

HITROL CO., LTD.

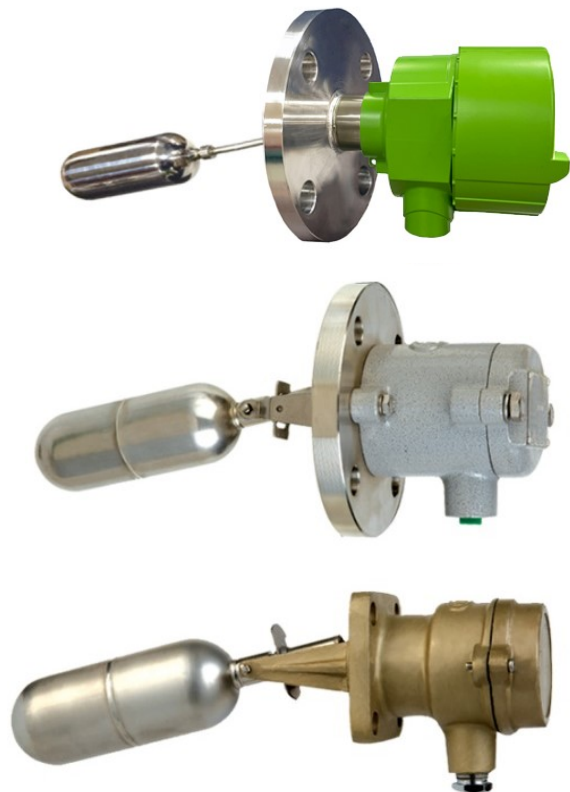
HEAD OFFICE.FACTORY.R&D INSTITUTE
HITROL CO., LTD. 141, Palhakgol-gil, Jori-eup
Paju-si, Gyeonggi-do, Korea
TEL. : (00)-82-31-950-9700
FAX. : (00)-82-31-943-5600
www.hitrol.com



INSTRUCTION MANUAL

FLOAT TYPE LEVEL SWITCH

HM-12 Series



Doc. no. : HM12_IM_Eng_Rev. 2.4

Issue date : 2024. 11

Table of Contents

Overview.....	3
Operating Principle.....	3
Features	3
Specification.....	4
Dimension.....	5
Operating and Usage	7
Precautions for Installation.....	7
Maintenance	7
Precautions for Removal.....	8
Precautions for Grounding (Ex-proof).....	8
Precautions for Inserted External Wire (Ex-proof) ...	8
Safety and Environment.....	8
Marking.....	9
User Training.....	9
Warranty and Contact.....	10



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.



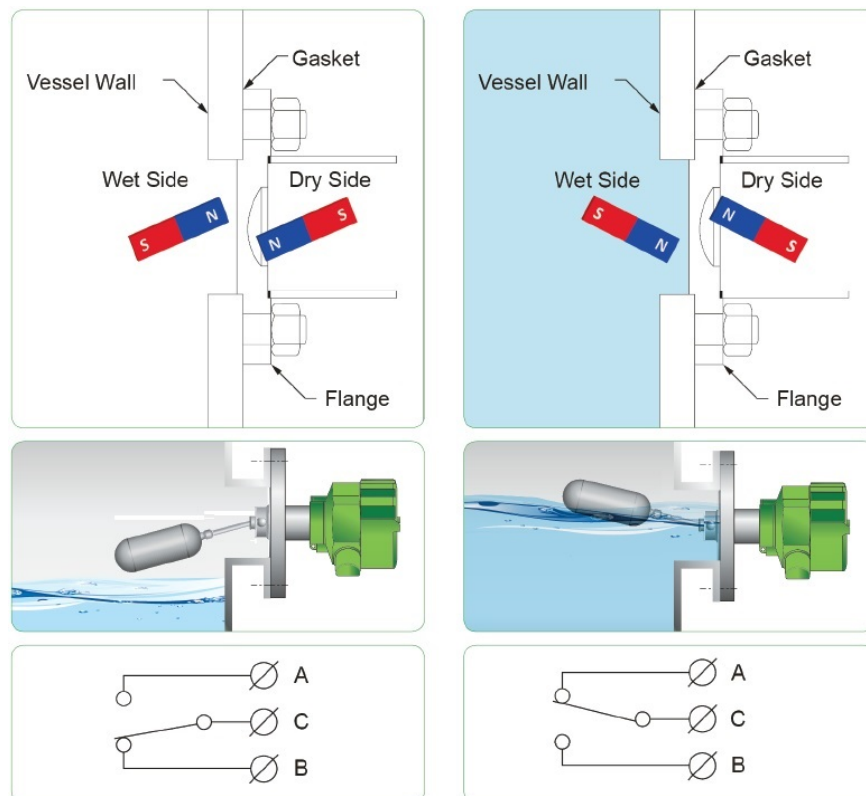
You should be aware of where NOTICE is marked to carry out the work.

