Globe United

MAGNETIC LEVEL GAUGE

Instruction Manual

www.globeunitedae.com

About the Company

Globe United FZE was established in 2010 in the Emirate of Sharjah within the United Arab Emirates. The company has three Business verticals: Manufacturing, Services and Distribution. Our quality and management practices are in compliance with ISO 9001:2015 and ISO 45001:2018 duly certified by TUV Nord

Introduction

The Globe United MLG is designed to safely determine the level of liquids and liquid interfaces. The operation of the MLG is both simple and unique. The magnetic circuit provides the best combination for floats and indicators available. The magnets in the float actuate the indicator flags as the level rises or falls. The indicator tracks the float exactly, which in turn provides an accurate level measurement.

Globe United

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1. PRODUCT WARRANTY

Globe United FZE warrants its products as designed and manufactured by Globe United to be free of defects in the material and workmanship for a period of one year after the date of installation or eighteen months after the date of manufacture, whichever is earliest. Globe United FZE will, at its option, replace or repair any products which fail during the warranty period due to defective material or workmanship. Prior to submitting any claim for warranty service, the owner must submit proof of purchase to Globe United and obtain written authorization to return the product. Thereafter, the product shall be returned to Globe United. This warranty shall not apply if the product has been disassembled, tampered with, repaired or otherwise altered outside of Globe United factory, or if it has been subject to misuse, neglect or accident. The responsibility of Globe United hereunder is limited to repairing or replacing the product at its expense. Globe United shall not be liable for loss, damage or expenses related directly or indirectly to the installation or use of its products, or from any other cause or for consequential damages. It is expressly understood that Globe United is not responsible for damage or injury caused to other products, buildings, personnel or property, by reason of the installation or use of its products.

THIS IS GLOBE UNITED'S SOLE WARRANTY AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED WHICH ARE HEREBY EXCLUDED, INCLUDING IN PARTICULAR ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This document and the warranty contained herein may not be modified and no other warranty, expressed or implied, shall be made by or on behalf of Globe United unless made in writing and signed by the General Manager.

Important

Globe United does not have any control over the manner in which our sight flow indicator is handled, installed or used, and Globe United cannot and does not warrant or guarantee that the sight flow indicator is suitable or compatible with the user's specific application.

Warning

Failure to follow any instruction could possibly result in a malfunction of the sight flow indicator or glass breakage with resulting sudden release of pressure causing serious personal injury or property damage

2. RECEIVING INSPECTION AND PERFORMANCE CONFIRMATION

2.1 Receiving Inspection

Upon receipt of the Magnetic Level Gauge with Chamber, check the entire component for damage incurred in transit. If damage is evident, do not attempt installation. Notify Globe United immediately for an inspection or for replacement.

2.2 User Rating Inspection

The user shall confirm that the Magnetic Level Gauge with chamber model number and pressure/temperature rating stamped on nameplate conforms to the description on your purchase order. The operating conditions described in the purchase order to be in line with the actual conditions at the installation site. The construction material of the Magnetic Level Gauge should be compatible with both the contained fluid and surrounding atmosphere in the specific application.

Important

If the size, model or performance data of the Magnetic Level Gauge as received does not conform to any of the criteria above, do not proceed with installation. Contact Globe United personnel for direction on what to do

2.3 Pre Installation/ Receiving Inspection Checklist

- Check the level gauge chamber on dents.
- Check the process connections if they are exactly what you have ordered.
- Check the Magnetic Level Gauge center to center distance equals the vessel's center to center.
- Check the measurement lengths of the indicator with the top mounted level gauges.
- Remove the float from the Styrofoam and check on damages for side mounted level gauge.
- Manually move the float from 0% to 100% to 0% prior to start up/check out in order to reinitialize accessory products, if so equipped. Accessories may inadvertently change state due to rough handling in shipment.
- Remove float prior to pressure testing tank.
- If you have ordered reed switches check the quantity. They are mounted on the side of the level indicator chamber, next to the indicator.
- Float damage will occur if not removed from chamber prior to pressure testing the tank.

