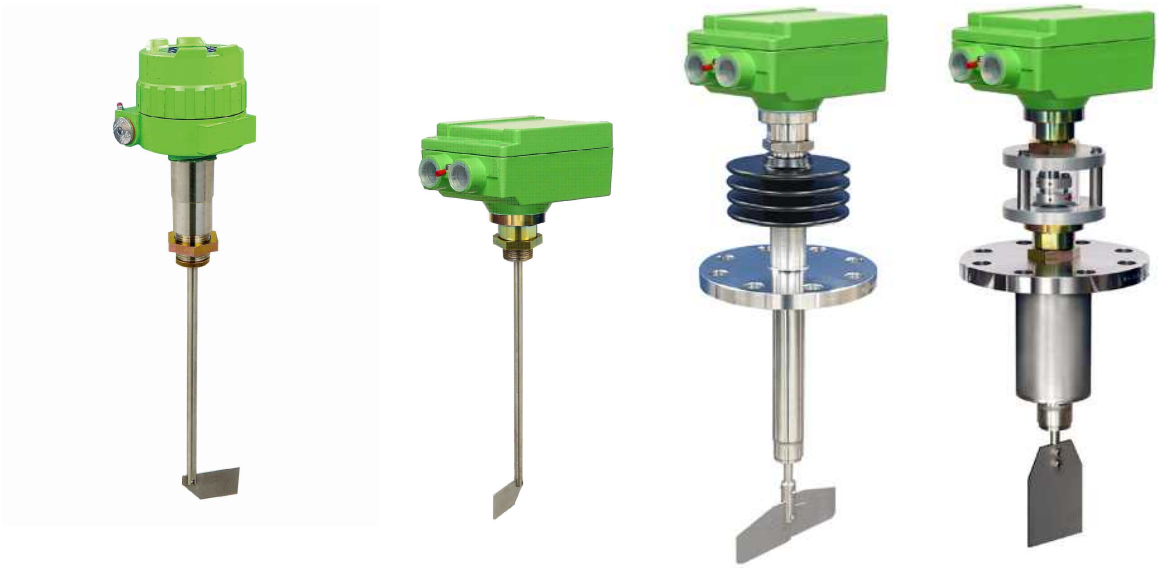
HITROL CO., LTD.
HEAD OFFICE.FACTORY.R&D INSTITUDE
HITROL CO., LTD. 141, Palhakgol-gil, Jori-eup
Paju-si, Gyeonggi-do, Korea
TEL. : (+82)-31-950-9700
FAX. : (+82)-31-943-5600
www.hitrol.com

INSTRUCTION MANUAL

PADDLE TYPE LEVEL SWITCH

HLV-Series



Doc. no.: HLV_IM_Eng_Rev. 0.1
Issue date: 2026. 01

Table of Contents

Overview ... 3

Operation Principle 3

Features 3

Applicatoins 3

Specifications 4

Weather-Proof 4
Explosion-Proof 5

Dimensions 5

Installation 7

Wiring 7

Setting for sensitivity 7

Precautions for Installation 8

Maintenance 9

Precautions for Removal 9

Precaution for Grounding 9

Precautions for External Wiring (Ex) 9

Safety and Environment 10

Marking 10

Model notation 10

User Training 11

Warranty and Contact 11



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.



