

# Level measuring instruments



 Part of your business

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## Ability to meet any challenge

As a family-run business acting globally, with over 7,900 highly qualified employees, the WIKA group of companies is a worldwide leader in pressure and temperature measurement. The company also sets the standard in the measurement of level and flow, and in calibration technology. Founded in 1946, WIKA is today a strong and reliable partner for all the requirements of industrial measurement technology, thanks to a broad portfolio of high-precision instruments and comprehensive services.

With manufacturing locations around the globe, WIKA ensures flexibility and the highest delivery performance. Every year, over 50 million quality products, both standard and customer-specific solutions, are delivered in batches of 1 to over 10,000 units. With numerous wholly-owned subsidiaries and partners, WIKA competently and reliably supports its customers worldwide. Our experienced engineers and sales experts are your competent and dependable contacts locally.



**Efficient logistics**



**Fully automatic production**



**Certified calibration laboratories**

# WIKA product lines

The WIKA programme covers the following product lines for various fields of application.

## Electronic pressure measurement

WIKA offers a complete range of electronic pressure measuring instruments: pressure sensors, pressure switches, pressure transmitters and process transmitters for the measurement of gauge, absolute and differential pressure. Our pressure measuring instruments are available in the measuring ranges 0 ... 0.6 mbar to 0 ... 15,000 bar. These instruments come supplied with standardised current or voltage output signals (also intrinsically safe per ATEX or with flameproof enclosure), interfaces and protocols for various field buses. Whether ceramic thick film, metal thin film or piezo-resistive, WIKA is the leading manufacturer worldwide that develops and produces the full range of today's leading sensor technologies.

## Mechatronic pressure measurement

As a result of the almost unlimited options for different combinations of mechanical and electrical connections, an extraordinary range of instrument variants is possible. Various digital and analogue output signals are also available for these measuring instruments.

For our measuring instruments we use latest sensors, tested in automotive applications millions of times over. They work without any kind of mechanical contact, consequently they are wear-resistant, and there's absolutely no influence on the mechanics.

## Mechanical pressure measurement

Indicating pressure gauges for gauge, absolute and differential pressure with Bourdon tube, diaphragm or capsule pressure elements have been tested millions of times over. These instruments cover scale ranges from 0 ... 0.5 mbar to 0 ... 7,000 bar and indication accuracies of up to 0.1 %.

## Diaphragm seals

WIKA diaphragm seals, mounted with pressure gauges, pressure transducers, pressure transmitters etc., are recognised and valued internationally for the most difficult of measuring tasks. The measuring instruments can therefore be used at extreme temperatures (-130 ... +400 °C), and with aggressive, corrosive, heterogeneous, abrasive, highly viscous or toxic media. The optimal diaphragm seal designs, materials and filling media are available for each application.

## Electrical temperature measurement

Our range of products includes thermocouples, resistance thermometers (also with on-site display), temperature switches as well as analogue and digital temperature transmitters for all industrial applications. Measuring ranges from -200 ... +1,600 °C are covered.

## Mechatronic temperature measurement

As a result of the integration of switch contacts and output signals into our mechanical temperature measuring instruments, we can offer a wide variety of combined instruments. With switch contacts the pointer position triggers a change-over. Electrical output signals are realised via an additional, independent sensor circuit (resistance thermometer or thermocouple).

## Mechanical temperature measurement

The mechanical temperature measuring instruments work on the bimetal, expansion or gas actuation principle and cover scale ranges from -200 ... +700 °C. All thermometers are suited for operation in a thermowell if necessary.

## Level measurement

WIKA has a comprehensive range of level measuring instruments available for temperatures up to 450 °C, specific gravity from 400 kg/m<sup>3</sup> and pressure ranges up to 500 bar. This includes standard instruments and customised products.

## Flow measurement

Orifice plates, meter runs, flow nozzles, Venturi tubes and pitot tubes are part of our portfolio of primary flow elements and restriction orifices. The wide range of our products is able to cover the majority of industrial applications. Customised solutions can be developed to meet your special needs.

