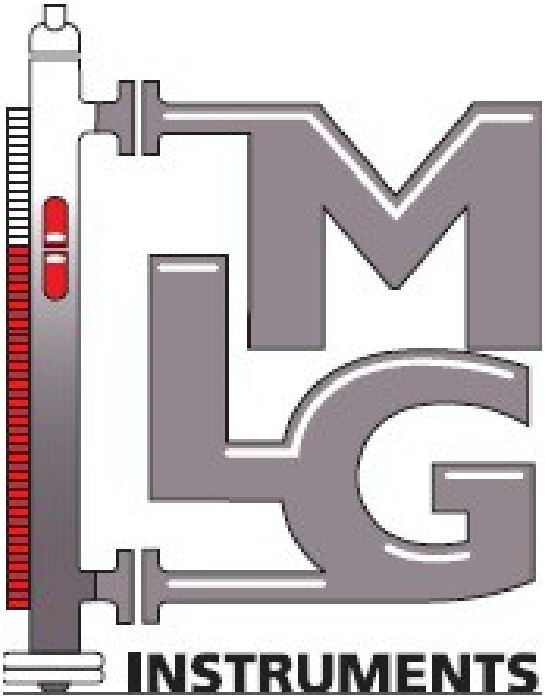



# IOM Manual

*Installation and Operation Manual.*

## “Original Manual”

**Content**


| | | Page |
|---|---|---|
| **1) General** | | |
| 1.1 | Shipping and storage | 3 |
| 1.2 | Working principle different models | 4-5 |
| **2) Tag plate** | | |
| 2.1 | Pressure Equipment Directive (PED) | 6 |
| 2.2 | **AT**mosfere **EX**plosibles (ATEX and IECEx) | 7 |
| **3) Unpacking** | | |
| 3 | Unpacking | 8 |
| **4) Checklist** | | |
| 4.1 | Level indicator out of box | 8 |
| 4.2 | Level indicator on damage | 8 |
| 4.3 | Process connection(s) | 8 |
| 4.4 | Centre to Centre dimensions (side mounted) | 8 |
| 4.5 | Centre dimensions (top mounted) | 8 |
| 4.6 | Float (side mounted type) | 8 |
| 4.7 | Float (top mounted type) | 8 |
| 4.8 | Switches | 8 |
| 4.9 | Transmitter | 8 |
| 4.10 | Indicator | 8 |
| 4.11 | Guided Wave Radar (GWR) | 8 |
| 4.12 | Tag Plate (PED/CE) | 8 |
| 4.13 | Tag Plate (ATEX) | 8 |
| 4.14 | Tag Plate (IECEx) | 8 |
| **5) Installation** | | |
| 5.1 | Tag plate | 9 |
| 5.2 | Side mounted level indicator | 9 |
| 5.3 | Top mounted level indicator | 9 |
| 5.4 | Switches | 10 |
| 5.5 | Transmitter 4-20 mA | 10 |
| **6) Commissioning** | | |
| 6.1 | Side mounted level indicator | 11 |
| 6.2 | Top mounted level indicator | 11 |
| 6.3 | Insulating for low /high temperature | 11 |
| **7) Out of commissioning** | | |
| 7.1 | Side mounted level indicator | 12 |
| 7.2 | Top mounted level indicator | 12 |
| **8) Maintenance** | | |
| 8.1 | Flushing | 12 |
| 8.2 | Side mounted level indicator | 12 |
| 8.3 | Top mounted level indicator | 13 |
| **9) Trouble shooting** | | |
| 9.1 | Side mounted level indicator | 14 |
| 9.2 | Top mounted level indicator | 14 |
| **10) Summary of ignition hazards and taken measures** | | |
| 10 | Summary of ignition hazards and taken measures | 15 |
| **11) Limit values chamber length and float weight** | | |
| 11 | Limit values chamber length and float weights | 16 |

# 1) General

## 1.1 Shipping and storage

The products are packed and shipped in special long boxes for maximum protection during the transportation. The same package can be used for air freight.

We recommend to store the boxes in a dry environment not colder than 0° Celsius. Do not place heavy boxes on top of the packages (max. 10kg). After receiving the product we advise you to immediately check the materials for damages and if necessary directly contact MLG Instrument within **48 hours** (contact details below):


Correspondence details

MLG Instruments
Olivier van Noortstraat 1
3124 LA Schiedam
The Netherlands
Phone : + 31(0) 10 473 50 50
Email : info@mlg-instruments.com

Warehouse details

MLG Instruments
Cornelis Houtmanstraat 2
3124 LB Schiedam
The Netherlands
Phone : + 31(0) 10 473 50 50
Email : info@mlg-instruments.com




## 1.2 Working principle

This installation and operation manual contains all information needed on Magnetic liquid indicators.

