Level and Pressure Instrumentation for Wastewater Treatment

Application Examples and Products

Looking Forward VEGA

Instrumentation for Wastewater Treatment

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

5	**Lift stations/wet wells**	Level measurement
7	**Open channel flow**	Flow rate measurement
17	**Digesters**	Level measurement and level detection
13	**Chemical tanks**	Level measurement
9	**Coarse and fine bar screens**	Gauge measurement
12	**Equalization/Surge tanks**	Gauge measurement
28	**Sludge handling tanks**	Level measurement
27	**Scum pits**	Level measurement

More applications can be found at

www.vega.com/wastewater

1	Sewer network	Gauge measurement
2	Combined sewer overflow	Level measurement
3	Stormwater retention basin	Level measurement
4	Vacuum sewage system	Level measurement
6	Sewage screw pump lifting station	Level measurement
8	Sludge receiving station	Level measurement
10	Grit trap	Point level detection
11	Grit washer	Point level measurement
14	Lime silo	Level measurement
15	Conditioning	Level measurement
16	Sludge thickener tank	Level measurement
18	Gas pipeline	Quantity measurement
19	Biogas storage facility	Volume and pressure monitoring
20	Sludge storage tank	Level measurement
21	Sludge dewatering	Point level detection
22	Sludge drying	Density measurement
23	Sludge granulate silo	Level measurement
24	Process water tank	Level measurement
25	Pump room	Flood protection
26	Gauge station	Gauge measurement
29	Sewer and stormwater collection	Level measurement
30	Receiving water	Level measurement
31	Fuel oil tank	Level measurement

Mobile access to website:
www.vega.com/wastewater

Instrument Overview

Continuous Level Measurement

Instrument Type		Measuring Range	Process Fitting	Process Temperature	Process Pressure
VEGAPULS WL 61 Radar sensor for continuous level measurement of water and wastewater		up to 49 ft (15 m)	Thread G1½ Mounting strap Collar flanges from DN 80, 3"	-40 … +176°F (-40 … +80°C)	-14.5 … +29 psi (-1 … +2 bar)
VEGAPULS 64 Radar sensor for continuous level measurement of liquids		up to 30 m	Thread from G¾, ¾ NPT Flanges from DN 50, 2" Mounting strap	-40 … +392°F (-40 … +200°C)	-14.5 … +290 psi (-1 … +20 bar)
VEGAWELL 52 Submersible pressure transmitter with CERTEC® measuring cell		up to 2000 ft (600 m)	Straining clamp Screw connection	-4 … +176°F (-20 … +80°C)	0 … +870 psi (0 … +60 bar)

Point Level Detection

Instrument Type		Measuring Range	Process Fitting	Process Temperature	Process Pressure
VEGACAP 64 Capacitive rod probe for point level detection		Fully insulated rod up to 20 ft (6 m)	Thread G¾, ¾ NPT Flanges from DN 25, 1"	-58 … +482°F (-50 … +250°C)	-14.5 … +928 psi (-1 … +64 bar)

Signal Processing

Instrument Type		Sensors	Mounting	Voltage Loss	Voltage Supply
VEGADIS 82 External display and adjustment unit for 4 … 20 mA/HART sensors		Sensors with HART protocol	Tube, panel, wall mounting, or carrier rail	Standard < 1.7 V, with lighting < 3.2 V	Via 4 … 20 mA current loop

Instrument Type		Hysteresis	Input	Output	Operating Voltage
VEGAMET 391 Signal conditioning and display instrument for level sensors		adjustable	1 x 4 … 20 mA/HART sensor input	1 x 4 … 20 mA/ current output 6 x relay outputs or 5 x relay outputs and 1 x fail safe relay	20 … 253 V AC, 50/60 Hz, 20 … 253 V DC
VEGAMET 625 Signal conditioning and display instrument for level sensors		adjustable	2 x HART sensor input	3 x 0/4 … 20 mA/ current output 3 x relay outputs 1 x fail safe relay	20 … 253 V AC, 50/60 Hz, 20 … 253 V DC
VEGATOR 142 Two-channel signal conditioning instrument for level detection		adjustable	2 x 4 … 20 mA sensor input	2 x operating relay (SPDT)	24 … 230 V AC, 50/60 Hz, 24 … 65 V DC

Wastewater Treatment

Accurate, Service-Proven Instrumentation

VEGA is an experienced supplier of instrumentation for sewage treatment plants. The company has been delivering level and pressure sensors to wastewater plants around the world for decades.