## Calibration technology

WIKA offers a broad product range of calibration instruments for the physical units of measurement for pressure and temperature, and for electrical measurands. Numerous patents ensure unmatched performance from many of our calibration instruments. The range of services covers the calibration of pressure and temperature measuring instruments in our accredited DKD/DAkkS calibration laboratories and a mobile service to calibrate your instruments on site.

# Bypass level indicators

Continuous level measurement via visual indication of the level without power supply

## Benefits

- Simple and sturdy design
- Level displayed proportional to volume or height
- Pressure- and gas-tight separation between chamber and display/measuring equipment
- Individual design and corrosion resistant materials make the products suitable for a broad range of applications
- Pressure range from vacuum up to 500 bar
- Temperature range up to 450 °C
- Density  $\geq 400 \text{ kg/m}^3$
- Explosion-protected versions
- Interface measurement and overall level from  $\Delta$  density  $\geq 100 \text{ kg/m}^3$

## Options

The following instruments can be attached externally to the bypass level indicator to provide additional functionality:

### Level sensor

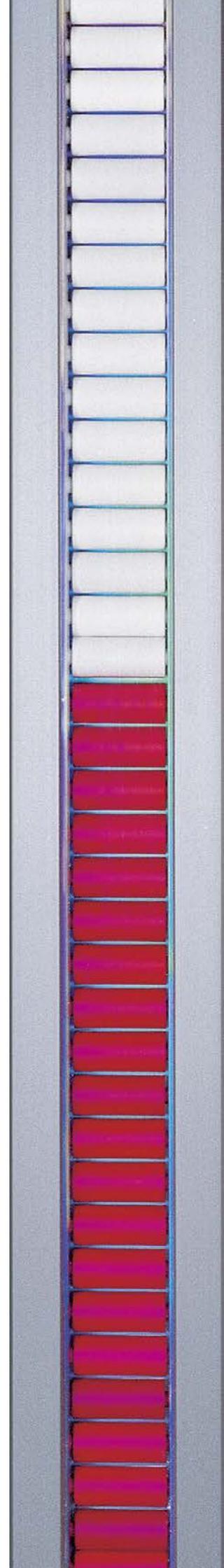
These are used for continuous monitoring and recording of the level in connection with external transmitters. They transform the resistance value of the level sensors into a standardised analogue signal that is proportional to the height of the level. 2-wire head-mounted transmitters are available in the versions programmable 4 ...20 mA, HART® protocol, PROFIBUS® PA and FOUNDATION™ Fieldbus.

### Magnetic switches

They serve to detect the limits of filling levels. They generate a binary signal which can be fed to downstream signalling or control equipment.

### Magnetic roller display with and without scale

Two-coloured, continuous visual indication of the current level without power supply.





## BNA

### Stainless steel version

Material:	Austenitic steels, 6Mo, Hastelloy, titanium, Monel, Inconel, Incoloy, Duplex, Super Duplex
Process connection:	<ul style="list-style-type: none"> <li>■ Flange: DIN, ANSI, EN</li> <li>■ Thread</li> <li>■ Weld stub</li> </ul>
Temperature:	-160 ... +450 °C
Density:	≥ 400 kg/m <sup>3</sup>
Data sheet:	LM 10.01



## BNA-P

### Plastic version

Material:	PVDF, PP
Process connection:	Flange: DIN, ANSI, EN
Pressure:	PVDF 6 bar, PP 4 bar
Temperature:	-25 ... +80 °C
Density:	≥ 800 kg/m <sup>3</sup>
Data sheet:	LM 10.01

# PLUS series

Combines the tried-and-trusted bypass with further independent measuring principles

## PLUS

- Guided microwave (TDR)
- Reed measuring chain
- Magnetostrictive
- Limit switch (magnetic, tuning fork)

The wide range of combination possibilities offer a very large application spectrum.