The magnetic level indicator is connected to the vessel. There are 7 different models; the mechanism of action is the same only the process connections are different:

**"The mechanism of action for the level indicator is based on the principle of communicating vessels"**

- Model **MLA,** side mounted with 1 process connection, working with 1 float
- Model **MLB,** side mounted with 2 process connections, working with 1 float
- Model **MLBR**, side mounted with 2 process connections and additional with side guided wave radar chamber (mechanical as electronically readable), working with 1 float and radar
- Model **MLC,** inline mounted with top and under process connection working with 1 float
- Model **MLD,** top mounted with 1 process connection working with 2 floats
- Model **MLE,** side mounted with 2 process connections with additional inner float chamber (mechanical as electronically readable), working with 1 float and guided wave radar
- Model **MLT**, mounted in the middle with 2 process connection, and in additional 1 side chamber (mechanical as electronically readable), working with 1 float and guided wave radar

**Mechanism of action**
Side mounted level indicators or inline level indicator **(models MLA.MLB, MLBR, MLC, MLC,MLE, MLT)**

As the liquid in the vessel rises or drops the float in the bypass chamber moves along with the liquid surface inside the vessel. The chamber is completely sealed meaning that the float is only in contact with the liquid. Inside the float is a fixed ring magnet.

**In general:** On the outside of the chamber is an indication rail with red/white SS square plates with small magnets inside. The chamber and the indicator are made from "non- magnetic material" As the float rises and falls the float corresponds with the red/white SS plates inside the indication rail. When the float is rising the plates will color red, when the float drops the plates will color white. Red means "liquid"-side and white means "Gas"-side.

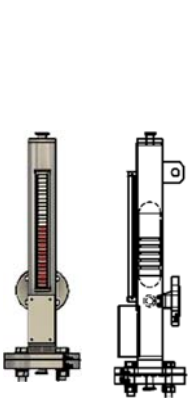
**Optional: Guided wave radar chamber in combination with magnetic level indicator (Models MLBR, MLE and MLT)**

Model MLBR: Same construction as model MLB only with additional side mounted chamber (direct welded on the magnetic level gauge chamber or connected with flanges on side of the MLG chamber)

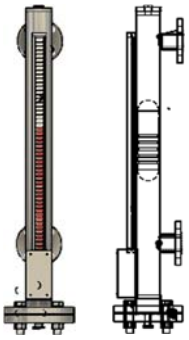
Model MLE: Consists out of a 3"or 4" outer chamber with 2 side process connections. This model has an additional inner 2" float chamber. On the top of the outer chamber a guided wave radar can be placed. In the inner 2" tube is a float installed and the float communicates with indication flapper (red/white) rail. The working principle is the same as describes above **"in general"**

Model MLT: Same construction as Model MLB only with an additional side mounted chamber for guided wave radar mounting. The process connection is in the middle between the magnetic level gauge and the radar chamber (Tee Design).

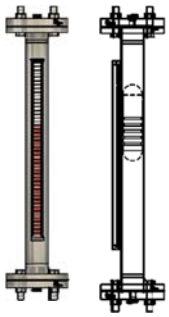
## 1.2 Working principle



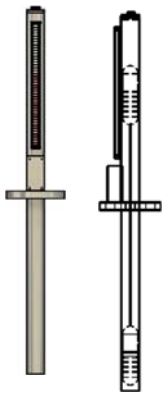
Model MLA



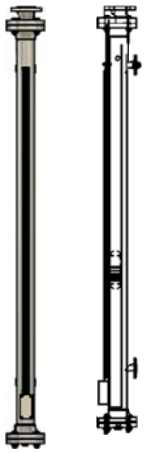
Model MLB



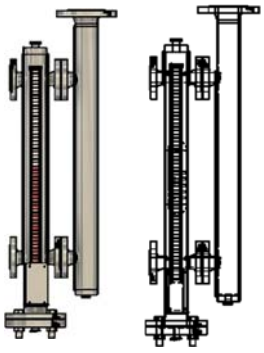
Model MLC



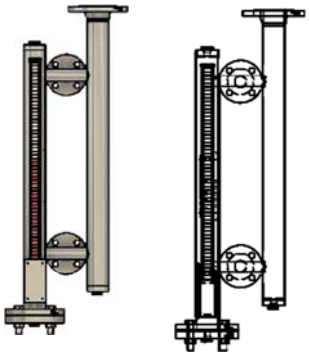
Model MLD



Model MLE



Model MLBR



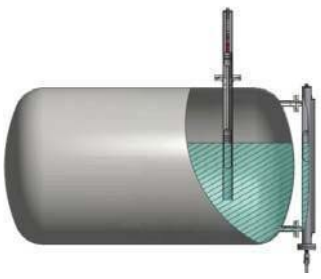
Model MLT

Mechanism of action for Top mounted level indicators **(MLD)**

As the liquid in the vessel rises or drops the **wetted** float in the stilling well chamber moves along with the liquid surface inside the vessel. The float is connected to a **dry** float with a magnet inside (protrudes tube) above the vessel by a guide rod in the middle.