VEGA instrumentation provides accurate measurement data as a basis for automatic control of the various steps of the treatment process. All sensors use state-of-the-art technology and are optimized and certified for deployment in wastewater treatment facilities.

Reasonable Price

Quality pays off: these durable sensors reduce maintenance and operating costs.

Fast Delivery

Whether initial delivery or repair: VEGA instruments arrive at your facility within a few days. This considerably reduces stocking costs.

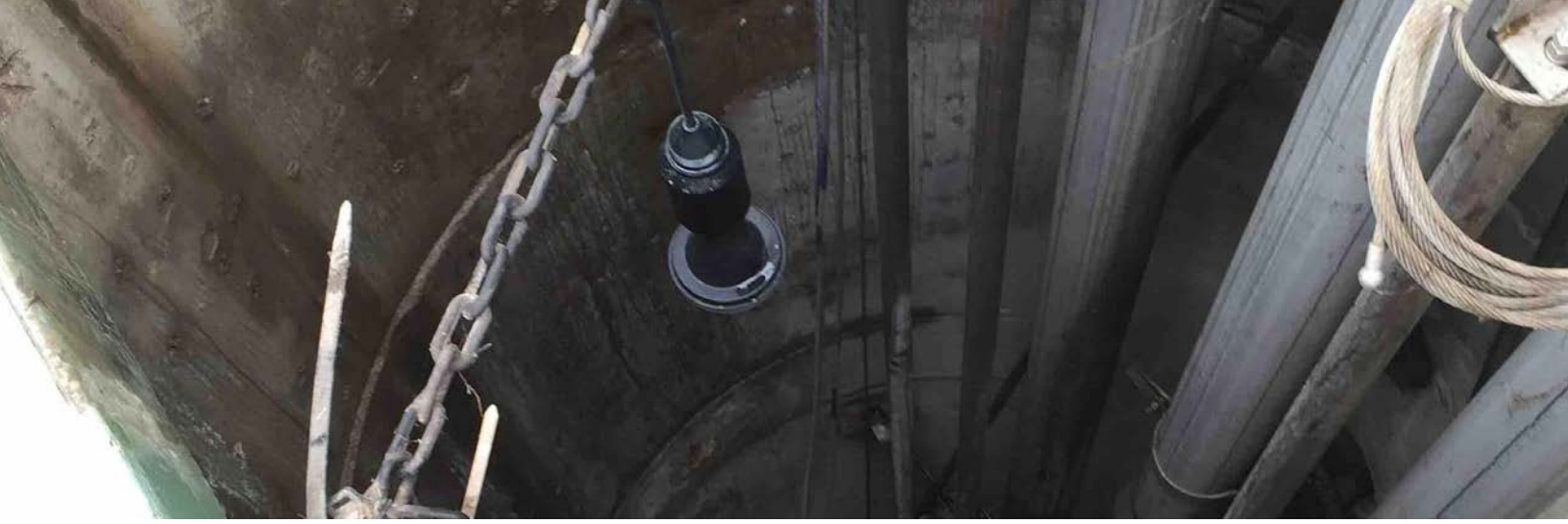
Simple Integration

VEGA sensors can be easily integrated into existing systems.
Fast mounting and setup make installation easy.

Hazardous Area Capabilities

VEGA offers extensive hazardous area approval options for our complete line of level products. We'll meet all your classification needs.