## Benefits

- Compact design
- Only 2 process connections required
- Absolute measuring redundancy possible
- Visual level measurement constantly given
- Up to 3 independent measuring principles possible
- Customer-specific versions

## Output signals/communication

2- and 4-wire technology, 4 ... 20 mA, HART®, PROFIBUS® PA, FOUNDATION™ Fieldbus/DTM/FDT (PACTware™)





**KOplus**

**Coaxial: 2 sensors,  
1 reference chamber**

Material:	Stainless steel, 6Mo, Hastelloy, titanium, Monel, Inconel, Incoloy, Duplex, Super Duplex
Pressure:	0 ... 40 bar
Temperature:	-200 ... +400 °C
Density:	≥ 400 kg/m <sup>3</sup>



**DUplus**

**Dual: 2 external  
chambers**

Material:	Stainless steel, 6Mo, Hastelloy, titanium, Monel, Inconel, Incoloy, Duplex, Super Duplex
Pressure:	0 ... 400 bar
Temperature:	-200 ... +400 °C
Density:	≥ 400 kg/m <sup>3</sup>



**SIplus**

**Single: 1 external  
chamber**

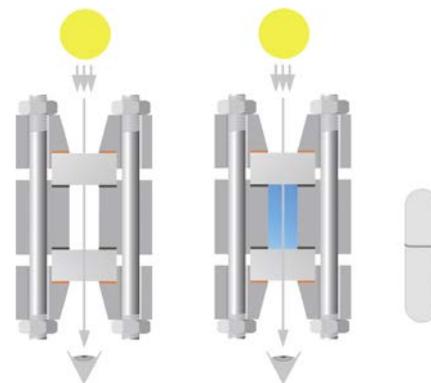
Material:	Stainless steel, 6Mo, Hastelloy, titanium, Monel, Inconel, Incoloy, Duplex, Super Duplex
Pressure:	0 ... 400 bar
Temperature:	-200 ... +400 °C
Density:	≥ 400 kg/m <sup>3</sup>

# Sight glass level indicators

For steam generation and the process industry

## Transparent sight glass level indicator

With this level indicator design, the liquid is encapsulated between two transparent sight glasses. This allows the liquid to be looked through and thus provides a clear indication of the level. Transparent level indicators are available in double-cover plate design for pressure ranges up to PN100. They are the most suitable indicators for steam applications above 35 bar, where mica shields have to be used to protect the sight glasses from corrosion by the steam boiler water. They can also be utilised in a great number of other applications, in particular for observing interface layers or liquid colour. A backlighting illuminator can be fitted to the rear to improve visibility.

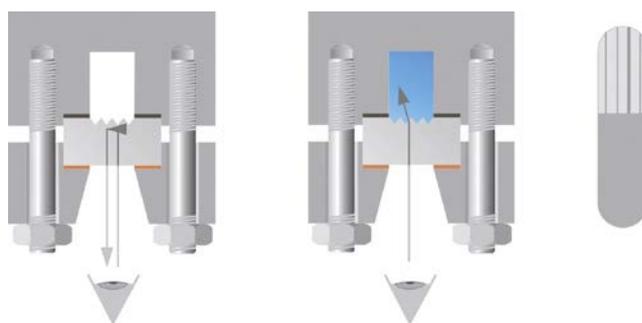


Gas phase (bright), liquid phase (bright), phase boundary (dark)

Operating principle "transparent"

## Reflex sight glass level indicator

The principle of the reflex level indicator is based on the reflection of light. In the gas or steam phase, the light is reflected by the prismatic grooves of the sight glass so that bright indication is achieved. In the liquid phase, the light is absorbed, resulting in a dark indication of the level. Reflex level indicators are available in cover box design for pressure ranges up to PN 25 and in cover plate design for pressure ranges up to PN 100. They are the suitable and favourably priced indicators for steam application up to 35 bar and are also suited for numerous applications in the process industry.