Overview

HM-12 Series is a Float Type Level Switch installing on the side of a tank and it is used for the process performing alarm function when filling and discharging of a tank with ON/OFF contact signal. It has advantages of strong structure and long life cycle, and there are two versions, Weather-proof and Ex-proof as per usage.

Operating Principle

HM-12 Series is a level switch which uses a force of repulsion by magnetic each other. As the process level rises, the float rises and the holder magnet in the housing is repelled by the shaft magnet connected to the float and it activates the micro switch. It can be used for high or low alarm.

**Features**

- Widely used to detect various liquid levels
- Strong structure and long life cycle
- Applicable to high temperature container also
- Easy installation
- Ex-proof version is available. (HM-12H-Ex)

Specification Weather-Proof

Model		HM-12S	HM-12H(-L)	HM-12H-SP	HM-12D
Type		Flange			Square Flange
Ambient Temperature		-20°C ~ +60°C			
Enclosure		Weather-Proof			
		IP66	IP65	IP66	IP65
Process Temperature		Max. 120°C		Max. 250°C	Max. 120°C
Process Pressure		Up to 10kg/cm ²	Up to 20kg/cm ²		Up to 10kg/cm ²
Contact Form		1-DPDT		1-SPDT	
Contact Rating		AC 250V, 10A		AC 125V, 5A	AC 250V, 10A
		DC 30V, 5A		AC 250V, 3A	DC 125V, 0.5A
Process Connection		40A JIS 10K RF	65A JIS 10K RF		92 x 92 (mm)
Material	Housing	AL.		AL + SUS 304	B.S
	Wetted part	SUS 316L			SUS 316L + BS
Cable Entry		PF 1/2"(F)			

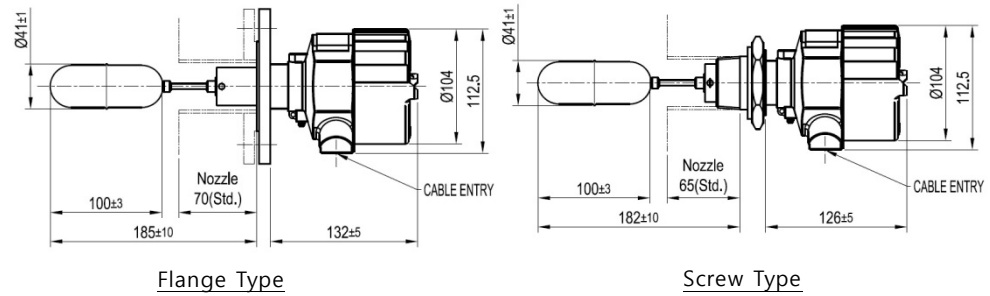
Explosion-Proof

Model		HM-12H(-L)-Ex	HM-12H-SP-Ex
Type		Flange	
Ambient Temperature		-20°C ~ +60°C	
Enclosure		Ex-Proof (IP66)	
Process Temperature (Max.)		Ex d IIC T6 (70°C) Ex d IIC T5 (80°C) Ex d IIC T4 (120°C)	Ex d IIC T3 (150°C) Ex d IIC T2 (250°C)
Process Pressure		Up to 20kg/cm ²	
Contact Form		1-DPDT	1-SPDT
Contact Rating		AC 250V, 10A	AC 125V, 5A
		DC 30V, 5A	AC 250V, 3A
Process Connection		65A JIS 10K RF	
Material	Housing	AL. + SUS304	
	Wetted part	SUS 316L	
Cable Entry		PF 1/2"(F)	

