

# LB 476 Level+

The solution for the most challenging processes



QUALITY  
MADE IN  
GERMANY

**BERTHOLD**

# MORE THAN A CLASSIC LEVEL MEASUREMENT SYSTEM

The LB 476 Level+ system adds that little extra to radiometric level measurements, which makes it the perfect system for challenging processes.

## Dual level measurement

LB 476 Level+ allows a simultaneous monitoring of two levels based on two different calibration curves. This feature is especially useful for level measurements of products in processes with two significantly different process stages (e.g., the normal and the outage stage of the delayed coking process). Since in such cases, one single calibration curve can by no means be used for both process stages. The simultaneous level output to the DCS can be realized by using the LB 47x Current Output/HART module, which comes with four additional current outputs.

## Outstanding compensation functions

Since the output level is determined based on attenuation, effects inherent to the process can influence the attenuation and, thus, may lead to measurement falsification (e.g. gas density fluctuations and product buildup on vessel walls or internal structures). LB 476 Level+ offers two outstanding compensation modes that prevent falsification of measured values by process influences in a targeted manner. The Gas Property Compensation (GPC) function compensates for the influence of fluctuating gas phase density and composition, e.g. due to process pressure variations or due to fines being carried in the vapour phase. The Product Buildup Compensation (PBC) function prevents level falsification caused by varying wall buildup.

## Detector options

LB 476 can be used with LB 4700 DuoSeries detectors or with LB 480 SENSseries detectors. Both detectors come with 304 Stainless Steel housings as a standard. LB 480 can also be ordered with a 316L Stainless Steel housing, if the site conditions require greater resistance to corrosion. LB 480 comes with an own 4...20 mA (HART) output for added redundancy.

## Single level and total level output

Then cascaded systems, where several level detectors are used to cover the entire measuring range, LB 476 Level+ allows the output of the total level value as well as the individual levels of the respective detectors. It is even possible to output these values and other measured values simultaneously by using the LB 47x Current Output/HART module, which comes with four additional current outputs.

# LB 476 Level+ SPECIAL FEATURES

## Gas Property Compensation (GPC)

The GPC detector is positioned at the top of the vessel and measures gamma radiation passing through the gas phase. Using the signal of the GPC detector, LB 476 Level+ compensates for changes in gas density, ensuring that the level measurement is accurate and reliable. This improves process control, reduces the risk of errors or failures, and helps customers achieve better efficiency, safety, and reliability. Additionally, the GPC detector can be used as high level switch to detect carryover events, helping to prevent overflows or spills and protect equipment and personnel.

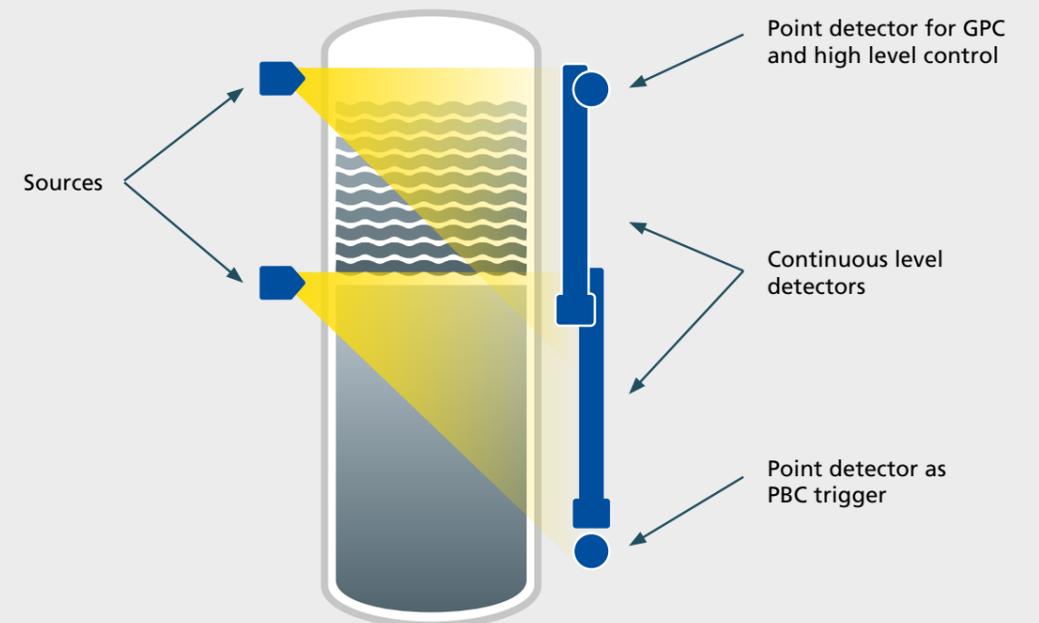
## Product Buildup Compensation (PBC)

