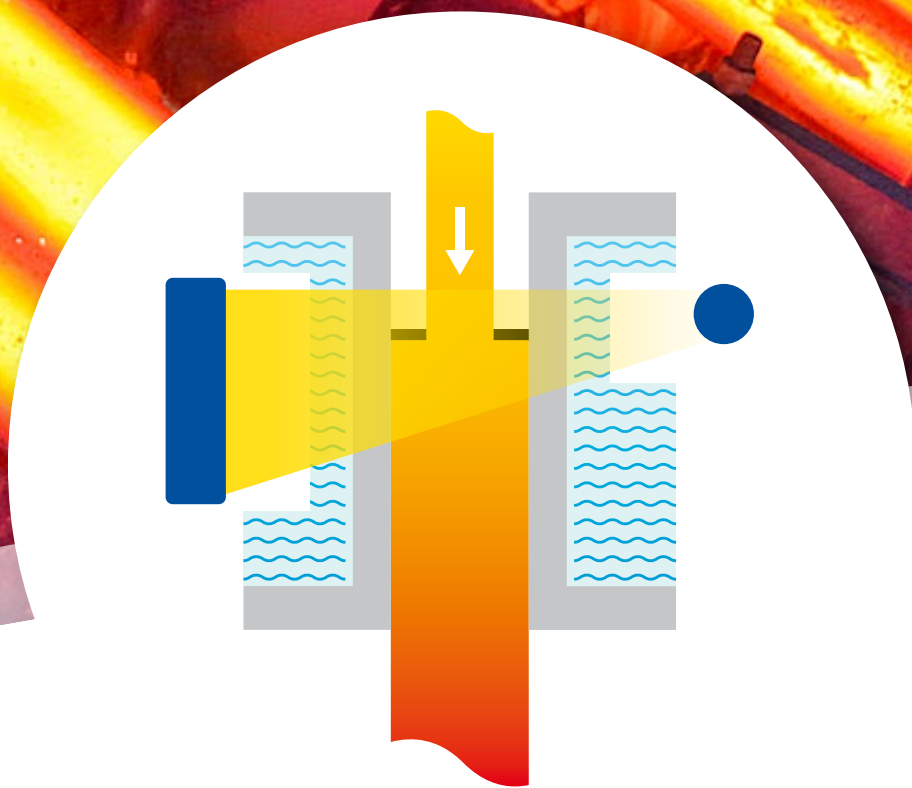


# MOULD LEVEL MEASUREMENT

Measuring the steel level  
in continuous casting



# QUICK AND PRECISE MOULD LEVEL MEASUREMENT IN CONTINUOUS CASTING APPLICATIONS

Radiometric based mould level measurement is the dominating technology for measuring the steel level in continuous casting. This technology has been available for more than 50 years and now with more than six thousand systems deployed.

The level of liquid metal in the mould is measured reliably and precisely. The extremely short cycle time of 5 ms allows for an optimum control of the casting process – both in automatic start-up and in normal operation.

## Measurement technology

Gamma radiation is attenuated as it passes through the mould. This attenuation is measured by a detector. The extent to which the radiation is attenuated depends on the mould level. The higher the level of molten metal in the mould, the less radiation will reach the detector. In this manner, the mould level can be reliably monitored - irrespective of dust, temperature and vibrations.

The radiometric measurement is maintenance-free and applicable for all mould types and sizes. Beside the typical installation on slab and billet casters, it is also successfully applied on beam-blank and round casters.

## Advantages of radiometric technology

- Robust and reliable
- Low cost of ownership
- Can be used for all mould formats
- Immune towards inference from electromagnetic stirrers and brakes
- Can also be offered with continuous mould powder measurement
- Virtually maintenance-free

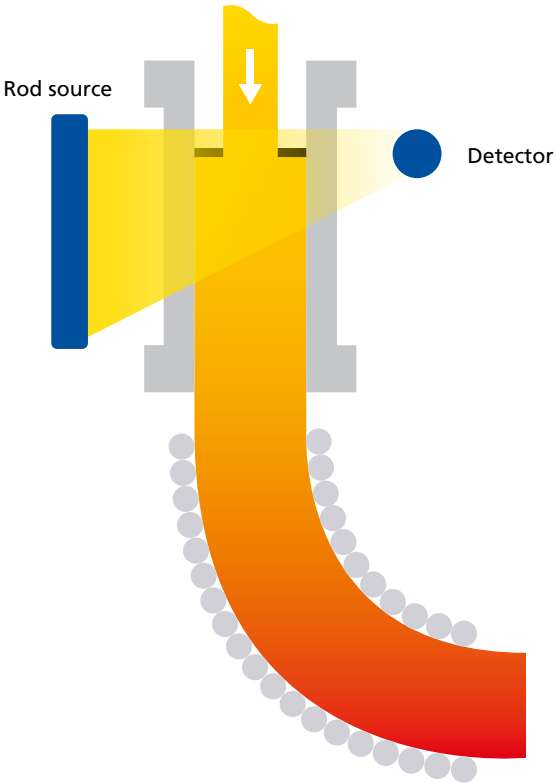
# MEASURING THE MOULD LEVEL OF STEEL MENISCUS

A precise and quick measurement of the mould level lays the foundation for the production of high-quality steel and the reliable prevention of steel overflows and breakouts. The Berthold mould level systems fulfill this role reliably and accurately.

