



Industry Information – Renewable Energy

Measurement technology
for a future-focused industry

Looking Forward **VEGA**



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Responsibility for man and the environment

VEGA's products and services for the measurement of level, point level and pressure are setting the standard in the renewable energy sector. This is because VEGA systematically combines the latest technologies with extensive know-how in this area, and because it adheres firmly to its guiding principle: long-term, fair business dealings based on high esteem for people and processes.

A complete line of future-oriented measurement products

VEGA provides optimal solutions from a single source for process instrumentation of level, limit level and pressure. The ongoing development of core technologies, like radar in level measurement and ceramic materials in pressure measurement, guarantees the availability of sustainable, efficient measuring techniques.

Modular and cost-efficient: The instrument system plics®

plics® is VEGA's unique modular instrument system that allows the user to create a customized combination of sensor, process fitting, electronics and housing. The user thus gets exactly the measurement technology they really need and put it into operation quickly with the simple, standardized functions and adjustment procedures.

Our philosophy for cost-effective energy production

- Deliver reliable measurement data even under varying process conditions
- Ensure highest plant availability and security through sensors with SIL qualification
- Provide time savings and cost advantages through solutions for wireless data transmission
- Support predictive maintenance with built-in asset management functions

Partnership for a future-focused industry

Energy from renewable sources is produced at locations where the raw materials are readily available today and in the future. This requires special facilities that are adapted to local conditions. The instrumentation of such facilities has to meet extraordinary demands, particularly with regard to longevity. VEGA instruments meet these demands and thus ensure cost-efficient, reliable production of energy from renewable resources.

Reliable measurement in all processes

The processes for production of renewable energy create new and very challenging measuring tasks. For example, in thermal solar power plants for example, the level of the heat transfer fluid in expansion tanks requires continuous monitoring. In offshore wind farms, the measurement of tides and wave height delivers important data concerning the mechanical stresses on the wind turbines. Point level detectors control the filling and emptying of storage silos for wood pellets. VEGA's measurement technology looks after all these processes and makes sure they run smoothly.

Dependability under extreme conditions

The implemented measurement technology must function reliably outside, whether in a desert or a marine environment. All sensor components from VEGA are designed for the expected ambient conditions anywhere in the world. The robust housings provide high levels of protection and the sensing elements and antennas withstand temperatures from -200 °C to +450 °C.





Reliability even in changing media

In the area of renewable energy sources, the properties of the measured media could hardly be more diverse. Whether coarse, fine, caking or abrasive bulk solids such as cane sugar or wood pellets, whether viscous, adhesive or corrosive liquids such as heat transfer fluid or gear oil, whether biogas or saturated steam: VEGA has the right solution for reliable measurement.

Measurement technology that's a perfect fit for every application

Whether the application involves a leachate sump, a reservoir, a storage tank for molten salt, a wood pellet silo or a gear oil tank – for every measuring situation there's an optimal solution. The wide range of physical measuring principles makes it possible. Every solution also includes connecting the sensor to the process: VEGA has a suitable process fitting for any kind of tank or pipeline. And when it comes to sensor signal transmission, all current bus and wireless standards are available.

plics[®] – easy is better

Indicating and adjustment module

- PLICSCOM
- VEGACONNECT

Electronics

- 4 ... 20 mA/ HART
- Profibus PA
- Foundation Fieldbus
- Level switch

Housing

- Plastic
- Stainless steel
- Aluminium
- Plastic double chamber
- Stainless steel double chamber
- Aluminium double chamber

Process fitting

- Thread
- Flange
- Hygienic connection
- Custom design

Sensor

- Radar
- Ultrasonic
- Guided microwave
- Capacitive
- Vibration
- Microwave barrier
- Process pressure
- Hydrostatic
- Differential pressure

Explosion protection (Ex)

Safety standards (SIL)

Hygienic standards (Hyg)

Ship approvals (Anchor icon)



Trend-setting measurement technology orientates itself around the people who use it. That's why we developed plics® – the world's first modular product system for instrumentation. Every one of our sensors is custom-built from plics® components and thus fulfils the requirements of your measurement application down to the last detail.

Simpler planning with plics®

The many possible combinations of sensor, process fitting, electronics and housing simplify instrument selection and project planning. Cost reduction with plics® thus starts early in the planning stage.

Clear advantages in setup and commissioning

Short delivery times, uncomplicated connection and fast setup, save time and money. The configuration, wiring and setup of all plics® instruments are always the same. This considerably shortens the time required for training employees as well as putting new measuring points into service.

