

ABB MEASUREMENT & ANALYTICS | OPERATING INSTRUCTION

LMT100 and LMT200

Magnetostrictive level transmitters
Foundation Fieldbus



High accuracy liquid level and
interface level detection

Measurement made easy

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1 Introduction

This manual is designed to provide information on installing, operating and troubleshooting the LMT Series of level transmitters. This LMT Series is comprised of the LMT100 and LMT200 models.

Every section of this manual is dedicated to the specific phases of the LMT lifecycle. The start of the lifecycle begins with the receipt of the transmitter and its identification and continues through installation, the connection of all electrical components, the configuration of the device and finally ends with the troubleshooting and maintenance operations.

Product description

The LMT Series of level transmitters is a modular range of field mounted, microprocessor-based electronic transmitters, utilizing multiple sensor technologies. Accurate and reliable measurement of liquid levels is provided in even the most difficult and hazardous industrial environments. The LMT Series can be configured to provide specific industrial output signals, according to Fieldbus digital communication. The LMT Series consists of two models (LMT100 & LMT200):

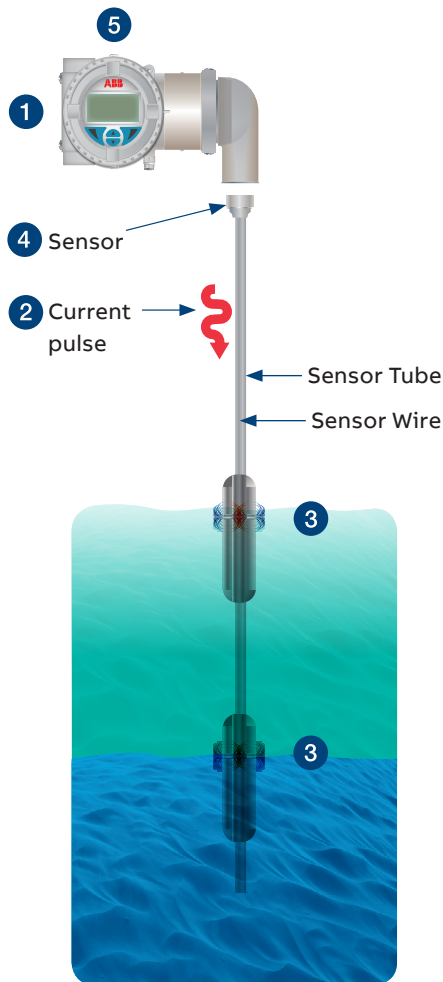


Figure 1 LMT100 (insertion-mounted)

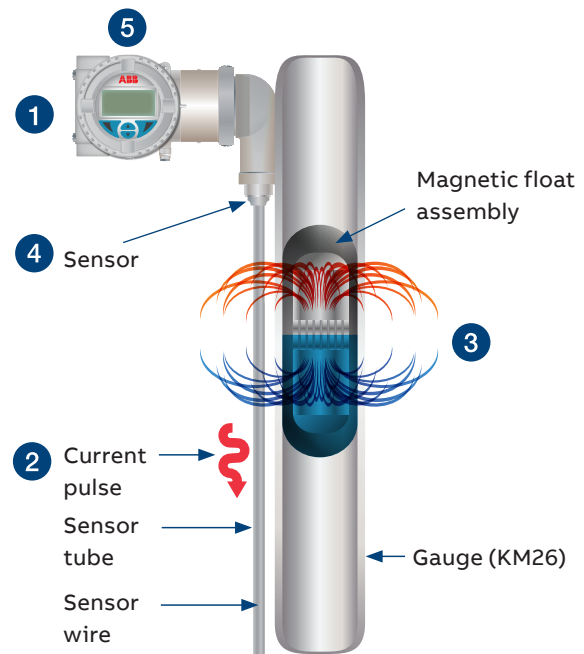


Figure 2 LMT200 mounted on gauge (KM26)

The LMT Series is based upon the magnetostrictive principle.