If the **wetted** float rises or drops the **dry float** moves along. The indicator is placed on the protrudes tube above the vessel. The read out of these indicators is equal to the side mounted level indicator as described on page 4.

The magnetic level indicator is only suitable for liquid applications.



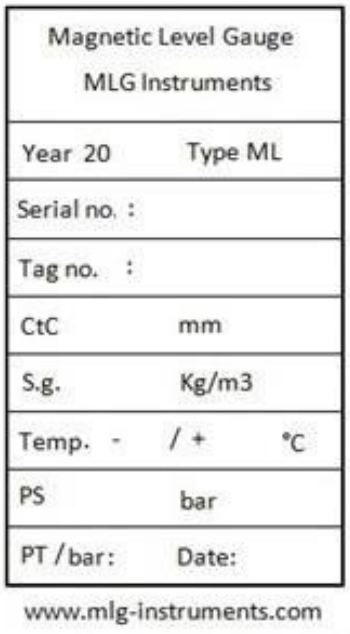
## 2) Tag Plate

### 2.1) Pressure Equipment Directive (PED/CE)

Magnetic level indicators fulfill the following European Directive:

- Pressure Equipment Directive acc. 2014/68/EU **(PED)**

| Marking | Signification |
|---|---|
| - Without CE | art. 4, par.3 (sound Engineering Practice) |
| - With CE | Cat. 1 acc. 2014/68/EU |
| - With CE + 1117 | Cat. 2 acc. 2014/68/EU with Notified Body number (NoBo) |
| - With CE + 1117 | Cat. 3 acc. 2014/68/EU with Notified Body number (NoBo) |










Explanation of the tag plate:

| | |
|---|---|
| Year 20 | : Manufacturing year |
| Type ML | : Model type |
| Serial no. | : Production number |
| CtC | : Centre to centre dimensions between process connection(s) |
| S.g. | : Specific gravity of media (**kg/m3)** |
| Temp. | : Minimum and maximum allowable working temperature (**°C)** |
| Ps. | : Maximum allowable working pressure into (**Barg)** |
| Pt. | : Pressure test done by Manufacturer (**Barg)** |
| Date | : Date of pressure test |

**Suitability is confirmed by MLG Instruments to the buyer in quotation stage and by order confirmation.**

## 2.2) **AT**mosfere **EX**plosibles **(ATEX and IECEx)**

Magnetic level indicators are certified according to the following European and International standards:

- EN-ISO80079-36:2016, EN-ISO80079-37:2016 **ATEX directive 2014/34/EU**
- ISO-IEC80079-36:2016, ISO-IEC80079-37:2016 **IECEx**

**Marking with the following:**

| | |
|---|---|
| CE 2813 | Magnetic Level Gauge<br>MLG Instruments |
| Year: 20 | Type: ML* |
| Serial No: | |
| Tag No: | |
| CtC: | mm |
| S.g. | kg/m$^3$ |
| | |
| Process temp. | - to + °C |
| PS: | bar(g) |
| PT / bar: | Date: |
| Media: | |
| Ambient temp: | -50°C to +60°C |
| ATEX Certificate: | KIWA 17ATEX0029 |
| IECEx Certificate: | IECEX KIWA 18.0005 |
| II 1G<br>II 1D<br>Ex h II* T1 .. T6 Ga<br>Ex h IIIC T450°.. T85°C Da | |
| MLG Instruments<br>Olivier van Noortstraat 1<br>3124 LA Schiedam / the Netherlands<br>Call: +31(0)10 473 50 50<br>Email: info@mlg-instruments.com | |

CE : Notified Body (NoBo) No. 2813
Year 20 : Manufacturing year
Type ML : The model (MLA, MLB, MLC, MLD or MLE)
Serial no. : The production number
CtC : Center to Center dimensions between the flanges or the measure lengths of the indicator
S.g. : Specific gravity of the liquid or gas in kg/m3
Process temp. : The process temperature
Ambient temp. : The ambient temperature -50°C to +60°C
PS : Maximum allowable working pressure of the level gauge under normal conditions in **Bar**
PT : Pressure test done by Manufacturer in **Bar**
Date : Date of pressure test
Media : media inside the process

