Reference Manual
00809-0200-4430, Rev AC
October 2025

Rosemount™ 9930 Magnetic Level Indicator

ROSEMOUNT™

EMERSON™

Safety information

⚠ WARNING

Read this document before installing the product.

⚠ WARNING

Physical access

Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users' equipment. This could be intentional or unintentional and needs to be protected against.

Physical security is an important part of any security program and fundamental to protecting your system. Restrict physical access by unauthorized personnel to protect end users' assets. This is true for all systems used within the facility.

⚠ CAUTION

Personnel injury

Never use the vent or drain on the magnetic level indicator as pressure relief for the process.

NOTICE

Equipment damage

Open the valve slowly to allow any pressure to equalize. This allows process fluid or vapor to enter the magnetic level indicator slowly and reach operating pressure and temperature at a reasonable rate.

Contents

1 Overview

1.1 Rosemount 9930 Magnetic Level Indicator

The Rosemount 9930 Magnetic Level Indicator (MLI) consists of a:

1. a flag indicator equipped with equally spaced flags viewed through clear panel
2. a float chamber mounted directly to the process vessel

While a variety of mounting styles are available to suit most vessel or piping requirements, standard MLIs are usually flanged or coupled to the process vessel.

MLIs are manufactured to meet the exact specifications of the process, such as:

1. Operating pressure
2. Temperature
3. Specific gravity
4. Many more

Standard chamber materials are stainless steel. Additionally, most non-magnetic material may be used, including but not limited to:

- PVC
- Hastelloy
- Monel
- Alloy 20

The float chamber is designed to meet the requirements of the process conditions. The float chamber contains a magnetized float. The float moves freely inside the MLI chamber as process fluid level rises and falls.

NOTICE

Floats are only interchangeable when process conditions and chambers are the same.

Note
Under normal conditions, the float should be about 70 percent submerged in the process fluid. With different process conditions, the float position in the fluid varies

If the MLI is placed in a location difficult to access, consider ordering an MLI with either:

- a top flange in place of the standard vent plug
- an inverted MLI

An inverted MLI is equipped with the drain flange at the top and the weld cap on the bottom. Inverted MLIs can be cleaned and serviced through the top end.

1.1.1 Flag indicator

The standard flag indicators are industrial grade and consist of a series of metal flags. Each flag is silver on one side and red on the other. As the magnetic float moves up and down with the level, each flag will rotate 180 degrees to show the other color.

Rosemount flags are housed in a rugged, hermeticallysealed aluminum housing with a recessed glass window. Each flag rotates on a ceramic and stainless steel bearing surface eliminating the possibility of an incomplete rotation. Flag assemblies are built to the length of the magnetic level indicator in one continuous piece up to 20 ft. (6.1 m) with no joints or blind spots.

1.1.2 Optional follower indicator

The scale assembly used for indicating level consists of the clear indicator tube with the red magnetic follower and a graduated scale marked with feet and inches. Other scale measurements are also available, including:

- Metric
- Gallons
- 0-100 percent

Note
The follower indicator is also referred to as a "bird."

The follower indicator assembly is mounted parallel and immediately next to the indicator tube. The hermetically-sealed indicator tube prevents moisture and dirt accumulation. The impact of the follower against the glass is cushioned by a rubber buffer sealed inside the indicator tube bottom. The bright red follower provides maximum visibility.

Note
Light kits for illuminating magnetic level indicators (MLI) are available.

A black reference line around the follower allows the operator to easily match the graduated scale with the actual level of the process fluid.

Positive zero indication is provided by a nameplate at the lower end of the scale. The MLI reads zero when the vessel is empty and the follower is visible.

NOTICE

Decoupling

If the follower is decoupled from the float, the follower will fall behind this nameplate and not be visible. To prevent the float from losing magnetic coupling with the follower, a spring or stop plate is mounted to both ends of the float chamber to cushion the impact of the float against the float chamber when the process vessel is completely full or empty.

In locations where surging or turbulent levels may cause decoupling problems, flag assemblies may be preferable to the optional follower indicator. Flag indicators provide higher visibility than follower indicators. Flag indicators may be ordered with scales in feet and inches.

2 Installation

2.1 Installing Rosemount 9930 Magnetic Level Indicator

2.1.1 Installation guidelines

Rosemount 9930 Magnetic Level Indicators (MLI) are securely packed in specially-designed crates to provide maximum protection during shipment.

Note
It is important to unpack and inspect each gauge upon receipt to ensure the flag indicator tube and float chamber are free from damage.

If damaged or broken parts are found, contact Emerson immediately. All Rosemount 9930 MLIs are fully insured against damage or loss (unless otherwise specified by customer). Claims must be filed within 15 days of the date of receipt of shipment.

NOTICE

Always level the float chamber vertically. If it is not leveled vertically, the float may become magnetically uncoupled from the follower.

If the float decouples from the follower during installation, use a permanent magnet or magnet tool (available from Emerson) to pull the follower back to the float's magnetic field. See Float magnetically decouples from the red indicator follower for more details on re-coupling float and followers.