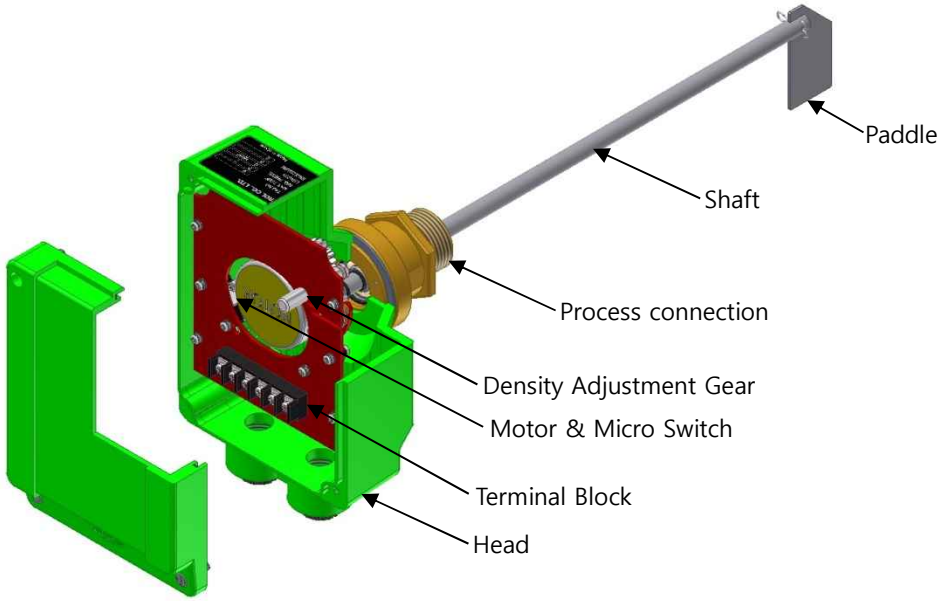
You should be aware of where NOTICE is marked to carry out the work.

Overview

The HLV Series detects the level inside the tank and is used in the process of performing alerts based on the user's use and measurements . This detector has the advantage of being robust in structure, excellent product reliability, and long life. It is mainly used by Hopper and is used for powder measurements such as Powder, Grains, and Lumps .

Operation Principle

When power is applied to the product, the motor rotates and rotates the shafts and wings that are connected together. If the measurement in the container does not touch the rotating wing, the micro switch turns to the 'OFF' state without any load on the motor , and when the measurement hits the rotating wing and loads, the rotating wing stops and the micro switch becomes the 'ON' state.



Features

- ■ Easy to install.
- ■ Easy to operate.
- ■ Simple structure for easy maintenance.
- ■ Have a variety of Paddle forms.
- ■ Ex-Proof Version (Ex d IIB T6/T5) (Ex tD A21 T90˚C)
- ■ Adjustment of measurement sensitivity according to density of measurements.

* It has a built-in clutch slip device, so even if excessive force is applied to the paddle, the motor is not loaded.

- ■ Building materials industry (limestone, foundry sand, etc.)
- ■ Food industry (cell, flour, salt, etc.)
- ■ Plastic industry (large plastic particles)
- ■ Chemical industry

Specification (Weather -Proof)

Model		HLV-300	HLV-300H	HLV-310	HLV-310H
Installation		Top or Side			
Type		Flange or Screw			
Ambient Temp.		-20˚C ~ +60˚C			
Process Temp. (Max.)		80˚C	180˚C	80˚C	180˚C
Enclosure		Weather-Proof (IP65)			
Process Pressure		ATM			
Power Source		AC 110V / 220V, 60Hz			
Power Consumption		Approx. 2.5VA			
Number of Rotation		2 rev./min			
Contact Form		SPDT			
Contact Rating		AC 250V/15A, DC 250V/0.3A, DC 125V/0.6A			
Switch Type		Micro Switch			
Length*		300mm (Std.) / Max. 600mm		300mm (Std.) / Max. 4,000mm (Extension Ver.)	
Process Connection		PF 1"(M) (Std.)			
Material	Housing	AL.C			
	Wetted Parts	SUS 304 (Shaft, Paddle)			
Cable Entry		PF 3/4"(F) (Std.)			