- 1 The device electronics generates a low energy current pulse at fixed intervals.
- 2 The electrical pulses create a magnetic field which travels down a specialized wire inside the sensor tube.
- 3 The interaction of the magnetic field around the wire and the magnetic float causes a torsional stress wave to be induced in the wire. This torsion propagates along the wire at a known velocity, from the position of the magnetic float and toward both ends of the wire.
- 4 A patented sensing element placed in the transmitter assembly converts the received mechanical torsion into an electrical return pulse.
- 5 The microprocessor-based electronics measures the elapsed time between the start and return pulses (Time of Flight) and converts it into a position measurement which is proportional to the level of the float.

2 Safety

General safety information

The following Safety section provides an overview of the safety aspects that must be observed for operation of the device. For the detailed safety guidelines, refer to the LMT Series Safety Manual (SM LMT100200-EN A).

The device is constructed in accordance with international and local regulations and is deemed to be operationally safe. Additionally, the device is tested and shipped from the factory in perfect working condition. The information contained within this manual, as well as all applicable documentation and certification, must be observed and adhered to in order to maintain the factory-deployed condition throughout the LMT Series period of operation.

Full compliance with the general safety requirements must be observed during operation of the device. In addition to providing general information, the individual sections within this manual contain descriptions, processes and / or procedural instructions with specific safety information for that corresponding action.

Only by observing all of the safety information can the user minimize the risk of hazards to personnel and / or the environment. The provided instructions are intended as an overview only and do not contain detailed information on all available models or every conceivable scenario that may arise during setup, operation and / or maintenance work.

For additional information, or in the event of specific issues not covered within these operating instructions, please contact the manufacturer. ABB declares the contents of this manual are not part of any prior or existing agreements, commitments or legal relationships and are not intended to amend those that are already in place.

CAUTION

Only qualified and authorized personnel are to be tasked with the installation, electrical connection, commissioning and maintenance of the transmitter. Qualified personnel are those individuals who have experience in the installation, electrical connection, commissioning and operation of the transmitter or similar devices and hold the necessary qualifications. These qualifications include but are not limited to:

- Training or instruction – authorization to operate and maintain devices or systems according to safety engineering standards for electrical circuits, high pressures and aggressive media.
- Training or instruction in accordance with safety engineering standards regarding maintenance and use of adequate safety systems.

For reasons of safety, ABB recommends that only sufficiently insulated tools, conforming to IEC EN 60900, be used.

Since the transmitter may form a link within a safety chain, it is recommended that the device be replaced immediately if defects are detected. In the event of use in a hazardous area, only non-sparking tools are to be used.

In addition, the user must observe all relevant safety regulations regarding the installation and operation of electrical systems and the relevant standards, regulations and guidelines concerning explosion protection.

WARNING

The device can be operated at high levels of pressure and with aggressive media. As a result, serious injury or significant property damage may occur if this device is operated incorrectly.

Improper use

The LMT Series magnetostrictive transmitters are designed for reliable and accurate measurement of liquid levels in the industrial applications. Use the LMT for this purpose only. The manufacturer accepts no liability for any form of damage resulting from improper use!

It is prohibited to use the device for the following but not limited to these purposes:

- As a climbing aid (for example, for mounting purposes) port for pipes.
- Removing material (for example, by drilling the housing).

Technical limit values

The device is designed for use exclusively within the values stated on the identification plates (Refer to “Identification”) and within the technical limit values specified on the data sheets.






The following technical limit values must be observed:

- The maximum working pressure must not be exceeded.
- The maximum ambient operating temperature must not be exceeded.
- The maximum process temperature must not be exceeded.
- The housing protection type must be observed.

Warranty provision

Using the device in a manner that falls outside the scope of its intended use, disregarding this manual, using underqualified personnel or making unauthorized alterations releases ABB from any liability for any resulting damage. This renders the manufacturer’s warranty null and void.

