

AUTOMATION PRODUCTS GROUP, INC.

Operator's Manual

FLE Series

Magnetic Float Sensors

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Doc. 9002273



Automation Products Group, Inc.

APG...Providing tailored solutions for measurement applications

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Table of Contents

Warranty 3
Description 4
Installation 5-6
Wiring 7
Circuit Protection 8
Inspection & Maintenance 9
Technical Notes 9
Specifications 10



• Warranty and Warranty Restrictions

APG warrants its products to be free from defects of material and workmanship and will, without charge, replace or repair any equipment found defective upon inspection at its factory, provided the equipment has been returned, transportation prepaid, within 24 months from date of shipment from factory.

THE FOREGOING WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES NOT EXPRESSLY SET FORTH HEREIN, WHETHER EXPRESSED OR IMPLIED BY OPERATION OF LAW OR OTHERWISE INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

No representation or warranty, express or implied, made by any sales representative, distributor, or other agent or representative of APG which is not specifically set forth herein shall be binding upon APG. APG shall not be liable for any incidental or consequential damages, losses or expenses directly or indirectly arising from the sale, handling, improper application or use of the goods or from any other cause relating thereto and APG's liability hereunder, in any case, is expressly limited to the repair or replacement (at APG's option) of goods.

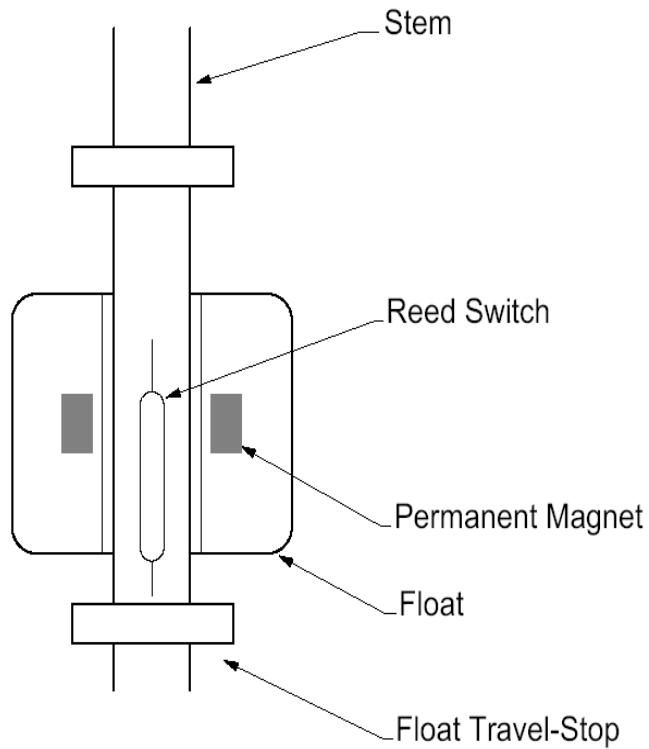
Warranty is specifically at the factory. Any on site service will be provided at the sole expense of the Purchaser at standard field service rates.

All associated equipment must be protected by properly rated electronic/electrical protection devices. APG shall not be liable for any damage due to improper engineering or installation by the purchaser or third parties. Proper installation, operation and maintenance of the product becomes the responsibility of the user upon receipt of the product.

Returns and allowances must be authorized by APG in advance. APG will assign a Return Material Authorization (RMA) number which must appear on all related papers and the outside of the shipping carton. All returns are subject to the final review by APG. Returns are subject to restocking charges as determined by APG's "Credit Return Policy".

• Description

The FLE series instruments contain reed switches in the stem and permanent magnets in the floats. As the float rises or falls with the level of the liquid, the magnet inside the float act on the reed switch inside the stem to provide the SPST switching action.



• Installation

- Unpacking -

When unpacking the instrument, exercise care not to subject the instrument to mechanical shock. After unpacking, visually inspect the instrument for damage.

- Environment -

The FLE series sensors should be installed in an area which meets the following conditions:

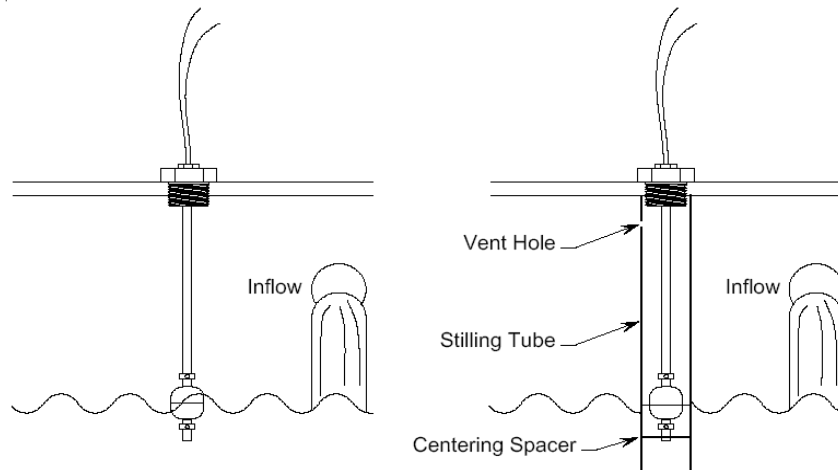
1. Non-hazardous area.
2. The medium temperature does not exceed -14°F to 185°F (-10°C to 85°C).
3. Locate the sensor away from strong magnetic fields such as those produced by motors, transformers, solenoid valves, etc.
4. The medium is free from metallic substances and other foreign matter.
5. No corrosive gases such as NH₃, SO₂, Cl₂, etc.
6. No excessive vibration
7. Ample space for maintenance and inspection.