The PBC trigger detector prompts the product buildup compensation feature to adjust the calibration curve to a new zero percent level for the continuous level detectors when the product level drops below the trigger detector's height. The new zero point remains in effect until the vessel is emptied and the PBC is activated again. This ensures more accurate measurements, as PBC compensates for any buildup that may affect the continuous level detectors.

## Compensated & uncompensated level measurement

Two calibration curves can be stored in the system and the two resulting levels are displayed simultaneously. One of the level measurements can be assigned with the compensation functions, while the other stays uncompensated.

Schematic measurement arrangement  
(e.g. point source / rod detector arrangement)



# THE SYSTEM

## TAILORED FOR YOUR MEASUREMENT TASK

### System Components

- Radioactive sources and shields: individual design, project-dependent
- Multiple detectors mounted on the outside of the vessel in the radiation source beam paths
  - up to 5 detectors for continuous level measurement
  - 2 compensation detectors:
    - 1 detector for Gas Property Compensation (GPC) and as high level switch;
    - 1 detector as trigger detector for Product Buildup Compensation (PBC)
- LB 476 Level+ transmitter with optional Current Output/HART module

### Transmitter LB 476 Level+ with Current Output/HART module

- Intelligent: continuous calculation of two levels based on two different calibrations and compensation of product buildups and gas density fluctuations
- NDT safe: proven radiation interference protection XIP
- Simple and intuitive: operation via 3.5" TFT display
- Reliable: important maintenance-oriented diagnostic functions and self-monitoring
- Ease of mounting and wiring: transmitter and extension modules are mounted in a standard 19" rack or in a wall-mounted housing
- Signal output to DCS: all relevant values via 4...20 mA (HART) with additional Current Output/HART module (4 current outputs per module)



### Detector Series for different requirements

The system LB 476 Level+ can be operated with both DuoSeries LB 4700 and SENSseries LB 480 detectors.

Both detectors series combine top of the class measuring technology with maximum manufacturing quality and innovative features – the best systems for challenging measuring tasks. Within each detector series there are several detector types with various scintillator sizes and materials.

### SENSseries LB 480

- Very robust: stainless steel housing (AISI 304 or 316L)
- SIL 2/3 certification available
- All contemporary Ex-approvals
- Communication with transmitter LB 476 via RS485 repeater
- Additional 4...20 mA (HART) current output
- Daily functional check and continuous self-monitoring



### DuoSeries LB 4700

- Proven 2-wire system
- Very robust: stainless steel housing (AISI 304)
- All contemporary Ex-approvals
- Communication with transmitter LB 476 via 2-wires (LB 47x Slave modules are required for multidetector operation)
- Cost-effective

### Possible applications

- Coke drums
- Fluidized bed reactors
- Storage tanks
- Settling tanks
- Separators with clear interfaces
- Fractionators





## THE EXPERTS IN MEASUREMENT TECHNOLOGY

Berthold Technologies stands for excellent know-how, high quality and reliability. The customer is always the focus of our solution. We know our business!

Using our varied product portfolio, our enormous specialized knowledge and extensive experience, we develop suitable solutions together with our customers for new, individual measurement tasks in a wide variety of industries and applications. Berthold Technologies is specialised in radiometric process measurements for over 75 years. This is our core competence with state-of-the-art and cutting edge products and solutions covering a vast range of industries and applications.

### **We are here for you – worldwide!**

The engineers and service technicians from Berthold Technologies are wherever you need them. Our global network assures you fast and above all competent and skilled assistance in case of need. No matter where you are, our highly qualified experts and specialists are ready and waiting and will be with you in no time at all with the ideal solution for even the most difficult measurement task.

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