More information

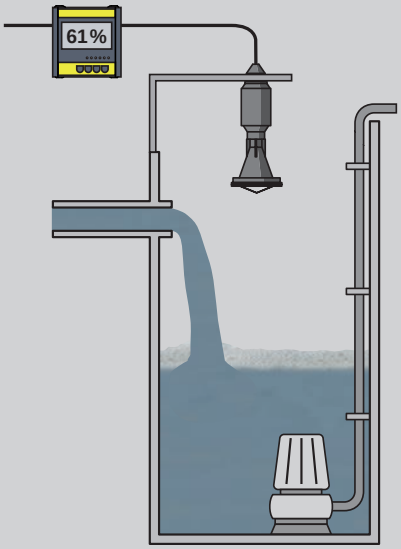


Application: Lift Stations/Wet Wells

Reliable
Reliable measurement of the level

Cost-effective
Optimal operating times through pump switchover

Convenient
Maintenance- and trouble-free operation



Level control in a lift station/wet well

Wastewater from households and businesses together with surface water, is carried to the wastewater treatment plant via an extensive sewer system. If the natural gradient is not steep enough, numerous lift stations/wet wells are required to create a sufficient height difference.

VEGAPULS WL 61

Non-contact level measurement in the wet well for cost-effective pump control

- Non-contact, absolutely maintenance-free measurement
- Measurement not influenced by condensation, fog, or most foam
- Simple mounting reduces installation and setup costs

VEGAMET 391

Signal conditioning and display instrument for pump control

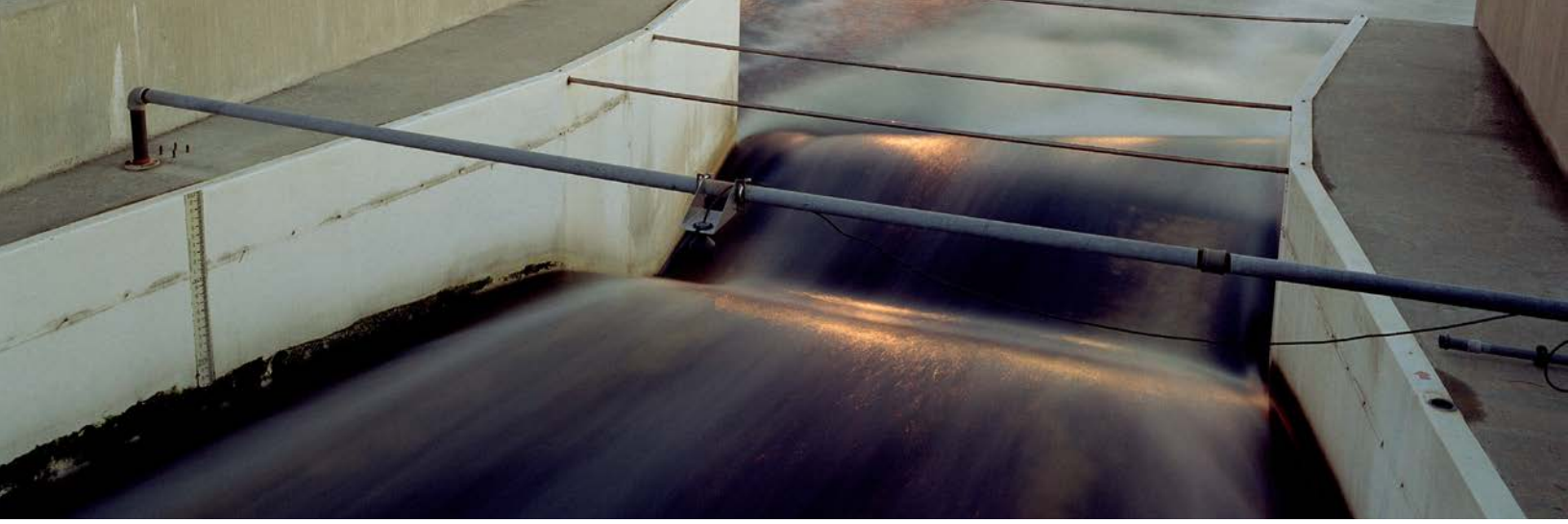
- Simple setup and adjustment
- Integrated pump and runtime control
- Control of up to 4 pumps

Hydrostatic pressure technology as an alternative:

VEGAWELL 52

Submersible hydrostatic level sensor for cost-effective wet well pump control

- Simple installation and reliable measurement in tight spaces
- Long-term stability allows maintenance-free operation
- Robust ceramic measuring cell ensures reliable operation
- High accuracy through use of optimally graduated measuring cells

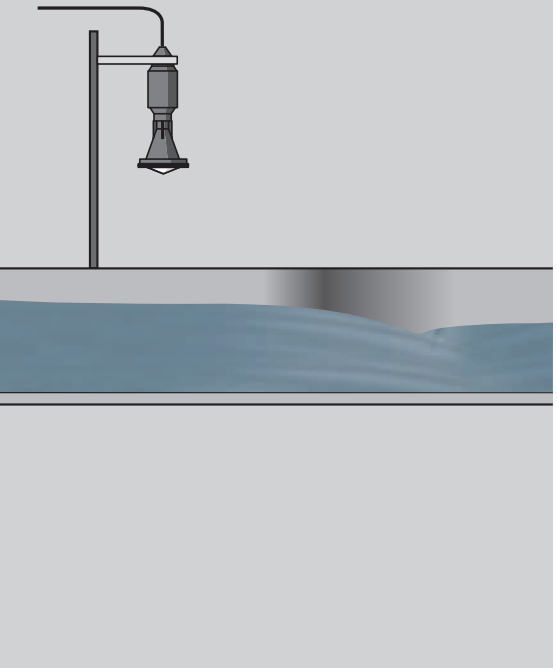


Application: Open Channel Flow

Reliable
High measurement accuracy, independent of temperature and weather influences

Cost-effective
Low maintenance requirements

Convenient
Flow-proportional output signal



Flow-rate measurement in open channels

Sewage and rainwater are often transported to the treatment plant in open collection channels or flumes. The flow rate is measured at various points in these channels. Measurement of the water flow at the inlet and outlet of the treatment plant is the basis for the calculation of tariffs and operating costs.

VEGAPULS WL 61

Flow measurement of collected wastewater with radar in open channels

- Non-contact measurement reduces maintenance requirements
- Very high accuracy due to no measurement effect from environmental influences
- Integrated flow algorithms for direct flowrate output via 4 … 20 mA signal

VEGAMET 391

Signal conditioning and indicating instrument, power supply for sensor

- Integrated flow algorithms for direct flowrate and volume indication and control
- Flow meter for documentation of the collected water quantities
- Data memory for measured values and status information
- Simple setup and adjustment

Application: Digesters

Reliable
Reliable level measurement and protection against foam overfill

Cost-effective
Continuous, maintenance-free operation of the digester

Convenient
Low maintenance costs and reliable gas production

Level measurement and point level detection in the digester

The organic components of sewage sludge are decomposed under anaerobic conditions in heated, closed digestion tanks. In the process, combustible gases such as methane are released from the sludge. These are collected in a biogas tank and then converted into electricity and heat in cogeneration (CHP) plants. A level sensor controls the filling of the digester. To ensure that no foam gets into the gas system along with the collected gas, a point level sensor is used for monitoring.

VEGAPULS 64

Level measurement with radar for control of the filling process

- Maintenance-free operation through non-contact measurement
- Accurate and reproducible measurement data, independent of gas concentration and pressure fluctuations
- Reliable measurement, even with foam and density changes
- Wireless operation via Bluetooth with smartphone, tablet, or PC

VEGACAP 64

Universal point level sensor detects the foam on top of the sewage sludge

- Reliable foam detection, even with different foam consistencies
- Unaffected by contamination and buildup
- Simple mounting and setup

VEGATOR 142

Double channel signal conditioning instrument for point level detection

- Simple adjustment of the switching point via potentiometer
- Clearly visible switching status via LED
- Simple installation through carrier rail mounting as well as detachable, coded terminals

Application: Chemical Tanks

Reliable
High operational reliability through the use of chemically resistant materials

Cost-effective
Optimal dosing of chemicals

Convenient
Non-intrusive measurement for plastic and fiberglass tanks

Level measurement in the chemical tank

The addition of chemicals is used at many stages of treatment. For example, phosphates in the wastewater are precipitated out in primary sedimentation, in aeration systems, or in special precipitation and secondary clarifiers. Precipitants like ferric chloride bind to the phosphate chemically and deposit it in the sludge.