Greater reliability in operation

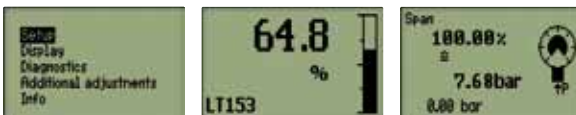
plics® instruments deliver a convincing performance in everyday operation thanks to high operational reliability, simplified maintenance and reduced replacement part stocks. The consistency of the technology and handling simplifies and accelerates work with the sensors. Whether performed directly on the instrument with the indicating and adjustment module PLICSCOM, or via a PC in the control room, the simple, menu-driven adjustment procedures are identical on all instruments. This saves time and money in training technical staff.

plics® – always with energy to spare

In the renewable energy sector, reliability, profitability, availability and longevity are the key criteria for sensor selection. The plics® concept is ideally suited to the needs of the industry. This technology thus makes a significant contribution to long-term energy security.

- Simple, customised instrument configuration reduces costs already in the planning stage
- Simple adjustment concept optimally supports setup and saves time and costs
- Retrievable status information makes it possible to plan maintenance and servicing
- Long-lasting sensors save costs in spare parts stocking

Where man and machine meet: Adjustment and system integration



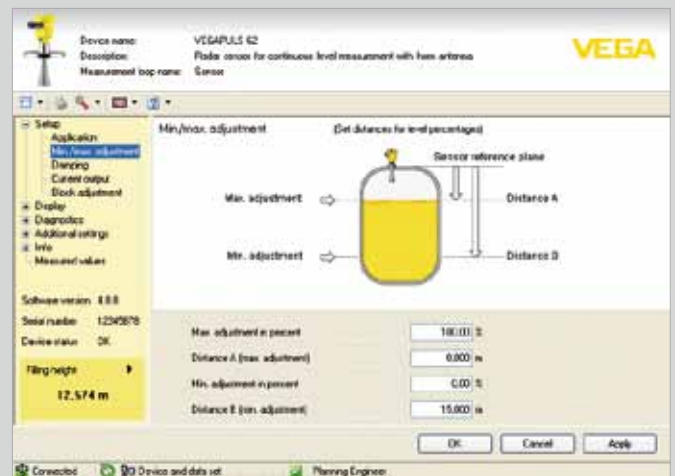
On-site instrument adjustment with PLICSCOM

The indicating and adjustment module PLICSCOM can be connected onto any plics® instrument at any time. It functions as measured value indication on the instrument and as an on-site adjustment tool. The structure of the adjustment menu is clearly laid out and makes setup and commissioning as easy as child's play. Status messages are also displayed in clear, readable text.

When several similar measuring points are put into operation at the same time, PLICSCOM ensures that each sensor is quickly up and running: all sensor data can be saved with a single key-stroke on PLICSCOM and then copied into the other sensors.

Instrument adjustment via PC and control system

FDT/DTM technology is an innovative, manufacturer-independent description technology for field instruments. By using it, complex field instruments can be operated as easily with laptop computers and PCs as with the current engineering and operating environments of control systems. With DTMs, the sensors are configurable down to the last detail, and important adjustments can be carried out easily and quickly. As a system-independent operating system for DTMs, PACTware is the first choice for many field device manufacturers. VEGA also delivers the corresponding field device descriptions for system environments that depend on EDD technology.



All current standards for measurement data transmission

VEGA offers a variety of established solutions: from the proven 4 ... 20 mA/HART measured value transmission, to field bus technologies like Profibus PA or Foundation Fieldbus or wireless transmission. When it comes to point level detection, the selection ranges from contactless electronic switch to relay, transistor and NAMUR signal.

