Level and pressure instrumentation for drinking water supply systems

Application examples and products

Looking Forward VEGA

Measurement technology for drinking water supply systems

This brochure presents examples of applied level and pressure measurement technology. Here, you'll learn which sensors fit into which measuring tasks.

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All applications can be found at

www.vega.com/drinking-water

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All sensors at a glance

Continuous level measurement

Instrument type		Measuring range	Process fitting	Process temperature	Process pressure
VEGAPULS C 21 Wired radar sensor for continuous level measurement		up to 15 m	Thread G1½, 1½ NPT	-40 … +80 °C	-1 … +3 bar (-100 … +300 kPa)
VEGAPULS C 23 Wired radar sensor for continuous level measurement		up to 30 m	–	-40 … +80 °C	-1 … +3 bar (-100 … +300 kPa)
VEGAPULS 21 Compact radar sensor for continuous level measurement		up to 15 m	Thread G1½, 1½ NPT	-40 … +80 °C	-1 … +3 bar (-100 … +300 kPa)

Point level detection

Instrument type		Measuring range	Process fitting	Process temperature	Process pressure
VEGAPOINT 21 Compact capacitive limit switch		–	Thread from G½, ½ NPT	-40 ... +115 °C	-1 ... +25 bar (-100 ... +2500 kPa)
VEGASWING 61/63 Vibrating level switch with tube extension for liquids		up to 6 m	Thread from G¾, ¾ NPT Flanges from DN 25, 1"	-50 … +250 °C	-1 … +64 bar (-100 … +6400 kPa)

Pressure measurement

Instrument type		Deviation	Process fitting	Process temperature	Measuring range
VEGABAR 38 Pressure sensor with switching function		0.3 %	Optional flush thread and hygienic fittings, universal connector for hygiene adapter	-40 … +150 °C	-1 ... +60 bar (-100 ...+6000 kPa)
VEGABAR 82 Pressure transmitter with ceramic measuring cell		0.2 % 0.1 % 0.05 %	Thread G½, ½ NPT Flanges from DN 15, 1½"	-40 … +150 °C	-1 … +100 bar (-100 … +10000 kPa)
VEGADIF 85 Differential pressure transmitter with metal measuring diaphragm		< ±0.065 %	¼-18 NPT	-40 … +85 °C	+0,01 … +40 bar (+1 … +4000 kPa)
VEGAWELL 52 Submersible pressure transmitter with ceramic measuring cell		0.1 % 0.2 %	Straining clamp, thread, suspension cable, threaded fitting of 316L, PVDF, Duplex, Titanium	-20 … +80 °C	0 … +60 bar (0 … +6000 kPa)

Signal conditioning

Instrument type		Hysteresis	Input	Output	Operating voltage
VEGAMET 842 Robust controller and display instrument for level sensors		adjustable	2x 4 … 20 mA sensor input	1/2x 0/4 … 20 mA current output 3x operating relay 1x fail safe relay (instead of an operating relay)	24 ... 65 V DC 100 ... 230 V AC, 50/60Hz
VEGAMET 861 Robust controller and display instrument for level sensors		adjustable	1x 4 … 20 mA/HART sensor input 2x digital input	1/3x 0/4 … 20 mA current output 4/6x operating relay 1x fail safe relay (instead of an operating relay)	24 ... 65 V DC 100 ... 230 V AC, 50/60Hz

Drinking water supply

Modern, service-proven instrumentation

VEGA is an experienced supplier of instrumentation for the drinking water supply network. When it comes to measurement technology for drinking water, we can offer decades of expertise. VEGA sensors measure the level and pressure accurately and reliably in vessels, pipes, filters and reservoirs. They are easy to install and put into operation.

Good value for money

VEGA sensors are designed for the special requirements of drinking water supply systems. The instrumentation is rugged, abrasionresistant, with a long service life and delivers reliable measurements, independent of weather conditions. Approved materials as well as hygienic designs provide protection against any possible water contamination.

Certificates

Approved materials according to FDA and EC 1935/2004, as well as local certification for use of sensors in contact with drinking water. The corresponding documents and certificates are supplied with the sensors and they are available online 24/7.

