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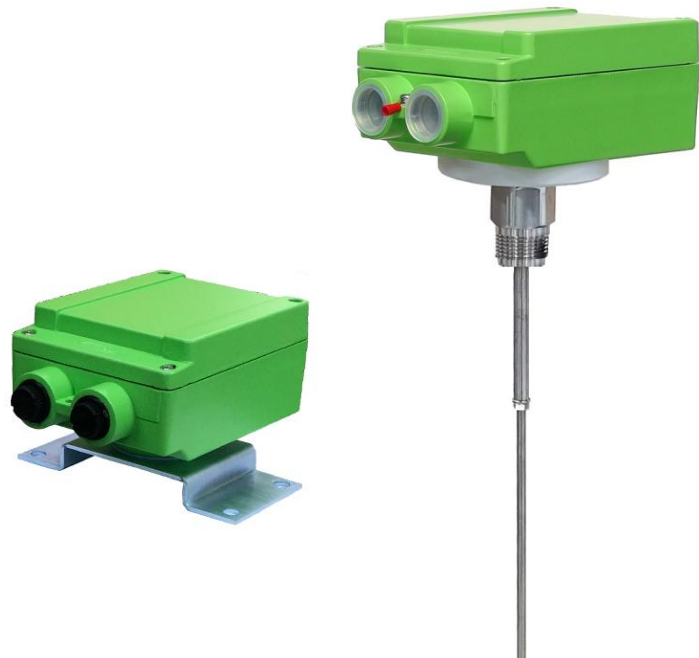
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# INSTRUCTION MANUAL

## Vibration Type Level Switch HNV-970 Series



Doc. no. : HNV970\_IM\_Eng\_Rev.0

Issue date: 2021. 03

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You should be well-informed of the contents where **WARNING** is marked before carrying out the work.

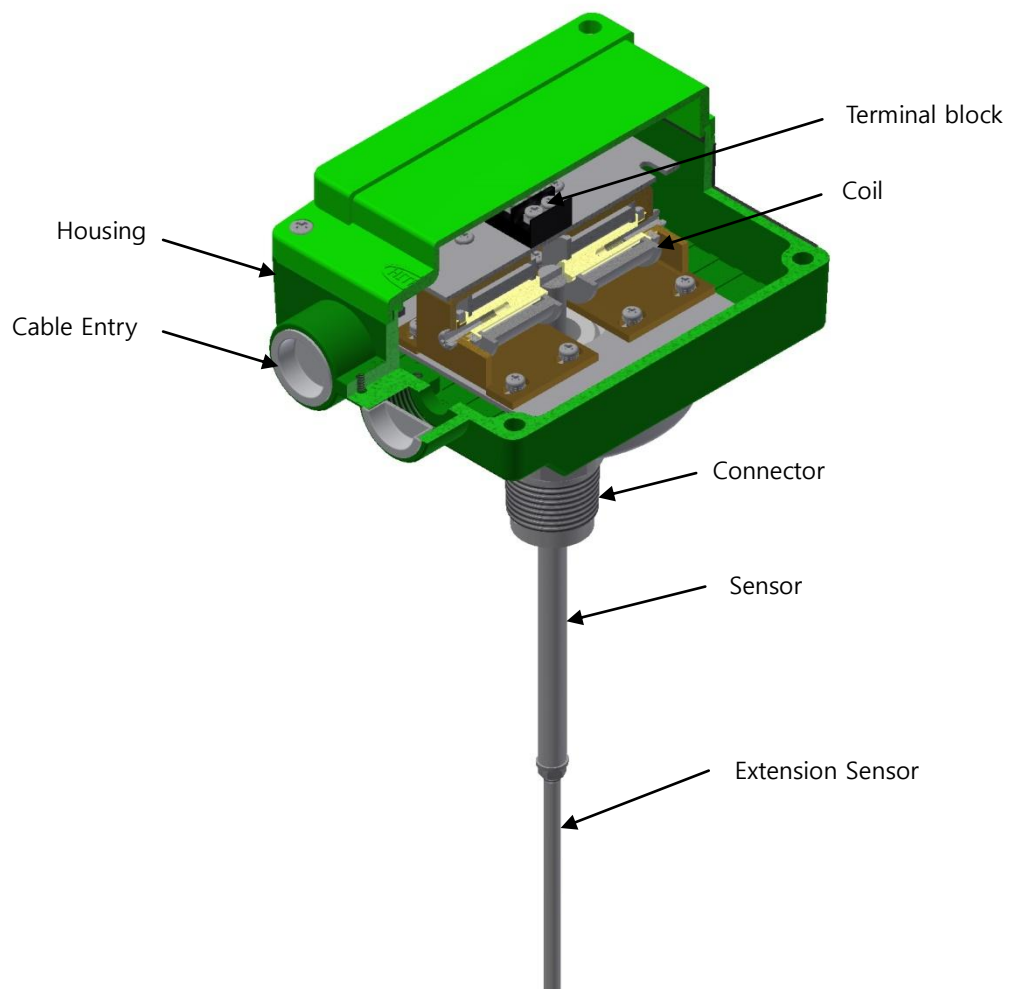


You should be careful where **CAUTION** is marked to carry out the work.