Model		HLV-310HP	HLV-310AP	HLV-320L
Installation		Top or Side		
Type		Flange		
Ambient Temp.		-20˚C ~ +60˚C		
Process Temp. (Max.)		200˚C	200˚C	80˚C
Enclosure		Weather-Proof	Weather-Proof (IP65)	
Process Pressure		ATM		
Power Source		AC 110V / 220V, 60Hz		
Power Consumption		Approx. 2.5VA		
Number of Rotation		2 rev./min		
Contact Form		SPDT		
Contact Rating		AC 250V/15A, DC 250V/0.3A, DC 125V/0.6A		
Switch Type		Micro Switch		
Length*		300mm (Std.) / Max. 4,000mm		500mm (Std.)
Process Connection		65A JIS 10K RF (Std.)		125A JIS 10K RF (Std.)
Material	Housing	AL.C		
	Wetted Parts	SUS 304 (Protection Tube, Shaft, Paddle)		
Cable Entry		PF 3/4"(F) (Std.)		

NOTICE **When Side Mounting, the maximum length of "Length" is limited.**

Specification (Explosion -Proof)

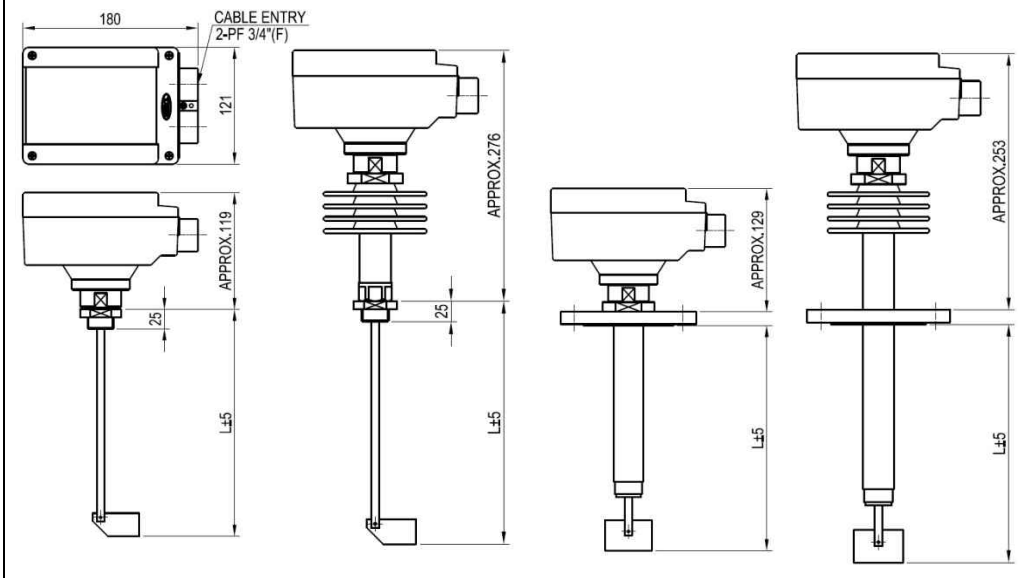
Model		HLV-330-Ex-A	HLV-330-Ex-B
Installation		Top or Side	
Type		Flange or Screw	
Ambient Temp.		-20˚C ~ +60˚C	
Enclosure & Process Temp. (Max.)		Ex-Proof (IP64)	
		Ex d IIB T6 (70˚C) Ex d IIB T5 (80˚C)	
		Ex tD A21 T90˚C (70˚C)	
Process Pressure		ATM	
Power Source		AC 110V / 220V, 60Hz	
Power Consumption		Approx. 2.5VA	
Number of Rotation		2 rev./min	
Contact Form		SPDT	
Contact Rating		AC 250V/15A, DC 250V/0.3A, DC 125V/0.6A	
Switch Type		Micro Switch	
Length*		300mm (Std.) / Max. 600mm	300mm (Std.) / Max. 4,000mm (Extension Ver.)
Process Connection		65A JIS 10K RF (Std.)	
Material	Housing	AL.C	
	Wetted Parts	SUS 304 (Protection Tube, Shaft, Paddle)	
Cable Entry		PF 3/4"(F) (Std.)	