Use of instruction

	DANGER - Serious damage to health / risk to life This symbol in conjunction with the signal word "DANGER" indicates an imminent electrical hazard. Failure to observe this safety information will result in death or severe injury.
	WARNING - Bodily injury This symbol in conjunction with the signal word "WARNING" indicates a potentially dangerous situation. Failure to observe this safety information may result in death or severe injury.
	CAUTION - Minor Injuries This symbol in conjunction with the signal word "CAUTION" indicates a potentially dangerous situation. Failure to observe this safety information may result in minor or moderate injury. This symbol may also be used for property damage warnings.
	NOTICE - Property Damage This symbol indicates a potentially damaging situation. Failure to observe this safety information may result in damage to or destruction of the product and / or other system components.
	IMPORTANT (NOTE) This symbol indicates operator tips, particularly useful information or important information about the product or its further uses. The signal word "IMPORTANT (NOTE)" does not indicate a dangerous or harmful situation.

Operator liability

In instances where corrosive and / or abrasive materials are being measured, the user must check the level of resistance of all parts that are coming into contact with these materials. ABB offers guidance in the selection of material but does not accept liability in performing this service. The user must strictly observe the applicable national regulations with regards to installing, functional testing, repairing and maintaining electrical devices.

Qualified personnel

Installing, commissioning and maintaining the device may be performed only by trained personnel who are authorized by the plant operator. These trained personnel must have read and understood this manual and must comply with its instructions.

RoHS Directive

This device and all of its subcomponents have been tested and found to be compliant with Directive 2011/65/EU (RoHS 2)

Returning devices

For the purpose of returning the device for repair or recalibration, use the original packaging or other suitably secure shipping method. The sender should contact the factory for return authorization number and fill out return form (provided at the end of the manual) and include it with the device. According to C guidelines other local laws for hazardous materials, the owner of the corresponding hazardous waste is responsible for its disposal. The owner must observe the proper regulations for shipping purposes. All devices returned

to ABB must be free of any hazardous materials (for example, acids, alkalis and solvents).

Disposal

ABB actively promotes environmental awareness and has an operational management system that meets the requirements of DIN EN ISO 9001:2000, EN ISO 14001:2004 and OHSAS 18001. ABB products are intended to have minimal impact on the environment and individuals during their manufacture, storage, transport, use and disposal.

This adherence to environmental standards includes the use of natural resources. In this endeavor, ABB maintains an open dialog with the public through its publications.

The product / solution is manufactured from materials that can be reused by specialized recycling companies.

Information on WEEE2 Directive (Waste Electrical and Electronic Equipment)

This product/solution is not subject to the WEEE2 Directive or corresponding national laws (e.g., the ElektroG-Electrical and Electronic Equipment Act-Germany). Dispose of the product/solution at a specialized recycling facility. Municipal garbage collection points should not be used for this purpose. According to WEEE2 Directive, only products that are used in private applications may be disposed of at municipal garbage facilities. Proper disposal prevents negative effects on both individuals and the environment and also supports the reuse of valuable raw materials. ABB can accept and dispose of returns for a fee.

Safety information for electrical installation

WARNING

Electrical connections may only be established by authorized personnel in accordance with the electrical circuit diagrams. The electrical connection information in the manual must be observed; otherwise, the application protection type may be affected. Ground the measurement system according to requirements.

Safety information for inspection and maintenance

Corrective maintenance work may be performed only by trained personnel.

- Before removing the device, depressurize the device and any adjacent lines or containers.
- Check whether hazardous materials have been used as measured materials before opening the device. Residual amounts of hazardous substances may still be present in the device and could escape when the device is open.
- Within the scope of operator responsibility, check the following as part of a regular inspection:
 - Pressure-bearing walls / lining of the level device
 - Measurement-related function
 - Leak-tightness
 - Wear (corrosion)

WARNING

There are electric circuits within the housing which are dangerous if touched. Therefore, the auxiliary power must be switched off before opening the housing cover.

