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.

2	**Combined sewer overflow**	Level measurement
5	**Pumping station**	Level measurement
7	**Intake channel**	Flow rate measurement
9	**Coarse and fine screens**	Gauge measurement
13	**Precipitant and chemicals station**	Level measurement and point level detection
17	**Digester**	Level measurement and level detection
19	**Biogas storage facility**	Volume and pressure monitoring
23	**Sludge granulate silo**	Level measurement

More applications can be found at

www.vega.com/wastewater

1	Sewer network	Gauge measurement
3	Stormwater retention basin	Level measurement
4	Vacuum sewerage 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
12	Mixing and equalization ponds	Gauge measurement
14	Lime silo	Level measurement
15	Conditioning	Level measurement
16	Sludge thickener tank	Level measurement
18	Gas pipeline	Quantity measurement
20	Sludge storage tank	Level measurement
21	Sludge dewatering	Point level detection
22	Sludge drying	Density measurement
24	Process water tank	Level measurement
25	Pump room	Flood protection
26	Gauge station	Gauge measurement

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

All sensors at a glance

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 waste water		up to 15 m (49 ft)	Thread G1½ Mounting strap Collar flanges from DN 80, 3"	-40 … +80 °C (-40 … +176 °F)	-1 … +2 bar (-100 … +200 kPa)
VEGAPULS 61 Radar sensor for continuous level measurement of liquids		up to 35 m (115 ft)	Thread G1½, 1½ NPT Flanges from DN 50, 2"	-40 … +80 °C (-40 … +176 °F)	-1 … +3 bar (-100 … +300 kPa)
VEGAPULS 67 Radar sensor for continuous level measurement of bulk solids		up to 15 m (49 ft)	Mounting strap Collar flanges from DN 80, 3"	-40 … +80 °C (-40 … +176 °F)	-1 … +2 bar (-100 … +200 kPa)
VEGAPULS SR 68 Radar sensor for continuous level measurement of bulk solids		up to 30 m (98 ft)	Thread G1½, 1½ NPT Flanges from DN 50, 2"	-40 … +250 °C (-40 … +394 °F)	-1 … +100 bar (-100 … +10000 kPa)
VEGAWELL 52 Submersible pressure transmitter with CERTEC® measuring cell		up to 600 m (2000 ft)	Straining clamp Screw connection	-20 … +80 °C (-4 … +176 °F)	0 … +60 bar (0 … +6000 kPa)

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 6 m (20 ft)	Thread G¾, ¾ NPT Flanges from DN 25, 1"	-50 … +200 °C (-58 … +392 °F)	-1 … +64 bar (-100 … +6400 kPa)
VEGASWING 63 Vibrating level switch with tube extension for liquids		up to 6 m (20 ft)	Thread from G¾, ¾ NPT Flanges from DN 25, 1"	-50 … +250 °C (-58 … +482 °F)	-1 … +64 bar (-100 … +6400 kPa)

Pressure measurement

Instrument type		Deviation	Process fitting	Process temperature	Measuring range
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 (-58 … +32 °F)	-1 … +100 bar (-100 … +10000 kPa)
VEGADIF 65 Differential pressure transmitter for level, interface, density and flow measurement		0.075 %	Wide range of chemical seals Asymmetric configuration possible	-40 … +400 °C (-58 … +752 °F)	from -100 ... +100 mbar (-40 ... +10 kPa) up to -40 … +40 bar (-4000 … +4000 kPa)

Signal processing

Instument 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

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 process steps. All sensors use state-of-the-art technology and are optimised 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.

More information

plics® – easy 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 customised, user-friendly instrument within an amazingly short time. The best part: these instrumens are more cost-effective and advantageous in every way – 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 enables a quick and easy setup. Status messages are displayed in plain text.

Connection

The VEGACONNECT connects your instrument to a PC via the USB interface. Setup of the instruments is carried out with the tried and trusted adjustment software, PACTware and the appropriate DTM. For EDD-based adjustment within the system environment, we also offer graphics-driven EDDs.

Asset management and maintenance

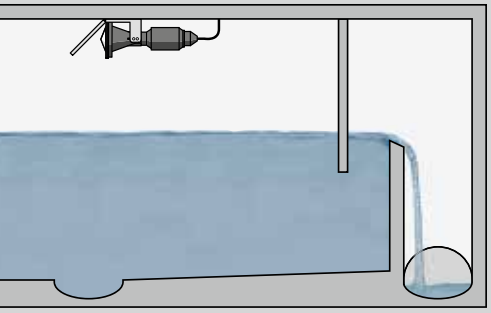
The integrated self-monitoring function of plics® instruments continuously reports on the status of the instruments. Status messages allow proactive and cost-effective maintenance. All diagnostic data can be called up easily and quickly in plain text via the built-in memory functions.