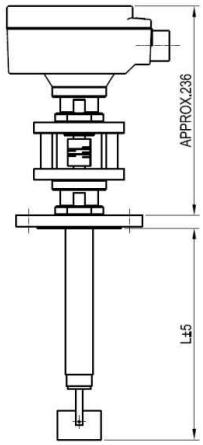
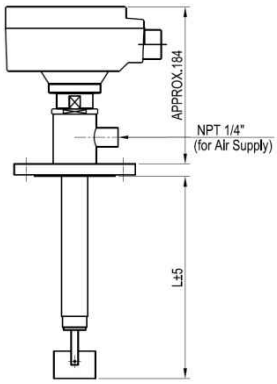
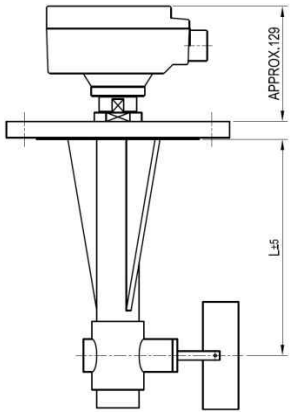
NOTICE **When Side Mounting, the maximum length of "Length" is limited.**

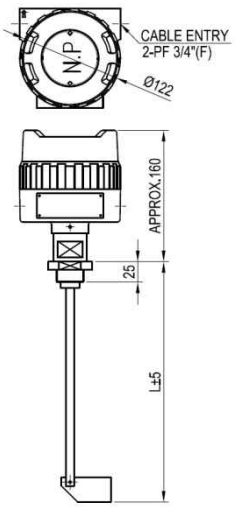
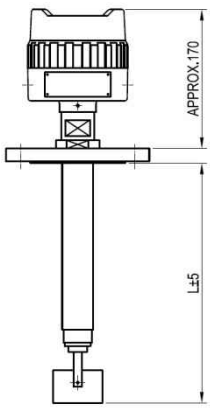
Dimensions

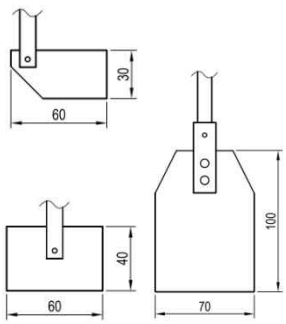
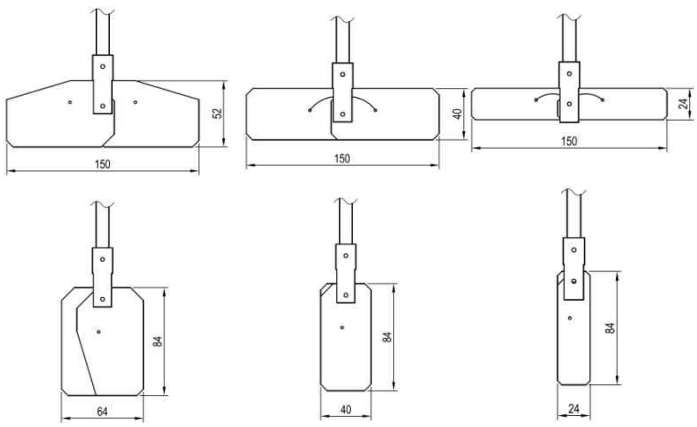
The dimensions on the following pages are indicated in [mm].

Weather-Proof			
HLV-300	HLV-300H	HLV-310	HLV-310H



Weather-Proof		
HLV-310HP	HLV-310AP	HLV-320L
		

Explosion-Proof	
HLV-330-Ex-A	HLV-330-Ex-B
	

Paddles	Foldable Type Paddles		
	3″	2″	1″
			

NOTICE **There may be some tolerance with the actual product.**

Installation

■ Use as a High Level Sensor

- It should be installed in a position where the measurement can be detected on the Level Switch, taking into account the maximum angle of the measurement .

■ Use as a Low Level Sensor

- It should be installed in a place that is not affected by the measurements attached to the Hopper wall with all the measurements escaping .