Install valves between the process vessel and MLI to allow draining, cleaning, etc. Standard block valves may be used and can be ordered with the MLI from Emerson or supplied by the customer. To protect flange faces, all MLIs are shipped complete with ⅛-inch aramid fibers with a nitrile binder style gasket.

Note
The aramid fibers with nitrile binder gasket that is shipped with the product is supplied only to protect flange faces during shipping. The user is responsible for supplying appropriate gasket for the process conditions.

NOTICE

Bolts on the product are only hand-tight for shipping purposes, and will need to be torqued to process specifications when installing.

2.1.2 Place the magnetic level indicator in service

To ensure proper operation of the magnetic level indicator (MLI):

Prerequisites

Ensure that operating conditions (temperature, pressure, specific gravity, etc.) are within the specifications of the magnetic level indicator. Each MLI has a permanent name plate at

the bottom of the scale indicating process specifications as well as the serial number and tag number.

Procedure

1. Install the float.

   Ensure that the side marked *TOP* is at the top.

   - For Style E magnetic level indicators (top mount), remove the float stop.
   - For Style A magnetic level indicators, install the included float stops between the top and bottom process connections.

⚠ CAUTION

The next step is very important in highpressure applications. If the bottom valve is opened first and the vessel is under pressure, the float inside the chamber will raise abruptly and could lodge in the top of the chamber, causing severe damage to the float and chamber.

NOTICE

Ensure that the float chamber is closed with no openings to the atmosphere. Ensure all drain and vent plugs are securely in place and that all vent and drain valves are closed.

2. When the MLI is mounted and ready to be placed in service, open the top process connection valve first.

   Note
   To equalize any existing pressure, open the valve slowly. This allows process fluid or vapor to enter the magnetic level indicator slowly and reach operating pressure and temperature at a reasonable rate.

3. When the MLI has reached process pressure, open the bottom process connection.

⚠ CAUTION

Personnel hazard

Never use the vent or drain on the magnetic level indicator as pressure relief for the process. Failure to follow this warning creates an unnecessary risk to personnel and equipment.

2.1.3 Remove the magnetic level indicator from service

Procedure

1. Close the bottom process connection valve to prevent further filling of the magnetic level indicator (MLI).
2. Close the top process connection valve to completely isolate the MLI from the process pressure.
3. Attach proper vapor collection equipment to the MLI vent connection if required.

4. Open the top vent to relieve pressure in the MLI and allow air to flow when the bottom drain is opened.

⚠ CAUTION

To prevent potential machine damage, open vent slowly to relieve magnetic level indicator pressure.

5. Attach the proper liquid collection equipment to the bottom drain.
6. Remove liquid.

After all process fluid is out of the MLI, the MLI is ready to be removed from service.

2.1.4 Retrofit magnetic level indicator with flag option

When you purchase flag indicators with a Rosemount Magnetic Level Indicator (MLI), no installation is necessary. If the indicator has been removed or a retrofit kit is purchased for a MLI already in service.

The mounting clamps connecting the flag assembly to the MLI chamber are adjustable to most manufacturers' standards (2- to 3-inch pipe). If the MLI is in service and there is liquid in the tank, only the individual flag adjacent to the float rotates to red when the indicator assembly is clamped on.

To reset the indicator to show the true level:

Procedure

1. Drain the magnetic level indicator to empty to zero the indicator.
2. Then fill it again.
3. As the float rises with the level, the indicator will reset and read properly.

Note
Red = Liquid; Silver = Vapor Space.

2.2 Install the gauge-mounted MLT Magnetostrictive Transmitter

Reference Magtech MLT Operations Manual for installation instructions for the gauge-mounted MLT Magnetorestrictive Transmitter.

2.3 Installing a Magtech LT1 Transmitter

To install a Magtech LT1 Transmitter, refer to Magtech LT1 Series Analog Level Transmitter instructions.

2.4 Installing a Magtech MLS Series Level Switch

To mount a Magtech MLS Series Level Switch, refer to MLS Series Specifications for instructions.

3 Clean and inspect the magnetic level indicator

Standard magnetic level indicators (MLI) have a ½-inch vent and drain plug in the top and bottom of the float chamber for cleaning and removal of the process fluid as required. To clean the MLI periodically without stopping service or removing the drain flanges or floats, connect the MLI to solvent or steam lines.

Prerequisites

Clean and inspect MLIs on at least an annual basis. You may need to clean and inspect more frequently, depending on the severity of the process.

Procedure

1. Block in the float and chamber with the process connection valves or wait until the vessel is empty or out of service.

   To remove the magnetic level indicator (MLI) from service, see Remove the magnetic level indicator from service.

2. When the fluid is completely drained from the MLI, remove the drain flange and gently remove the float.
3. Examine the float for excessive wear. If excessive wear is found, then contact the factory.
4. Clean as required.
5. Clean the inside wall of the chamber with a bottle brush or similar scrubbing tool.

   Note
   For some processes, you may need to clean with a suitable solvent.

