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INSTRUCTION MANUAL

CAPACITANCE TYPE LEVEL SWITCH

HCC-95R Series

HPC-95R Series



Doc. no. : HCC(HPC)95R_IM_ENG_R0

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(Ex-Proof Product)			

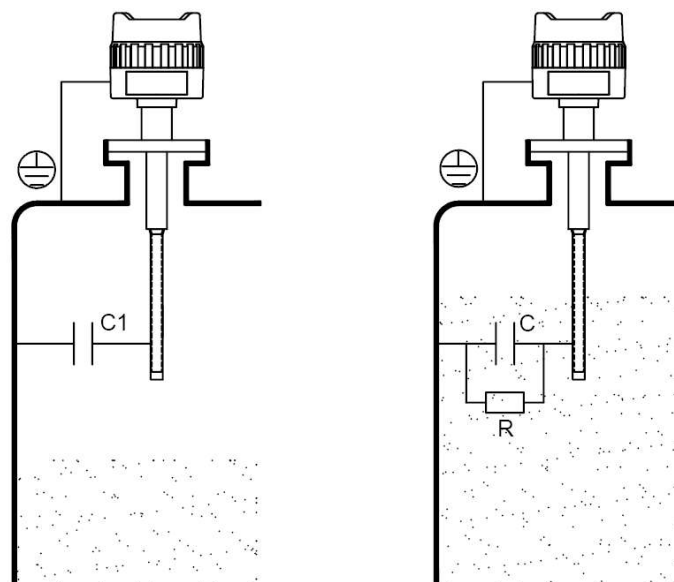
Overview The HCC(HPC)-95R Series is a level switch to detect an object to be measured in a tank using its dielectric constant. It can be installed on the top or side of a tank, and it is easy to adjust and use with corrosive fluid, making it applicable to different industries.

Features

- The level of different types of liquid and powder can be detected.
- It has a solid structure and is semi-permanent, because it does not have any mechanically moving part.
- Different shapes of probes are offered for different purposes.
- It can be used with a corrosive liquid (aqueous solution).
- Operation state can be checked.
- Output delay can be set.
- It has the pressure-resistant and ex-proof structure (ex. d IIC) (HPC-95R Series)

Mechanism

When the level between the electrode probe and wall increases, the air around electrode probe is replaced with another dielectric substance (object to be measured) to change the capacitance value. Initially, the electrode probe has a low capacitance value in the air, but the value increases when the object to be measured rises and covers the electrode probe. This change is sensed to detect the object to be measured.



C: Capacitance of object to be measured

C1: Initial capacitance

R: Conductivity of object to be measured

Specifications

Weather-Proof Version

Model	HCC-95R	HCC-95RH	HCC-95RW	HCC-95RWH
Probe Type	Rod		Rope	
Mounting	Screw & Flange			
Ambient emperature	-20°C ~ +60°C			
Process Temperature	-40°C~+80°C	-40°C~+150°C	-40°C~+80°C	-40°C~+150°C
Process Pressure	Vacuum~ 20kg/cm2(300#)			
Enclosure	Weather-Proof (IP65)			
Wetted Parts Material	316L with TEFLON			
Process Connection	PT 1"(M) Screw			
Housing;Cable Entry	AL;PF3/4"(F),IP65			

Ex-Proof Version

Model	HPC-95R	HPC-95RH	HPC-95RW	HPC-95RWH
Probe Type	Rod		Rope	
Mounting	Screw & Flange			
Ambient Temperature	-20°C ~ +60°C			
Process Temperature	-40°C~+80°C	-40°C~+150°C	-40°C~+80°C	-40°C~+150°C
Process Pressure	Vacuum~ 20kg/cm2(300#)			
Enclosure	Ex-Proof (Ex d IIC T6, IP65)	Ex-Proof (Ex d IIC T4, IP65)	Ex-Proof (Ex d IIC T6, IP65)	Ex-Proof (Ex d IIC T4, IP65)
Wetted Parts Material	316L with TEFLON			
Process Connection	PT 1"(M) Screw			
Housing ; Cable Entry	AL. ; PF 3/4"(F), IP65			