• Installation

- Location -

Do not locate the FLE series sensor near inlets/outlets.

If there is surface wave action, then use a time-delay relay or stilling tube. If a stilling tube is used, drill vent holes in the tube and use a centering spacer on the bottom of the stem to assure the float has free travel inside the tube.



Wave action may cause switch to chatter.

Use a stilling tube or time-delay relay to prevent switch chatter.

- Mounting -

The FLE can be mounted up to 30° from vertical.

1. Flange Mounting

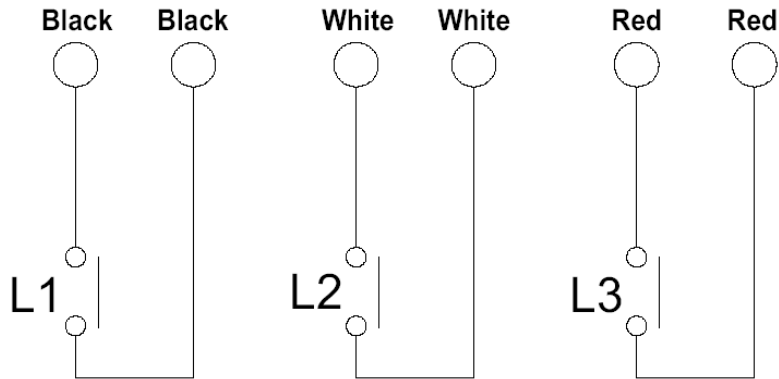
Provide the compatible mating flange on the tank and install using a suitable gasket.

2. Plug Mounting

Provide the compatible female boss on the tank and install the FLE with a suitable gasket, O-ring, or thread tape.

• **Wiring**

- Wiring for 1 to 3 switches



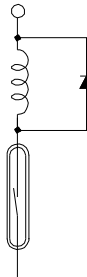
Number of Levels	Wiring Color		
	L1	L2	L3
L1	Blk x 2		
L2	Blk x 2	Wh x 2	
L3	Blk x 2	Wh x 2	Red x 2

• **Circuit Protection**

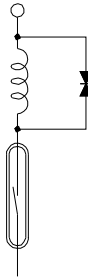
WARNING!

DO NOT EXCEED CONTACT RATINGS! When an inductive load is used (e.g. a motor, a coil, or an electromagnetic relay), a back electromotive force of several hundred volts (energy stored in the inductance) arises when the contacts are opened. This results in considerable decrease in contact life. The same result arises even when a resistive load is used with a high voltage or a large current. The figures below show circuits for protecting the reed switch(s) from the back electromotive force.

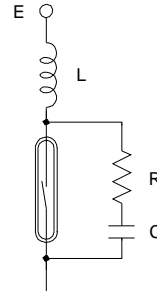
Protecting Circuit Using Diode



Protecting Circuit Using Varistor



Protecting Circuit Using CR



$$C = I^2/10 \text{ (uF)}$$

$$R = \text{Approx. } \frac{E}{10 \times I (1 + 50/E)}$$

Switch	Code A	Code B
Max. contact capacity	20 VA	50 VA
Max. switching current	0.5A AC	0.5 A AC
Max. Voltage	220 VAC	220 VAC

• Inspection and Maintenance

Periodic inspection is necessary to keep your FLE unit in good working order.

CAUTION! Do not remove the housing cover until the power supplied to the unit is turned off.

Keep the sensor clean.

Never leave the housing cover off (for units equipped with a housing). If the cover becomes damaged or is misplaced, order a replacement immediately.

If sediment or other foreign matter is trapped between the stem and the float, detection errors may be caused. Keep the float and stem clean.

• Technical Notes

1. The float travel stop settings are based on how the magnetic field influences the reed switch. Normally it is not necessary to move the stop. If the stops are moved, check the switch action for float overrun.
2. Normally Open (NO) (switch closes as level rises) and Normally Closed (NC) (switch closes as level falls).

• FLE Specifications

Maximum Number Switching Points	3	
Resolution	+/- 1/16" (2mm)	
Field Adjustable Actuation Levels	No	
Maximum Length	48 in.	
Maximum Process Temperature	-14° to 185° F (-10° to 85° C)	
Housing Material (optional)	Aluminium (IP68, NEMA 4X), Stainless Steel ((NEMA 4X) Nylon (IP 65)	
Hazardous Rating	None	
Contact Rating:		
Switch	Code A	Code B
Max. contact capacity	20 VA	50 VA
Max. switching current	0.5A AC	0.5 A AC
Max. Voltage	220 VAC	220 VAC

Notes

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