**Explanation of ATEX**

| | | |
|---|---|---|
| **II 1G** | II | Equipment group, **only** for surface installations |
| | 1 | Equipment Cat. 1 internal and external for use in zone 0, 1 or 2 |
| | G | Gas |
| **II 1D** | II | Equipment group, **only** for surface installations |
| | 1 | Equipment Cat. 1 external for use in zone 20, 21 or 22 |
| | D | Dust |

**Explanation of IECEx**

| | | |
|---|---|---|
| Ex h II* T1 .. T6 Ga | Ex h | Non electrical parts explosion safe |
| | II* | Gas group is depending on chamber length and float weight, see chapter 11, page 16 |
| | T1.. T6 | Temperature class depending on process temperature |
| | Ga | Equipment protection Level inside |
| Ex h IIIC T450°C..T85°C -/ Da | Ex h | Non electrical parts explosion safe |
| | IIIC | Dust group IIIC |
| | T450°C..T85°C | Max. surface temperature depending on process temperature |
| | Da | Equipment protection level outside |

| The temperature class is depending on the process temperature according to the following table: | | | |
|---|---|---|---|
| **Process temperature** | **Ambient temperature** | **Temperature Class** | **Max. Surface temperature** |
| ≤ 68 °C | -50°C .. +60°C | T6 | T85°C |
| > 68°C ≤ 80°C | | T5 | T100°C |
| > 80°C ≤ 108°C | | T4 | T135°C |
| > 108°C ≤ 160°C | | T3 | T200°C |
| > 160°C ≤ 240°C | | T2 | T300°C |
| > 240°C ≤ 360°C | | T1 | T450°C |

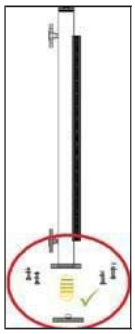
## 3) Unpacking

Open the box and check the package list if it corresponds to your Purchase Order. Remove all the packaging material from the box.

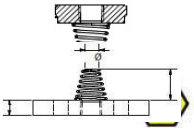
During transportation there is a change for damages, therefore check all materials carefully to make sure everything is received in good order. Claims must be reported within 24 hours to MLG Instruments. **Email info@mlg-instruments.com or call +31(0)10 473 50 50**

### 4) Checklist

4.1 Remove the magnetic level indicator carefully from the box and place it horizontally on a table. Make sure the table is clean (for the protection of the facing of the process connections).
4.2 Check the level gauge chamber on dents.
4.3 Check the process connections if they are exactly what you have ordered.
4.4 Check the Centre to Centre dimensions for side mounted level gauges. The tolerance between the process connections is till 2000mm, < 2mm, and till 5700mm max.< 3mm
4.5 Check the measurement lengths of the indicator for the **top mounted level gauges.**
4.6 Remove the float from the styrofoam and check on **damages** for side mounted level gauge
4.7 Remove the float from the chamber from the bottom for **top mounted** level indicators. CAUTION! ,since this is secured by a rope which is connected to a tube with a second float (at the end). Make sure that the tube is not curved.



4.8 If you have ordered reed switches check the quantity; these are mounted on the side of the level indicator chamber, next the indicator.
4.9 If you have ordered a level indicator with a Transmitter check if the junction box is intact.
4.10 Be sure that the indicator cover plate is not broken. Pick up the float and slide it along the indication rail, the flappers inside the rail must change color. Repeat this step to make sure that the flapper segments turn 180° (to the left red colored and to the right white).
4.11 If you have ordered a Guided Wave Radar, please use the checklist and installation manual of the GWR, this is supplied separately in the box.



**Remark**:We supply the radar sensor solely as a service. This means we only verify the length of the sensor and offer the convenience of a complete, single delivery. Regarding the ATEX and IECEx certification for the GWR sensor, MLG Instruments cannot be held responsible if the sensor has been incorrectly selected/installed.

Final products of MLG Instruments with a weight of 35 kg or above must be additionally supported against collapse and/or welding tears. MLG Instruments is not responsible for the supply of the extra support.

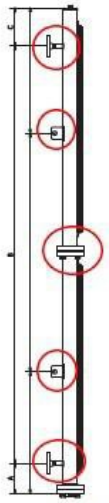
**4.12 Installations under Pressure Equipment Directive (PED2014/68/EU) should be marked with CE. Compare the tagplate with the PED information on page 6.**

**4.13 For installations in a hazardous environment (ATEX acc. 2014/34/EU), first check the tag plate on the level gauge and compare this information with the table on page 7**
**4.14 For installations in a hazardous environment (IECEx), first check the tag plate on the level gauge and compare this information with the table on page 7**

The installation and operation of the level gauge may only be carried out by qualified people. If the person does not use the installation and operation manual **the warranty on the level indicator will expire directly** and MLG Instruments is **not** responsible for further consequences, if the magnetic level indicator and/or technical installation where it would be installed are damaged. We assume that the installer/end user has the knowledge of the application and installation regulations and uses it to prevent human and environmental accidents/errors. In all cases the user is always responsible for the application, assembly and use of the level indicators.