Amplifier Specification



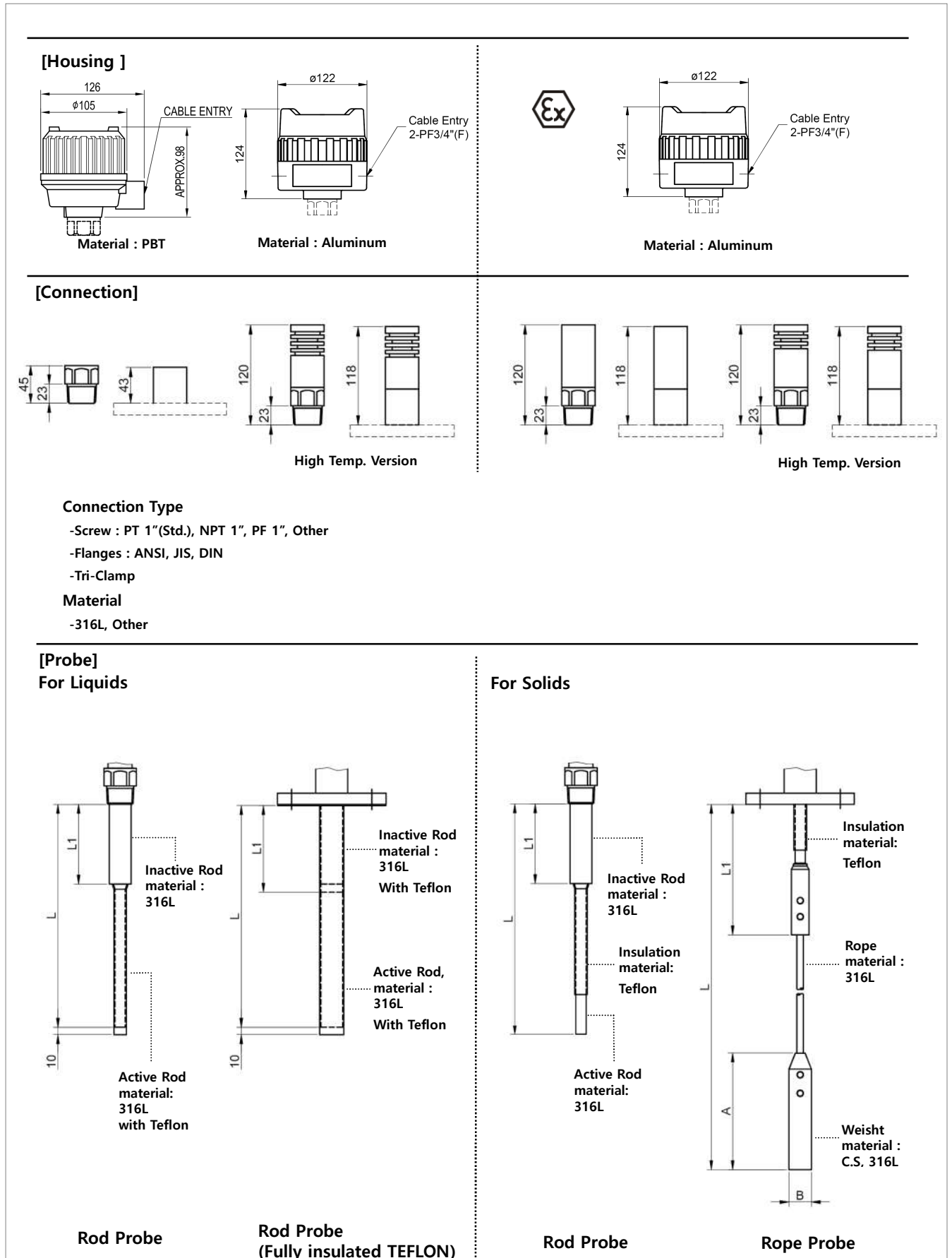
No.	Item	Specification
1	Combination Unit	<ul style="list-style-type: none"> ■ HLC-95R-L ■ HLC-95R-P
2	Combination Cable (A.W.G : 16~26)	<ul style="list-style-type: none"> ■ + : DC Power ■ - : GND ■ OUT : DC Data
3	Power Consumption	DC+18V @ 22mA / HLC-95R
4	Oscillating Frequency	520KHz
5	Output Data Range	DC +2V ~ +12V
6	Power State	LED @ Green
7	Operating Temperature	-20°C ~ +70°C
8	Dimension	80mm x 65mm x 20mm
9	Weight	50g