3. INSTALLATION

3.1 Equipment's/ Tools Required for Installation

- Open-end wrenches or adjustable wrench to fit the process studs and nuts. A torque wrench is highly desirable.
- Flat-blade screwdriver.
- Digital multimeter or digital volt/ammeter if transmitters or switches are attached.
- Gasket for mating flanges.
- Teflon tape & "never seize" for threaded units.
- Pipe wrench for threaded units.
- Level.

3.2 Side Mount Installation

The Side Mounted Magnetic Level Gauge nameplate can be used as bottom reference of the external cage. Install the cage to the vessel with nameplate at bottom. Isolation valves are recommended for installation between vessel and external cage. Check to ensure the external cage is vertical. All piping should be straight and free of "low spots" or "pockets" so that the lower liquid connection will drain toward the external cage. Adjust piping as required. It is recommended a drain valve be installed in the bottom flange to allow cleaning and checking level. Close the isolation valves until start up. Initial installation of the Magnetic Level Indicator is simple. Unless otherwise specified, MLG will be shipped from the factory fully assembled. All flanges will be torqued to ANSI specifications. Make sure all process connections attached to the vessel that the gauge would be mounted to be vertically level, and flanges, if any are level. Carefully unpack the MLI and stand it up vertically.

- Select a suitable location on tank, where vibrations if any are minimum.
- Ensure that process connections and C=C distance of level gauge match with those on tank.
- Ensure counter connections provided on tank are vertical and in plumb line.
- Provided separate Isolating valve on the tank for Safety and removal of Level Gauge for repairs / Maintenance.
- Minimum clearance required from bottom nozzle to ground for Float removal / replacement = 500 mm.

Important

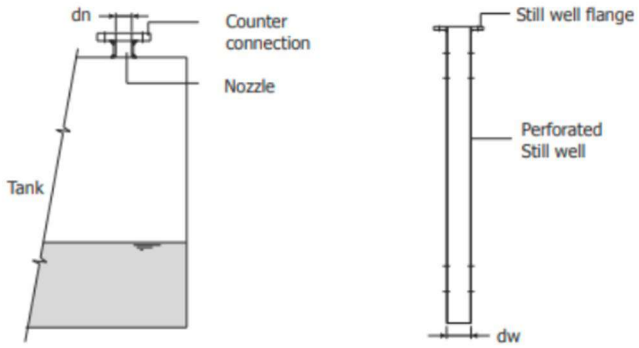
Isolation valves are recommended, but not required. If isolation valves are used, care must be taken when opening the valves to prevent a surge of fluid or gases through the chamber. A surge can cause the float to be propelled to the far end of the chamber, and float damage could result.

Warning

- If under any situation, the MLG is pressurized higher than the maximum pressure
- If an explosive atmosphere can be present in the system, the vertical filling and emptying speed of the liquid surface inside chamber may never exceed 1 meter per second.
- Do not open the bottom isolation valve quickly, always open slowly.
- Be sure that both isolation valves are closed before you start the commissioning
- The level indicator is a part of the system. It is not allowed to place a safety valve on the level indicator. Level indicators must always be disconnected during the process without having any negative consequences on the rest of the system.

3.3 Top Mount Installation

A top mount lLG can be installed as one complete unit into the top of the vessel. Take care to ensure that the float is inserted vertically in the vessel so that the magnet pack extension tube does not get bent. If the float / magnet pack needs to be removed, the magnet pack retaining snap ring and Teflon disc can be removed from the bottom side of the mounting flange.



- Ensure that ID of mounting nozzle is greater than float diameter and still well diameter.
- Still well is recommended to be used, where 1) Turbulence is present. 2) Ranges beyond 1.5 mtrs.
- Provide suitable gasket between the flanges and appropriate thread sealant between threads before bolting / tightening, to ensure zero leakage through joints.
- In case of Magnetic follower capsule glass tube should be filled with clean water & the capsule is submerged in water.
- Ensure that the Follower capsule or Flappers are properly coupled with magnetic float to get level indication. If required, coupling of float and bi color can be made using external magnet.
- Ensure intact coupling between float & bi-color flappers after opening of Isolation valve, if not open isolation valve gradually.
  Adjust Scale, so that zero marking on it corresponds to dead liquid level in gauge. (Float starting point).