Gas phase (bright)

Liquid phase (dark)

Operating principle "reflex"

## LGG



Material:	Forged steel, heat-resistant C-steel, stainless steel, Monel, Hastelloy
Design:	Available as welded, glass tube, reflection, transparent and refraction indicators
Pressure:	0 ... 250 bar
Temperature:	-200 ... +400 °C
Data sheet:	LM 33.01



# High-precision level measurement

For liquid media, employing the magnetostrictive measuring principle

## Benefits

- The simple and effective principle of operation is suitable for a very wide range of applications
- Continuous measurement of levels, independent of physical and chemical changes of the liquid such as foaming, conductivity, dielectric, pressure, vacuum, temperature, vapours, condensation, bubble formation, boiling effects, density change
- Signal transmission over long distances
- Simple installation and commissioning, onetime calibration only, no recalibration necessary
- Interface measurement and overall level from  $\Delta$  density  $\geq 50 \text{ kg/m}^3$
- Explosion-protected versions
- Functional safety IEC 61508/IEC 61511, SIL-2
- Output signal: 4 ... 20 mA, HART®
- Measuring accuracy  $\leq 1 \text{ mm}$

## FLM-S

### Stainless steel version



Process connection: ■ Mounting thread  
 ■ Flange: DIN, ANSI

Guide tube length: Max. 6,000 mm

Pressure: 0 ... 200 bar

Temperature: -90 ... +450 °C

Density:  $\geq 400 \text{ kg/m}^3$

Data sheet: LM 20.01

## FLM-SP

### Plastic version



Process connection: ■ Mounting thread  
 ■ Flange: DIN, ANSI

Guide tube length: Max. 5,000 mm

Pressure: 0 ... 16 bar

Temperature: -10 ... +100 °C

Density:  $\geq 800 \text{ kg/m}^3$

Data sheet: LM 20.01

## FLM-H

### Hygienic version



Process connection: All common process connections with hygienic design

Guide tube length: Max. 6,000 mm

Pressure: 0 ... 10 bar

Temperature: -40 ... +250 °C

Density:  $> 715 \text{ kg/m}^3$

Data sheet: LM 20.03

# Level sensors

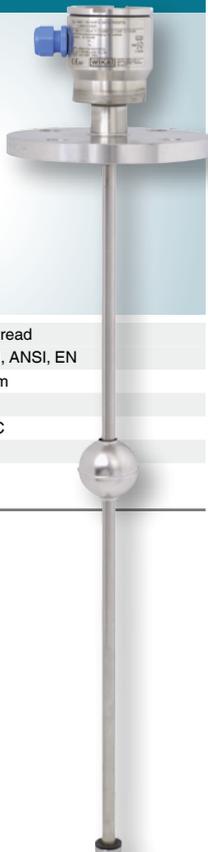
For liquid media, utilising reed measuring chains

## Benefits

- The reliable and proven operation principle is suitable for a very wide range of applications
- Continuous measurement of levels, independent of physical and chemical changes of the liquid such as foaming, conductivity, dielectric, pressure, vacuum, temperature, vapours, condensation, bubble formation, boiling effects, density change
- Signal transmission over long distances
- Simple installation and commissioning, onetime calibration only, no recalibration necessary
- Interface measurement and overall level from  $\Delta$  density  $\geq 50 \text{ kg/m}^3$
- Explosion-protected versions
- Output signal 4 ... 20 mA, HART®, PROFIBUS® PA, FOUNDATION™ Fieldbus
- Resolution  $\geq 5 \text{ mm}$
- Level displayed proportional to volume or height
- In combination with limit switches, stepless setting of the limit values possible over the entire measuring range
- High repeatability accuracy of the set points
- Cable and plug versions

