

I N S T R U C T I O N M A N U A L

F O R

SIDE-MOUNTED FLOAT SENSOR



MODEL : H M



Revision 2012-03-01

Read and understand this manual for safely usage.

- This manual describes the product of standard specification. Read the other manual for the product of explosion-proof specification.
- This manual describes the handling, inspection and adjustment of the product which model is mentioned on cover page. Read and understand this manual before handling.
- Follow the additional document and/or direction, submitted by NOHKEN INC. and our distributor or agent, even if the terms are mentioned in this manual.
- Save this manual in proper place being available to refer immediately.
- The specification of product mentioned in this manual may not be satisfied by the condition of environment and usage. Check and consider carefully before using.
- Contact to sales office at NOHKEN INC. for any question or comment about this manual and product.

The followings are the description of the terms in this manual.

 WARNING	Indicates a potentially hazardous situation which, if not pay attention, could result in death, serious injury or serious disaster.
 CAUTION	Indicates a hazardous situation which, if not pay attention, may result in minor or moderate injury or damage to device.

	Indicates prohibited matter. The explanation with this mark shallbe followed
	Indicates instructed matter. The explanation with this mark shallbe followed.

 **WARNING**

This product is not explosion-proof construction. Do not install this product to the place where the flammable gas or vapor is occurred.

If installed, the flammable gas or vapor may be ignited, and serious disaster may be occurred. Use the product of explosion-proof construction in this case.



Do not modify or disassemble the product. Otherwise, the product and connected device may be malfunctioned, damaged, fired, or miner injury and electric shock may be occurred. (Follow the additional document and/or direction, submitted by NOHKEN INC. and our distributor or agent.)



Turn off the power, before wiring and inspection. Otherwise, electric leakage, fire caused by short circuit, and electric shock may be occurred.



Ensure the wire is properly connected. The product and connected device may be malfunctioned, damaged, fired, or miner injury and electric shock may be occurred by improper wiring.



Turn off the power immediately, if the smoke, strange smell and sound are occurred.

Do not use it until the problem is solved.



 **CAUTION**

Avoid shock and rough handling to this product. The product may be damaged by shock as dropping, falling, throwing, knocking, lugging, and etc.



Follow the specification of operating temperature, operating pressure, switch rating, and etc. Otherwise, the product and connected device may be malfunctioned, damaged, fired, or miner injury and electric shock may be occurred. Check the manual or specification sheet.



Operation test shall be done before practical usage. If the serious accident is expected to occur by malfunction of product, the other operating principle of product shall be installed in parallel.





CAUTION

Check and deeply consider the chemical compatibility for material of product in advance. The part especially float, which is very thin, may be malfunctioned by miner corrosion.



Check and deeply consider the chemical compatibility for material of product in advance.



Hold the stem very close to mounting point, when carrying, installing, and removing. If hold the terminal box, it may be taken off from the flange or plug, and the product may be damaged by dropping.



Provide arrester or surge absorber to avoid electrical impact such as lightning and static electricity. If not provide, the product and connected device May be malfunctioned, damaged, and fired, or miner injury and electric shock may be occurred.



In case of connecting inductive or lamp load to the product. Provide protective circuit to the load to avoid over voltage and over current. If not provide, the contact may be damaged.



INTRODUCTION

- A) This manual specifies the specification of general product. If you order special product, some details of specification may be different with the manual.
- B) We are glad to suggest and advice for Model selection and chemical resistant of material, but final decision has to be made by the customer.
- C) This manual has prepared with close attention. Ask sales office at NOHKEN INC. for any question or comment about the contents of this manual.
- D) For replacement parts
The quality of product has frequently improved, so same spare part may not be supplied. In this case, replacement part or product may be supplied. Ask sales office at NOHKEN INC. for details.
- E) The contents of this manual are subject to change any time without notice due to the improvement of product.

WARRANTY & DISCLAIMER

- A) NOHKEN INC. warrants this product against defect in design, material and workmanship for a period of 1(one) year from the date of original factory shipment.
- B) The warranty only covers the damage of products. The secondary and third kind disasters are not covered by NOHKEN INC.
- C) NOHKEN INC. shall not be liable for the following.
 - C-a) Do not follow the description and direction in this manual.
 - C-b) Damage due to improper installation, wiring, usage, maintenance, inspection, storing, and etc.
 - C-c) Repair and modification are done by the person who is not employee of NOHKEN INC. and our distributor or agent.
 - C-d) Improper parts are used and replaced.
 - C-e) The damage is occurred by the device or machine except our products.
 - C-f) Improper usage. (See "Proper of usage" in chapter 1 in this manual)
 - C-g) Force Majeure including, but not limited to, fire, earthquake, tsunami, lightning, riots, revolution, war, radioactive pollution, acts of God, acts of government or governmental authorities, compliance with law, regulation, and order.