Important

Claim for warranty against abnormal usage, mishandling, breakage, disaster, incorrect installation and usage beyond limits of specified operating conditions / electrical parameters is invalid and warranty tends to be void.

3.4 Special Accessory Installation

3.4.1 Insulation or Blanket Installation for high temperature Insulation

Factory-installed high temperature insulation blankets are fastened to the chamber with straps and are removable. Optional flange covers are also available as well. If the gauge is to be field insulated, switches and transmitters must be mounted outside of the insulation to protect sensitive components from excessive temperatures. Globe United recommends purchasing of in house installed insulation blankets. All removable insulation blankets are sewn with fire retardant Teflon thread.

Temperature	Thickness	Liner	Jacket
0 ... 250 F (-18 ... +121^0 C)	1/2″	Weather resistant silicone cloth	Weather resistant silicone cloth
+251 – 500 F (+122 ... +260^0 C)	1″		
+501 – 1000 F (+261 ... +538^0 C)	2″	Weather resistant aluminized silicone cloth	

Important

Consult Globe United for high temperature guidance for Magnetic Level Flow Gauge.

3.3.2 Insulation or Blanket Installation for Cryogenic Insulation

Cryogenic insulation is permanently fixed to the chamber and cannot be removed without permanent damage to the insulation. The indicator used with cryogenic insulation is a wide bar graph with a frost extension to eliminate frost buildup on the indicator tube while allowing maximum visibility. The weather resistant jacket will be sealed to the 2" or 4" Plexiglas frost extension, with weather resistant caulk. The face of the frost extension must always be exposed. Proper Care must be taken when installing a cryogenic gauge to protect the insulation and aluminum jacket.

Globe recommended cryogenic insulation specifications:

Temperature	Thickness	Liner	Jacket
+32 ... -100 F (0 ... -73^{0}C)	2″	Outdoor .016 smooth aluminum jacket with vapor barrier.	Polyurethane with all service jacket vapor barrier.
-101 ... -320 F (-74 ... -196^0 C)	4″		

3.4 Switch Installation

The MLG reed switch is available to augment the control capabilities of extensive line of magnetic level indicators. Housed in an explosion proof stainless steel enclosure, the switch mounts to the outside of the MLG via clamps. This mounting style allows addition or repositioning of switches at any time, without disruption of the process. The reed switches are pre-installed, calibrated, and checked for proper orientation at the factory. Your unit may be equipped with one or more switches for alarming or control. To change the location of the switch in the field, simply unscrew the clamp and slide the switch to a new location.

Warning

Usage of instruments beyond the limits of specified Pressure, Temperature, Voltage & Current, may cause permanent damage beyond repair

3.4.1 Wiring Connection

The leads protruding from the potted end of the switch housing are color coded as follows:
White = Common
Black = Normally Closed
Red = Normally Open

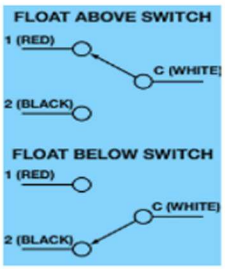


Fig. I

Note:
Contact closure shown in Fig. I for both conditions of the switch relative to the magnetic float.

Important

- For supply connections, use wire with a minimum rating of +167° F (+75° C) as required by the process conditions. Use a minimum of 14 AWG wire for power and ground field wires.
- Housing must be grounded via protective ground screw on upper mounting tab.

3.5 Transmitter Installation

The Transmitter can be mounted with Globe United's Style-H MLG model. The MLG is designed to support operation of the transmitter in the same chamber as the float. Due to this, the coaxial type probe must be used. With the Style H design, either the twin rod, coaxial, or single rod types may be used.

Note:

Flag or shuttle indicator can be designed for mounting at any angle. Do not rotate indicator after gauge is manufactured, due to inability to rotate baffle plate once welding has been completed.