## FLR-S

Stainless steel version



Process connection: ■ Mounting thread  
 ■ Flange: DIN, ANSI, EN

Guide tube length: Max. 6,000 mm

Pressure: 0 ... 100 bar

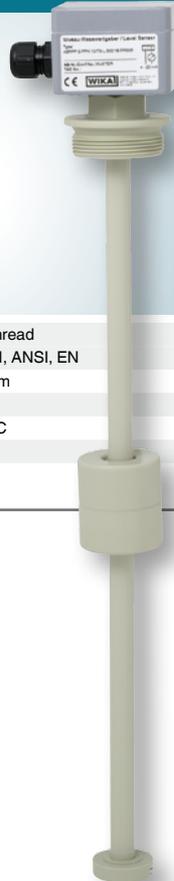
Temperature: -80 ... +200 °C

Density:  $\geq 400 \text{ kg/m}^3$

Data sheet: LM 20.02

## FLR-P

Plastic version, PP, PVDF, PP



Process connection: ■ Mounting thread  
 ■ Flange: DIN, ANSI, EN

Guide tube length: Max. 5,000 mm

Pressure: 0 ... 3 bar

Temperature: -10 ... +100 °C

Density:  $\geq 800 \text{ kg/m}^3$

Data sheet: LM 20.02

## FLR-H

Hygienic version



Process connection: All common process connections with hygienic design

Guide tube length: Max. 6,000 mm

Pressure: 0 ... 10 bar

Temperature: -40 ... +200 °C

Density:  $\geq 400 \text{ kg/m}^3$

Data sheet: LM 20.02

# Magnetic float switches

Sturdy switches for liquid media

## FLS-S

Stainless steel version,  
for vertical installation



Switch points:	Max. 8 switch points
Process connection:	■ Mounting thread ■ Flange: DIN, ANSI, EN
Guide tube length:	Max. 6,000 mm
Pressure:	0 ... 100 bar
Temperature:	-196 ... +300 °C
Density:	≥ 390 kg/m <sup>3</sup>
Data sheet:	LM 30.01

## FLS-P

Plastic version,  
for vertical installation



Switch points:	Max. 8 switch points
Process connection:	■ Mounting thread ■ Flange: DIN, ANSI, EN
Guide tube length:	Max. 5,000 mm
Pressure:	0 ... 3 bar
Temperature:	-10 ... +100 °C
Density:	≥ 400 kg/m <sup>3</sup>
Data sheet:	LM 30.01

## ELS

For lateral mounting



Reference chamber:	Aluminium, red bronze, stainless steel
Process connection:	Threaded pipe connection GE10-LR galvanised steel
Pressure:	Up to 6 bar
Temperature:	-30 ... +300 °C
Data sheet:	LM 30.03

## FLS-H

Hygienic version



Process connection:	All common process connections with hygienic design
Guide tube length:	Max. 6,000 mm
Pressure:	0 ... 6 bar
Temperature:	-40 ... +200 °C
Density:	≥ 300 kg/m <sup>3</sup>
Data sheet:	LM 30.01

## LSD-30

Electronic level switch,  
with display



Measuring range:	Sensor length 250, 370, 410, 520, 730 mm
Density:	$\geq 0.7 \text{ g/cm}^3$ (NBR float)
Switching output:	<ul style="list-style-type: none"> <li>■ 1 or 2 (PNP or NPN)</li> <li>■ Analogue output (optional)</li> </ul>
Process connection:	G 3/4 A, 3/4 NPT
Data sheet:	LM 40.01

## HLS-S

Stainless steel version,  
for horizontal installation



Process connection:	Flange: DIN, ANSI, EN
Pressure:	0 ... 232 bar
Temperature:	-196 ... +350 °C
Density:	$\geq 600 \text{ kg/m}^3$
Material:	Stainless steel, titanium
Data sheet:	LM 30.02

## HLS-P

Plastic version,  
for horizontal installation



Process connection:	Flange: DIN, ANSI, EN
Pressure:	0 ... 3 bar
Temperature:	-10 ... +80 °C
Density:	$\geq 750 \text{ kg/m}^3$
Material:	PP
Data sheet:	LM 30.02

## HLS-M1

Plastic version,  
with cable outlet



Process connection:	<ul style="list-style-type: none"> <li>■ 1/2" NPT (installation in the tank from outside)</li> <li>■ G 1/4" (installation in the tank from inside)</li> </ul>
Pressure:	1 bar
Temperature:	-10 ... +80 °C
Material:	PP
Electrical connection:	Cable
Data sheet:	LM 30.06

## HLS-M2

Stainless steel version,  
with cable outlet



Process connection:	<ul style="list-style-type: none"> <li>■ 1/2" NPT (installation in the tank from outside)</li> <li>■ G 1/4" (installation in the tank from inside)</li> </ul>
Pressure:	5 bar
Temperature:	-40 ... +120 °C
Material:	Stainless steel 1.4301
Electrical connection:	Cable or connector
Data sheet:	LM 30.06