**Overview** HNV-970 Series is a level switch which detects powder and liquid in the tank. It is generally used to detect a contact output after sensing of medium in the tank. In particular, the HNV-970 series can be used to detect an interface level of sediments such as sand and carbon, etc in liquids.

- Characteristics**
- Various kinds of solid or powder level can be detected.
  - Used to detect an Interface level of sediments such as sand and carbon, etc in liquids.
  - Long life cycle due to mechanical moveless parts
  - Length extension is available.

**Operating Principles and Appearance** A coil which generates a frequency is installed in the housing and it vibrates the sensor continuously with natural frequency. When the medium is contacted with the sensing rod, the frequency is becoming low and output is significantly decreased. It is sensed by the control unit and relay signal is out. It can be generally used for alarm and process control.



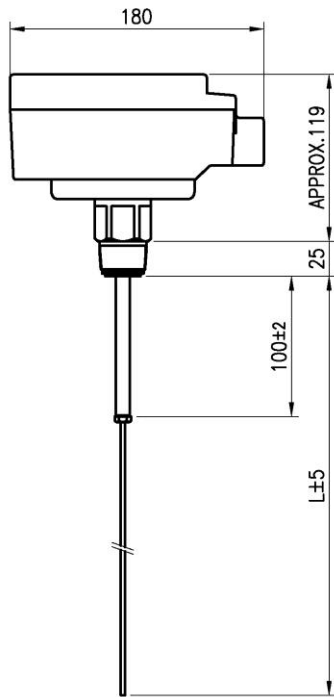
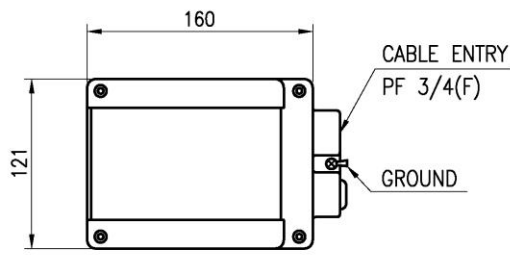
**Specifications****Sensor**

Model	HNV-970
Housing ; Cable Entry	AL.C ; PF 3/4"(F)
Enclosure	Weather-Proof, IP54
Max. Temperature	80°C
Max. Process Pressure	10kgf/cm <sup>2</sup> (Screw Type)
Mounting	Screw, Flange
Wetted Part Material	316L SS
Process Connection	PT 1"(M)
Installation	Side & Top
Distance	Max. 500m (between sensor and unit)

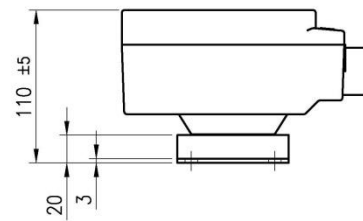
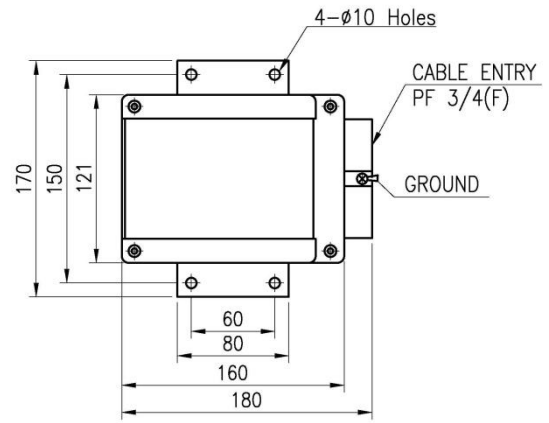
**Combination Unit**

Model	HLC-970-L
Housing ; Cable Entry	AL.C ; 2-PF 3/4"(F)
Enclosure	Weather-Proof, IP65
Ambient Temperature	-20°C ~ +60°C
Installation	Local
Power Source	AC 110V, AC 220V, DC 24V
Contact Form	DPDT
Contact Rating	AC 250V, 5A / DC 30V, 5A

**Dimensions**



**HNV-970**



**HLC-970-L**

## Precautions for Mounting

For the mounting of vibration level switch, Screw and Flange (ANSI, JIS and DIN) types are available and installation with various mounting type is available. Below points shall be considered when installation of the product.