Dimension

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

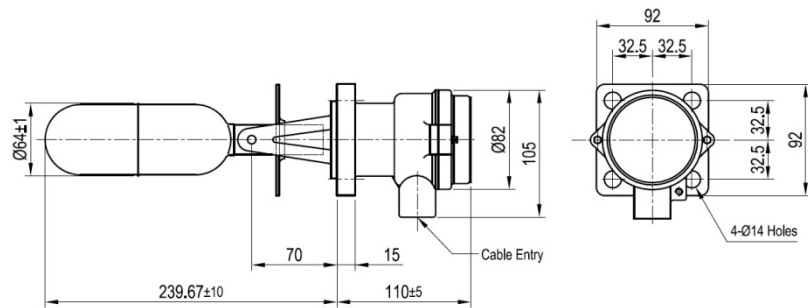
HM-12S



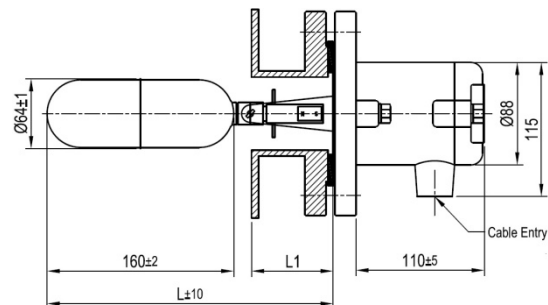
Flange Type

Screw Type

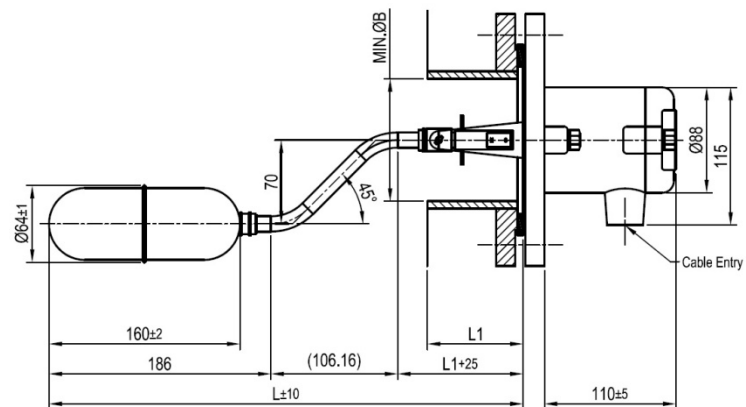
HM-12D



HM-12H



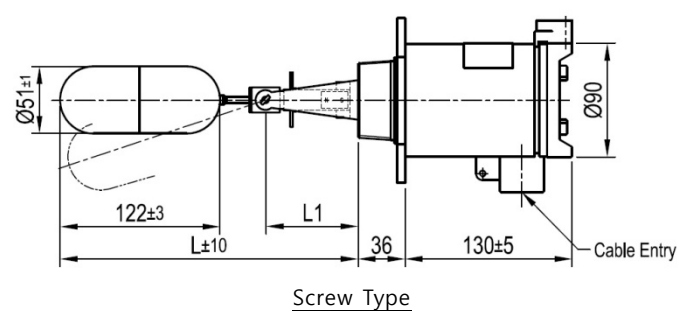
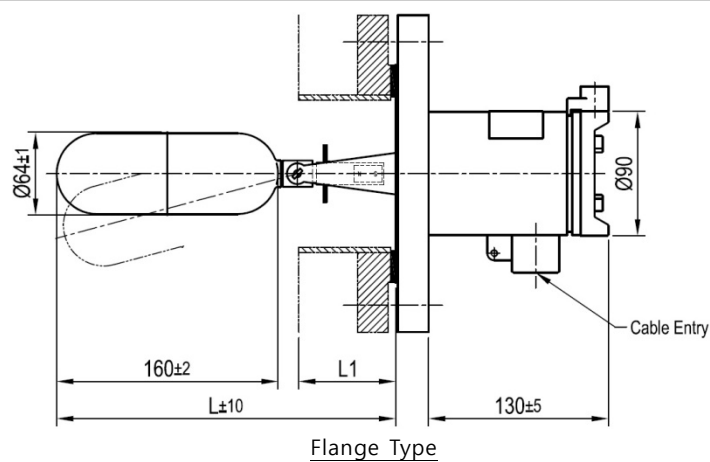
HM-12H-L