6. After cleaning the chamber, reinstall the float and drain flange.

   NOTICE

   If replacing gaskets, ensure they are compatible with the process fluid.

7. Ensure that the stainless steel pipe clamps are tight.
8. Adjust the scale holder up or down on the float chamber to make sure the positive zero is correctly positioned.
9. Use a Rosemount permanent magnet or magnet tool to attract the red follower until it is coupled to the float inside the chamber on standard indication.

4 Troubleshooting

4.1 Troubleshooting Rosemount 9930 Magnetic Level Indicators

Rosemount 9930 Magnetic Level Indicators are relatively easy to install and use. The following tips may be helpful as you install and start up the magnetic level indicators.

4.1.1 Float magnetically decouples from the red indicator follower

If the follower is decoupled, it will fall behind the name plate and not be visible.

If this is a recurring problem, there are several possible causes, most resulting from improper magnetic level indicator (MLI) installation.

Recommended actions

1. Slide a magnet along the indicator window from “0” to where red is displayed.
2. Verify that the scale and channel assembly are tight against the MLI chamber the entire length of the scale, so that the magnetic coupling is maintained from the top to bottom of the indicator tube.

NOTICE

Sometimes, especially with longer MLIs over 5 ft. (1.5 m), the glass will bow out slightly and the float will lose coupling with the follower at some point. Emerson supplies stainless steel tie wires with MLIs over 5 ft. (1.5 m) long to keep the glass from bowing out. Ensure these wires are in place, tightened, and secure.

3. Verify the float inside the chamber is right side up.

NOTICE

If the float has been placed in the chamber upside down, it has only half normal magnetic strength and will decouple from the indicator follower. All floats are clearly marked `TOP` on the top end.

4. Ensure the float stop springs or plates mounted in the top and bottom of the MLI chamber are in place.

NOTICE

If the float stop springs or plates have been removed, the float will continue to rise past the top of the indicator tube and will lose coupling with the follower at that point.

5. If sudden surges of process fluid are causing decoupling, partially close the process connection valves or retrofit the MLI with the flag option.
6. If none of the above actions solve your decoupling problem, contact Emerson for more information or for replacement floats and/or indicators.

NOTICE

Magnets exposed to extreme temperatures (over 1100 °F [593 °C]) will lose their magnetic properties. Other problems that could damage the float and cause decoupling include over pressurization, solids or large particulates lodged in the chamber, or dropping the float.

4.1.2 Magnetic Level Indicator level differs from true level in tank

This is a common problem during start-up and is easily corrected.

Potential cause

Under normal conditions, most floats are about 70 percent submerged in the process fluids and magnets are in the upper portion of the float. However, the position of the float in the fluid varies with different process conditions.

Recommended action

To get a true reading, loosen the pipe clamps that mount the indicator scale and tube and adjust the scale up or down the chamber as required to get an exact reading (within ½ in. [12.7 mm]).

4.1.3 Magnetic Level Indicator tube is cracked or broken

If the glass tube is cracked or broken, Emerson can usually ship a replacement within 24 hours after the order is placed.

One of the advantages of the Rosemount magnetic level indicator (MLI) is that the glass can be easily replaced without taking the MLI out of service or shutting down the process. To replace the glass:

Recommended actions

1. Loosen the two screws in the PVC or PTFE block located in the top or bottom of the scale assembly.
2. Remove the block and slide out the broken glass.

Note
If the MLI is over 6 ft. (1.8 m) tall, it may be easier to remove the entire scale and channel by loosening the pipe clamps and taking it off the MLI. This will protect the new glass when replacing it and remounting it to the MLI chamber.

4.1.4 Level switches don't trip properly

All level switches may be wired to trip on rising or falling level.

After the switch is wired for the desired alarm action, it is necessary to set the switch.

Recommended actions

1. Pass the float manually to the switch level.
2. Fill the magnetic level indicator chamber until the float passes the highest switch.
   This will trip the switch to the desired setting, so it will alarm properly with the rise or fall of level.

4.2 Troubleshoot the sensor probe

Refer to Magtech LT1 Series Analog Level Transmitter for Liquid Level Measurement Instruction and Operations Manual for sensor probe troubleshooting.

A Rosemount 9930 Magnetic Level Indicator parts

When ordering replacement parts for Rosemount 9930 Magnetic Level Indicators, include the following information:

- Serial number of magnetic level indicator or accessory item
- Description of item
- Original purchase order if possible

The following items/options are available for purchase:

- Typical float chamber parts
  - Vent plug and spring
  - Drain flange and spring
  - Drain plug
  - Magnetized float
  - Top float spring
  - Float stop plates with spring (Style A only)
- Indicator scale assembly parts
  - Scale/channel assembly
  - Indicator tube (glass or polycarbonate)
  - Pipe clamps
  - Name plate
  - Indicator tube mounting blocks (top and bottom)
- Follower indicator option

00809-0200-4430
Rev. AC
2025

For more information: **Emerson.com/global**

ROSEMOUNT™

EMERSON™