Important

Probe selection to be taken into account along with media dielectric, viscosity, temperature, pressure, and transition zone distances and overfill requirements. Installation Manual for the transmitters will be shared with you. A review of the manual is recommended prior to installation of the transmitter in the MLG.

4. OPERATION

4.1 Operating Principle

When the process liquid raise in the tank or vessel the same level comes in float chamber, due to buoyancy force flow starts moving within the chamber, which cause bi - colored flapper flip to the opposite sides or 180 °, providing a visual display of the liquid and protects against the false actuation.

4.2 Operating Procedures

- Check the Operating Conditions (Temperature, pressure and specific gravity) are within that maximum rating of the gauge. Each gauge has a permanent nameplate indicating process specification, serial number, tag number etc. It is critically important to check that the specific gravity of the process media is specified at the maximum operating conditions.
- The gauge chamber should be leveled vertically, empty, blocked in and isolated. Check to see that all drain and vent plugs are in place. Close all vent and drain valves if plugs are not used.
- For standard gauges, install the float by removing the bottom drain flange located at the base of the gauge. The float should be installed in proper orientation. A spring is attached to the inside of the drain flange to cushion the float when the vessel is empty. Reinstall the bottom drain blind flange with a new flanges gasket after the float is in place.
- For inverted gauges, remove the top vent blind flange from the gauge chamber. Install the float by inserting a string through the float loop and lower the float into position slowly. Remove the string from the float and chamber after the float is resting on the bottom of the gauge. An auxiliary magnet may be required to recouple the indicator to the internal float.
- Reinstall the blind flanges with a new gasket. The gauge chamber should be isolated with no opening to atmosphere. Check to see that all drain and vent plugs are securely in place and that any vent and drain connections are closed.
- When the gauge is mounted and ready for placement into service, PARTIALLY OPEN THE TOP PROCESS CONNECTION VALVE FIRST' and very slowly to all initial pressure and temperature equalization between the vessel and the level gauge. This allows the process conditions of the vessel to equalize with the gauge slowl and reach operating conditions at a slow, even and reasonable rate.

- After the float chamber has reached process condition, continue to open the TOP process connection valve slowly, allowing any liquid or condensate to enter the gauges slowly. This procedure is critically important for high pressure and temperature applications. The float and indicator may react or rise to condensate accumulation migrating through the top valve with the bottom valve closed.
- When the gauge chamber has attained normal operating condition, open the BOTTOM process valve connection slowly. This will allow proper fluid entry into the gauge chamber under normal operating conditions. This will allow proper fluid entry into the gauge chamber under normal operating conditions. The level indicator should rise vertically, thus rendering a fluid level. Flag or flapper indication will result in Bi-color rotation of the flapper as the fluid rises. At this point, installation should be complete. Allow at least 30 minutes for both top and bottom valve procedures.
- Please note that under elevated process operating conditions, the indicator may record a significant level from condensate influx through the top valve before the bottom valve is opened, If this is the condition, it is possible the indicator (and float) may readjust and fall slightly from the effects of final process equalization after the bottom valve is completely opened.

5. MAINTANANCE

Magnetic Level Gaige contains vent and drain in the top and bottom of the gauge to allow cleaning and removal of the process fluid. Some gauge are connected to a solvent or steam line that allows empty gauges without floats to be decontaminated or blown down periodically without removing the gauge from the vessel location. MLG should be maintained annually or inspected depending on the application type. Procedure to be followed for proper maintenance of MLG.

- Block in the gauge chamber with the process connection valves or wait until the vessel is empty and out of service.
- Close the bottom valve first and the top valve second.
- Open the vent valve slowly or remove vent plug carefully to depressurize the gauge especially if the gauge has been under pressure.
- Open the drain valve slowly or remove the drain plug carefully to allow any remaining fluid to drain from the chamber.
- When all the gauge fluid has been drained, carefully remove the drain flange and float from the gauge chamber. Be sure to examine the float for excessive wear and clean required.
- Clean the inside wall of the chamber with a "bottlebrush" or similar scrubbing tool. Some processes may dictate the use of a suitable solvent for cleaning.
  After cleaning of the chamber, replace the float and drain flange. A new flange gasket should be installed. Use gaskets compatible with the process media is replaced.
- Check the stainless steel pipe clamps to insure they are tight and adjust the scale channel. Correctly match the zero point to process connection elevations.
- If necessary, use a permanent magnet to attract the indicator until it is coupled to the float inside the chamber.