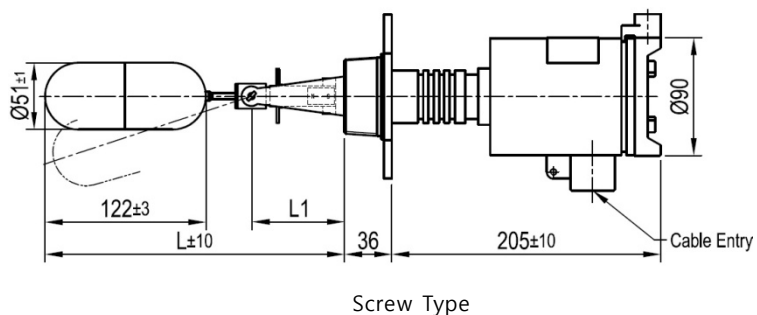
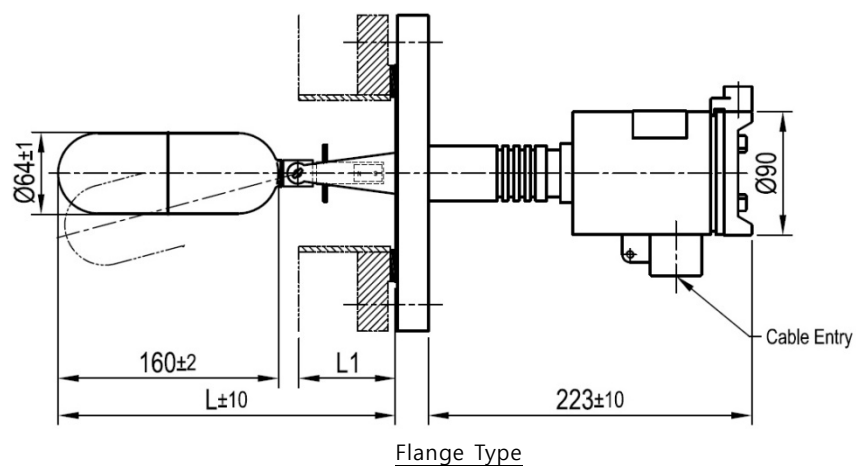
Actual product may have a slight tolerance.

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

HM-12H-Ex



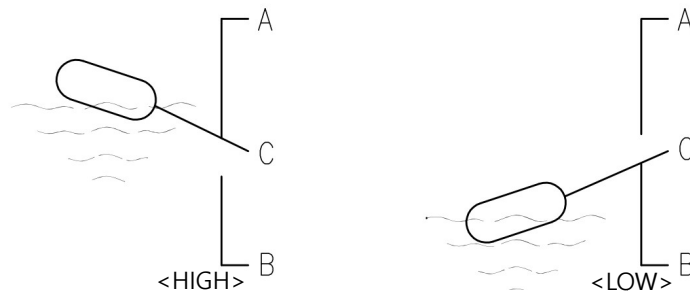
HM-12H-SP(-Ex)



Actual product may have a slight tolerance.

Operating and Usage

Types of contact signal are as below.



Precautions for Installation

- Use the same standard flange or screw.
- Make sure to insert washers between bolts and nuts to prevent loosening.
- Make sure to insert gaskets between flanges.
(Select the gaskets in consideration of temperature of content and pressure of vessel.)
- For Ex-proof zone, make sure to install an Ex-proof version only.
- After the installation is complete and the cover of the product is assembled, power it on.
- The product shall be installed with the direction of the cable entry downward.
- Cable gland and blanking element with KCs safety certification above the certification equivalent level should be used.
- If the measured fluid temperature is higher than 120°C, the inlet temperature exceeds 80°C, so cable gland suitable for this is and The cable must be used.



Please do not apply impact to the product when movement and transportation.

Maintenance

The major parts of HM-12 Series to be checked are a float and magnet. The life spans of major parts vary with user environments and can be used in optimum conditions through periodic inspections. Therefore, the user shall maintain and repair the product through periodic inspections conducted at least once a year. The appearance of the product shall be visually checked to see if there is any damage, and if there is scale caused by measure objects, it shall be removed for the smooth operation of the float.

- Checkup for the micro switch can be simply conducted using a digital multimeter as below.
 - Position the selector of digital multimeter to the buzzer and connect the test pins to N.O or N.C contact signal and COM in the terminal block.
 - Move a float upward or downward and it is normal if the buzzer makes sound on high or low contact points.
 - To check the status of contact signal with resistance value, it is normal if the digital multimeter indicates 0Ω for N.C(Normal Close) and ∞(infinity) for N.O(Normal Open).



Turn off the power of the product for maintenance.

In an explosion area, do not disassemble when power is applied.