Combination Unit

Model	HLC-95R-L	HLC-95R-P
Installation	Local	Panel inside
Ambient Temperature	-20°C ~ +60°C	
Power Source	AC 110/220V, 60Hz (SPDT) AC 110 or 220V, 60Hz (DPDT) DC 24V	AC 110/220V DC 24V
Output	SPDT, DPDT	SPDT
Contact Rating	AC 250V 10A, DC30V 10A (SPDT) AC 250V 5A, DC30V 5A (DPDT)	AC 250V 10A, DC30V 10A
Enclosure	Weather-Proof (IP54)	
Housing ; Cable Entry	AL. ; 2-PF 3/4"(F), IP54	

Component and Technical Data

The dimensions on the following pages are indicated in mm



		For Liquids		For Solids			
		Rod Probe	Rod Probe Fully insulated TEFLON	Rod Probe	Rope Probe		
Total length(L)		100~2,500	300~1,000	100~2,500	Min. 1,000, Max. 10,000		
					≤2,500	≤4,500	>4,500
Active Rod Length(L-L1)		100~1,000	150~500	100~1,000	-		
Inactive Rod Length(L1)		~1,500	150~500	~1,500	-		
Active Rod dia.		Φ15 (including Teflon)	Φ30 (including Teflon)	Φ15 (including Teflon)	-		
Inactive Rod dia.		Φ25.4	Φ30 (Including Teflon)	Φ25.4	-		
Weight	A	-	-	-	170	300	300
	B	-	-	-	Φ28	Φ28	Φ40
For acid liquids		-	O	-	-		
For high-viscosity liquids		O	O	-	-		

Dielectric Constant Value

Air	1
Nitrogen, liquid	1-2
Fuel oil: gasoline, diesel	2
Hydrogen chloride	4.6-12
Hexane, liquid	6
Butanol	17-18
Ammonia	16-25
Alcohol	16-31
Acetone	20
Caustic soda	22-26
Ethanol	25
Methanol	32-33
Glycerine	47-68
Water	81
Sulfuric acid	84

For the dielectric constant value, visit our website, www.hitrol.com and download from Technical Data.

Attachment and Cautions

A capacitive level switch can be attached using screws (PT, NPT, PF), flanges (ANSI, JIS, DIN), or Tri-Clamp.

Pay attention to the following for installation.