Important

- For side mounted MLG, Floats should be removed carefully from the bottom flange. Clean the float and chamber properly and refit the float with arrow mark on the float pointing upwards.
- For top mounted MLG, float can be cleaned by removing the instruments from top of the tank, ensure that stem does not get damaged during cleaning process.

6. TROUBLESHOOTING

6.1 For Side Mounted MLG

Problem 1:
Flags do not rotate with level change.

Cure 1:
Test flags with a magnet from bottom to top (magnet not included). If flags test okay, check for float obstruction.

Problem 2:
Flags rotate at different height than actual level.

Cure 2:

Float selected for different specific gravity. Replace float with a float with correct specific gravity rating. Confirm correctness of float orientation. Top is up.

Problem 3:

Float inside the level gauge is moving slow or not at all.

Cure 3:

- Make sure the MLI is level vertically.
- The process fluid being measured may be too viscous and heat tracing may be required to make the material more fluid. Heat tracing can be purchased from the factory.
- The specific gravity of the process fluid and the float weight may need to be re-verified.
- The liquid being measured may contain magnetic particles collecting on the magnetic section of the float causing drag. If this happens, magnetic trap assemblies can be purchased from the factory.
- Visual inspection of the float may be required to see if the float has collapsed.

Problem 4:
Scale is at zero to the center of the bottom process connection, but the indicator is above or below zero.

Cure 4:

- The scale assembly is mounted to the chamber using stainless steel gear clamps. It can be easily adjusted in the field using a screwdriver. Make sure the scale zero is in line with the center of the process connection.
- The float stop spring at each end of the chamber is there to cushion as well as position the float assembly to the center of the process connection. Make sure top or bottom float stop springs are not bent or broken.

Problem 5:
Shuttle indicator has uncoupled fallen to the bottom of the glass tube.

Cure 5:

- In some "flashing" applications, the float may rise or fall quickly. Consult factory for suggestions to help avoid this.
- To re-couple the indicator to the float, simply use a small magnet and run it along the length of the chamber to locate the float. Mark the location of the float on the outside chamber. Use the small magnet to couple with the indicator and pull the indicator up to meet and couple with the float.
- Make sure all stainless steel gear clamps are tight. The scale channel must be tight against the chamber.

6.2 For Top Mounted MLG

Problem 1: The float assembly or visual indicator moving slowly or not at all.

Cure 1:

- The top mount guide rod assembly may be bent. Visual inspection is required.
- The process fluid in the vessel may be too viscous, heating the vessel to make the process fluid more liquid may be required.
- The specific gravity of the process fluid and the float may need to be re-verified.
- Visual inspection of the float inside the process fluid may be required to see if the float has collapsed.
- Make sure the vessel opening or flange connection that the top mount flange connects is level.

Problem 2: My scale is at the center of the zero mark on the outside of the top mount chamber but the indicator is above or below zero.

Cure 2:

- The scale assembly is mounted to the chamber using stainless steel gear clamps. It can be easily adjusted in the field using a screwdriver. Make sure the scale zero is in line with the zero mark on the outside of the top mount chamber.
- The float stop spring at the top of the chamber is there to cushion the magnet assembly. Make sure the bottom float stop tube is not bent or broken.
- The float stop tube is at the bottom inside the chamber. It is there to stop the magnet assembly at the zero mark on the outside of the chamber.