VEGAPULS WL 61

Continuous level measurement data for permanent inventory control and optimal dosage

- Operationally reliable, maintenance-free measurement
- Chemically resistant, plastic-encapsulated instrument version
- Radar signal cuts through condensation and foam within tank

VEGADIS 82

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

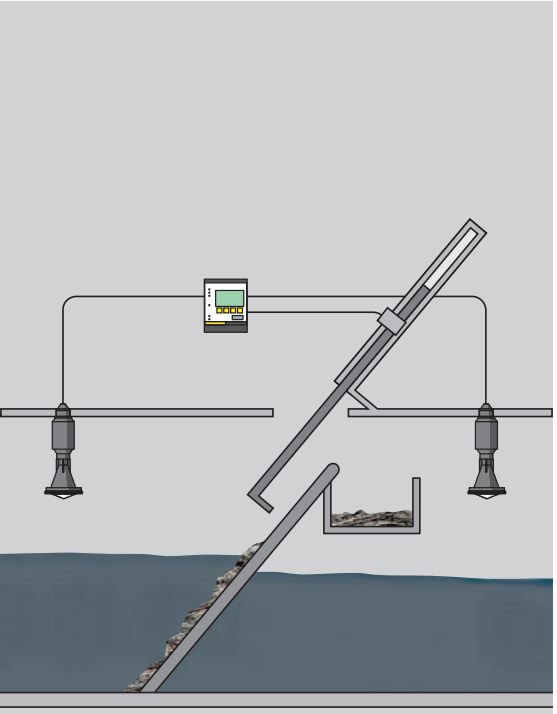
- Simple configuration of radar sensor
- Level reading at convenient location

Application: Coarse and Fine Bar Screens

Reliable
Reliable control of screen cleaning functions

Cost-effective
Non-contact, wear-free measurement

Convenient
Maintenance-free operation of plant



Differential water level measurement for control of screen raking

Mechanical cleaning removes larger, floating and entrained objects from the intake rakes, 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, sometimes finer secondary screens remove smaller residual materials. The screenings are processed in a press and then disposed of.

VEGAPULS WL 61

The difference between the water level in front of and behind the screen indicates the degree of contamination of the screen

- Reliable, maintenance-free measurement
- Simple installation thanks to contactless measuring principle
- Unaffected by foam or condensation
- Measurement without blocking distance (dead band)

VEGAMET 625

Signal conditioning and display instrument for level sensors

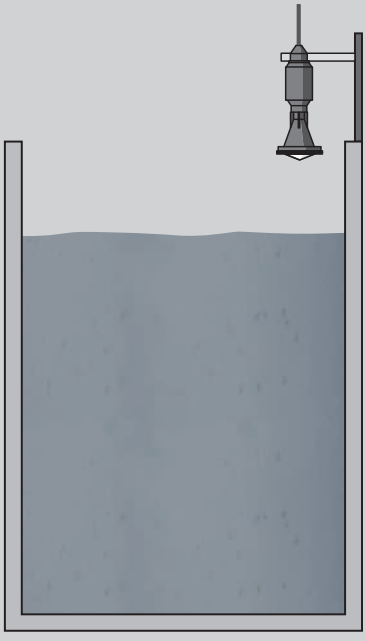
- Differential measurement from two level sensors
- Simple adjustment of differential measurement
- Relay outputs for controlling screen cleaning

Application: Equalization/Surge Tanks

Reliable
Reliable measurement independent of the process conditions

Cost effective
Optimal plant operation

Convenient
Simple mounting and setup



Level measurement in the equalization/surge tanks

These basins compensate for peak loads, strong inflow volume, or concentration fluctuations. When the rate or quality is stabilized, the wastewater is pumped from the basin into the subsequent primary treatment stages.

VEGAPULS WL 61

Continuous level readings for control of the storage and release of excess inflow to the treatment process.