## 5) Installation

5.1 Check the information on the tag plate. This must correspond to the process data. All level indicators from MLG Instruments are provided with a (Stainless steel) tag plate (pinned and welded on the chamber). Tag plate is clearly visible and placed between the indicator and bottom flange.

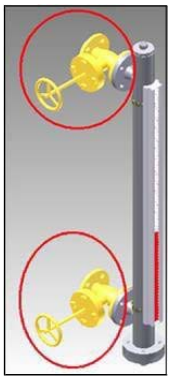

image 5.2A LV

**<u>See page 7 and 8 for installation in a hazardous area. The ATEX/IECEx marking must be according to the area requirements.</u>**

**<u>It is *not allowed* under any circumstances to exceed the mentioned process specifications described on the tag plate.</u>**

**<u>We recommend placing isolation valves between the vessel and level indicator chamber (top and under).</u>**

**<u>The level indicator shall not be used with flammable liquids of low conductivity (< 50 pS/m). The conductivity of low conductive liquids shall be increased with static dissipative additives for example.</u>**



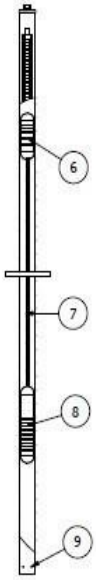
5.2 **a)** Place the level indicator vertically with the bottom blind flange and tagplate **<u>downwards</u>** to the vessel and mount these on the counter connection on the side of the vessel. Finish the installation with bolts, nuts and washers.
**<u>If the level gauge exists of multiple lengths (long version up till 20 mtr), first connect all lengths of the level indicator on a stable surface together (horizontally) and place the level gauge to the vessel after assembly. Use the additional support plates for mounting on to the vessel together with the process connections. See image 5.2A LV</u>**

**<u>Do the same when it comes to type MLBR, MLE or MLT. For guided wave radar mounting please read the installation instruction of guided wave radar manufacturer, IOM is supplied separately.</u>**

**b)** Remove the bottom blind flange.
**c)** Slide the float from the bottom inside the chamber in vertical position in the direction as indicated by the arrows. The arrows are permanently indicated on the float.
**<u>For model MLE do the same as point 5.2 only slight the float in the special inner 2" float chamber</u>**

**d)** Install the blind flange. Use in all cases the supplied bolts, spring washer(s) and gasket.

**<u>In all cases assemble the process connection between the chamber and counter process connections tension free.</u>**




5.3 **a)** Lay the Top mounted indicator horizontally on the table. Ensure that both floats are secured to the rod with on each side a mini locking pin.
**b)** Slide the first smaller float carefully inside the chamber followed by the tube and bigger float.
**c)** Insert the locking tube through the 2 holes in the chamber. Block these on both sides with the supplied mini security pins**. <u>Be sure that the mini security pins are fitted correctly otherwise the floats will fall out and will not function properly</u>**
**d)** Place the gasket on the vessel process connection



**e)** Never keep the level indicator upside down. Always keep the red/white flapper indication rail in upward direction. **The tag plate must be present above the process connection.**

**f)** Place the level indicator on top of the vessel and finish the installation with bolts, nuts and washers.

**Never connect or disconnect electronic equipment if the power is on. In all cases shut the** POWER OFF

**Electrical switches and transmitters for ATEX or IECEx environments must comply with ATEX 114 /IECx and IEC 60079-14 standard and shall be suitable for the intended EPL, ambient temperature range, T-rating and gas- or dustgroup . Always use the guided wave radar installation manual for radar installation.**

**Level indicators and electrical devices must be grounded via a protective screw at lower flange with a ground connection of at least 4 mm$^2$. The ground wire should be fixed within 30 cm of external earth point to prevent pulling and twisting. Grounding resistance may not exceed 1 MΩ.**