FDA

Food and Drug Administration

EG 1935/2004

More information

Deep well

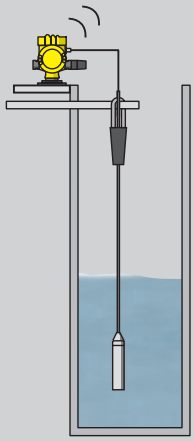
Reliable
Approved materials according to FDA and EC 1935/2004, as well as local drinking water certification

Cost effective
Maintenance-free operation

User friendly
Simple installation and setup

Level measurement in deep wells

Ground water from deep wells is pumped to the surface with the help of submersible pumps. It must be ensured, however, that the amount of water extracted is balanced to the amount that seeps back in. Reliable, maintenance-free level measurement is necessary for smooth operation of the well.



VEGAWELL 52

Suspension pressure transmitter for hydrostatic level measurement

- High operational availability thanks to integrated overvoltage protection
- High measurement reliability due to extremely high overload resistance of the ceramic measuring cell
- Long-term stability through use of oil-free ceramic capacitive CERTEC® measuring cell

PLICSMOBILE T81

External wireless transmission telemetry station for HART sensors

- Continuous transmission of level data via mobile network
- Remote diagnosis and maintenance
- Compact, robust housing ensures reliable use in the field

Bank filtration

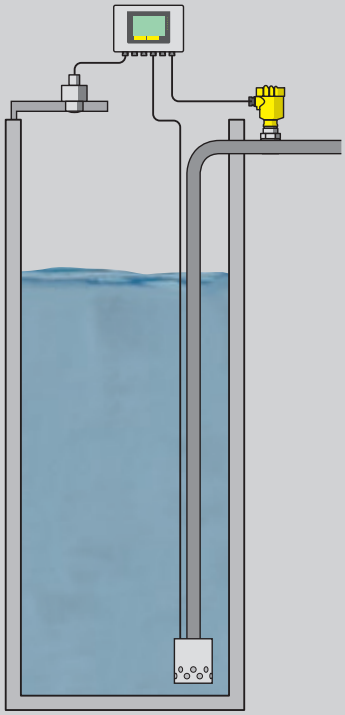
Reliable
Reliable measurement independent of weather conditions

Cost effective
Maintenance-free operation

User friendly
Simple installation and setup

Level and pressure measurement of water from lake and river banks

Water obtained from wells adjacent to lakes and rivers is called bank filtration. The flowing water constantly seeps through the riverbed and mixes with the ground water. The level of water must be constantly monitored for an optimum extraction of water. The pump pressure is also monitored in the delivery line.



VEGAPULS C 21

Non-contact level measurement with radar for pump measurement

- Accurate level monitoring unaffected by internal fixtures
- Materials approved for drinking water ensure a long service life
- Reliable measurement ensures optimal water extraction

VEGABAR 82

Pressure transmitter for pump monitoring

- The water supply is secure thanks to reliable measurement
- Resistant to sand abrasion
- Monitoring of pump efficiency

VEGAMET 861

Controller and display unit for pump control

- Universal controller for simple pump control
- Fast setup and commissioning thanks to simple menu navigation and application wizards

Gauging station

Reliable
Reliable monitoring of the river level

Cost effective
Maintenance-free operation

User friendly
Simple installation and setup

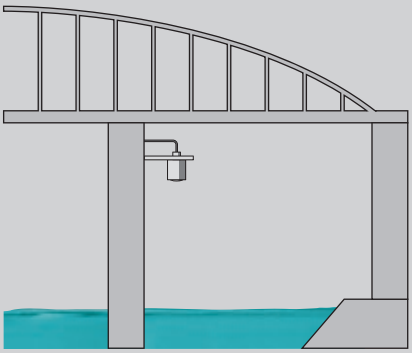
River level measurement

Precise monitoring of the river level is an important requirement for sustainable extraction of river water for use as drinking water. The measurement sites are often in exposed locations and sensors are subjected to all weathers and surface conditions.

