

## LLT100

# Level measurement in biogas tank



Measurement made easy

LLT100

### Introduction

Determining the level in biogas tanks with the processes used today exhibits shortcomings in reliability.

ABB's laser measurement technology offers an alternative for obtaining a reliable measurement in this safety-related application.

### Additional Information

Additional documentation on LLT100 is available for download free of charge at [www.abb.com/level](http://www.abb.com/level).

Alternatively simply scan this code:



## Overview

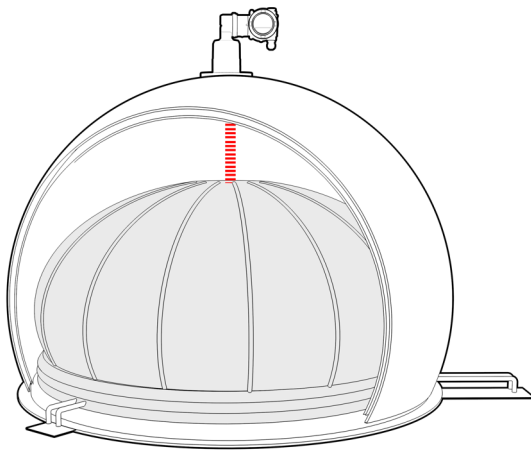
01 LLT100 Laser level transmitter on a double-membrane biogas tank

02 Double-membrane biogas tank

In times where people are moving away from fossil fuels and towards sustainable power generation, biogas offers an environmentally-friendly alternative.

Biogas is produced by fermenting biomass. This gas is combustible and is ultimately used in co-generation plants to generate power.

Storing biogas is very important, particularly for needs-oriented power generation. It is stored in many types of gas tanks, such as the most common double-membrane biogas tank.



01

The inner and outer membrane consists of polymers (e. g. PVC).

Depending on the biogas fill level, the inner membrane alters its spatial expansion. Conversely, the outer membrane is permanently tensioned, thereby protecting the inner membrane from external influences.

The distance between both membranes is determined via laser level measurement. This distance produces a conclusion on the bio gas tank's level.

## The problem

Determining the exact level of the bio gas tank is essential so that the co-generation plant can control and monitor the biogas system and power generation.

The level allows for conclusions to be drawn on the gas volume that is available for power generation. Various measurement methods can fulfil this measurement task without any contact. These include, for instance, ultrasonic measuring devices and radar measuring devices. Both methods have disadvantages in practical use.

Apart from the limitation posed by the membrane material's excessively low dielectric constant, the significant expansion of the measuring beam is also bothersome in practical use. Using radar measurement entails high costs, since the gas tank membrane needs to be adapted to the special requirements of radar measurement.

Propagated ultrasonic measurement has problems with false echoes during use due to the large radiation angle if the biogas membrane has an uneven shape. Furthermore, electromagnetic fields cause interference that can lead to incorrect measurements.



02

---

## Solution

—  
03 LLT100 on a biogas  
tank

ABB's solution for determining the level is to use the LLT100 laser level transmitter.

The tried-and-tested laser measurement process has proven itself advantageous during use, since the device is not affected by electromagnetic fields, making it possible to accurately measure at a membrane tilt of up to 45° without any problems.

The device has a radiation angle of just < 0.3, less than a tenth compared to other contactless measurement methods. In addition, it is possible to measure virtually independently of the gas tank's membrane characteristics.

As a result, many plants around the world have already been successfully equipped with the LLT100 by ABB.



03

The ABB LLT100 has a measuring range of up to 100 m and can therefore be used for all size categories of double-layer biogas tanks. Using the transmitter, the measurement results of the distance measurement can be converted directly into fill volumes.

Naturally, the device is governed by the ABB standardized operating concept for measuring devices. The operating concept's Easy Setup menu allows for simple commissioning compared to other measurement methods

As a result, the user saves time and money with the LLT100.

In addition to maintenance and wear-free operation, the measuring device also offers a high level of reliability and provides the user with an early alarm warning if various limits are reached. Safe operation in the rough environment of a biogas plant is guaranteed with the LLT100 by ABB.

---

**ABB Limited**  
**Measurement & Analytics**  
Howard Road, St. Neots  
Cambridgeshire, PE19 8EU  
UK  
Tel: +44 (0)870 600 6122  
Fax: +44 (0)1480 213 339  
Email: [enquiries.mp.uk@gb.abb.com](mailto:enquiries.mp.uk@gb.abb.com)

**ABB Automation Products GmbH**  
**Measurement & Analytics**  
Schillerstr. 72  
32425 Minden  
Germany  
Tel: +49 571 830-0  
Fax: +49 571 830-1806

[abb.com/level](http://abb.com/level)

**ABB Inc.**  
**Measurement & Analytics**  
125 E. County Line Road  
Warminster, PA 18974  
USA  
Tel: +1 215 674 6000  
Fax: +1 215 674 7183

**ABB Inc.**  
**Measurement & Analytics**  
3400, rue Pierre-Ardouin  
Québec (Québec) G1P 0B2  
Canada  
Tel: +1 418 877 2944 (worldwide)  
1 800 858 3847 (North America)  
Fax: +1 418 877 2834  
Email: [lasers@ca.abb.com](mailto:lasers@ca.abb.com)

[abb.com/laserlevel](http://abb.com/laserlevel)

---

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents – in whole or in parts – is forbidden without prior written consent of ABB.