THE TERMS OF WARRANTY AND DISCLAIMER SHALL IN NO WAY LIMIT YOUR REGAL LIGHT.

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1. PURPOSE OF USE

The Side-mounted float sensor Model HM-10 is manufactured specifically to detect for clean liquid level, such as oils, water and so on. This sensor is designed for horizontal mounting on a tank or vessel wall. This sensor work well as high or low level alarm or control applications.

2. SPECIFICATIONS

2.1 Specifications

2.1.1 Operation characteristics

- (1) Specific gravity : 0.65 Min.
- (2) Viscosity : 1 Pa·s Max.
- (3) Float travel length : -70 to +70 mm (At center line of sensor)
- (4) Life expectancy : 1×10^5 Min.

2.1.2 Contact rating : 250 V 5 A AC, 230 V 0.25 A DC (Resistive load)
250 V 5 A AC, 230 V 0.05 A DC
(Inductive load $\cos \phi = 0.4$)

2.1.3 Environmental condition

- (1) Withstanding Pressure : 3 MPa Max. (Except a mounting part)
[Static pressure]
- (2) Allowable impact : 100 m/s²
- (3) Working temperature : -10 to +120

2.1.4 Construction : IP44

2.1.5 Others

- (1) Material of wetted parts: 304 Stainless steel, 316 Stainless steel
Epoxy resin
terminal box: Aluminum die casting(ADC12)
- (2) Flange size : JIS 5K 65A
- (3) Float size : 64 × H120
- (4) Cable inlet : G 3/4 or equivalent
- (5) Mass : Approx. 2.6 kg

2.2 Dimensions and Internal Circuit

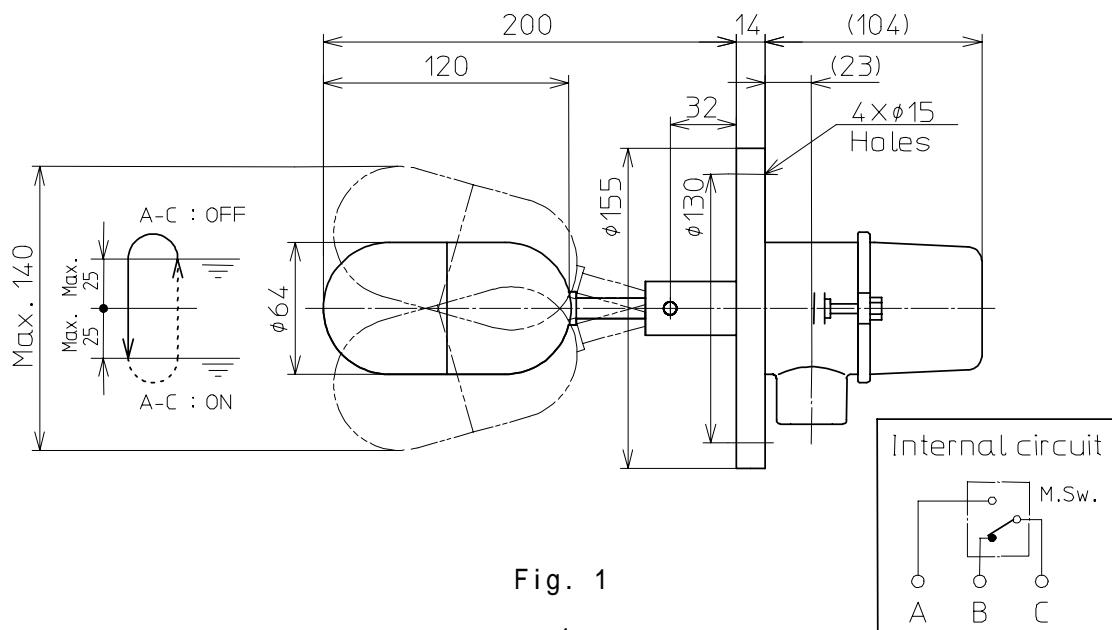


Fig. 1

3. PRINCIPLE OF OPERATION

This sensor is built in microswitch. That actuates due to using repulsion of two magnets. One of the magnet is arranged a state of same polarity facing on the magnet holder inside the terminal box as shown Fig. 2.