VEGAPULS C 23

Radar sensor for level measurement outdoors

- Maintenance-free 80 GHz non-contact radar sensor technology
- Sensor reliability and accuracy unaffected by weather conditions
- Secure wireless operation via Bluetooth with smartphone, tablet or PC
- No stilling or sounding tubes are needed

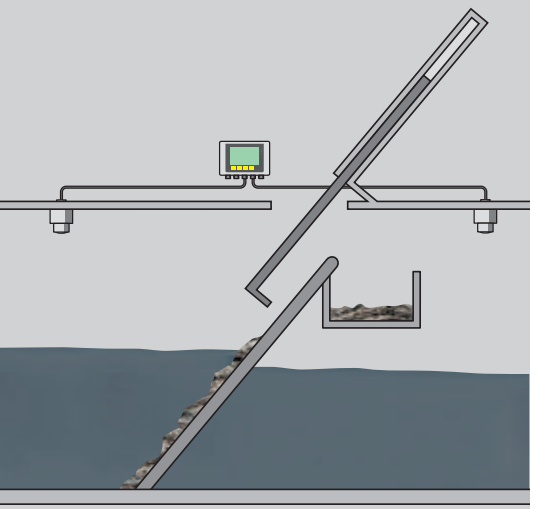


Coarse and fine screens

Reliable
Reliable control of screen cleaning

Cost effective
Non-contact and wear-free measurement

User friendly
Maintenance-free operation of the system



Differential water level measurement for control of screen raking

Mechanical cleaning removes entrained floating matter with screens or sieves. This protects the downstream process stages from buildup, clogging and abrasion. Solids with diameters greater than 25 mm are trapped in the coarse screens, compressed in a press and then disposed of. Finer secondary screens remove smaller residual materials. Measurement of the difference in water level between the front and the back of the screen determines the degree of contamination and initiates the cleaning of the screen when necessary.

VEGAPULS C 21

The radar sensors measure the water level difference between the front and back of the rake screen

- Exact measuring results unaffected by ambient conditions
- High plant availability thanks to wear and maintenance free technology
- Secure wireless operation via Bluetooth with smartphone, tablet or PC

VEGAMET 842

Controller for measured value processing and display

- Universal controller for two analogue sensors for differential measurement
- Analogue outputs for connection to process control systems
- Fast setup via simple menu navigation and application wizards

Chemical tanks

Reliable
Reliable measurement right through tank top

Cost effective
Tank fabrication costs are lower with less process fittings

User friendly
Simple installation

Level measurement and point level detection in the chemical tank

Through the addition of chemicals, phosphates in the wastewater are precipitated out, for example in primary sedimentation, aeration systems or in special precipitation and secondary clarifiers. Precipitants like ferric chloride bind the phosphate chemically and settle out into the sludge. In the storage tanks for these chemicals, a level measurement and point level detection system is deployed for continuous inventory control and optimal dosage.

VEGAPULS 21

Continuous level measurement with radar for inventory monitoring of treatment chemicals

- Maintenance-free operation through non-contact 80 GHz radar technology
- Accurate measurements independent of product, process and ambient conditions
- Highly corrosion resistant materials ensure a long service life
- On plastic containers, measurement from the outside is possible, through the vessel top

VEGASWING 63

Backup point level detection system to avoid overfilling the tank with media hazardous to water

- Chemically resistant materials and coatings
- Universally applicable
- Adjustment and maintenance free operation

Gravel bed filter

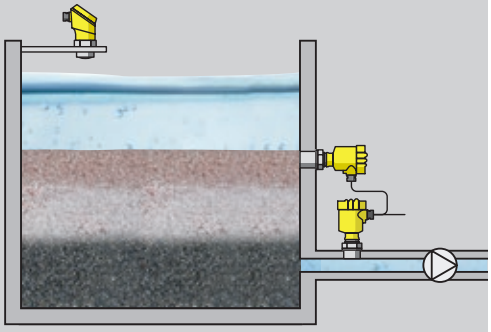
Reliable
Approved materials according to FDA and EC 1935/2004, as well as local drinking water certification

Cost effective
Optimal flow

User friendly
Function check is possible during operation

Differential pressure and level measurement in a gravel filter

The suspended matter is filtered out of the water via the sand and gravel filled filter tank. Pressure is applied to pump water through the filter bed. Dirt particles are retained in the filter material. The electronic differential pressure measurement monitors the level of contamination in the filter. As soon as the threshold contamination is exceeded, an automatic cleaning cycle of the filter is triggered.