### Side Installation (Horizontal Installation)

The product is not much affected by the material build-up on the sensor but it can be sensitive by shock due to thin sensing part. So, if possible, it is not recommended to install where the medium is falling down. However, if it is unavoidable to install at the inlet, protector shall be installed to prevent a sensing part from damage by falling medium.

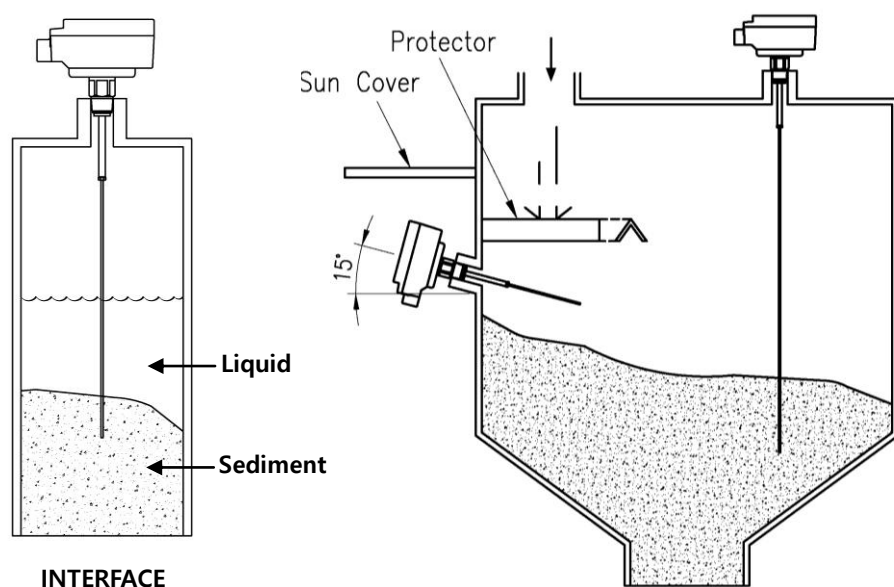
### Top Installation (Vertical Installation)

Special precautions are not required. It is generally used to detect an interface level of sediment in liquids.

- When side installation, inactive rod shall be exposed min. 50mm at least into the tank inside and it is recommended to install slopingly (about 15°) against a horizontal line in order to prevent a malfunction by foreign substance between nozzle and probe.
- Sensor shall be installed at the place far from inlet of the tank and protector shall be installed in order to protect the sensor from damage.
- When side installation, cable entry shall be installed facing the ground for rain proof.
- When the installation at outside, it is recommended to install a sun cover in order to avoid an effect caused by temperature rise.
- If there is an agitator in the tank, the probe shall be installed with a safe distance from the agitator.