When liquid level is below the float, magnet of shaft side rises due to dead load of float, another one move down due to repulsion of magnets. Then the microswitch actuates (terminal between A and C ; close, B and C ; open). Similarly, when liquid level rises above the float, magnet of shaft side falls due to float buoyancy, another one move up due to repulsion of magnets. Then the microswitch releases (terminal between A and C ; open, B and C ; close).

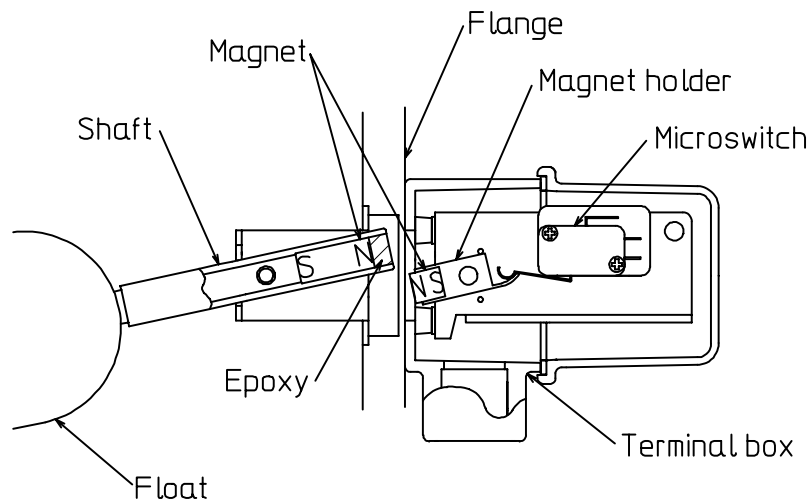


Fig. 2

4. INSTALLATION

4.1 Unpacking

This sensor has been thoroughly inspected and carefully packed at the factory to prevent from damage during shipment. When unpacking, visually check the instrument exterior for damage.


4.2 Installation Location

This sensor should be installed in an area which meets the following conditions:

- (1) Provide adequate working space for maintenance/inspection.
- (2) Low relative humidity and no exposure to moisture.
- (3) No corrosive gases. (Such as NH_3 , SO_2 , Cl_2 and so on.)
- (4) No excessive vibration.

4 . 3 I n s t a l l a t i o n

The cable inlet should be positioned to ground. The terminal between B and C is ON operation with rising liquid level, and the terminal between A and C is ON operation with falling liquid level.

 **CAUTION**

The cable inlet should not be positioned to upward otherwise, sensor may not be malfunctioned.

Refer to Fig. 3.

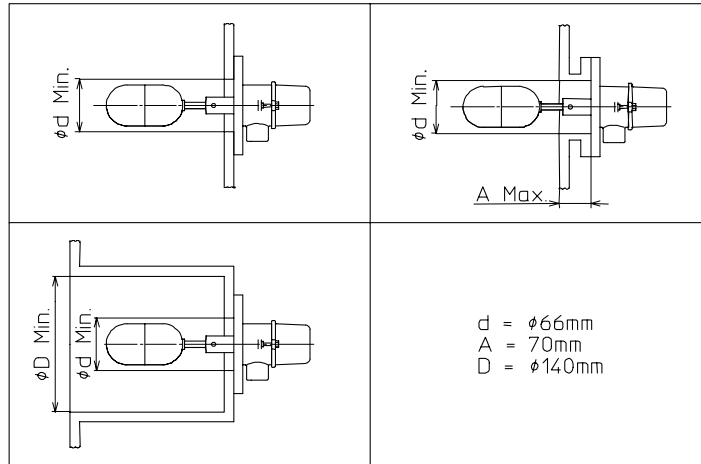


Fig. 3

5 . W I R I N G

Fig. 4 denote inside of terminal box from side view.

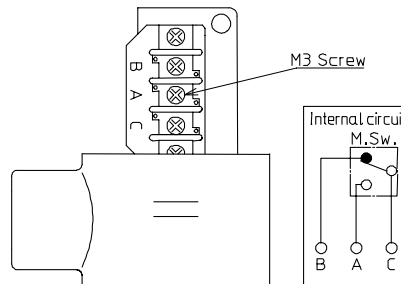


Fig. 4

NOTE the following points ;

- (1) Install solderless lugs fitted to M3 screw to the end of lead wires.
- (2) The cable inlet and the terminal cover must be protected from rain, splashing water and so on.
- (3) Make sure that there are no miswiring.
- (4) The size of the cable inlet is G 3/4. There are two ways for connecting the sensor cable. One is fixing the cable with a cable gland. The other is connecting a conduit to the housing. In either case, an adequate sealing should be provided to prevent water or dust ingress into the housing through the sensor cable. Secure the cable using sealing material for the conduit connection, or a proper tool when the gland is used, to protect the housing inside from dust or water. When water or moisture comes into the housing from the conduit, use putty to fill the inside of the conduit.