Stormwater overflow chamber

Reliable
High operational reliability even in case of flooding

Cost-effective
Reliable measurement and maintenance-free operation

Convenient
Extremely simple setup and adjustment



Level measurement in a stormwater overflow chamber

Large Combined Sewer Overflows (CSO's) protect the wastewater treatment plant from a capacity overload during heavy rain. The precipitation is temporarily stored and then delivered to the treatment plant at a reduced rate. If the stormwater basin cannot hold the accumulating quantities of water, part of it will be discharged. Due to legal requirements, such operational events and discharged water quantities have to be measured and documented.

VEGAPULS WL 61

Non-contact level measurement as basis for the documentation of impounding operation and discharging events

- Non-contact, maintenance-free measurement
- Small dead band allows measurement up to the ceiling
- High accuracy allows measurement of discharge volume with one sensor
- Reliable full signal even if sensor is inundated

VEGAMET 391

Signal conditioning and display instrument for level and discharge volume

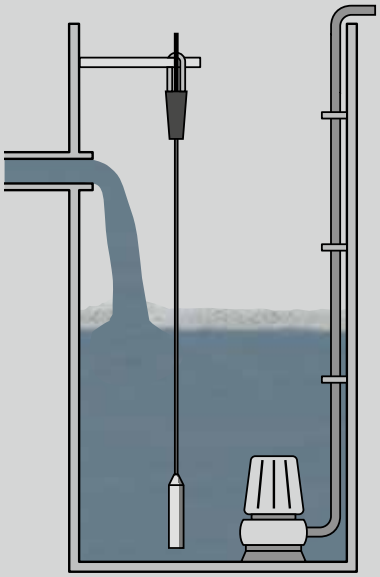
- Display and storage of the impounded volume
- Calculation of the discharge volume
- Data transmission over Ethernet or analogue 4 ... 20 mA

Pumping station

Reliable
Reliable measurement of the level

Cost-effective
Optimal operating times through pump switchover

Convenient
Maintenance and trouble-free operation



Level control in a pumping station

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 pumping stations are required to create a sufficient height difference.

VEGAWELL 52

Submersible hydrostatic level sensor for cost-effective sump pit 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

VEGAMET 391

Signal conditioning and display instrument for pump control

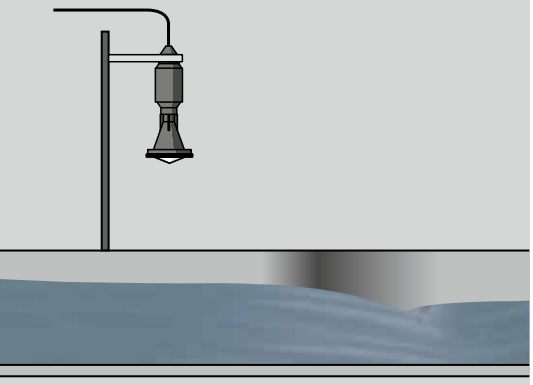
- Simple setup and adjustment
- Integrated pump and runtime control
- Control of up to 4 pumps

Intake channel

Reliable
High measuring precision, independent of temperature

Cost-effective
Low maintenance costs

Convenient
Flow-proportional output signal



Flow-rate measurement in open channels

Heavily polluted wastewater is in many cases transported to the treatment plant via open channels. Measurement of the wastewater quantities entering the treatment plant is the basis for calculation of its operating costs.

VEGAPULS WL 61

Continuous, non-contact flow measurement of wastewater in open channels

- Non-contact measurement reduces maintenance requirements
- Very high accuracy, because independent of temperature influences
- Integrated flow curve makes flow-proportional output signal possible

VEGAMET 391

Signal conditioning and display instrument for flow measurement

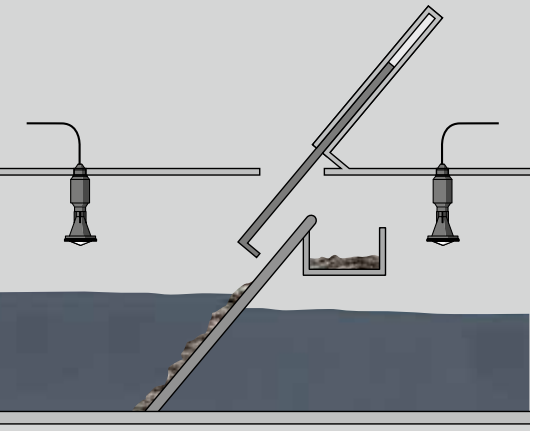
- Integrated flow curve for direct quantity indication
- Data memory for measured values and status information
- Simple setup and adjustment

Coarse and fine 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

Precipitant and chemicals station

Reliable
High operational reliability through the use of chemically resistant materials