- Non-contact, maintenance-free measurement
- Independent of vessel obstructions, weather influences, and surface foam
- Trouble-free operation and installation flexibility

VEGAMET 391

Signal conditioning and indicating instrument, power supply for sensor

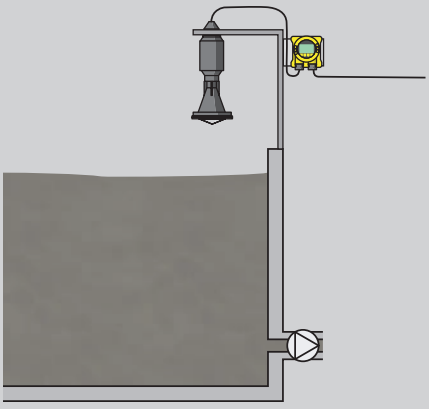
- Data memory for measured values and status information
- Simple setup and adjustment

Application: Sludge Handling Tanks

Reliable
Reliable content measurement

Cost-effective
Non-contact measurement ensures maintenance-free operation

Convenient
Simple installation and setup



Level measurement in various handling tanks

As solids go through the handling process after biological treatment, usually there are multiple tanks and measuring points for level. Reliable level measurements are needed to manage the movement and storage of the solids throughout the treatment process.

VEGAPULS WL 61

Radar sensor for continuous level measurement of water and wastewater

- Non-contact measurement immune to coating from solids
- Unaffected by condensation buildup on sensor
- Various mounting options

VEGADIS 82

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

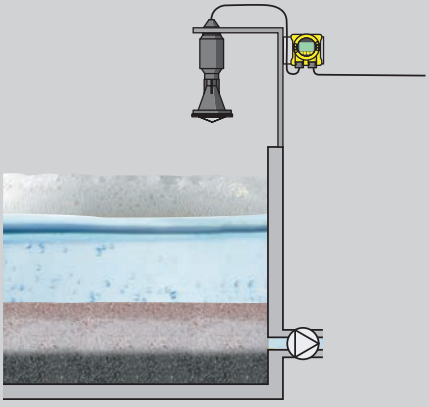
- Simple configuration of radar sensor
- Level reading at convenient location

Application: Scum Pits

Reliable
Reliable content measurement

Cost-effective
Non-contact measurement ensures maintenance-free operation

Convenient
Simple installation and setup



Pump control in scum pits

Clarifiers allow solids to settle and cleaner water to rise to the top. Any other debris (scum) will float on top of the water and be scraped off and directed to a holding pit. Turning pumps on and off to deliver the accumulated debris to the headworks of the plant is dependent on reliable level measurement.

VEGAPULS WL 61

Radar sensor for continuous level measurement of water and wastewater

- Non-contact measurement immune to coating from debris
- Ability to see actual water level through foam
- Not susceptible to interferences due to weather or solar effect

VEGADIS 82

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

- Simple configuration of radar sensor
- Level reading at convenient location

plics® — Easier is Better

Instrument Platform plics®

The plics® idea is simple: Each instrument is assembled from prefabricated components once the order is received. This modular design allows full flexibility when selecting the required sensor features. You receive your customized, user-friendly instrument within an amazingly short time. And the best part: these instrumens are more cost-effective and advantageous in every way – and that throughout their entire life cycle.

Display and Adjustment

The display and adjustment module PLICSCOM is used for measured value indication, adjustment, and diagnosis of the sensor. Its menu structure is simple and allows for quick setup and commissioning. Status messages are displayed in plain text. Optional Bluetooth technology allows for wireless remote access to all functions of a PLICSCOM sensor using a smartphone, laptop, or tablet.

Connection

The mobile VEGACONNECT is used to connect your instrument to a PC via the USB interface. Parameterization of the instruments is carried out with the tried-and-true adjustment software PACTware and the appropriate DTM. For EDD-based adjustment we also offer graphics-driven EDDs.

Recognition of Maintenance Requirements

The integrated self-monitoring function of plics® instruments continuously reports on the status of the instruments. Status messages allow proactive and cost-effective maintenance. All diagnostic data can be called up easily and quickly in plain text via the built-in memory functions.

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