7. REFERANCE DRAWING AND TAG PLATE DETAILS

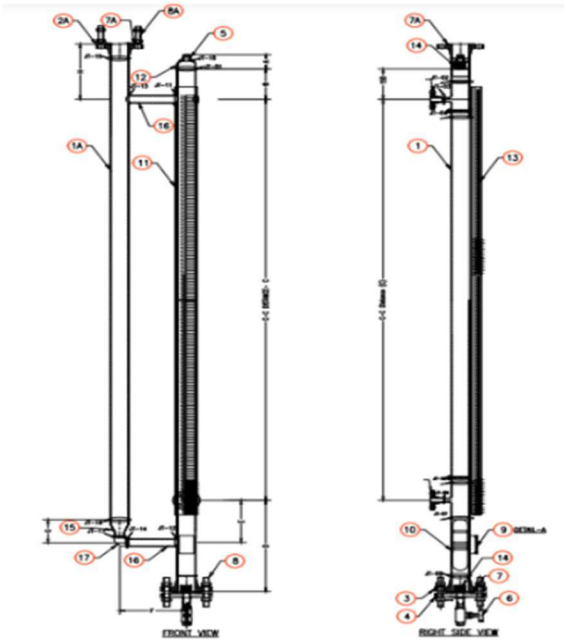


Fig. I

1. Pipe (Magnetic Level Gauge) 1A. Pipe (Level Chamber)
2. Process connection Flange 2A. Instrument Connection Flange
3. Bottom Flange 4. Bottom Flange (Blind) 5. Vent Connection
6. Drain Connection 7. Gasket 8. Studs and Nuts.
9. Tag Plate 10. Float 11. Scale (in mm)
12. Top End Cap 13. Indication Rail 14.Spring
15. Con Reducer 16. Pipe 17. Elbow

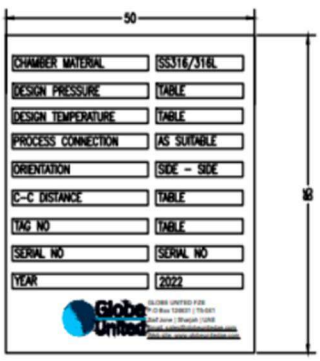


Fig. III (Tag Plate)

8. Technical Specifications

Sl.No	Part Description	Size	MOC
1	Pipe	2'' to 3''	Stainless Steel, Nickel Alloy, Titanium
2	Pipe (Chamber)	Class 150 to Class 1500	Stainless Steel, Nickel Alloy, Titanium
3	Process Connection Flange	Class 150 to Class 1500	Stainless Steel, Nickel Alloy, Titanium
4	Instrument Connection Flange	Class 150 to Class 1500	Stainless Steel, Nickel Alloy, Titanium
5	Bottom Flange	Class 150 to Class 1500	Stainless Steel, Nickel Alloy, Titanium
6	Bottom Flange (Blind)	Class 150 to Class 1500	Stainless Steel, Nickel Alloy, Titanium
7	Vent Connection	Threaded	Stainless Steel, Nickel Alloy, Titanium
8	Drain Connection	Threaded	Stainless Steel, Nickel Alloy, Titanium
9	Gasket	Class 150 to Class 1500	Metallic and Non- Metallic Gasket as per ASME B16.20 & ASME B16.21)
10	Studs and Nuts	As suitable	Low alloy steel, alloy steel, Nickel alloy and special alloy
11	Tag Plate	85 x 50 x 2 mm	SS316
12	Float		Stainless steel, Nickel Alloys, PVDF, Titanium
13	Scale in mm		SS316L
14	Top End cap	Suitable to chamber cap	Stainless steel, Nickel Alloys, Titanium
14	Indication Rail		SS316
15	Spring		SS316
16	Elbow	Suitable for chamber branch	Stainless steel, Nickel Alloys, Titanium

9. Technical Assistance

If you are having difficulty with your Magnetic Level Gauge, contact Globe United FZE. To assist you more effectively on call, please have following details with you ready

a) Process Condition (Pressure, Flow rates etc)
b) Your purchase order number, our sales order number and invoice copy.
c) Trouble shooting procedures attempted by you but failed.

Note:
There will be nominal charges applicable for evaluation at the site for non-warranty products and if under warranty but not physically damaged there will nominal charges applicable.

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