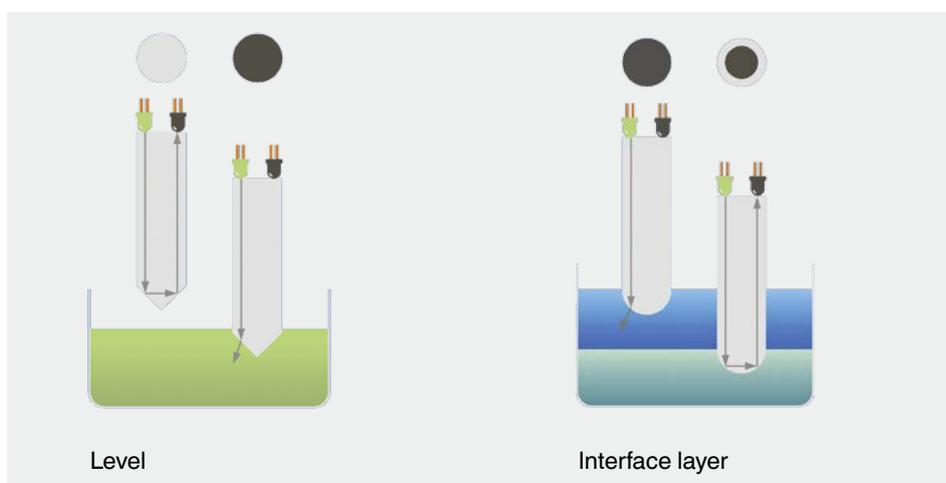
# Optoelectronic switches

For applications with limited mounting space

## Benefits

- Recording of the level with the cone tip is independent to a large extent of the physical characteristics of the liquids such as density, dielectric constant, conductivity, colour and refractive index
- Detection of interface layers with rounded tip (switch OLS-S)
- The extremely compact design guarantees minimum space requirements and measurement in very small volumes

## Operating principle



## OLS-C20

### High-pressure version



Material:	Stainless steel, quartz glass
Process connection:	■ M16 x 1.5 ■ G ½ A ■ ½ NPT
Insertion length:	24 mm
Pressure:	0 ... 50 bar
Temperature:	-30 ... +140 °C
Data sheet:	LM 31.02

## OLS-S, OLS-H

### Standard version , High-pressure version



Material:	Stainless steel, Hastelloy, KM-glass, quartz glass, sapphire, graphite
Process connection:	■ G ½ A ■ ½ NPT
Pressure:	0 ... 500 bar
Temperature:	-269 ... +400 °C
Approval:	EX i, overflow control per WHG § 19
Data sheet:	LM 31.01

## OSA-S

### Switching amplifier, for models OLS-S, OLS-H



Output:	1 signal relay, 1 failure relay
Function:	High or low alarm
Time delay:	Up to 8 s
Voltage supply:	AC 24/115/120/230 V DC 24 V
Approval:	EX i, overflow control per WHG § 19
Data sheet:	LM 31.01

## OLS-C01

OEM level switch, compact design, standard version



Material:	Stainless steel, borosilicate glass
Process connection:	G 3/8", G 1/2" or M12 x 1
Pressure:	Max. 10 bar
Temperature:	-30 ... +100 °C
Data sheet:	LM 31.31

## OLS-C02

OEM level switch, compact design, with selectable switch length



Material:	Stainless steel, borosilicate glass
Process connection:	G 1/2"
Pressure:	Max. 25 bar
Temperature:	-30 ... +100 °C
Switch length:	65 ... 3,000 mm
Data sheet:	LM 31.32

## OLS-C04

OEM level switch, compact design, refrigerant version, with transistor output



Material:	Steel, nickel-plated; glass
Process connection:	G 1/2", 1/2" NPT
Pressure:	Max. 40 bar
Temperature:	-40 ... +100 °C
Data sheet:	LM 31.34

