

LMT100 magnetostrictive level transmitter

Level measurement in CO₂ storage tank



Reliable level
measurement of
cryogenic liquids

Managing hazardous or non-hazardous chemical storage inventory requires safe and reliable level measurement solutions.

Measurement made easy

Introduction

Carbon dioxide is the combination of two atoms of oxygen joined with a single atom of carbon. Its chemical formula CO₂, is almost as well-known as that of water, H₂O, and it is frequently referred to by its formula rather than its name. CO₂ is a colorless, inert gas approximately 1½ times heavier than air and 0.03 % is present in the earth's atmosphere. It is odorless, has a sweet biting taste (soda water) and is highly stable (difficult to separate). CO₂ can exist in three forms:

- in gaseous form; for the beverage and food industries
- in liquid form; in a storage tank under pressure
- in solid form; called dry ice (for cooling, blasting etc.)

Low pressure liquid is an alternative method of storing CO₂ and is produced either by expanding high pressure CO₂ to a lower pressure or by refrigeration. It is held in specially constructed storage tanks, heavily insulated and equipped with refrigeration units to hold the internal tank pressure at or below 21 bar (304.58 psi) and -18 °C (-0.4 °F) temperature. Unlike water, carbon dioxide cannot exist in the open air in liquid form. It must be held under pressure or refrigeration (or a combination of both) to remain in the liquid state.

The application

The customer is a CO₂ plant in Virginia, USA. The application is a cryogenic CO₂ storage tank.

- Ambient temperature: -26 to -40 °C (-14.8 to -40 °F)
- Fluid SG: 0.90
- Process temperature: -40 °C (-40 °F)
- Process pressure: 2.4 barg



The challenge

The storage tank is a 4.0 m tall horizontal cylinder used for storing CO₂ inventory. The customer wanted a solution which the sensor could be removable without requiring evacuation of the storage tank and would not be susceptible to freezing and icing of the sensor or electronics

The application requires accurate measurement and uses a 2 out of 3 voting system with two AT100 magnetostrictive transmitters which are installed into the two interconnecting tanks.

The solution

The customer installed the LMT100 with a ¾ in sensor well so that the sensor could be removable while the vessel is under pressure. The transmitter installed easily and indicated accurately as soon as it was installed. The vertical head rotation and waveform display made installation and calibration verification easy.



LMT100 insertion type magnetostrictive liquid level transmitter

LMT100 features and benefits

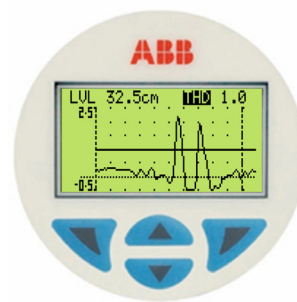
- High accuracy: 0.01 % of full scale or ±1.27 mm (0.05 in), whichever is greater
- Superior sensor (patent #5,473,245)
- Local indication with HMI display
- Never requires recalibration: set it & forget it
- Dual compartment housing with separate field terminal compartment
- Rigid probes up to 9 m (30 ft) probe length
- Total and/or interface level measurement
- Field replaceable/upgradable electronics module
- Built-in RFI/EMI filter
- Probe and flange materials to meet your process compatibility needs
- 4 to 20 mA HART®, FOUNDATION™ Fieldbus*
- Certified for use in SIL2/3 rated systems per IEC61508
- DTM, EDDL, FDI software available
- Integral RTD option available for process temperature measurement
- Waveform display (no need for an oscilloscope)
- 360° display rotation
- Standard sealed sensor tube
- NAMUR NE107 messaging

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LMT series rotatable housing design



LMT series built-in waveform for easy commissioning and troubleshooting

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