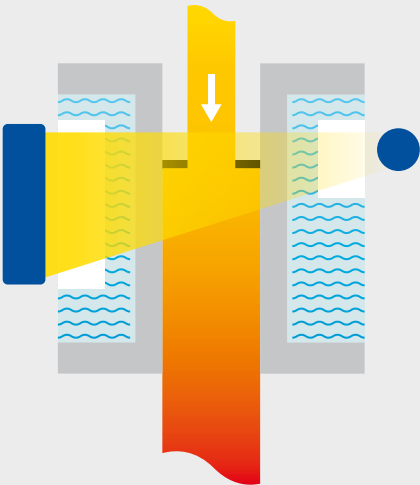
Several thousand strands throughout the world are equipped with Berthold systems.

Depending on the casting format and the mould construction, different arrangements of sources and detectors can be realised.

- Reliable and extremely robust mould level measurement
- Fully compatible with electromagnetic stirrers and brakes
- Extremely short cycle time of 5 ms
- Cycle time powder level: 250 ms



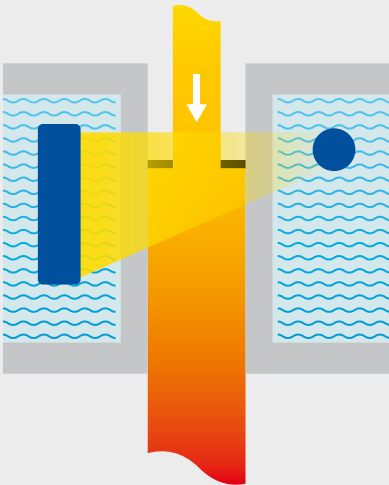
External arrangement with reduced water jacket



Rod source in lockable shield

This arrangement is preferred for tubular moulds for billet casting formats.

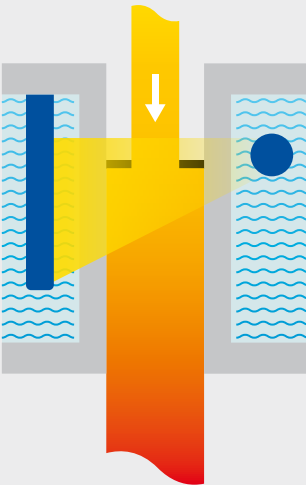
Internal arrangement



Rod source in lockable shield

This arrangement is necessary where space is particularly limited.

Internal arrangement with dip tube



Rod source in dip tube

This arrangement requires particularly low source activity and has the advantage that no major modification measures are required, even for retrofitting.



## castXpert LB 452

### THE UNIVERSAL CONTROL UNIT

The castXpert LB 452 is the mould level measuring system that has been setting standards for years. It provides accurate and reliable measurements, and ensures optimal control of the continuous casting process due to the short cycle time of 5 ms.

The castXpert LB 452 handles up to 4 independent level measurements channels in one control unit. Each channel is independently powered and can also be equipped with different communication interfaces.

#### Designed for reliability

With well over 1.000 units in operation world-wide, the castXpert LB 452 is probably the most trusted level mould level measurement system.

- Easy to use, intuitive, multilingual user interface
- Highest safety and measurement robustness
- Supports automatic start-up
- Handles up to 4 measuring channels per unit
- Extremely fast processing and the world's fastest response time
- Highest safety (designed according to IEC 61508 (SIL Standard))
- Highest accuracy



## GAMMAcast detectors

### RADIOMETRIC MOULD LEVEL DETECTORS

The GAMMAcast detectors are robust, maintenance-free and applicable for most mould types. Successful installations can also be found in casters for beam blank and round moulds. Although working under extreme temperatures and harsh environmental conditions, these detectors are proven to be reliable for many years of operation.

#### Designed for all casting applications

GAMMAcast detectors are characterized by their excellent sensitivity, leading to a significant reduction in source size. The robust detector design ensures highest mechanical stability and longest lifetime.

Berthold is the only supplier offering silicon photomultiplier (SiPM) based detectors, which are immune toward interfere from electromagnetic stirrers and brakes, as well extremely robust.

- Virtually unlimited measuring ranges possible
- Automatic voltage control and self-diagnostics
- Minimum source activity due to highly sensitive detectors
- Consistent high accuracy over the entire measurement range
- Unmatched thermal stability



# CONGAUGE LB 6755 DETECTOR FOR STEEL AND CASTING POWDER LEVELS

The CONGAUGE LB 6755 is a highly advanced detector specifically developed for the closed casting process.