Cost-effective
Optimal dosing of chemicals

Convenient
Reliable, maintenance-free measurement

Level measurement and point level detection 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 61

Continuous level measurement data for permanent inventory control and optimal dosage

- Operationally reliable, maintenance-free measurement
- Chemically resistant, plastic-encapsulated instrument version
- High accuracy independent of outgasing and temperature fluctuations

VEGASWING 63

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

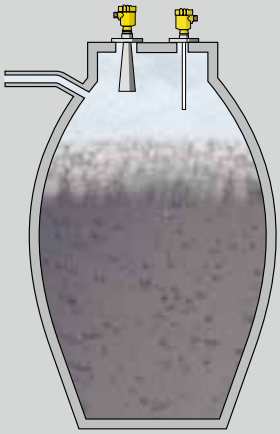
- High chemical resistance through use of application-oriented materials
- Adjustment and maintenance-free operation
- Approved as overfill protection system according to SIL and WHG

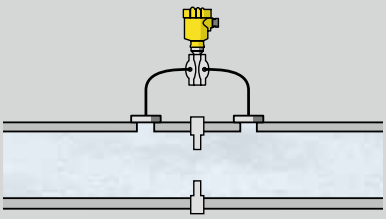
Digester

Reliable
Reliable protection against overfilling, even with foam present

Cost-effective
Maintenance-free operation of digester

Convenient
Low maintenance costs and reliable gas production





Level measurement and point level detection of foam in the digester

In heated, closed digesters, the organic components of the sludge are decomposed under anaerobic conditions. Combustible gases such as methane are released from the sludge retrieved and used as fuel for heating.

Flow meter for sludge gas

The biogas generated from the sludge is used for the environmentally friendly production of heat and electricity. It is transported through a gas pipeline to the storage tanks.

VEGAPULS SR 68

Accurate, reproducible measured values for control of the filling process

- Reliable measurement, even with foam and density changes
- Independent of gas concentration and pressure fluctuations
- Maintenance-free operation with non-contact measurement

VEGACAP 64

Detection of the conductive foam prevents it from entering the gas facility

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

VEGADIF 65

Measurement of gas volume that is taken from the digester

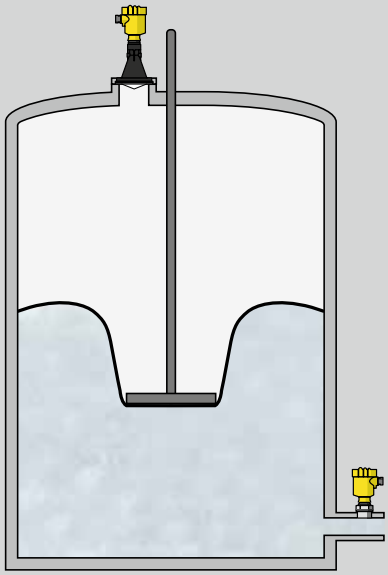
- Detection of the gas volume with standard orifice plate and differential pressure transmitter
- Simple adaptation to existing systems through different orifice plate dimensions
- Reliable measurement and maintenance-free operation

Biogas storage facility

Reliable
High measurement certainty without mechanical wear

Cost-effective
Optimal information on the quantity of available gas

Convenient
Maintenance-free, reliable operation of the plant



Volume and pressure monitoring in the biogas storage facility

After drying, the methane gas is temporarily stored in a gas reservoir. Depending on the design of the reservoir, either a flexible diaphragm of plastic or a floating roof is used for volume equalization.

VEGAPULS 61

Continuous level measurement for uninterrupted gas volume measurement

- Operationally reliable, maintenance-free measurement
- Independent of ambient conditions
- Simple installation even in existing gas storage facilities
- No dead band, so measurement is possible right up to the vessel ceiling

VEGABAR 82

Monitoring of the gas pressure in the gas reservoir

- High measuring accuracy through use of finely graduated measuring cells
- Robust sensor construction for high availability
- Long-term stability of the ceramic measuring cell ensures maintenance-free operation

Sludge granulate silo

Reliable
Optimal protection against overfilling

Cost-effective
Continuous measurement allows maximum utilization of vessel

Convenient
Reliable, maintenance-free operation

Level measurement in the sludge granulate silo

After thermal drying, the dried sludge is stored in silos for further use. The granulated product is deposed of in landfills, used in agriculture or burned for energy generation.

VEGAPULS 67

Continuous level measurement in the granulate silo

- Simple mounting and setup
- Unaffected by ambient conditions and dust generation
- Maintenance-free through contactless measurement

VEGACAP 64

Point level detection for reliable full signal during filling

- Insensitive to buildup and adjustment-free
- Robust and maintenance-free
- Reliable protection against overfilling

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