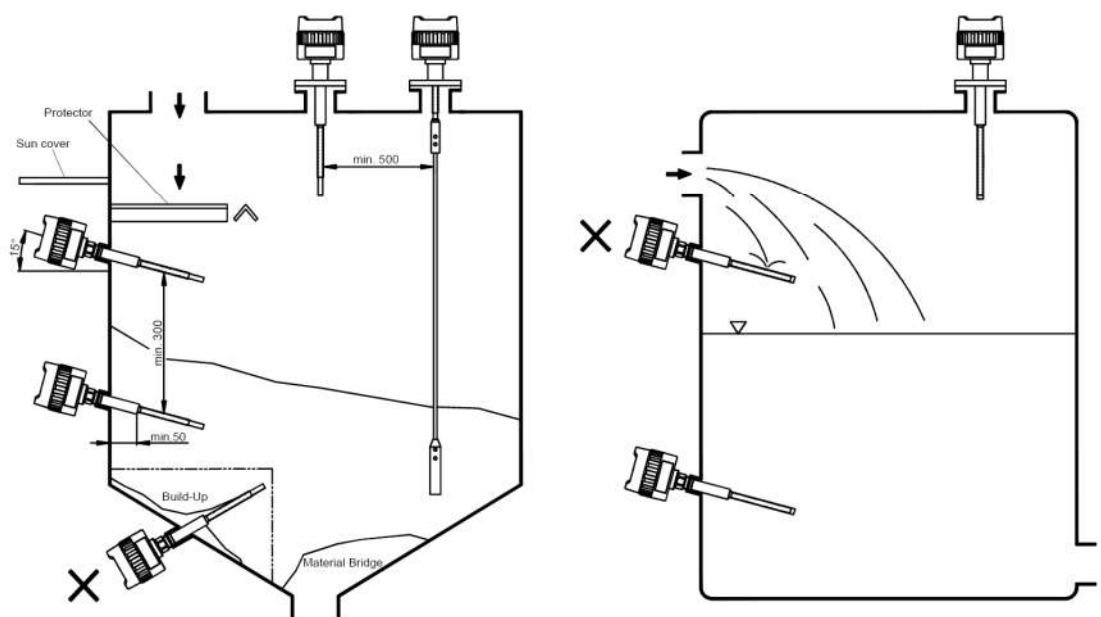
Installation on the side of a tank (horizontal)

As level is detected with an entire electrode, very sensitive measurement is available. However, build-up causes malfunction. As such, the electrode needs to be installed at a slant with its tip horizontally at the bottom.

Installation on top of a tank (vertical)

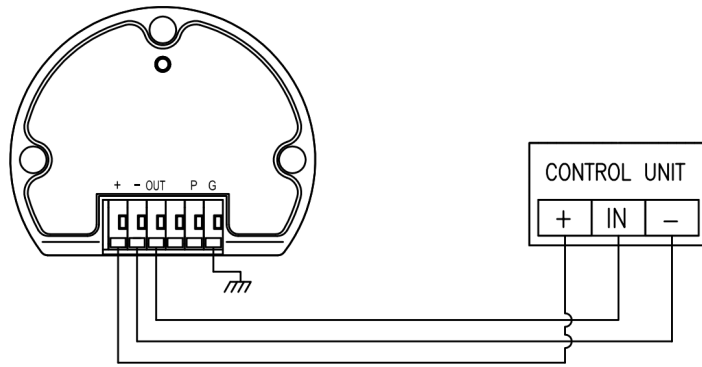
This installation reduces the effect of build-up, but level is detected only with the tip of an electrode. As such, it has relatively lower sensitivity and may thus be inadequate for an object to be measured with low dielectric constant.

- To install 2 or more level switches in one container, keep 300mm or more between probes. (If the gap is smaller between probes, they may interfere each other causing instability.)
- For the side installation, the inactive road must be exposed by 50mm or more in the tank with the probe slanted by 15° to the horizontal plane. (Foreign substance between a nozzle and probe may cause malfunction.)
- Keep the probe away from the inlet of measure object, and install a protector to protect the probe.
- Keep the wire inlet facing the ground to maintain its rainproof feature.
- When installing it in low level, be careful with dead stock and material bridge.
- If the measure object is fluid in the tank, set adequate time delay for the output relay.
- Install a sun cover for outdoor installation so as to avoid the influence of temperature rise.
- If there is an agitator, keep safety distance between the agitator and probe.



Wiring and AMP

- Connect AC (110/220 V) or DC (24 V) according to the power specifications.
- Make sure to connect the power with the correct polarity (+, -).
- Do not connect the wire with the power connected.
- This product provides SPDT, DPDT. Wire it with COM and NO terminal to use HIGH contact.
- Make sure to connect it to an external ground.