WARNING

The device can be operated at high pressure and with aggressive media. Any process media released may cause severe injuries. Depressurize the pipeline / tank before opening the transmitter process connection.

Explosive atmospheres installation

For installation requirements in Explosive Atmospheres applications refer to IEC 60079-14 and any local Safety or Electric Code regulations mandatory in your area.

For specific conditions for safe use of the LMT100 and LMT200, refer to the LMT Series Safety Manual (SM LMT100200-EN).

3 Transmitter overview

Transmitter components overview

The following represents an exploded view of the components comprising the LMT Series level transmitter (see Figure 3).

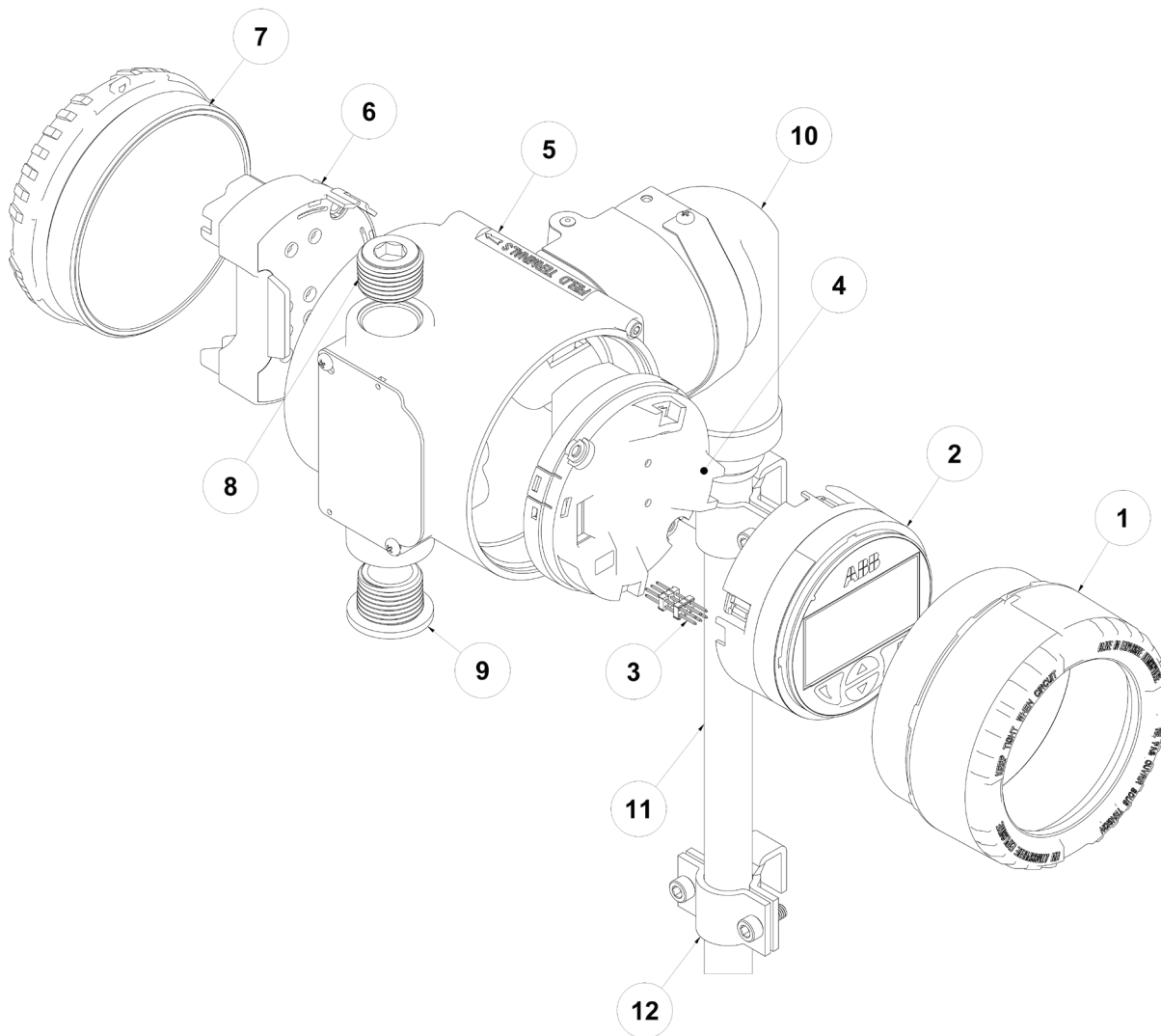
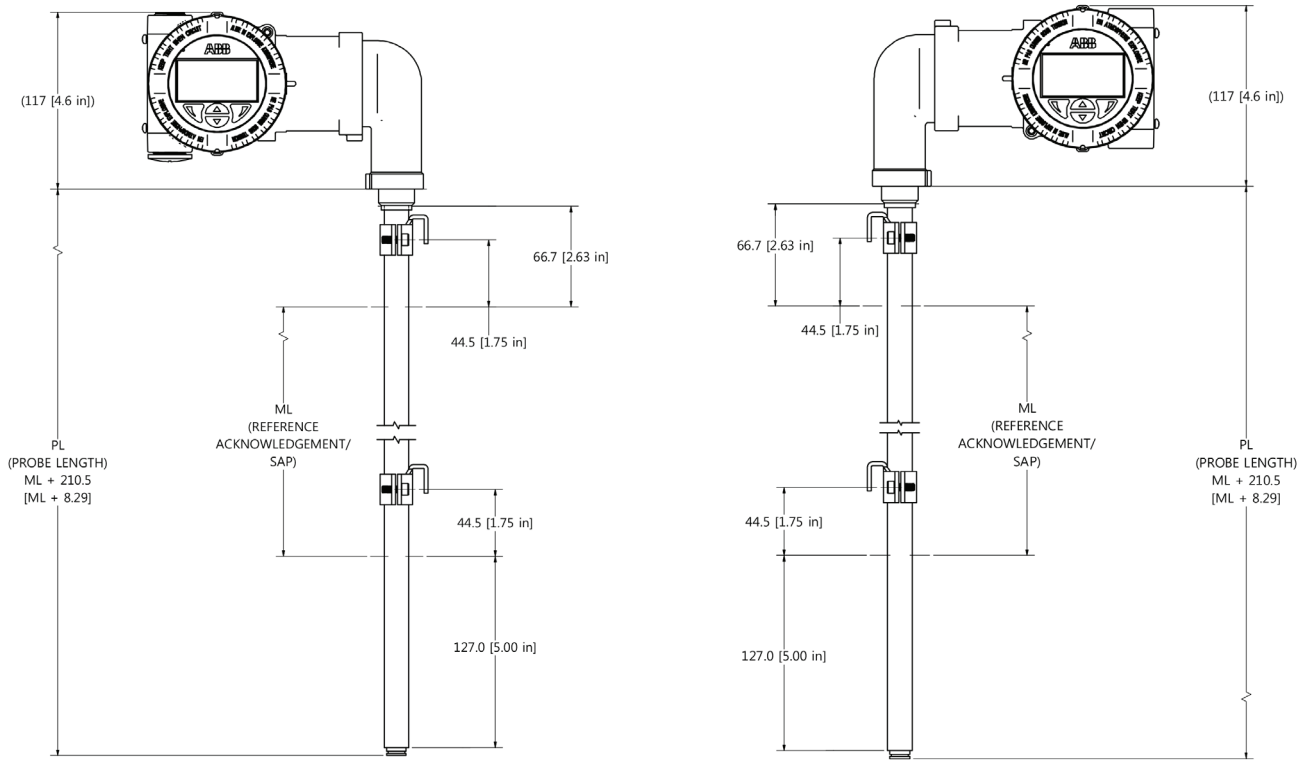


