current Accuracy	4mA ~ 20mA @ ±0.2% F.S	
Measurement Sensor Range	<ul style="list-style-type: none"> ■ Min. : 200Ω [100mm] ■ Max. : 12KΩ [6M] @ 20Ω Sensor 	
Self-Diagnosis (3.6mA Current Output)	<ul style="list-style-type: none"> ■ In case the level is below the Zero setting point ■ In case of float breakaway ■ In case of incomplete sensor cable connection 	
Self-Diagnosis (21mA Current Output)	<ul style="list-style-type: none"> ■ In case the level is above the Span setting point 	
Setting Menu	Quick Menu / Set Menu / Auto Set	
Ambient Temperature	-20°C ~ +60°C	
Status Indicator	Bi-Color LED [Green / Red / Orange]	
UART Communication	Check and adjustment of setting status	

Dimensions





**Wiring /
AMP Composition**



Any tools are not required when wiring because it has one-touch type terminal block.
(AWG 26~14 Str 0.13mm²~2.1mm² wire should be used for the wiring.)



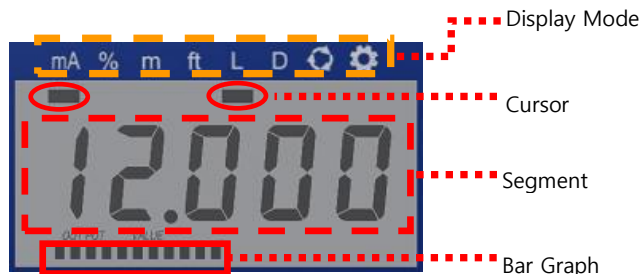
- LED. : Green (Normal)
 Red (When input signal is out of DC 4~20mA)
- LCD : Display Window (5-Digits)
- S/M/▲/▼ : Control Keys
- UART : Connection port to laptop for setting
- DC : DC Power
- F.G : Field Ground
- T : Output Test Point
- H/C/L : Resistance Value Input Signal
- * Cable color: H – Red, C – White, L – Black

CAUTION While wiring, the wrong connection of H, C, and L is the cause of the product failure.

Setting Menu List

NO.	Content	Explanation
[00]	mA / % Unit Settings	▲ : mA ▼ : Percentage
[01]	Level / Distance Settings	▲ : Level ▼ : Distance
[02]	Zero Settings	Setting with 4mA or 0% as fixed
[03]	Span Settings	Save as user setting value
[04]	Zero Height Settings	-9.999~99.999 m
[05]	Span Height Settings	
[06]	Tank Height Settings	
[07]	Auto Set	Yes : Active, No : Inactive
[10]	Damping Time Settings	0~10sec.(Default 0.5 sec @ 0.5 sec Step ADJ.)
[11]	Zero Position	-0.010 ~0.090 m @ 0.010m step(User Setting)
[12]	Span Position	※ In case to change the float position as virtual
[20]	Zero Output Current Settings	-0.100~ 0.100 mA (User setting)
[21]	Span Output Current Settings	※ In case of offset adjustment of current output
[30]	Rotation time	0.5 ~ 10sec.(Default 1 sec @ 0.5 sec Step ADJ.)
[31]	'mA' Display On/Off	On/Off setting of 'mA' into rotating display
[32]	'%' Display On/Off	On/Off setting of '%' into rotating display
[33]	'Meter' Display On/Off	On/Off setting of 'm' into rotating display
[34]	'Feet' Display On/Off	On/Off setting of 'Ft' into rotating display
[40]	4mA Output	"4mA" current is out for 5 seconds
	12mA Output	"12mA" current is for 5 seconds
	20mA Output	"20mA" current is for 5 seconds
[90]	Error Indication	Indication of number as per abnormal status
[91]	Output of sensor voltage value	Display of Zero,Span andcurrently measured sensor voltage value