VEGABAR 82

Electronic differential pressure measurement for filter monitoring

- Highly abrasion resistant ceramic CERTEC® measuring cell
- Moisture proof measuring cell for long-term stability and reliability
- Simpler installation, direct mounting means impulse lines are not required

VEGAPULS 11

Non-contact level measurement with radar in the gravel filter

- High measuring accuracy independent of ambient conditions
- Reliable measurement ensures continuous water supply
- Maintenance-free operation due to non-contact measurement

Osmosis filter

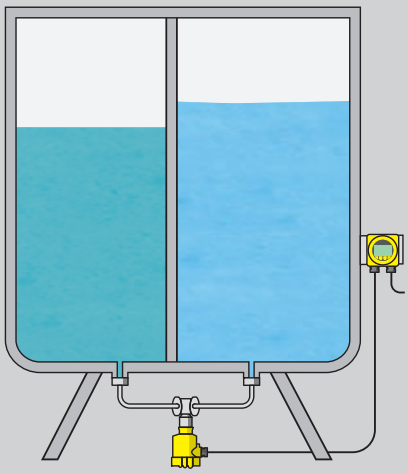
Reliable
Approved materials according to FDA and EC 1935/2004, as well as local certification

Cost effective
Efficient cleaning of the filter is possible even during continuous operation

User friendly
Maintenance-friendly thanks to front-flush mounting

Differential pressure measurement in an osmosis filter

Sea water is pressed through a semi-permeable membrane under high pressure. The semi-permeable membrane allows only water molecules to seep through. Salts, bacteria and viruses are retained in the filter. The finished product is almost the same as distilled water. A differential pressure measurement is needed to monitor the level of contamination across the filter.



VEGADIF 85

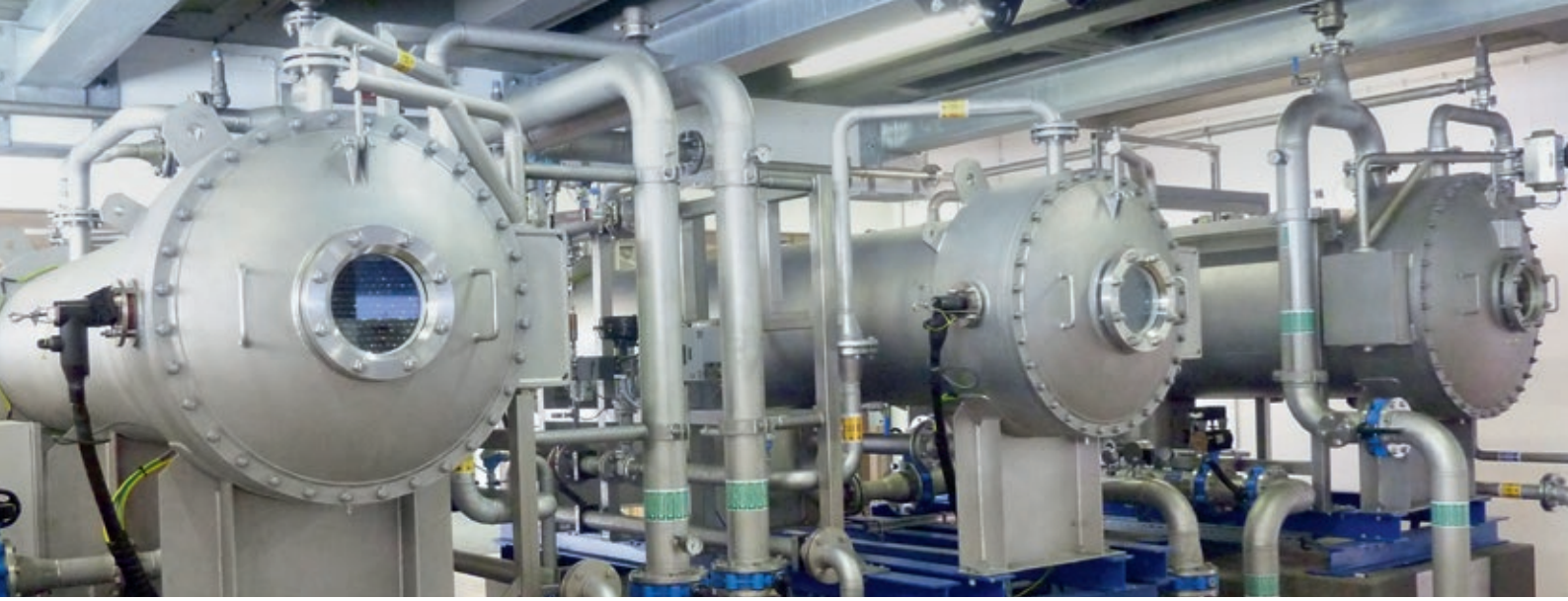
Differential pressure transmitter for measuring the level of contamination in the filter