6. TECHNICAL NOTES

- (1) Do not store this sensor as following location.
 - High temperature and high humidity
 - Corrosive field
 - Dust field
 - Magnetic field
- (2) Do not give this sensor mechanical shocks.
- (3) Do not install this sensor near inflow or outflow.
- (4) Keep the sensor away from magnetic material such as iron dust.
- (5) If the liquid has sediment or suspended solid, clean the wetted parts.

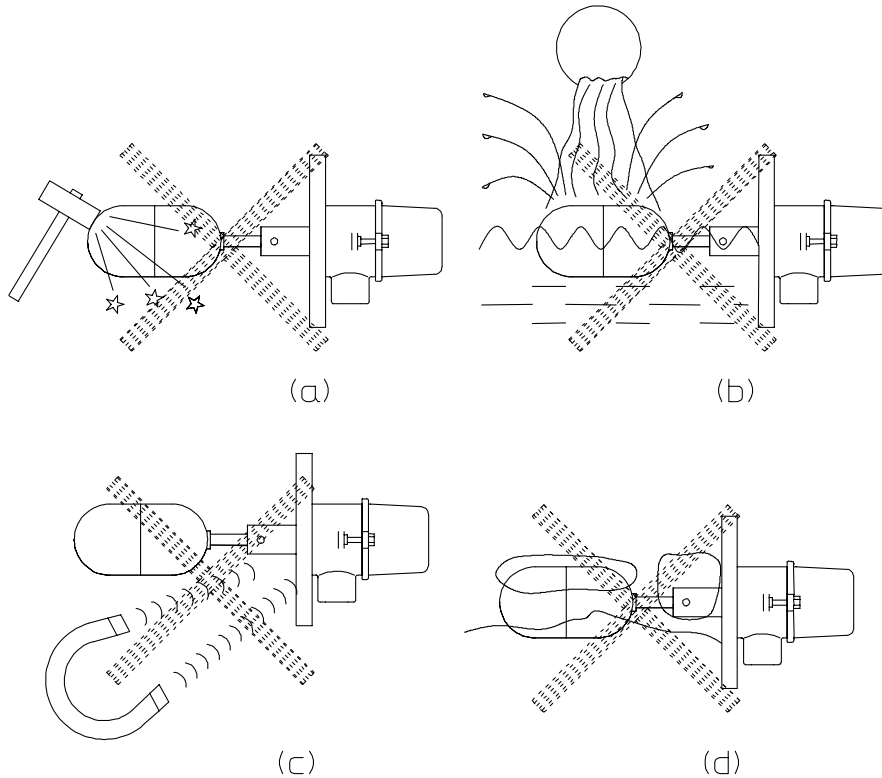


Fig 5

7. MAINTENANCE / INSPECTION

The following annual servicing tasks should be carried out on the sensor.

- (1) Visually check the sensor exterior for damage.
- (2) If sediment or other foreign matter are stained on wetted parts of sensor, keep clean the sensor.
- (3) Connect ohmmeter or electronic buzzer to terminals, check the sensor actuation corresponding to float operation.

Re-install and re-wiring the sensor after maintenance / inspection in accordance with " 4. INSTALLATION " and " 5.WIRING " .

8. TROUBLESHOOTING

▲ CAUTION

Use the following chart to troubleshoot the malfunctioning sensor. If your remedies are unsuccessful, ask Nohken for repair and replacement.

Table 1

Problems	Possible causes	Remedies
Float does not rises or falls with the liquid level	Sediment or other foreign matters on float and shaft.	Clean float and shaft.
	Specific gravity of liquid too light (less than 0.65).	Change the proper level switch.
	Viscosity of liquid too high (exceed 1 Pa · s).	Clean the unit at periodic intervals.
	Float is filled with liquid or is collapsed.	Replace float.
	Float is collapsed by overpressure.	Replace float and keep 3MPa Max. pressure
	Float is contact with mounting nozzle.	Install in good location.
	Float is corroded by chemicals or solvents.	Replace float or change the proper level switch
	Wrong installation.	The cable inlet should be positioned to ground.
Float rises or falls with the liquid level. Switch does not actuate.	Wiring leading to control may be defective.	Replace cable and wire correctly.
	Install in improper level.	Install in proper level.
	Install wrong position.	Install correctly.
	Magnet may be damaged.	Replace the float.
	Affected by strong magnetic field.	Use shield or install in good location.
	Iron particles on float and shaft.	Clean float and shaft.

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