Precautions for Removal

- Check the level and presence of measure object in the tank before removing it.
- Wear gloves when removing it, to prevent a burn.
- Disassemble work shall be done with the power off.
- If there is an atmosphere of explosive gas, do not open the cover of the product.
- Unlock the lock key before removing the cover. (Ex-proof)
- Make sure that any O-ring or gasket is not damaged while opening or closing the cover of product.

Precautions for Grounding (Ex-proof)

- The grounding has an external and an internal grounding. When connecting to an external ground, the ground wire shall be 4mm² (4mmSQ).
- The internal grounding wire shall be the same size as the power line, and the size of the internal grounding terminal lug shall be 3.1mm² (3.1mmSQ). If the power line is larger than 3.1mm², connect the ground wire without terminal lug.



Make sure to insert a washer if the terminal lug is removed from ground terminal and then re- connected. (Loosening prevention)

Precautions for Inserted External Wire (Ex-proof)

- Use the cable gland connection or metal pipe line lead-in on the wire inlet, and use a product with equivalent Ex-proof certificate to connect it with the external line lead-in method.
- For non-use external wire inlet, use a closed plug that passes safety certificate above equivalent performance with the product.

Safety and Environment

■ Precautions for Use

- Make sure to connect the product and vessel using required tools for sure.
- Keep the lock key safe and make sure that it is locked.
- Do not apply high impact to the product.

■ Disposal of Product

- Make sure to separate the amplifier and main unit from housing before disposing the products.
- No part (ex. Mercury switch) has influence on the environment, so no special attention is required.

Marking

■ Product Identification

- The product identification mark is attached onto 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 products.

HITROL CO., LTD.	
PRODUCT	TAG NO.
SER. NO.	
MAX. TEMP.	MAX. PRESS.
CONTACT RATING	CONTACT FORM
ENCLOSURE	

www.hitrol.com
Made in Korea

<HM-12S>

HITROL CO., LTD.	
PRODUCT	
TAG NO.	
SER. NO.	
MAX. TEMP.	°C
MAX. PRESS.	kgf/cm ²
CONTACT RATING	
CONTACT FORM	
ENCLOSURE	

www.hitrol.com
Made in Korea

<HM-12D>

HITROL CO., LTD.	
PRODUCT	TAG NO.
SER. NO.	
MAX. TEMP.	MAX. PRESS.
CONTACT RATING	
CONTACT FORM	
CABLE ENTRY	
AMBIENT TEMP.	°C
ENCLOSURE	

www.hitrol.com
Made in Korea

<HM-12H>

EXPLOSION PROOF Ex d IIC, IP66	
PRODUCT	CABLE ENTRY
TAG NO.	CONTACT FORM
SER. NO.	CONTACT RATING
MAX. TEMP.	AMBIENT TEMP.
MAX. PRESS.	

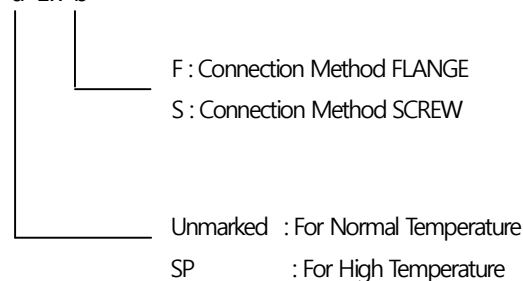
www.hitrol.com
Made in Korea

<HM-12H-(SP)-Ex>

Model Notation

The model configuration of HM-12H-Ex is as below.

HM-12H-a-Ex-b



User Training

The fluid temperature of the container where the product is used shall not exceed 120°C for normal version, 250°C for high temperature version, and 200°C for Ex-proof version. In addition, make sure that the ambient temperature of housing is kept at -20°C ~ +60°C. In the case of an explosion-proof type product, never open the cover of the product during use. Ex-proof products are designed according to Article 34 of the Industrial Safety and Health Act and Article 58.4 of the Enforcement Rules of the same Act.

**Warranty
and
Contact**

■ **Warranty and Service**

This product is subject to the warranty for 2 years of shipment and unpaid service will be provided for any damage found under normal operating conditions. If it is not about the failure of product, the service charge will be payable.

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

■ **Headquarters . Factory . Laboratory Contact Number**

ADDRESS: HITROL CO., LTD 141, Palhakgol-gil, Jori-eup, Paju-si, Gyeonggi-do, Korea

T E L : 031-950-9700 (Headquarters & A/S)

F A X : 031-943-5600 (Headquarters & A/S)