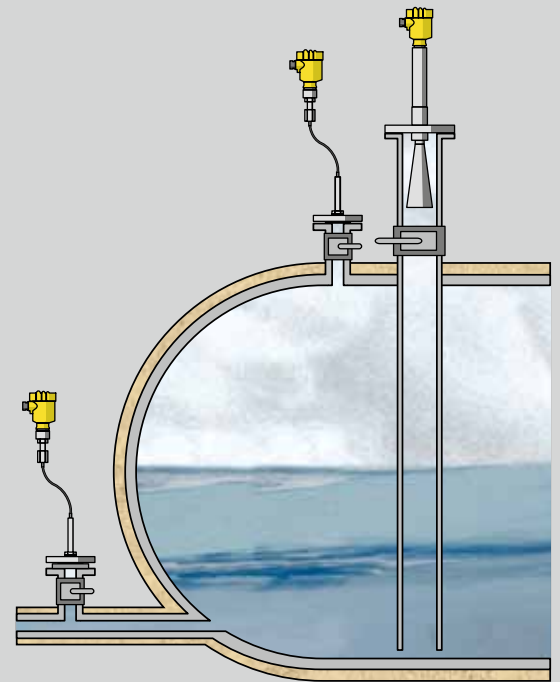
Communication at all levels

VEGA supports all important standards for uniform, centralized field instrument operation. If the field instruments are integrated in higher-ranking management or control systems, they can be accessed for adjustment, servicing and diagnosis purposes via DTM or EDD description technologies and the existing infrastructure. Setup, diagnosis and operation of the field instruments are always the same – this saves time and money.

Thermal solar plants

Heat transfer fluid (HTF)

In solar thermal plants the solar heat collected by the mirror system is transported to the steam generator at the central turbine via a heat transfer fluid. This fluid generally has a temperature between +300 °C and +400 °C. A variety of different containers is used to hold the heat transfer fluid. When the fluid is heated, its volume in the containers changes and has to be accurately measured, in order for the plant to be safely and profitably operated.



Level measurement in the expansion tank with VEGAPULS 62

The expansion tanks absorb the volume changes that take place within the heat transfer fluid circulatory system. They hold a pressure of about 12 bar at temperatures up to +400 °C. To ensure reliable measurement of the levels in the tanks, radar technology is employed. VEGAPULS 62 is mounted in a standpipe and provided with a shutoff valve, so that it can be mounted or dismantled during ongoing operation.

Pressure measurement with VEGABAR 51

To measure the pressure in the entire piping system, a separating system with capillary is implemented. This allows the actual pressure sensor to be kept at a safe distance from the harsh conditions of the process. If the pressure transmitter is mounted directly on the heat transfer fluid container, debris or buildup can contaminate the membrane. In such case the membrane can be cleaned as needed by rinsing via a flushing ring.



VEGAPULS 62

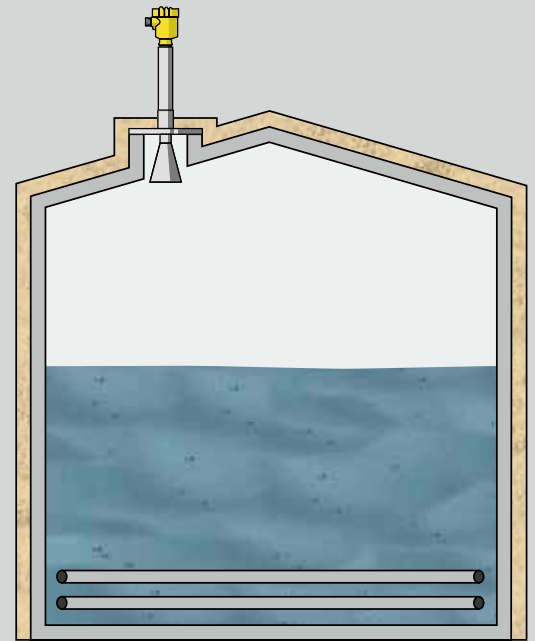
- Reliable operation even at high temperatures
- Long service life thanks to resistant materials
- Wear-free operation thanks to non-contact measuring method

VEGABAR 51

- Highly resistant to overload from pressure surges
- Seal-free measuring cell ensures high durability
- Wear and maintenance-free thanks to highly resistant membrane materials

Storage of molten salt

The most important criterion for the installation of a thermal solar system is the total available solar radiation per year. In order to produce electric power during periods with little or no sunlight, molten salt is used to store the thermal energy that is collected on sunny days.



Level measurement with VEGAPULS 62

Two large vessels are normally used for storing the molten salt – one for salt with a lower temperature (approx. 300 °C), the other for salt with a higher temperature (approx. 400 °C). With its non-contact measuring technique, VEGAPULS 62 guarantees a safe, maintenance-free and reliable level measurement at these high temperatures. Even density changes at higher temperatures do not affect the measuring result. The contactless measuring method allows VEGAPULS 62 to be used even if there is a ball valve fitting is installed on the mounting boss.