## OLS-C05

OEM level switch, compact design, high-pressure version



Material:	Stainless steel, borosilicate glass
Process connection:	G 1/2"
Pressure:	Max. 25 bar
Temperature:	-40 ... +150 °C
Data sheet:	LM 31.33

## OLS-C29

Compact design, refrigerant version, with relay output



Material:	Stainless steel, borosilicate glass
Process connection:	G 1/2", NPT 1/2, M20 x 1,5
Pressure:	Max. 42 bar
Temperature:	-30 ... +120 °C
Data sheet:	LM 31.03

## OLS-C51

Compact design, explosion-protected version



Material:	Stainless steel, borosilicate glass
Process connection:	G 1/2"
Pressure:	Max. 20 bar
Temperature:	-30 ... +135 °C
Approval:	EX i, overflow control per WHG § 19
Data sheet:	LM 31.04

# Submersible pressure transmitters

Submersible pressure transmitters are available in a wide range of different versions for level measurement on open and closed vessels, tanks, drinking water wells, deep wells and wastewater plants.

## LS-10

### Standard version



Accuracy ( $\pm$  % of span):  $\leq 0.5$   
 Measuring range: 0 ... 0.25 to 0 ... 10 bar  
 Data sheet: PE 81.55

## IL-10

### Intrinsically safe



Accuracy ( $\pm$  % of span):  $\leq 0.25$  or  $0.5$   
 Measuring range: 0 ... 0.1 to 0 ... 25 bar  
 Special feature:
 

- Explosion protection in accordance with ATEX, FM and CSA
- Hastelloy design (optional)
- Highly resistive FEP cable (optional)

 Data sheet: PE 81.23

## LH-20

### High performance



Non-linearity ( $\pm$  % of span):  $\leq 0.2$  or  $0.1$   
 Measuring range:
 

- 0 ... 0.1 to 0 ... 25 bar
- 0 ... 1.6 to 0 ... 25 bar abs.

 Special feature:
 

- Slender design
- Scalable measuring range (optional)
- Resistant against the harshest environmental conditions
- Reliable and secure by double-sealed design
- Titanium case for especially high resistance (optional)

 Data sheet: PE 81.56

# Individual requirements demand tailor-made solutions

Whether particularly large or highly precise - level measurement is our passion

WIKA is a global market leader in pressure, temperature and level measurement technology. Working together with our customers, we develop comprehensive solutions based on our high-quality measurement technology components, with the solutions ultimately being integrated into their business processes.

Since 2008, WIKA now also offers a wide range of level measuring instruments for temperatures up to 450 °C or pressure ranges up to 400 bar. A major part of the development is applied to individual solutions for the widest variety of applications in the chemical, pharmaceutical, offshore and petroleum, shipbuilding, and food industries, as well as for machine and plant building, water treatment plants and

increasingly for the large environmental engineering sector. Our qualified employees are always dedicated to finding the solution to customer-specific problems. The latest production techniques, no-compromise quality management as well as national and international approvals are further prerequisites for our company's good name.



# Accessories

## Transmitter



- Compact design
- Simple mounting
- High accuracy (0.05 %)
- EMC resistant
- EEx ia IIC variant available

## Limit value signal transmitter



- 1 or 2 limit values act on 2 output relays
- Test jacks for switch point (limit value/actual value)
- High or low alarm can be set
- Hysteresis from 0 ... 60 % of measuring range can be set
- EMC per NAMUR NE21

## Transmitter indicator



- Compact design
- Simple mounting
- High accuracy (output 0.2 %, input 0.05 %)
- EMC resistant
- Field case IP 65 available

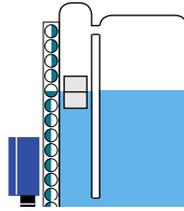
## Contact protection relay



- 2-channel
- 1 potential-free relay output per channel
- Switching state indication (yellow LED)
- Effective direction reversible
- Cable break monitoring (red LED)
- Control circuits Ex ia

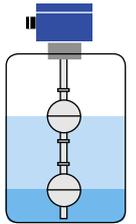
### Bypass level indicator

The magnetic field of the radial-symmetric magnetic system positioned in the float at submersion height activates the magnetic roller indicator attached to the outside of the bypass chamber as well as the switching and measuring elements. The magnetic field of the radial-symmetric magnetic system positioned in the float at submersion height activates the magnetic roller indicator attached to the outside of the bypass chamber as well as the switching and measuring elements.