Operating Method

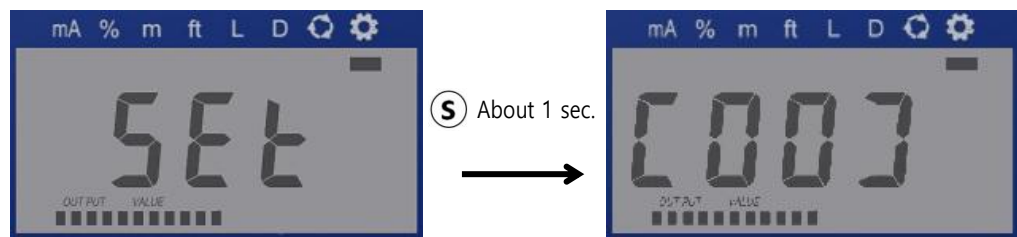


Display Mode
mA : mA Mode
% : Percentage Mode
m : Meter Mode
Ft : Feet Mode
L : Level (Setting separately)
D : Distance (Setting separately)
⌚ : Rotation Mode
⚙️ : Setting Mode

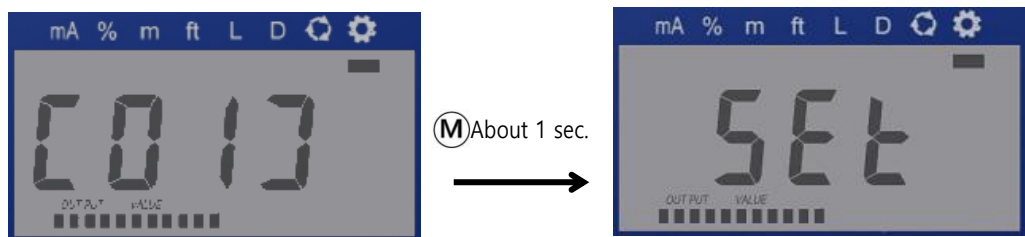
Whenever (M) button is pressed, the cursor moves sequentially, and the sequence of display mode is as follows:

mA → % → m → ft → ⌚ → ⚙️ → mA → % → ...

■ Setting Mode

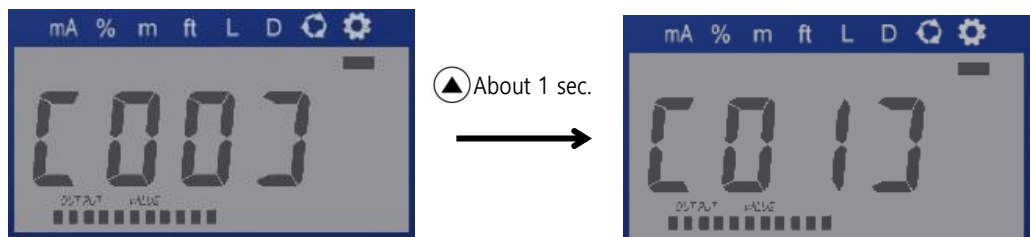


In the Setting Mode, press **(S)** button for about 1 second then green LED will be flickering and you can go into the Setting Menu.



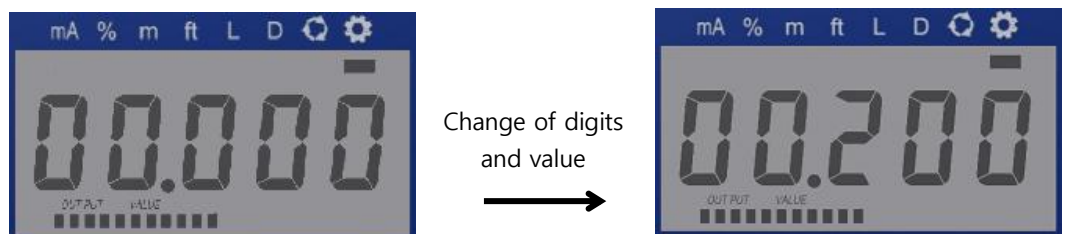
In the Setting Menu, press **(M)** button for about 1 second then green LED will be flickering and you can go into the Setting Mode.

■ Setting Menu



After entering into the Setting Mode, change the numbers using **(▼) / (▲)** buttons.

■ After Entering into the Setting Menu



Press **(S)** button for about 1 second to enter the applicable function.

If **just 1 digit is flickering**, it can be moved between the digits.