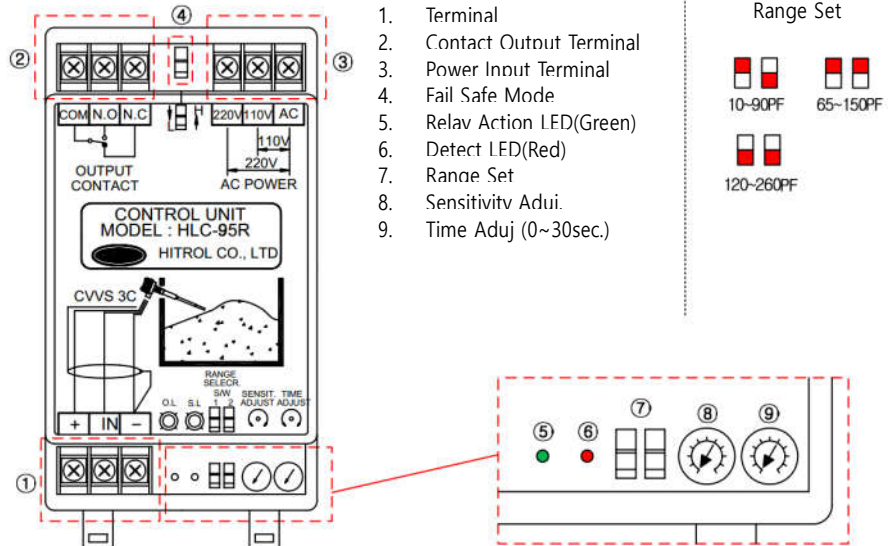


Setting

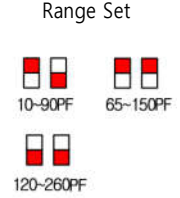
- Measure the safety after installing the product.
 - Set Fail Safe Mode to H.
 - Turn on the power.
 - Set the Sensitivity Volume to the center and select range S/W (10~90PF), (65~150PF), (120~260PF) to place the Red LED On / Off between the center and H of the Sensitivity volume.
 - Red LED should be On when the probe touches the work piece.
 - Fail Sage Mode to L when using for the lower limit.
- (The product is set for the upper limit when the product is shipped.)

■ Unit Composition and Designation

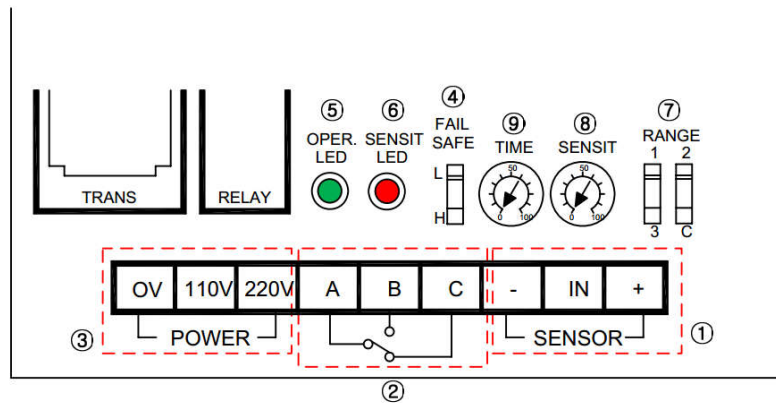
- HLC-95R-P



1. Terminal
2. Contact Outout Terminal
3. Power Input Terminal
4. Fail Safe Mode
5. Relav Action LED(Green)
6. Detect LED(Red)
7. Range Set
8. Sensitivv Adui.
9. Time Aduj (0~30sec.)



- HLC-95R-L



Removal

- Check the level and presence of liquid in the tank before removing it.

Cautions

- The product may be overheated so wear gloves to prevent burns.
- If there is explosive gas in the atmosphere, do not open the cover.
- To open the cover of an ex-proof product, release the SET SCREW (ex-proof key) first.
- Disconnect the power first.
- Make sure that any O-ring or gasket is not damaged while opening or closing the product cover.



Make sure that it is not subject to any high impact when moving it.

Cautions for

Inserted External

Wire

(Ex-Proof Product)

- Use the cable gland connection or metal pipe line lead-in on the wire inlet, and use a product with an equivalent ex-proof certificate to connect it using the external line lead-in method.
- For an unused external line inlet, use a closing plug with an equivalent ex-proof certificate.