It enables precise and simultaneous measurement of the molten steel level and the casting powder layer, a task that cannot be accomplished with conventional detectors. By using ten scintillation crystals combined with an intelligent software algorithm, the powder layer thickness is reliably detected and clearly distinguished from the steel level.

## Designed for maximum process reliability

The detector offers an industry-leading response time of just 5 ms for steel level measurement and 250 ms for the powder layer. Thanks to silicon photomultiplier (SiPM) technology, it is immune to electromagnetic interference caused by stirrers and braking systems. The robust stainless-steel housing and excellent temperature stability ensure a long service life, even under extreme operating conditions.

## Focus on powder level measurement

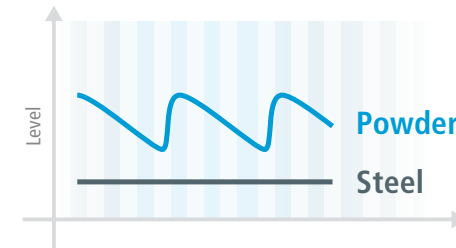
Accurate detection of the casting powder layer thickness is critical for casting quality. It enables automatic powder dosing via feeding systems and reduces manual intervention in hazardous areas. This ensures a uniform powder layer and significantly improves overall process stability.

- Simultaneous and precise measurement of steel and powder levels
- Reduced number of strand breakouts
- High stability of the steel meniscus position
- Improved steel quality
- Process automation through integration of an automatic powder feeding system

in cooperation with  
**SMS group**  
SMS Concast AG

## CONGAUGE detector Redefining industry standards

The separate output of the powder signal enables precise monitoring of the powder thickness and an evenly dosing of the powder.



## Advantages

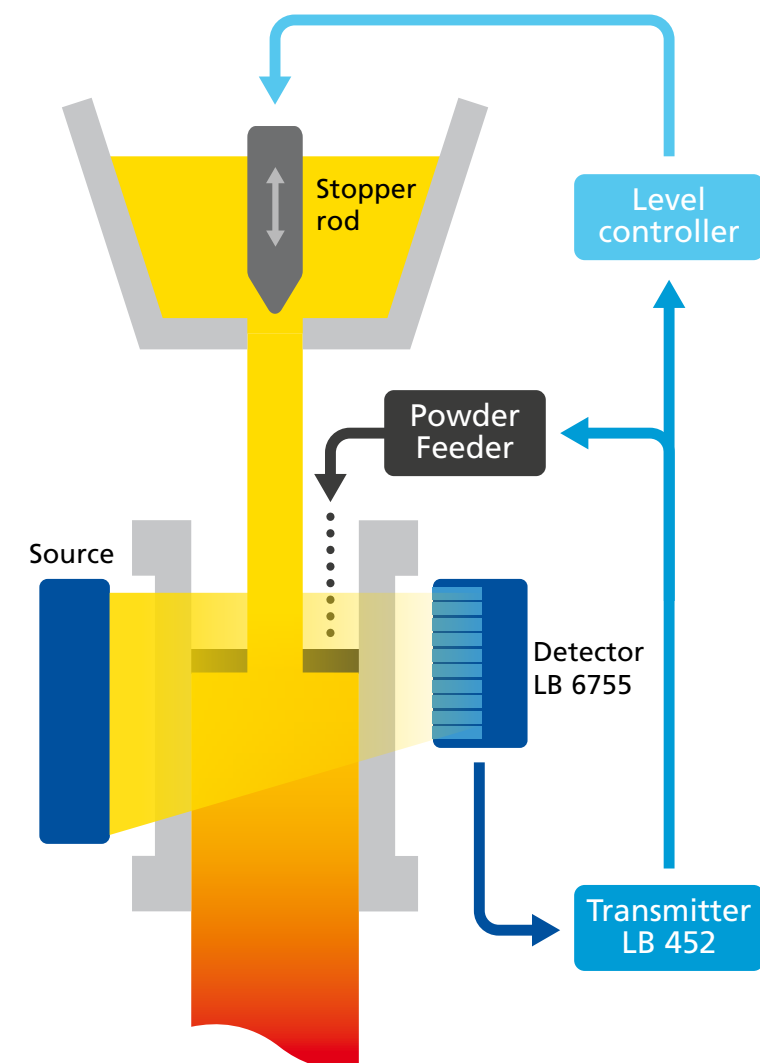
- One device, two signals (steel and powder)
- Constant highest steel quality
- High reliability under extreme process conditions
- Low maintenance
- Easy retrofit of LB 6752 and LB 6652 without mechanical adaptations
- Robust against environmental influences like electromagnetic stirrers and brakes, high temperature, mechanical shock
- Compatible with LB 452

## Technical features

- 10 sensors within 1 housing
- Cycle time steel level: 5 ms
- Cycle time powder level: 250 ms

## Communication

- Current output via 4 to 20 mA
- Profibus
- ProfiNET







## 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.

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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