If **full digits are flickering**, it can only be set up to the specified number.

Key Button		Function
▲	Press more than 1 sec.	Increasing of digits
▼	Press more than 1 sec.	Decreasing of digits
▲	Press shortly	Increasing of the numerical value
▼	Press shortly	Decreasing of the numerical value
M	Press more than 1 sec.	Leave without saving
S	Press more than 1 sec.	Save and Leave

Installation

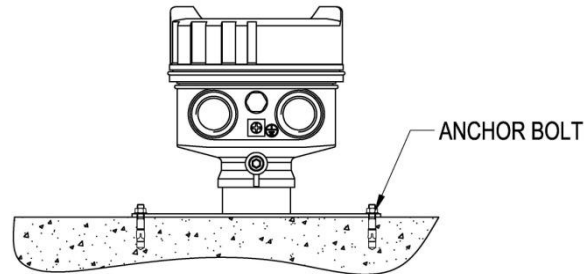
The RIU-Series shall be installed in a non-vibration location by bolted to a wall or a 2" (50A) pipe. If it is installed where the vibration is unavoidable, the user shall pay special attention for loosening of the bolts fixed by vibration.

M10 is recommended as a maximum bolt size.

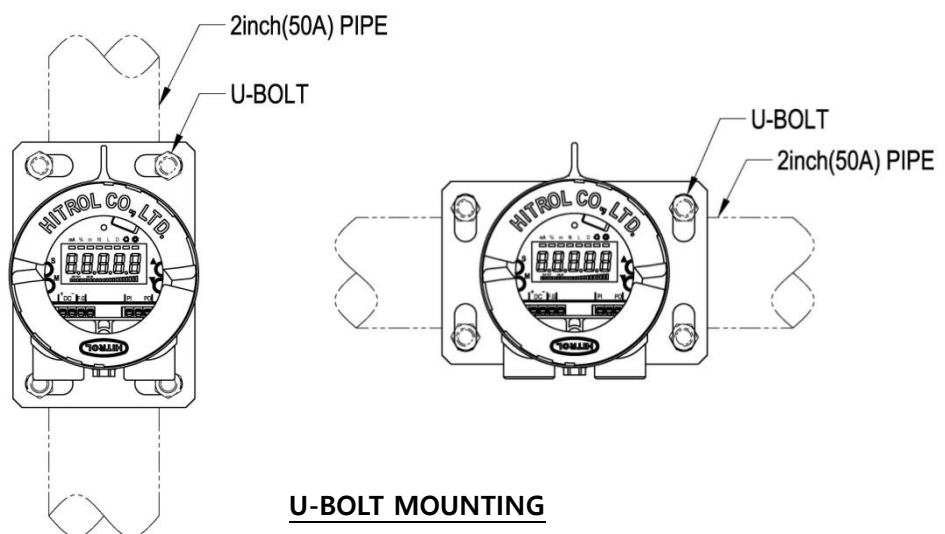
Unless otherwise requested, installation bolts and pipes are not provided.

In addition, note the following:

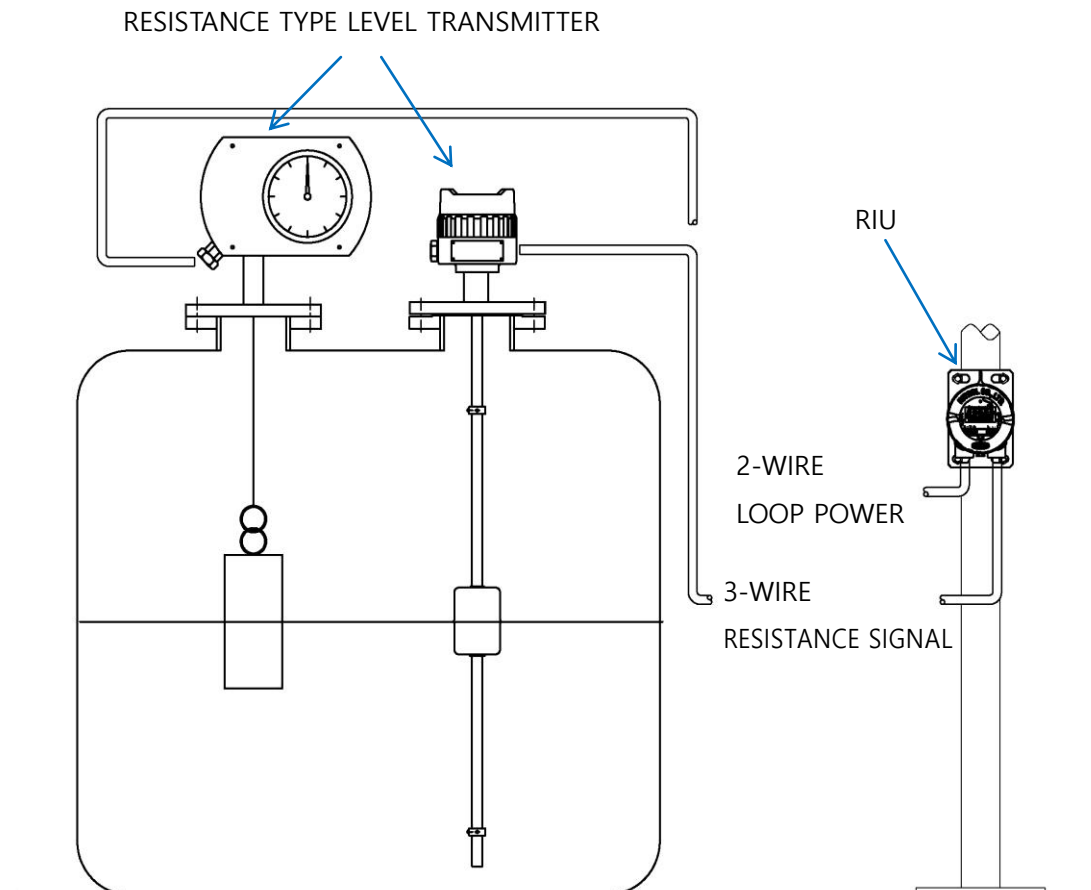
- Use only within ambient temperature -20°C to +60°C.
- Install it where it can be seen visually.



ANCHOR BOLT MOUNTING



U-BOLT MOUNTING



Usage

Usage of RIU / RIU-Ex shall be restricted as follows:

- If it's not an Ex-proof version such as **RIU**, do not install it in explosive area.
- Ex-proof version such as **RIU-Ex** can be installed at Zone 1 and Zone 2.
- It should not be used if the ambient temperature range (-20 to +60°C) is exceeded.
- It should not be used if the Ingress protection requirement is higher than IP65.
- Do not use where vibration is existing.

Maintenance



- Special maintenance activity is not required as it is not installed directly at the tank, but if there are foreign substances on the surface, the display may not be visible, so cleaning should be performed.
- If the signal does not out properly, check the operating method and set it up again or contact our head office.



**During the maintenance, checkup shall be carried out with the machine completely de-energized.
In explosive area, disassembly should not be performed where power is applied.**

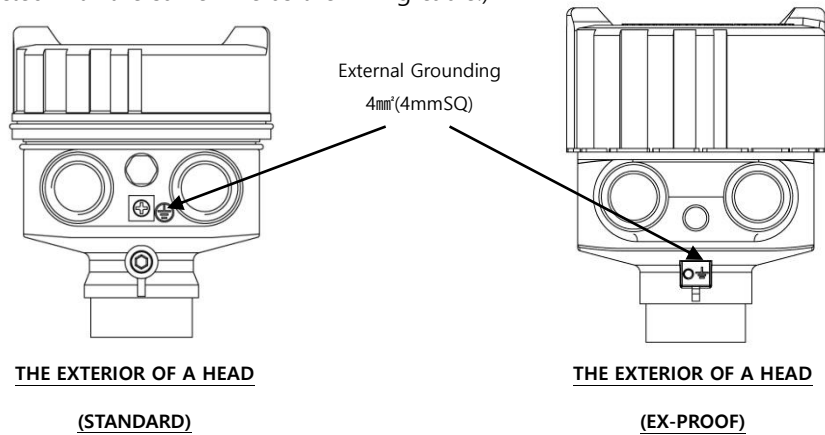


After checking the sensor parts, the wrong connection of H, C, and L is the cause of the product failure.