Cautions for Grounding

(Ex-Proof Product)

- There are external and internal groundings. For the external grounding, the ground wire must be 4 mm² (4 mm SQ)
- An internal ground wire must have the same size as the power line. The size of an internal grounding terminal lug must be 3.1 mm² (3.1 mm SQ). If the power line is bigger than 3.1 mm², connect the ground wire with the terminal lug removed.



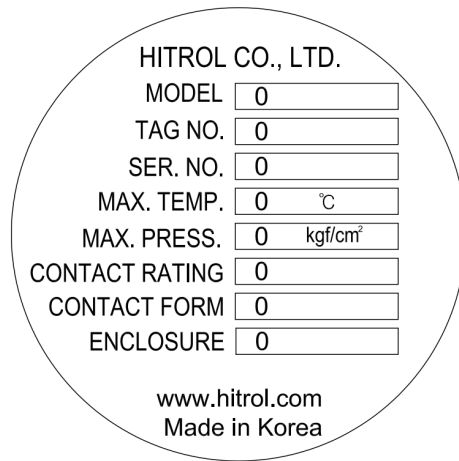
To connect the internal ground terminal with the terminal lug removed, make sure to insert a washer (to prevent loosening).

Safety and Environment

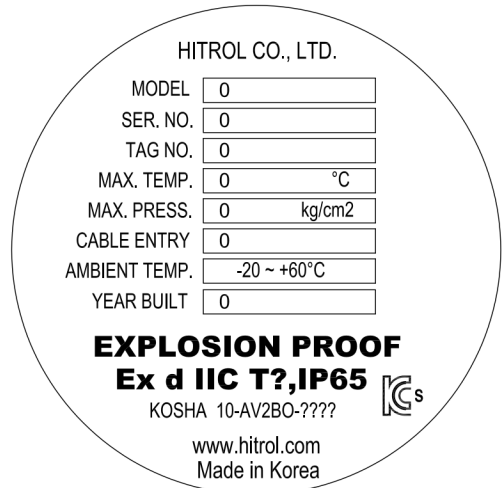
- Cautions for Use
 - Make sure to connect the product and container using the required tools.
 - Store the key safely and make sure that it is locked.
 - Do not apply high impact to the product.
- Disposal
 - Make sure to separate the AMP and main unit from the housing before wasting it. No part affects the environment so no special attention is required (e.g., mercury switch).

Label

- Label
 - The label is attached on the housing to state the model, serial number, working temperature, working pressure, and output. The serial number is a unique manufacturing number.



<Weather-Proof >



<Ex-Proof>

User Training

Understand the aforementioned and never measure any general-type liquid exceeding 80°C and 150°C for the high-temperature type. Also, keep the ambient temperature of the housing in the -20 - +60°C range.

An ex-proof product is a pressure-resistance and ex-proof type, so do not open the cover while using it.

The ex-proof product is designed according to Articles 34 and 4 of Article 58, Occupation Safety and Health Act.

Do not apply a non-ex-proof product in an ex-proof zone.



An ex-proof product can be used where the environment and liquid of the containers are type 1 and 2.

Failure Check And Maintenance

■ Inspection

The sensor and transmission parts of a capacitive-level transmitter must be inspected.

Their service lives depend on the user environment and can be optimized with regular inspection. As such, users are advised to conduct regular inspections and maintenance at least every year. The exterior damage will be visually inspected, and any object to be measured and foreign substance will be regularly removed from the probe as these can affect accuracy.

When removing them, prevent causing damage to the Teflon.

■ Failure Check

- 1) Is the power connected correctly?
- 2) Is the power voltage correct?
- 3) Is the cabling correct?
- 4) Is the green LED turned on?

Warranty and Contact

Warranty and Service

This product is subject to a two-year warranty upon shipment and free service will be provided for any damage found under normal operating conditions. If troubles that occur are not due to product failure, service charge will apply.

You can request A/S from our website or by contacting our headquarters.

Headquarters, Factory and Research Center (Contacts)

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