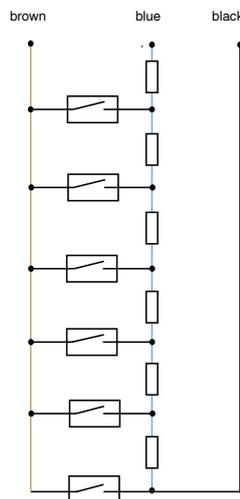


### Magnetic float switch

A float with a built-in magnetic system moves, with the level of the medium to be measured, on a guide tube which has one or more reed switch contacts built into it. The magnet actuates the contacts at the pre-set switching heights and thus allows individual levels to be monitored. The simple and proven operation principle is suitable for a very wide range of applications. It works independently of foaming, conductivity, dielectric, pressure, vacuum, temperature, vapours, condensation, bubble formation, boiling effects and vibrations.

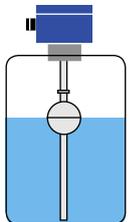


Internal circuit diagram  
Resistance measuring chain



### Level sensor

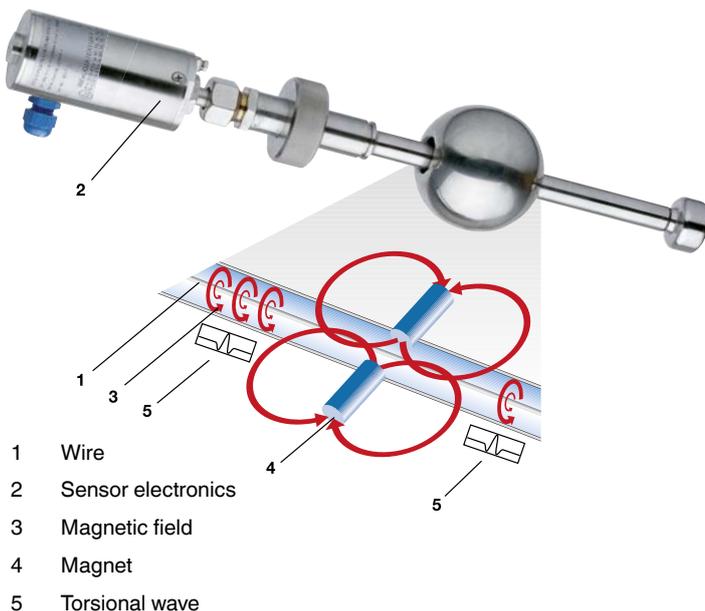
These level sensors work on the float principle with magnetic transmission. The float's magnetic system in the guide tube actuates a resistance measuring chain that corresponds to a 3-wire potentiometer circuit. The measurement voltage generated by this is proportional to the fill level and finely-stepped as a result of the contact separation of the measuring chain and is thus virtually continuous. Resolutions between 5 and 18 mm are available depending on the requirements.



### Magnetostrictive level measurement

These level sensors are used as measured value pick-ups for the continuous recording of liquid levels, and are based on determining the position of a magnetic float according to the magnetostrictive principle.

The measuring process is triggered by a current impulse. This current produces a circular magnetic field (3) along a wire (1) made of magnetostrictive material fixed in the probe tube. At the point being measured (liquid level) there is a float with permanent magnets (4) acting as a position transducer. This magnetic field of the float tensions the wire. The superposition of these two magnetic fields triggers a mechanical wave (5) in the wire. This is converted into an electrical signal at the end of the wire in the sensor housing (2) by a piezoceramic converter. The measured propagation delay enables the origination point of the mechanical wave, and thus the float position, to be determined with high accuracy.



- 1 Wire
- 2 Sensor electronics
- 3 Magnetic field
- 4 Magnet
- 5 Torsional wave

# WIKA worldwide

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