

**Operating  
Data  
Installation  
Maintenance  
Instructions**

**For**

**Magnetic Level Gauge**

# **RVI Magnetic Level Gauge**

## **1. Note**

Please read and take note of these operating instructions before unpacking and commissioning. The instruments may only be used, maintained and installed by qualified personal familiar with the operating instructions and the applicable health and safety requirements.

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## **3. Specific Applications**

The Level Control Gauge has been designed for use in level monitoring applications and pump control for liquids

The gauge usually consists of a custom stainless standoff tube; adjustable latching reed sensors, custom ruler and a NEMA box with inlet and outlet connections and internal terminal strip. The terminals have blank white clips for customer identification marks.

The RVI is a remote visual indicator and is usually mounted externally of a tank in custom configurations. Unlike sight glasses with fluid following the level – the RVI uses flags magnetically coupled. If the glass is broken no fluid will leak as the flags are magnetically coupled.

## **4. Operating Principles**

A float, housed inside the standoff tube follows the liquid level and rises and falls in the main tank. The float is equipped with a special magnet configuration that allows the magnetic lines of force to react with the flags. The flags have tiny directional magnets inserted inside as well. This special feature both helps to flip the flags as well as keeps them vertical as well.

The float / flag combination must be matched to direction and is factory set.

In order for the switches to work with a float that is not regulated by “stops” to maintain the state position, a special reed configuration is used. The switches are SPDT per the specification sheet but a tiny magnet is placed in line with the switch. The magnet is not strong enough to pull the switch in but is strong enough to maintain a latched position once activated by the larger traveling float. Switches are factory set in the correct pole position.

Simply – the float travels past the switch and changes the state. The switch will remain changed until the magnet passes it the opposite direction – in then goes back to it's at rest position.

## **RVI Magnetic Level Gauge**

### **5. Instrument Instructions**

The instruments are thoroughly inspected by the factory prior to shipment and sent in perfect condition. Should any damage to the device be visible, we recommend a thorough inspection of the delivery packing. In case of damage please inform your parcel service/forwarding agent immediately, since they are responsible for damages incurred during transit.

Scope of delivery:

- Custom RVI Magnetic Gauge per Purchase Order
- Operation Manual
- Reed Operation

### **6. Mechanical Installation**

Must be installed to local piping and plumbing codes.

## RVI Magnetic Level Gauge

### 7. Technical Specifications

#### Preliminary Technical Data Sheet

Instrument Type	Magnetic Level Gauge
Model	RVI Stainless Steel
Housing Size	Custom
Housing Material	316 Stainless Steel
Float	316 SS
Flag Display	Red / White Engineered plastic
Flag Temperature with housing	-20 to 200 Deg. C
Reed (standard enclosure– pvc cable) Option	SPDT, Silicon cable, Latching
Top Flange	¾" NPT 316 SS
Bottom Flange	¾" 316 SS
Reed position (option)	Adjustable
Ruler	N/A
Liquid Indication	Red Flags
No Liquid Indication	White

## RVI Magnetic Level Gauge

### 8. Electrical Connection

**ATTENTION:** Ensure that the voltage levels of your supply system are in agreement with the voltage levels given on specification sheet.

Make sure that the electric supply lines are not active during connection to this device.

- Improper wiring can lead to damage of this device as well as injury to the user.
- Make sure that installation; wiring and circuit protection are in **accordance with all local electrical codes.**
- Make sure the supply circuit **provides adequate fuse or circuit breaker protection** that is in accordance with the circuits current rating.
- Make sure that proper snubber circuits are used per the reed switch specification sheet.

Electrical connections to the relay module are made by - connecting the wires to and out of the NEMA box. Wiring is per attached drawings and specifications.

**Wiring Table**

<b>Terminal #</b>	<b>Description</b>	<b>Function</b>
Contact	Rating	120 AC/DC @ 0.5 amps resistive
N/O	Normally Open	Blue
N/C	Normally Closed	Brown
Common		Black
Grd.	Ground	Green

Each NEMA box contains three sets of three terminal blocks. Each block is equipped with a white tag for identification. Each set of three terminal blocks is marked with it's switch position.

The reeds are factory set in the dry position. Be sure to connect the wires and check using an OHMmeter only per reed switch specifications.

## **RVI Magnetic Level Gauge**

### **Adjustments**

**Moving Sensors.** Loosen the screws, slightly, that hold the flag display to the gauge. Loosen the gear clamp and slide the sensor. Tighten the flag display

**Moving Ruler.** Loosen the screws, slightly, that hold the flag display to the gauge. Have one or two people support the ruler and loosen the four gear clamps. Do not loosen the nuts holding the ruler to the post. Slide the ruler to the new position and re-tighten the flag display.

### **Operation**

In the empty position the float is at the bottom all flags are red and switches are set to either N/O (normally open dry) or N/C (normally closed dry). As the liquid rises the flags will flip to white following the liquid level.

When the float passes a reed sensor the state of the sensor will flip. The sensor will maintain the flipped state until the float passes it in the other direction.

# Wiring Diagram

Wiring to be completed by installer.

## 9. Set Up

### IMPORTANT INFORMATION

#### Horizontal Flange Model

Do not drop the float into a dry vertically standing gauge.

Carefully lay the gauge flat with the flags facing up. All flags will be red with green intervals. The switches are factory set to position. Slip the float in the top with the arrow pointing up or to the top. Lift the tube very slow and let the float slide down the tube to the bottom. If done so at a slow speed all the flags will flip to white indicating an empty position. The reeds will also go to requested state.

If the flags did not all flip to white slowly slide the float out and repeat the procedure. This will work due to double magnetic coupling.

Connect the three reed sensors to the terminal box and mark. Connect to the control panel. Please read "Reed Switch Protection"

Ensure that all wiring to the Level Control Module is correctly installed and the level switches are installed and functioning correctly

## 10. Troubleshooting

The reeds do not switch:

- Check the sensor with an OHM meter scale. If both contacts show closed (circuit complete) the switch has most likely been burnt. This can be caused by a voltage spike or exceeding the limit of the reed. It is a pilot duty device. See reed spec sheet.
- If the float is not moving it is possible an object has lodged itself between the float and the gauge wall.
- The reed can change state if the unit receives a blow or hit. The reed would have shaken itself loose from the small holding magnet. No damage will be done the float will have to go through the cycle to correct the situation.

## 11. Maintenance

The RVI requires no special maintenance other than making sure sludge or debris to not enter the gauge. The nuts on the scale should be checked from time to time for tightness. If they do loosen it may be due to the resonance of the tank and a thread locker should be applied. The machine screws on the scale should be checked. If they come loose use a thread loc on them. Also check all gear clamps for tightness

Sensors can be replaced as well as added to.

There are no user serviceable parts inside the SSR 1000 module. If repair is required please contact your local distributor to return for repair.