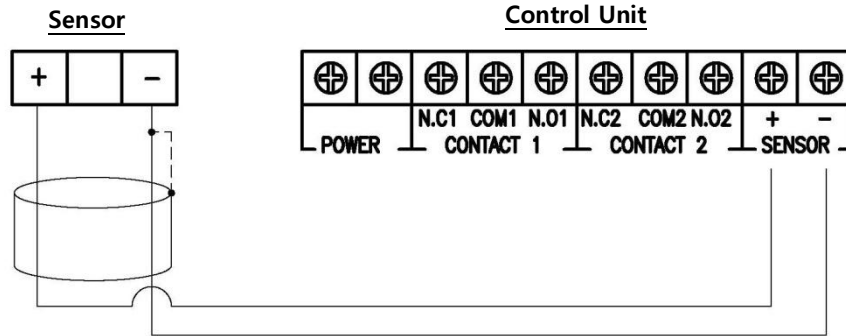


**Pay more attention for installation to the tank which has a vibration because it may cause a malfunction.**

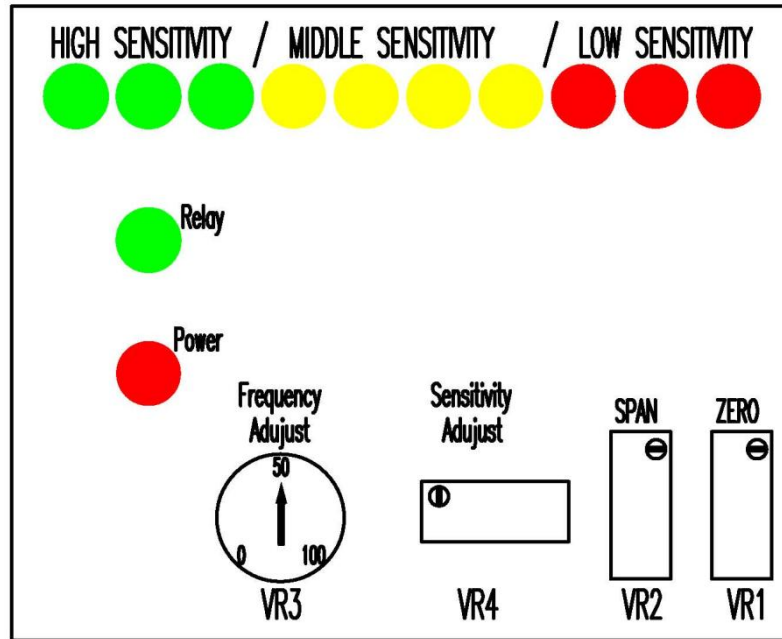


**Wiring**

- Wiring shall be performed after confirming of power source, AC 110V, AC 220V or DC +24V.
- In case of DC power, +, - shall be wired correctly.
- Make sure that wiring shall not be carried out when the power is supplying.
- When wiring of HNV-970 to HLC-970L, use CVVS1.25<sup>2</sup> x 2C cable and maximum distance between sensor and control unit is 500 meter.



**Operating**



- Power and LOW / MIDDLE SENSITIVITY LEDs are on when the power is supplied. When the medium is detected, LOW / MIDDLE SENSITIVITY LEDs are off and Relay LED is on. No need separate setting by user because it is basically set by factory.
- If the setting at the site is newly required, adjust VR1 and VR2 to LEDs to be off and adjust VR1 until Red LED of LOW SENSITIVITY is on. After that, adjust SPAN to be detected turning yellow LED on additionally.



**If frequency is adjusted at the site, it causes a malfunction so make sure to do not set it.**

- Precautions for installation**
- Connect the flanges or bolts with the same specifications.
  - Make sure to insert washers between bolts and nuts to prevent loosening.
  - Make sure to insert a gasket between flanges.  
(Select the gasket in consideration of the temperature of the medium and the pressure inside the container.)
  - Do not bend the sensor which is a vibration part.
  - After installation is completed, make sure to assemble the product cover before supplying of the power.
- Precautions for Removal**
- Check the level and presence of medium in the tank before removing it.
  - Overheated product may cause burn, so wear gloves to remove it.
  - Remove it with the power disconnected.
  - Make sure that any o-ring or gasket is not damaged while opening or closing the cover.
- Safety and Environment**
- Precautions for Use
    - Make sure to mount the product to a vessel using required tools for sure as tightly as possible.
    - Do not apply high impact to the product.
  - Precautions for Wiring
    - Make sure to wire correctly to the terminal of contact. (Refer to wiring method)
    - Wire and supply the power to the product after checking of the specifications.
    - Incorrect power supplying may cause damage to the product.
    - Pay attention to prevent electric shock.
- Maintenance**
- Maintenance
    - Remove a material stuck on the sensor when cleaning of the tank or silo.
    - If the medium moves fast or the agitator works in the tank, perform regular inspection to prevent mechanical damage to the sensor.
    - If the measuring medium is so sticky, check if the medium is stuck on the sensor and remove it periodically.
    - The material stuck on the sensor may cause a malfunction and damage to the device.
- Precautions for Transportation & Assembly**
- Pay special attention to prevent any impact on the device during transportation or assembly. The impact may directly lead to failure.
  - While transporting or assembling the product on a tank or silo, prevent any damage to the assembly packing



**Please do not apply high impact to the product.**




**Failure Check** If the operating does not work normally, check first below points.

- Is the power connection correct?
- Is the power supplying properly in accordance with the specifications?
- Is the wiring for output contact correct?

**Marking**

■ Product Identification

The product identification mark is attached on the housing and shows the model name, serial number, working temperature, working pressure and matters regarding output. The serial number is a unique manufacturing number for the identification of

		<b>HITROL CO., LTD.</b>	
PRODUCT	<input type="text"/>	TAG NO.	<input type="text"/>
SER. NO.	<input type="text"/>	CABLE ENTRY	<input type="text"/>
MAX. PRESS.	<input type="text"/> kgf/cm <sup>2</sup>	MAX. TEMP.	<input type="text"/> °C
AMBIENT TEMP.	<input type="text"/> °C	ENCLOSURE	<input type="text"/>
www.hitrol.com		Made in Korea	

**Warranty and Contact Information**

**Warranty and Service**

The product is subject to the warranty for 2 years after shipment and unpaid service will be provided for any damage occurred under normal operating conditions. If it is not about the failure of product, service fee will be charged.

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