VEGAPULS 62

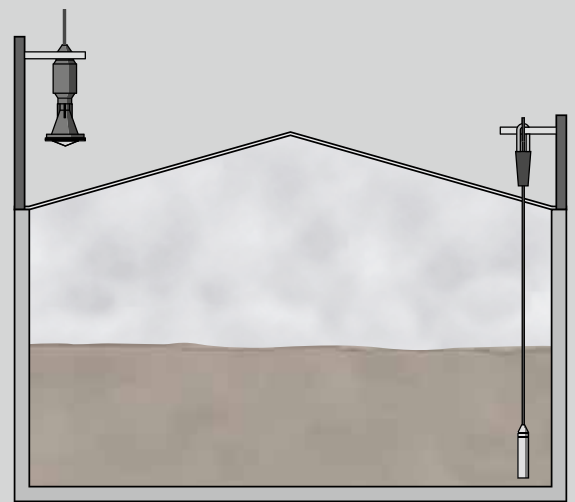
- High measuring accuracy independent of product properties
- Reliable measurement for extremely high temperature ranges
- Maintenance-free, non-contact measurement

Biogas plants

Energy from liquid manure

Biogas plants convert organic wastes together with renewable raw materials into valuable energy – and are largely CO₂ neutral. Beside animal wastes, other organic by-products from agriculture and industry are also used in the conversion processes. For example, up to 50 % corn silage or other renewable resources are mixed in as an additional energy source.

Optimal use of resources and maintenance-free operation requires reliable measurement technology. In every phase of the process – from the delivery of raw materials to the removal of residues – the levels, limit levels and pressures have to be monitored.



Level measurement with VEGAPULS WL61

The radar sensor VEGAPULS WL61 ensures maintenance-free operation through its robust design and high chemical resistance. Since the radar signals travel right through the plastic cover of the container, measurement can be performed from the outside without exposing the sensor to the aggressive atmosphere. This guarantees a long service life.

Hydrostatic level measurement with VEGAWELL 52

Through the use of highly resistant materials, level measurement in the liquid manure tank with the suspension pressure transmitter VEGAWELL 52 with FEP suspension cable is a long-term solution. It detects the liquid level reliably and without influence from the generated foam.



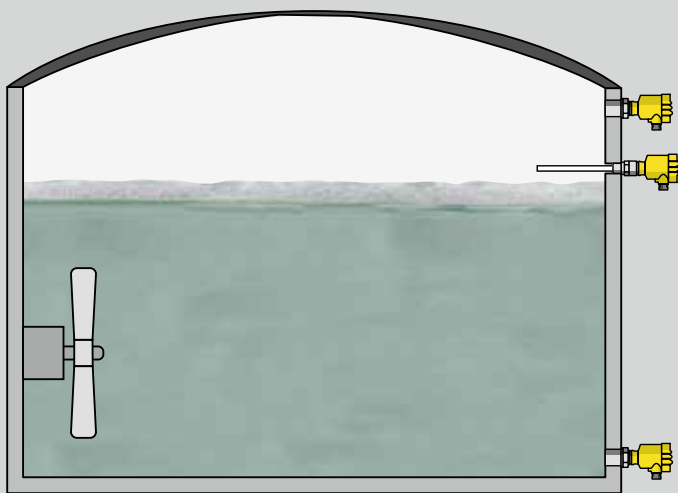
VEGAPULS WL61

- Radar measurement is independent of ambient conditions
- Non-contact measurement allows maintenance-free operation
- Simple mounting reduces installation costs



VEGAWELL 52

- High resistance ensures a long service life
- Hydrostatic measurement is independent of foam formation
- Simple setup and commissioning lowers the costs



Level detection with VEGACAP 64

The robust construction of the capacitive level switch VEGACAP 64 makes it especially well suited and reliable for monitoring limit levels. Being completely unaffected by buildup, the sensor is used for full and empty signal in slurry tanks, fermenters and residue containers.

Pressure measurement with VEGABAR 52

With its high accuracy and high chemical resistance, VEGABAR 52 is ideal for universal use in fermenters. Through the wide selection of available measuring cells, even the tiniest pressures in the gas phase can be reliably detected.

VEGABAR 52 is also used for hydrostatic level measurement in the ferment residue storage container. Its front-flush measuring cell of highly resistant ceramic is characterised by maintenance-free, continuous operation.



