

Density Gauge

Uniprobe LB491

CONTACTLESS MEASUREMENT



Determining density and concentration using the Density Gauge LB 491

The measuring system LB 491 is used for contactless, continuous measurement of liquids, slurries or bulk materials in pipes and vessels.

Applications

Concentration measurements of acids, alkalis, saline solutions and suspensions.

Crystallisation and polymerisation monitoring.

Measurement of the solid matter content in slurry, in flue gas desulphurisation suspensions, in aluminium production and in mining.

Determination of the bulk density in washing powder and clinker.

It can easily be installed on existing pipelines without down time. It works reliably and is unaffected by colour, temperature, pressure or chemical properties of the product to be measured.

Measuring principle

The gamma radiation emitted by a source is attenuated when it passes through matter. The extent to which it is attenuated depends on the measuring path and on the density of the product. Given a constant distance in the measuring path, radiation absorption is a function of the density of the material being measured.

Measuring arrangement

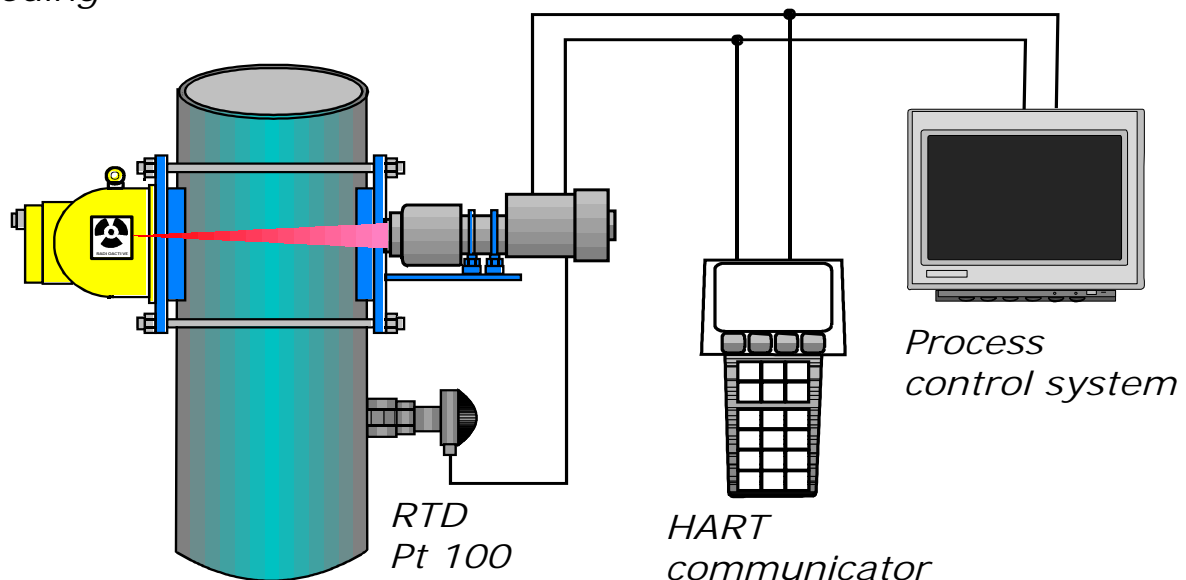
The figure below shows a typical schematic arrangement of a complete measuring system. It consists of the source with shielding, a clamping device and the UNIPROBE LB 491.

The UNIPROBE LB 491 contains a scintillation counter with NaJ crystal and evaluation unit in one housing. The detector has an excellent sensitivity and long term stability. For temperature compensation a RTD Pt 100 can be connected. This system is used for very precise measurements in the chemical industry, for example, and for application under very tough conditions on dredgers and in mining. Installation can be carried out without pipeline modification or production downtime. Both the shielding and the UNIPROBE LB 491 can be mounted on the outside of the pipe using various clamping devices (90°, 45°, or 30° irradiation angle). For very precise measurements on small pipe diameters, a special s- or u- shaped measuring pipe is available.

The evaluation unit uses state-of-art micro-processor technique; parameters can be set via HART communicator. This communicator can be connected to any position in the current loop of the 4-20 mA output signal.

*Source with
shielding*

*UNIPROBE
LB 491*



*RTD
Pt 100*

*HART
communicator*

*Process
control system*

Technical Data LB 491

Operating Data

Power supply	90 – 265V AC
Power consumption	approx. 15 VA
Operating Temperature	- 20 to + 50°C
Storage temperature	- 4 to + 122°F
	-40°C to 55°C
	-40 to 130°F

Inputs

Digital input	1 for hold signal
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Outputs

Relay outputs max. 5A at 250V AC or 30 V DC

1 for error signal

3 for either

Max.. alarm
Min.. alarm
Hold signal
Detector
temperature
Interference
radiation

Current outputs 4-20 mA, isolated
max. 500 W
1 for density

Option 1 for mass flow

Interfaces

HART
RS 232

Cable connections

Conduits 4 conduits NPT 3/4 inch

Terminal cross-section max. 1.5 mm²

Electronics

CPU Data storage in flash memory
Self monitoring by watchdog timer

Detector

Scintillation counter with NaI crystal 2"
Long term stability ± 0.1 %

Protection types

Explosion protection Pressure-resistant capsule

FM according to NEC 500

Class 1 Division 1 Group A,B,C,D

Class 2 Division 1 Group E,F,G

Temp. class T6

IP protection class NEMA 4X

Roughly corresponding to IP 66

Housing material

Stainless steel
1.4301 Roughly
corresponding
to 304

Source and shielding see separate brochure.

Design modification may occur without notice.

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