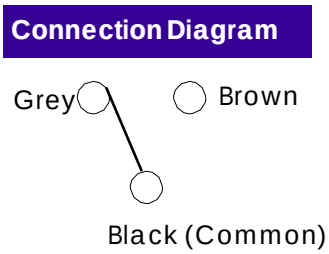


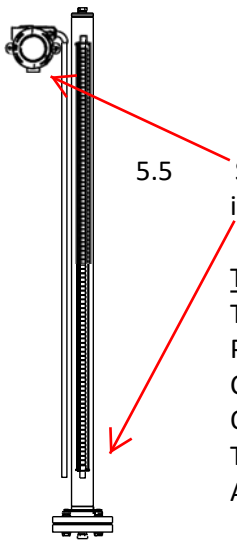
**At all times use a low gauss magnet to change the position of the switch from NO/NC as mentioned in point 5.4. Never use a strong magnet to change the position from NO/NC or NC/NO. Never hold a magnet directly on the switch.**

**We recommend you check the switching point again after commissioning the installation. It is possible that the switch position differs from the previously positioned switch point by pressure and temperature fluctuations.**

5.4 Clamp the switches on the right **switching point** position with the supplied hose clamp. Install the switches with the cable in a **downwards** direction. If necessary you can change the position of the switch with a distance of 2 cm down (NC) or up (NO) with a magnet. All switches supplied by the factory are in normally close (NC) position. Use the below depicted diagram schedule for connecting.



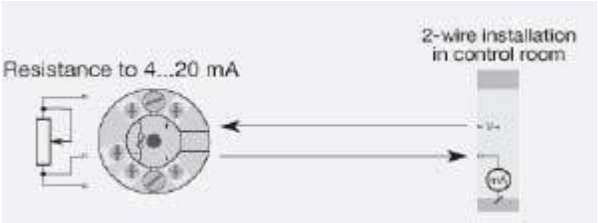



5.5 Slide the transmitter tube to the middle of the process connection(s) till the mentioned indicated 0% and 100% points and junction box to the front. Use the below depicted diagram for connecting.

Technical details head Transmitter head

| | |
|---|---|
| Type | : 5333A/D 5343A/B or 5337A/D |
| Power supply | : 8 – 35 V (Atex 8 - 30 V) |
| Connection | : 2 wires |
| Output | : 4 – 20 mA |
| Temperature | : -40 < 85°C |
| Accuracy | : 5 mm |



## 6) Commissioning

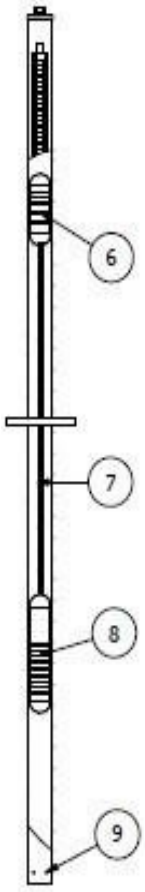
**If an explosive atmosphere can be present in the system, the vertical filling and emptying speed of the liquid surface inside chamber may never exceed <u>1 meter per second.</u>**

**In case of a pressure test remove the float out of the chamber before testing. It's not allowed to exceed the pressure (Pt) mentioned on the tag plate.**

**Do not open the bottom isolation valve quickly, always open slowly<u>!!</u>**

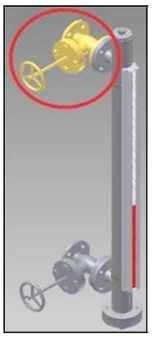
**Be sure that both isolation valves are closed before you start the commissioning**

**The level indicator is a part of the system. It's <u>not allowed</u> 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.**




**<u>Side mounted level indicator</u>**

6.1 a) Increase the system pressure slowly
b) Check if all connections are tightened (process connections, valves, plugs, GWR connection, etc)
c) Open the upper (top) process valve **<u>carefully</u>**
d) Check again if all connections are free of leakage, **<u>if necessary, close the leak(s).</u>**
e) When the chamber has reached the optimal process specification open the bottom side process valve **<u>carefully.</u>** (The float will rise; the color of the flappers will change from white to red)
f) Check again if all connections are free of leakage, **<u>if necessary close the leak(s).</u>**
g) Level indicator is now in operation

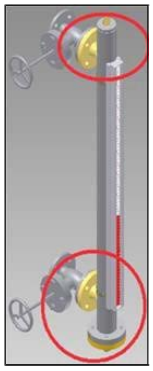


**<u>Top mounted level indicator (one piece)</u>**

6.2 a) Check all connections and make sure they are tightened (process connections and plug
b) Start up the pump, filling the vessel slowly
c) Level indictor is now in operation

**<u>Insulation</u>**

6.3 We recommend insulating the tube completely. It is not allowed to mount switches and Transmitter between the housing and insulation.



| Process temperature | recommended Insulation |
|---|---|
| -50 °C to < -10 °C | Armaflex 2 layer |
| -10°C to < +135°C | |
| +136°C to < +160°C | |
| +160°C to < + 200°C | 1 layer of glass fiber |
| +200°C to < + 250°C | 2 layer of glass fiber |
| +250°C to < + 300°C | 2 layer with shielding plate |
| +300°C to < + 350°C | 2 layer with shielding plate |