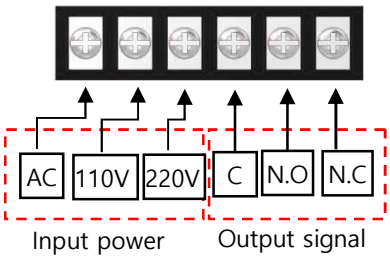
※ Pre-installation inspection points

1) It should not be used in powder with strong adhesion (viscosity).
2) When installing the sensor, avoid shaking areas or obstacles.
3) Installation should be avoided near the outlet as powder flows heavily and is prone to mechanical damage or chattering.
4) The temperature and pressure generated inside the Hopper must be checked to meet the specifications.
5) If the paddle does not fit in the intake port, the foldable paddle must be applied.
6) If the temperature of the housing differs greatly from the ambient temperature, condensation may occur, so dehumidifier filling or Gortex should be applied before use .
7) The flange or screw engagement must be of the same specification.

WARNING **The user shall determine whether the relevant product is an explosion proof area and install the appropriate product.**

Wiring

- It is divided into AC 110V / AC 220V, so connect according to the power specification.
- No connection should be made with power applied.
- For explosion proof products, the external/internal ground terminals must be connected.
- During the run-off, the terminal lug is used to finish the run-off .

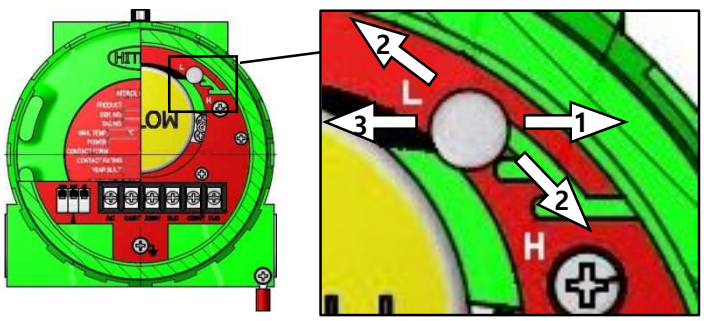


C : Common
N.O : Normal Open
N.C : Normal Close

Setting for Sensitivity

You can set the switching sensitivity by adjusting the DENSITY GEAR .

- Depending on the density of the powder, it can be set in three stages. (H: High density /L: Low density)
- The shipment is set to H .