- Defect Check** If the operation is not normal, check first as shown below:
- Is the power connecting correctly?
 - Is the correct power supplying to the specification properly?
 - Is the wiring of Level Transmitter correct?
- Precautions for Removal**
- Disassembly shall be performed while the power is off.
 - Be careful not to damage to O-ring or gasket when opening or closing of its cover.
- Precautions for Transportation and Assembly**
- Be careful not to shock to the machine when transportation or assembly. The shock of the product can be a direct cause of defect.
-  **Do not shock to the product when moving or transporting it.**
- Precautions for Installation**
- When tightening of bolts, make sure to use the correct size suitable for the bracket hole.
 - Washers should be used to prevent a loosening between bolts and nuts.
 - After determining whether the installation area is explosive or not, suitable version of product should be installed.
 - Power should be applied after completing of wiring connection and assembling the cover of the product
- Safety and Environmental**
- Precautions While Using
 - Do not lose the locking device while the product is being used, and the product should be locked without failure.
 - Do not shock the product.
 - Do not open the cover of the product if explosive gas atmosphere exists.
 - Precautions for Product Wiring
 - Make sure that the wires are connected to the terminal block that corresponds to the position of the contact points. (Refer to the connection method)
 - Power supply to the product should be applied after you check its relevant specifications and wire the cable correctly.
 - Incorrect power supply voltage can be caused damage or fail of the device.
 - You should be careful for your safety as there is a risk of an electric shock.
 - Insert the power line and the signal line into different cable entries of the housing and wiring them separately. (Refer to the wiring method)
 - Precautions for Using External Wire (Ex-Proof Type)
 -  **When placing the cable into the product, certified cable gland (Ex d IIC, IP65or above, PF 1/2 ") should be used.**

■ Precautions for Grounding Connection

- The exterior earth is located as shown below, and the earth line should be at least 4mm² in size (4mmSQ) when connected to an external ground. (Internal ground can be connected with the same wire as the wiring cable.)

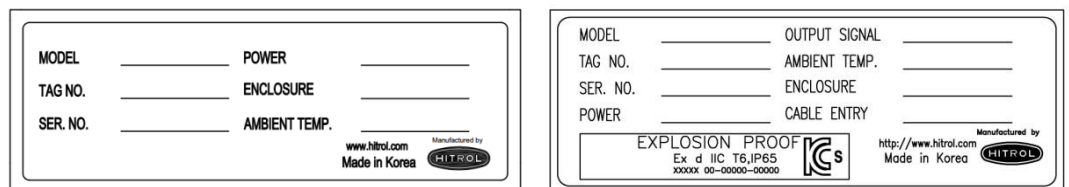


■ Disposal of the Product

- When disposing of the product because it is not usable, the AMP in the product housing should be separated and disposed separately. No special attention is required because there are no parts that affect environments. (e.g., Mercury Switch)

Marking

The product identification mark is attached to the housing and shows the model, serial number, operating temperature, operating pressure and matters regarding output signal. Serial number is a unique manufacturing number for the identification of the product.



<STANDARD>

<EX-PROOF>

User Training

The above matters should be fully understood, and ambient temperature around the housing should be within the range of -20°C to +60°C.

Ex-Proof version of product has been designed pursuant to Article 34 of the Industrial Safety and Health Act and Article 58-4 of the enforcement rules of the same act.



Products that are not Ex-Proof version should not be applied to explosive area.

Ex-Proof version of products can be used only in places where the surrounding environment is zone 1 or 2.

**Warranty and
Contact****■ Warranty and Service**

The warranty period of this product is two years after shipment of the product and after sales service will be provided free of charge during this period for problems that would have occurred during normal use. If after sales service service is requested for matters other than product issues, charges may be requested regardless of the warranty period.

A/Scan be requested through our website or below head office.

■ Head office · Factory · Laboratory Contact Number

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