

Float Level Switch

FS series

Instruction Manual



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◆ Introduction

We thank you for choosing our level sensor.

This manual describes the handling, installation and wiring precautions of the FS series reed-type float level sensor. Read and understand this manual carefully before using.

◆ Warranty

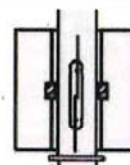
1. NICOM warrants this product against defects in design, material, and workmanship for a period of one (1) year from the date of original factory shipment.
2. If defects occur during the warranty period, NICOM will, at NICOM's option, replace or recondition the product without charge. This warranty is in lieu of and excludes all other warranties of merchantability or fitness for a particular purpose.
3. NICOM makes no warranty with respect to:
 - failure to comply with instructions of this manual.
 - failure or damage due to improper electrical protection, installation, wiring or operation.
 - product repaired, altered or tampered by the purchaser or third parties.
 - direct incidental or consequential damages or losses or expenses resulting from any defective product or the use of any product.
 - Inevitable accidents such as acts of God, force majeure, and so on.

◆ 1. Service

FS series reed-type float level sensors are designed for liquid level detection in containers. The FS custom designed sensors are ideal for rugged hostile applications in numerous industrial, machinery and process control with wide variety of wetted materials, such as SUS304, SUS316, PVC, and so on.

◆ 2. Principle of Operation

A hermetically sealed reed switch is contained in the stem, and a permanent magnet is in the float. As the float rises or falls with the level of the liquid, the reed switch is magnetically actuated.



◆ 3. Unpacking

When unpacking, do not damage the sensor with mechanical shock. After unpacking, make sure that products you ordered are complete. If any part is missing, wrong or damaged, please contact to us.

◆ 4. Installation

Install the sensor in an area, which meets following conditions;

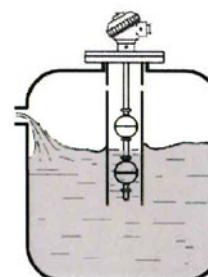
1. Within specified temperature ranges.
2. Locate away from strong magnetic fields such as those produced by motors, transformers, solenoid valves, etc.
3. Low humidity.
4. No drop, splash or vapor around the lead wire egress.
5. Low vibration.
6. Free from metallic substances and any other foreign matters in the liquid.
7. Ample space is provided for inspection and maintenance.



Install the sensor where the liquid level will actually make contact with it. Do not locate near liquid inlet or outlet. If there is surface wave motion, use a time-delay relay or a slosh shield as shown on right.

Mounting orientation should be vertical or horizontal.

To achieve a seal, provide a suitable female thread on the container, and use sealing compound, gasket or thread tape.



Material	Operable temperature range	Gasoline	Alcohol	Solvent	Acid	Alkali
NBR	-20~+130°C	○	○	×	△	○
EPDM	-40~+150°C	×	○	○	×	○
Silicone	-40~+240°C	○	○	○	○	○

○ : No effect (Good)

△ : Moderate effect (Fair)

× : Severe effect (Poor)

◆ 5. Wiring

! Caution

The reed switch cannot be repaired after damaged. Contact must be protected by properly rated electrical protection devices, such as miniature relay or PLC. Check that there is no miswiring, overload, or short-circuit before supplying the power.

Contact rating

Code	Max. Contact capacity	Max. Working voltage	Max. Working current
Japanese domestic use	50W / 50VA	200V DC / 240V AC	0.5A DC / 0.5AAC
European Use	10W / 10VA	48V DC / 50V AC	0.3A DC / 0.5AAC

Maximum contact rating of all sensors is 50 VA for Japanese domestic use, and is 10VA for European use. For long-life usage, we recommend to provide a contact protection circuit to the sensor. Do not exceed the contact ratings. Otherwise, reed switch in the sensor will be broken immediately.

Eventual current, voltage, and that multiplier should be within the rating.

Example of Japanese domestic use :

$100(V) \times 0.1(A) = 10(VA) \cdots \text{Useable.}$

$200(V) \times 0.5(A) = 100(VA) \cdots \text{Exceeds capacity. Connect to a relay or PLC for protection.}$

For European users, we use the small contact-rating switch for safety reason to meet Low Voltage Directive (73/23/EEC).

Wiring table for up to 5 actuation points (terminal number and wire color)

	L1	L1	L3	L4	L5	Com
1P	1 (Black)					C (Black)
2P	1 (Red)	2 (White)				C (Black)
3P	1 (Red)	2 (White)	3 (Yellow)			C (Black)
4P	1 (Red)	2 (White)	3 (Yellow)	4 (Blue)		C (Black)
5P	1 (Red)	2 (White)	3 (Yellow)	4 (Blue)	5 (Green)	C (Black)



◆ 6. Field adjustable actuation levels and NO/NC

NO (Normally Open: switch closes as liquid level rises) and NC (Normally Closed: closes as liquid level falls) can be changed in the field by inverting the float. Direction of close is marked on the float.

Actuation levels of the FSF-T- N series are adjustable in the field, but the FSF-T-/FSS series cannot adjustable.

For the user of the FSF-T- N, please proceed following procedures:

1. Open the housing. Loosen the terminal plate mounting screw.
2. Pull the terminal plate with the internal circuit out from the stem.
3. Move position of reed switches to new levels. Secure reed switch with the vinyl tape.
4. Insert the internal circuit back into the stem, and tighten the terminal plate.
5. Adjust position of floats and float-travel-stops to match the position of reed switches.

◆ 7. Maintenance

1. Clean contaminant or sticky buildup on the float.
2. Check for and replace the damaged or collapsed float.
3. Check for corrosion due to condensation, gas and vapor.

◆ 8. Troubleshooting

Phenomena	Remedies
Float rises or falls with the liquid level. Switch de-activated.	<ol style="list-style-type: none"> 1. Miswiring. Wire correctly 2. Cable broken. Replace the cable. 3. Float-travel-stop is in improper position. Adjust it. 4. Reed switch In the stem is improper position. Adjust it. 5. Reed switch is damaged. Replace the new one. 6. Affected by strong magnetic field. Use the iron shield or install in the good position. 7. Liquid penetrates into the float. If you can listen water slosh when shaking the float, replace the new one.
Float does not rise or fall with the liquid level.	<ol style="list-style-type: none"> 1. Sediment or other falling matters on the float. Clean it. 2. Specific gravity of t liquid is too light. Change the proper float. 3. Liquid penetrates into the float. If you can listen water slosh when shaking the float, replace the new one. 4. The sensor is installed into the stilling tube without vent holes. Drill holes. 5. Float is in contact with the stilling tube. Use the spacer. 6. Float is collapsed by over-pressure. Replace the proper float. 7. Float is swelled or corroded. Replace the chemically compatible float
Switch chattered	<ol style="list-style-type: none"> 1. Loose cables. Tighten connections. 2. Waves or disturbances in the container. Use the stilling tube or time-delay timers.

If above remedies are unsuccessful, ask us for repair or replacement.