- Highly accurate measurement of the smallest differential pressure
- High reliability with integrated overload diaphragm system
- Static pressure output also possible through integrated sensor for multi parameter measurement

VEGADIS 82

External display and adjustment unit for 4 ... 20 mA HART sensors

- Simple voltage supply of display via the existing 4 ... 20 mA current loop
- Easy-to-read display in plain text with additional graphical support menu
- Simple operation via four buttons and a clearly structured menu



Ozone gas collection pipe

Reliable
Dependable measurement for safe, reliable containment through Second Line of Defense

Cost effective
Maintenance-free operation

User friendly
Simple parameterization and on-site display

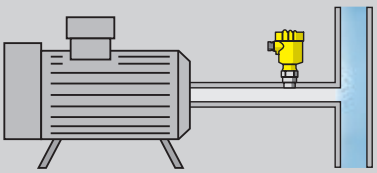
Pressure measurement in the ozone gas collection pipe

Ozone is used for the disinfection of drinking water. It is produced from oxygen in a hyperbaric reactor by means of electrical energy. The gas produced then flows into the ozone gas collection pipe. Reliable pressure measurement is mandatory in order to keep the pressure in the pipeline constant and monitor the process integrity.

VEGABAR 82

Pressure transmitter for pressure monitoring in the ozone gas collection pipe

- The ceramic CERTEC® measuring cell is fully resistant to ozone
- Reliable measurement assured through high measurement accuracy
- Second Line of Defense inside transmitter for additional process security



Drinking water pipeline

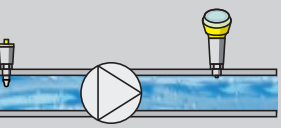
Reliable
Approved materials according to FDA and EC 1935/2004, as well as local drinking water certification

Cost effective
Long service life guarantees uninterrupted operation

User friendly
Uniform operation

Pressure monitoring and point level detection in the drinking water pipeline

To transport drinking water even to the remotest drinking water storage facilities, pumping stations generate the required water pressure, which is constantly monitored by a pressure transmitter. A level switch serves as dry run protection for the pumps.



VEGABAR 38

Pressure sensor for monitoring pressure in the drinking water pipeline

- CERTEC® measuring cell meets the hygiene requirements
- Long-term stability thanks to robust ceramic CERTEC® measuring cell
- Resistant to hydraulic pressure shocks

VEGAPOINT 21

Capacitive level switch as dry-run protection for drinking water pumps

- Wear and maintenance free for high plant availability
- Reliable switching function independent of process conditions
- Simple setup via Bluetooth operation

Elevated tanks

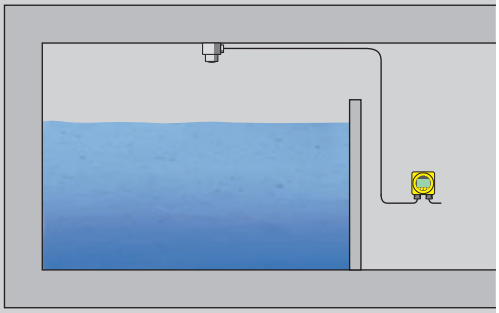
Reliable
High supply reliability through dependable measurement

Cost effective
Maintenance-free operation

User friendly
Simple mounting and parameterization

Level measurement in the elevated tank

Elevated water storage tanks are reservoirs located at high places that act as a buffer during periods of peak demand. They compensate for delivery fluctuations and enable efficient plant operation. Reliable level measurement is therefore indispensable.