## 7) Out of Commissioning

**Side mounted level indicator**

**7.1** a) Make sure that the system is : pressure less, contains no liquid and is dry.
b) Close the side **bottom** process valve carefully
c) Close the side **upper** process valve carefully
d) If applicable, wait until the chamber has cooled down
e) **Be sure that all flappers are white and the float is at the bottom of the tube before you remove the draining plug**
f) Open the blow off drain valve slowly
g) If applicable, open the vent plug
h) If necessary disconnect electrical devices **(be sure that the power supply is switched off)**
i) Release the media to a safe environment **(beware of corrosive, aggressive or explosive media).** Make sure there is no more pressure and media inside the chamber
j) If you want remove the radar (Model MLBR, MLT or MLE please check the manual of the guided wave radar (supplied seperatly)
k) Level indicator is out of commissioning

**Top mounted level indicator**

7.2 a) Make sure that the system is pressure less
b) Open the vent plug
c) If necessary disconnect electrical devices **(be sure that the power supply is switched off)**
d) If applicable, wait until the chamber has cooled down
e) If the vessel is cooled down the level gauge can be disconnected from the vessel
f) Level indicator is out of commissioning

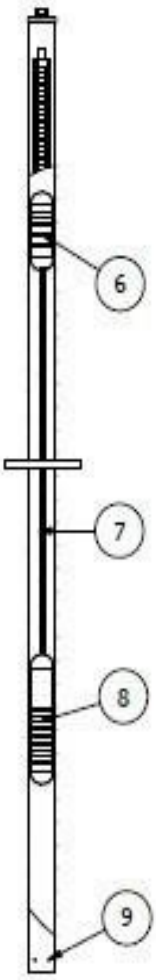
## 8) Maintenance

8.1 **Flushing**

The level indicators are standard equipped with a ½" vent plug and ½" drain plug.
It is possible, in a simple way, from the bottom or from the top connection to install a cleaning machine with solvent or steam. In this way the level indicator can be flushed. Be sure that the process connections are connected.Depending of the installation we recommend cleaning the chamber and float, and if applicable, inspection of the springs at least **once a year.**

**Side mounted level indicator**

8.2 a) Close the side bottom valve and the top process valve.
b) Make sure that the system is : pressure less, contains no liquid and is dry.
c) Open drain plug slowly or if present open the blow off valve and drain the media
d) Remove the vent plug (top or on the side)
e) When the chamber is empty remove the blind flange and remove the float carefully.
f) if applicable(spring)**,** If the level indicator is mounted in a hazardous zone check the blind flange damping springs and lower locking pins (if applicable) on damages or corrosion yearly. Replace when damaged or corroded.
g) Clean / scrub the inside of the level gauge chamber with a hard brush or a suitable solvent to remove stubborn dirt.
h) Check the float for damages, wear, pollution and rust. If damage has been detected it may no longer be used, order a new one.
i) After the level indicator is cleaned and if necessary, renew the float. Replace the gasket. Slide the float back into the chamber (Model MLE in the float chamber) and install the blind flange. Always use original mounting parts such as bolts, nuts, etc.
j) Check the float for damages, wear, pollution and rust. If damage has been detected it may no longer be used, order a new one.
k) Check if the indication rail is still positioned between the process connections
l) Check if the flappers turn 180° with a low gauss magnet (red/white and return)
m) Use in all cases original parts
n) In case of an order, specify the serial number and Centre dimensions.




**Top mounted level indicator**

8.3 a) Make sure that the system is : pressure less, contains no liquid and is dry.
b) Open the vent plug
c) Disconnect the level indicator from the tank
d) Never keep the level indicator upside down. Keep the red/white flapper indication rail in upward direction at any time. **The tag plate must be present above the process connection.**
e) Place the Top mounted indicator horizontally on the table.
f) Remove the mini locking pins from both sides. Remove the blocking tube
g) Carefully remove the bigger float from the chamber, the connection tube and small float will follow automatically.
h) Check that the tube, present between the floats, is not bent
i) Clean / scrub the inside of the level gauge chamber with a hard brush or a suitable solvent to remove stubborn dirt.
j) Check the float for damages, wear, pollution and rust. If damage has been detected it may no longer be used, order a new one.
k) Check if the indication rail is still positioned between the process connectors, if not unscrew the clamping ring to get the indicator in the right position and tighten again
l) Check if the flappers turn a 180° with a low gauss magnet
m) In all cases use original parts
n) In case of an order specify the serial number and Centre dimensions