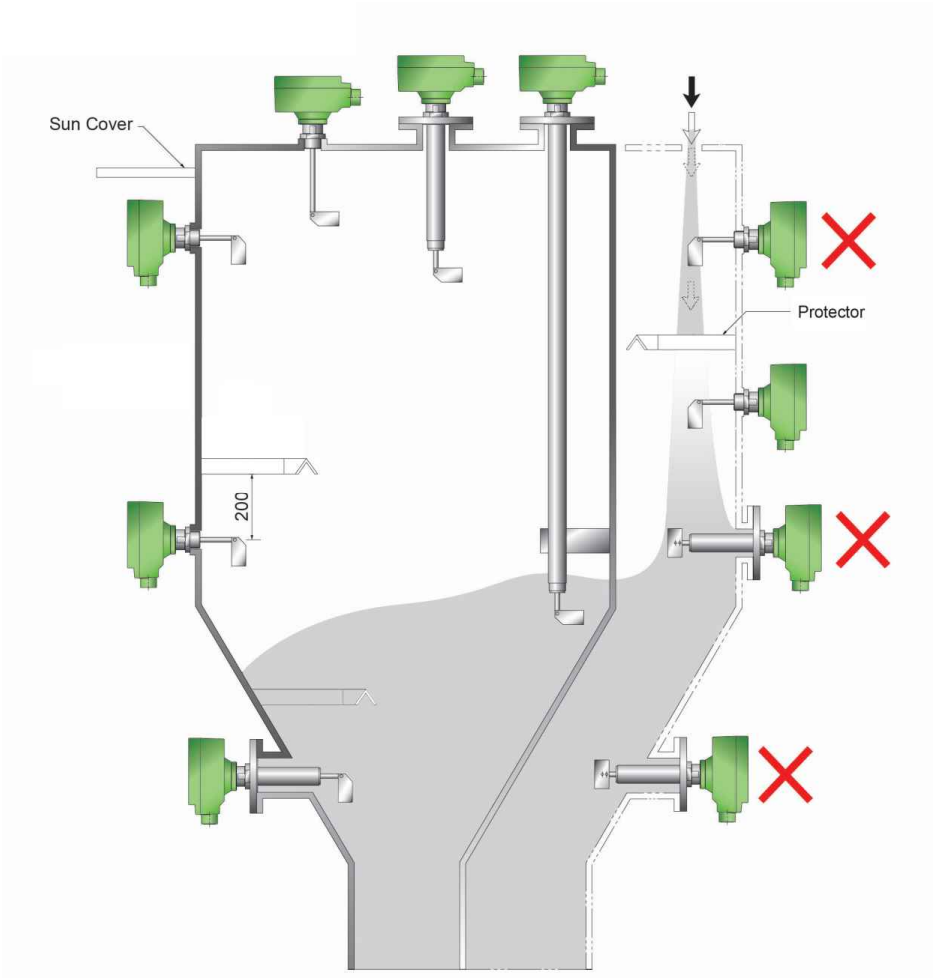


※ Adjust the Density Gear

1. Move to the right.
2. Move it in the direction of H or L set the desired. sensitivity.
3. Move it to the left. Secure the Density Gear.

Precaution for Installation

- The sensor should be installed to avoid the entrance of the contents, and if installed at the entrance of the contents, a protector should be installed on top to prevent the falling contents from directly contacting the sensor.
- When installed on the side, the wire inlet must be installed facing the ground to maintain the rain protection .
- If the load on the paddle is heavier than specification, a protector must be installed on the side installation.
- When installing at a low level, be careful with the Dead Stock and Material Bridge.
- It is recommended that Sun Cover be installed to avoid the effects of temperature rise during outdoor installations.
- The paddle must be installed so that it does not come into contact with the hopper's coronation or wall.
- After installation is complete and the product's cover is assembled, power is applied.
- The user shall fasten a washer between bolts and nuts to prevent loosening .
- When fastening a product to a container, it must be fastened to make it as bonded as possible using a tool or the like.
- When engaging flanges with flanges , the gasket should be used. (The gasket should be selected by considering the temperature of the contents and the pressure of the container.)
- It should not have a big impact on the product.



CAUTION **For Side Mounting, it is not recommended to apply both wings Type Paddle when installing Low Level .**

Maintenance

The life of key parts depends on your environment and can be used in optimal condition through periodic inspection. Therefore, the user should maintain it through periodic inspections at least once a year. Inspection of the appearance of the product should be visually checked for damage, etc., and when the paddle is rotated by hand by separating the product, it should be rotated properly. Measurement objects and foreign substances are attached to the paddle, which deteriorates the quality, so it should be removed regularly.



During maintenance, the product should be checked with the power completely cut off.

Precautions for Removal

- The presence of water levels and measurements in the tank must be checked and separated.
- The product may overheat and burn, so it should be separated using gloves or the like.
- Demolition work should be done with the power off.
- If an explosive gas atmosphere is present, do not open the cover of the product.
- The explosion proof product must be dismantled and the cover must be opened when the cover is disassembled .
- Be careful not to damage the O-ring or gasket when opening and closing the cover of the product.

Precautions for Grounding

The connection room ratio for the grounding and equal-potential coupling conductors shall be in accordance with the criteria of Appended Table 6 (Connection Facilities for Grounding and Coupling Conductors) of the Safety Certification Notice for Protection Devices.