Figure 3 Exploded view of LMT Series transmitter

1	TopWorks Window Cover
2	HMI Display Assembly
3	HMI Connector
4	Communication Board
5	TopWorks Housing
6	Terminal Board
7	TopWorks Blind Cover
8	Agency Approved Plug
9	Plastic Plug
10	Sensor Elbow Housing
11	Sensor Tube
12	LMT200 Mounting Bracket

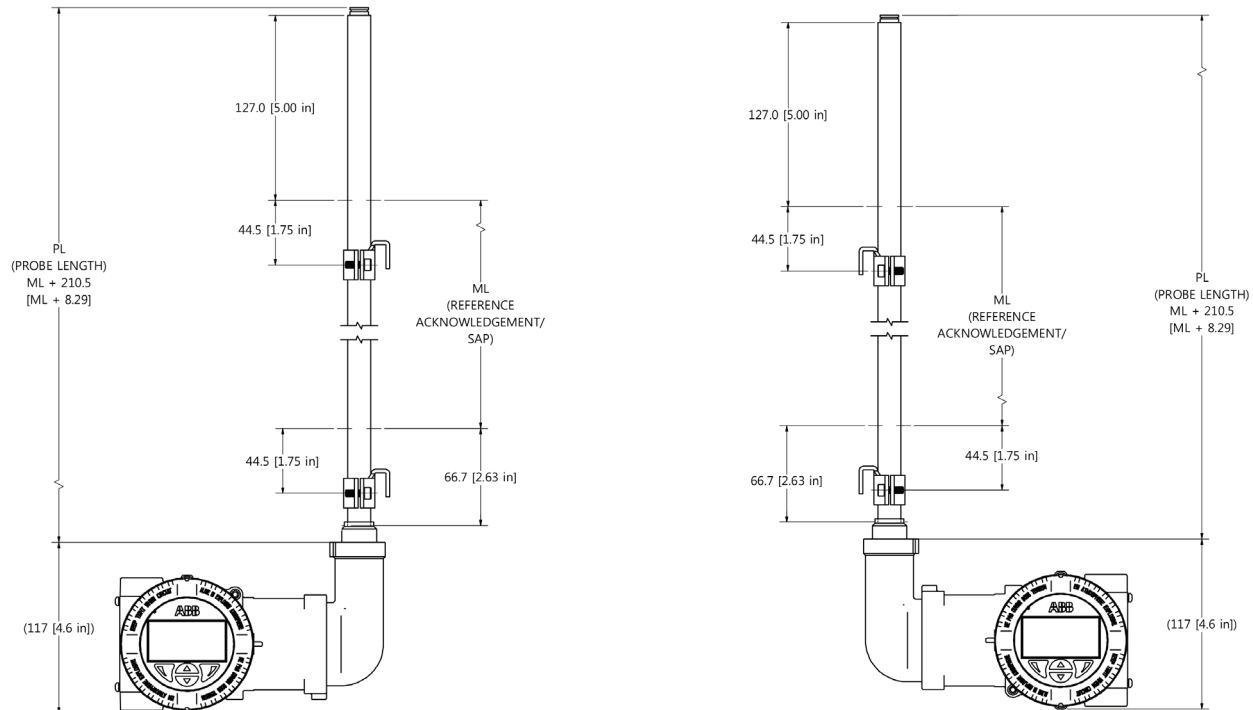
Note: Spare parts list is located in the back of chapter 10.

LMT200 Probe Type R1, R2 & R3 - Top Mount



*Drawings for Reference Only

LMT200 Probe Type R1, R2 & R3 - Bottom Mount



*Drawings for Reference Only