## 9) Trouble shooting

### 9.1 Side and inline mounted level indicators type MLA, MLB, MLC, MLBR, MLT or MLE

| Problem | Probable Solution |
|---|---|
| Flapper does not rotate | - Test flappers with a magnet from bottom to top. If the flappers are still not rotating check the float on damage<br>- Check inside the indicator if it is frozen<br>- Check if the cover glass is not broken |
| Float moves slowly or not at all | - Check if the float still slides with the arrow in an upwards direction<br>- Check if the level gauge is vertical mounted<br>- Check if the specific gravity is correct<br>- Check if the float is dirty or if there are some hard metal parts on the magnet area |
| Transmitter sometimes or always losing the 4-20 mA signal | - Remove the transmitter from the chamber and test with an external magnet. If this works check the float<br>- Too much distance between the transmitter probe and float |
| Switch is not working | - Remove the switch from the chamber and check with an external magnet and multimeter from NO/NC and NC/NO<br>- Too much distance between the switch and floats |
| Guided wave Radar is not working | - Check the Installation and operation manual of the Radar manufacturer, this is supplied seperatly or check the website of the radar manufacturer (download the IOM) |

### 9.2 Top mounted level indicator Type MLD

| Problem | Probable Solution |
|---|---|
| Flapper does not rotate | - The guide rod can be bent, visual inspection is required<br>- Check inside the indicator if the flappers are not frozen<br>- Check if the cover glass is not broken<br>- Check if the “wetted” float inside the liquid has collapsed<br>- Check if both floats are still connected to the guide rod |

## 10) Summary of ignition hazards and taken measures

| Ignition hazard | Applied measures |
|---|---|
| **Hot surface or mechanical sparks due to internal friction** | Maximum fill and drain speed < 1 m/s prescribed in user manual. Surface temperature depending on process temperature. |
| **Mechanical sparks from falling Float**<br>**Note:**<br>***(if applicable, spring is not standard)*** | Yearly cleaning of float and tube essential and draining instructions added to user manual. Chamber length and float weight are limited depending on gasgroup. |
| **Mechanical sparks from broken Spring**<br>**Note:**<br>***(if applicable, spring is not standard)*** | Non-sparking metal applied for springs. Yearly inspection of springs prescribed and draining instructions added to user manual |
| **Electrostatic discharge non-conductive liquids** | Earthing and bonding of all metallic parts, earth connection provided, restriction for use with low conductivity fluids, restriction of filling and draining speed to < 1 m/s. |

## 11) Limit values chamber length and float weight

The relation between gas group, maximum chamber height and float weight is shown in the the following tables:

Model MLA, MLB or MLE

| Equipment group | Max. Chamber height (mm) | Max. float weight (gr) | Max. impact energy (J) |
|---|---|---|---|
| IIC | 20000 | 300 | 58,9 |

Model MLC

| Equipment group | Max. Chamber height (mm) | Max. float weight (gr) | Max. impact energy (J) |
|---|---|---|---|
| IIA | 4000 | 300 | 11,9 |
| IIB | 4000 | 250 | 9,8 |
| IIB + $H_2$ | 2000 | 250 | 4,9 |
| IIC | 1200 | 250 | 2,9 |

Model MLD

| Equipment group | Max. Chamber height (mm) | Max. float weight (gr) | Max. impact energy (J) |
|---|---|---|---|
| IIA | 4000 | 300 | 11,9 |
| IIB | 2900 | 350 | 10 |
| IIB + $H_2$ | 1700 | 300 | 5 |
| IIC | 1200 | 250 | 2,9 |

The relation between dust group, maximum chamber height and float length is shown in the following table:

Model MLA, MLB, MLC, MLD or MLE

| Equipment group | Max. Chamber height (mm) | Max. float weight (gr) | Max. impact energy (J) |
|---|---|---|---|
| IIIC | 5700 | 350 | 19,6 |

Remark:
The maximum float weight for Model MLD is based on the joint weight of the following parts acc. data sheet number 0410AMLDKIWA rev.2

* Wetted float (item 25)
* Connection tube (item 24)
* Top float (item 23)

© Copyright / Disclaimer This manual is an issue of MLG Instruments Schiedam April 2017 version 1.0. Nothing in this publication may be reproduced without the permission of MLG Instruments. MLG Instruments reserves the right to make changes, including but not limited to modelling and performance changes, without prior notice. MLG Instruments cannot be held liable for damage or injury resulting from misuse or use that does not conform to the instructions in this manual.

MLG Instruments
Olivier van Noortstraat 1
3124 LA Schiedam The
Netherlands Tel: +31(0)10
473 50 50
Email: info@mlg-instruments.com