- The ground has an outer ground and an inner ground. When connecting external ground, the size of the ground wire is 4 ㎟
  It shall be (4 mmSQ) and the size of the inner ground wire shall be 3.1 ㎟ (3.1 mmSQ).
- The terminal lug is used in the same size as the cable.



The washer must be used when connecting with the internal ground terminal without the terminal lug . (Prevention of Unleash)

Precautions for External Wiring (Explosion - Proof)

- Users should use cable ground connection or metal tube wire-in at the inlet of the wire, and when connecting with external wire-in, products certified as explosion proofs with performance equal to or greater than the corresponding explosion proof device .
- For unused external wire inlets, use closing plugs that have passed safety certification equal to or higher than the explosion proof device.

Safety and Environment

■ Precautions during use

- When fastening a product to a container, it must be fastened to make it as bonded as possible using a tool or the like.
- The lock must not be lost during use and must be fastened.
- It should not have a big impact on the product.

■ Precautions for product run-off

- The transmitter should be connected to suit its purpose.
- The ground must be connected to the internal ground (there is a ground terminal inside the product head) and the external ground.
- There is a risk of an electric shock, so you have to be careful about your safety.

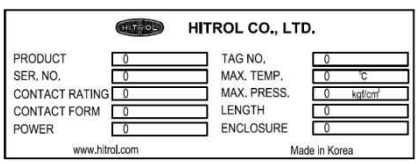
■ disposal of products

- When discarding because the product cannot be used, the AMP body part in the housing of the product is separated from the metal and non-metal materials of the product. There are no accessories that affect the environment, so there is no need to be extra careful. (e.g. mercury switch)

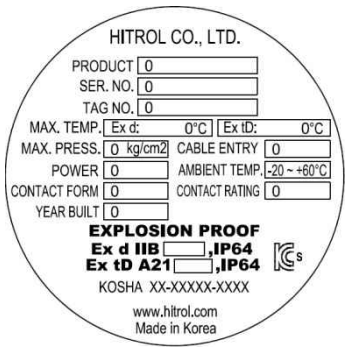
Marking

■ Show product awareness

- The product recognition mark is attached to the housing and displays the model name, serial number, temperature of use, pressure of use, output, etc. of the product. The serial number is the manufacturing unique number that distinguishes the product.



<Weather Proof>



<Explosion proof>

Model notation

The HLV-Series-Ex model configuration is as follows:

HLV-3 3 0 - Ex – a b

- S : Process Connection Screw
- F : Process Connection Flange

- A : General type
- B : Protective tube type

User Training

Be aware of the above, and the fluid temperature of the container using the product should be selected and used within the temperature range. In addition, the ambient temperature of the housing should not exceed -20 to +60℃.

If an explosion-proof product is an explosion-resistant product, never open the cover of the product while in use .

Explosion-proof products are designed in accordance with Article 34 of the Occupational Safety and Health Act and the Ministry of Employment and Labor Notice No. 2020-33.



General products other than explosion-proof products should not be applied to explosion-proof areas, and explosion-proof products can only be used in type 1 and type 2 places where explosive gas atmosphere exists .

It must be installed in compliance with explosion proof temperature rating and applied fluid temperature.

Warranty and Contact

■ Warranty and Services

The warranty period for this product is two years after the product is shipped, and in case of failure that occurs under normal use, you can receive free service. If the product is not broken, requesting service may result in charges regardless of the warranty period.

You can apply for aftersales service through the website or the headquarters.



The warranty period for the motor is one year after the product is shipped.

■ Contact information of headquarters, factories, and research institutes

Adress : 141 Palhakgol-gil ,Jori-eup, Paju-si, Gyeonggi-do (98) High Roll
HITROL CO., LTD 141, Palhakgol-gil, Jori-eup, Paju-si, Gyeonggi-do, Korea

TEL: 031-950-9700 (head office and A/S)

Fax: 031-943-5600 (head office and A/S)