VEGAPULS C 21

Non-contact level measurement with radar in the elevated tank

- Reliable, water proof and unaffected by condensation
- Maintenance-free operation through non-contact measurement
- Secure, user-friendly wireless operation via Bluetooth with smartphone, tablet or PC
- Simple installation with additional mounting accessories

VEGADIS 82

External display and adjustment unit for
4 … 20 mA/HART sensors

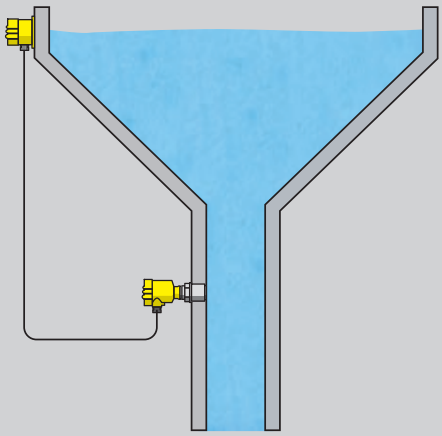
- Measured value display can be connected anywhere along the supply cable of the sensor
- Easy-to-read display with plain text and graphics
- Simple operation via four keys and clearly structured menu

Water tower

Reliable
Approved materials according to FDA and EC 1935/2004, as well as local drinking water certification

Cost effective
Maintenance-free operation thanks to dry measuring cell

User friendly
Wireless parameterization via Bluetooth communication



Pressure measurement in a water tower

Water towers are used as storage facilities for drinking water and as pressure balancing tanks in the network of water supply pipelines. In order to keep the water level and thus the network pressure constant, the level in the water tower needs to be constantly maintained. The level of water is monitored by a pressure transmitter.

VEGABAR 82

Pressure transmitter for pressure monitoring in a water tower

- Front-flush diaphragm protects against contamination from microbes
- High long-term stability with ceramic CERTEC® measuring cell
- Robust instrumentation withstands even intensive cleaning

VEGADIS 81

External display and adjustment unit for plics® sensors

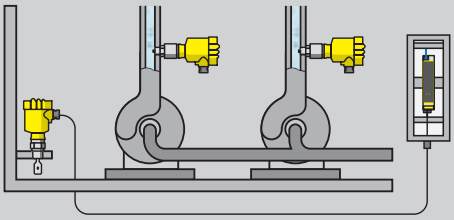
- User friendly display which can be used in accessible places
- Simple operation, graphically supported with clearly structured operating menu
- Easy connection directly to sensor without additional measures

Pump room

Reliable
Reliable protection against flooding due to defective pumps

Cost effective
Simple installation and reliable function

User friendly
Maintenance-free operation



Pressure monitoring and flood protection in the pump room

To protect the process pumps, any leakage water, for example, arising from a faulty pump seal, is detected and an alarm triggered. The pressure in the pipe is measured directly at the pump and displayed in the control system of the plant. Any malfunctions can be quickly detected and dealt with.

VEGASWING 61

Point level detection signals an alarm in case of flooding

- Reliable detection even of small amounts of water
- Adjustment-free and easy to install
- Maintenance-free operation, fail safe design

VEGABAR 82

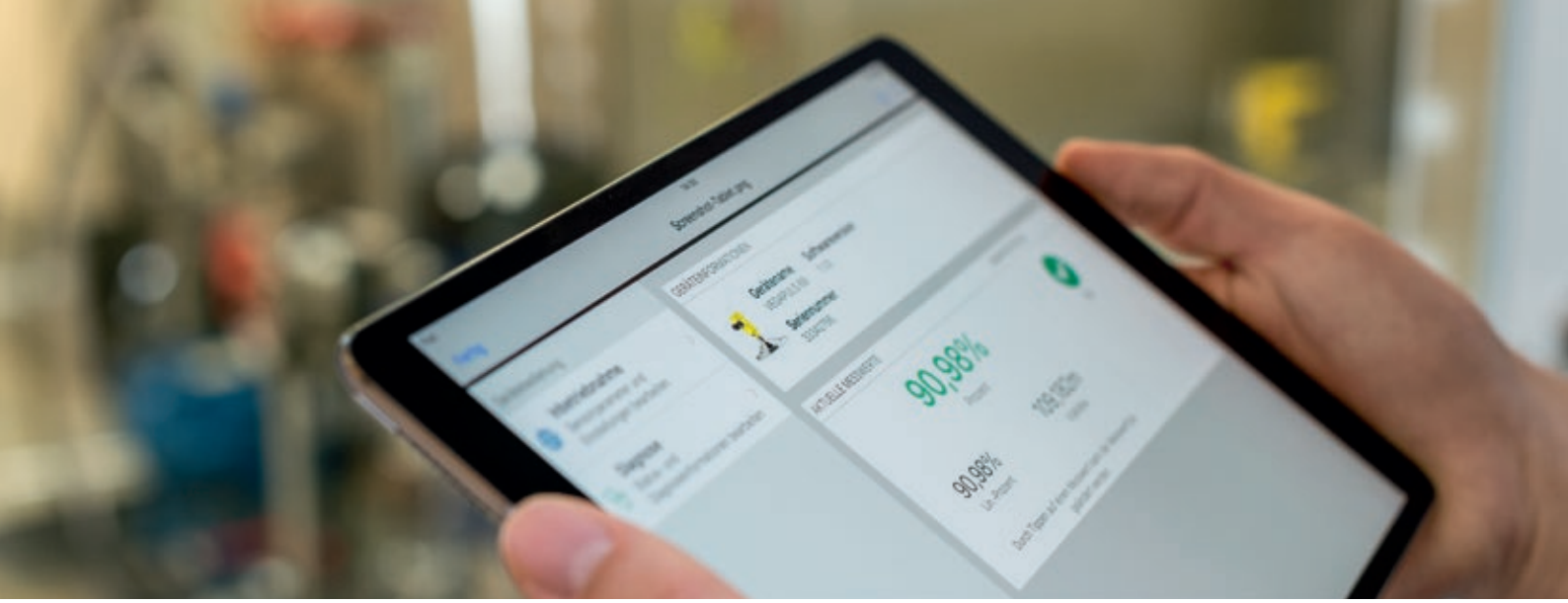
Process pressure transmitter for monitoring the pump pressure

- High overload resistance, withstands water hammer
- Ceramic measuring cell ensures high long-term stability
- Measurement display directly on the sensor or on the external housing
- Wireless operation via Bluetooth with smartphone, tablet or PC

VEGATOR 121

Single channel controller for level detection

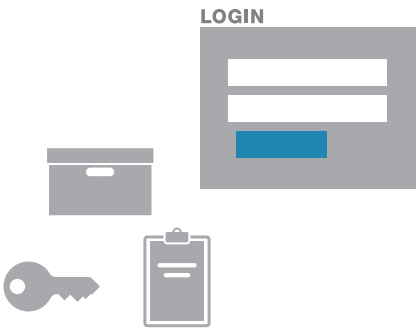
- Comprehensive monitoring detects short-circuit and line break of the measuring cable and interferences in the sensor
- Simple and comfortable SIL and WHG function test by means of test key
- Simple installation through carrier rail mounting as well as detachable, coded terminals



Interconnected solutions

Wireless operation

With Bluetooth, VEGA is looking far into the future. But even today, radio technology is already making processes more and more flexible. Wireless communication provides better accessibility: In clean rooms, in harsh industrial environments and in hazardous areas. It allows setup, display and diagnostics from a distance of up to 25 metres, thus saving time and avoiding hazardous situations. Simply via VEGA Tools app – on any available smartphone or tablet.



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- Configurator for the entire VEGA product range
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- Access to product data, operating instructions, certificates and software
- Manage offers and order data, and also track shipments
- Save, manage and synchronize access codes for VEGA sensors

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Looking Forward