VEGACAP 64

- Not affected by heavy product buildup
- Maintenance-free thanks to robust sensor design
- Adjustment-free setup and commissioning minimizes costs



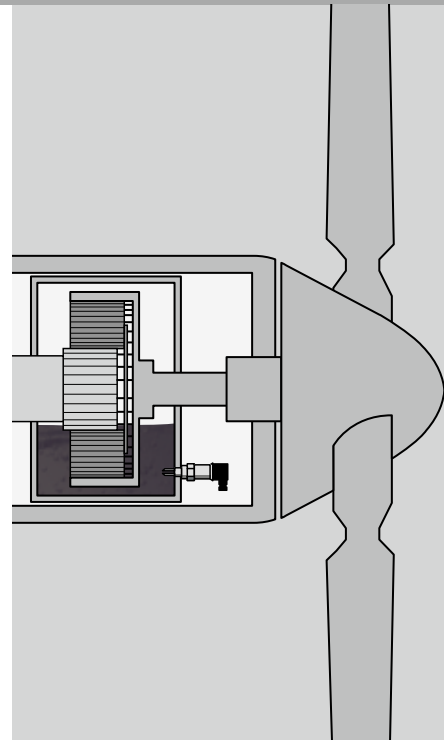
VEGABAR 52

- Different measuring cells allow a targeted selection of pressure ranges
- High chemical and mechanical resistance through ceramic measuring cell
- Wide range of process fittings allows easy integration

Wind turbines

Gearbox oil in wind turbines

Efficiency is central to the operation of wind turbines. The higher the availability, the higher the profitability and the quicker a return on investment is achieved. Wind power is transmitted to the generator via the rotor gearbox. Adequate lubrication of all moving parts is a critical factor that determines the service life and the availability of the wind turbine. That's why the oil level in the rotor gearbox has to be monitored continuously.



Gear protection with VEGASWING 51

The task of VEGASWING 51 is to ensure that all rotor gearbox components are adequately lubricated and thus protected against wear. It reproducibly monitors the minimum level of oil in the gearbox and therefore contributes to the long-term profitability of the plant. With its compact dimensions and standard electrical connections, it can be easily integrated into any system.

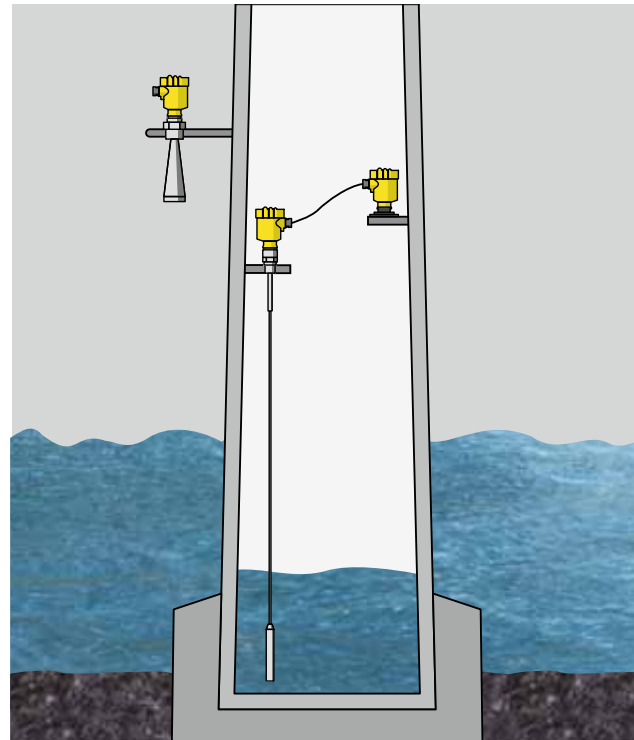


VEGASWING 51

- High reliability through product-independent switching point
- Adjustment without medium allows fast setup and commissioning
- Easy installation thanks to compact sensor dimensions

Offshore wind farms

Wind turbines in offshore wind farms are exposed to a harsh environment. They have to withstand not only the rough seas and sometimes very strong winds, but the corrosive action of salt water as well. During the construction of a plant, it is unavoidable that seawater will get into the turbine tower. This water level must be monitored continuously in order to detect leaks, as they can lead to a higher rate of corrosion. A continuous tide and wave height measurement is also carried out in order to determine the mechanical loads on and the accessibility of the wind power plant.



Leak detection with VEGAFLEX 61

The sensor, which operates according to the guided microwave principle, withstands the aggressive atmosphere inside the tower due to its high-resistance materials. Its simple installation and setup ensure reliable, continuous operation. To provide easier access to the electronics for adjustment and servicing, the electronics of VEGAFLEX 61 can be located up to 10 m distant from the sensor itself.

Tide and wave height measurement with VEGAPULS 62

The VEGAPULS 62 radar sensor offers non-contact measurement with extremely fast response times. Its Duplex stainless steel construction makes it practically invulnerable to the saline environment. These features make it the ideal sensor for measuring tide and wave height.



VEGAFLEX 61

- Simple setup and commissioning through factory calibration
- Ideal operability via remote electronics
- Long service life thanks to corrosion-resistant materials

VEGAPULS 62

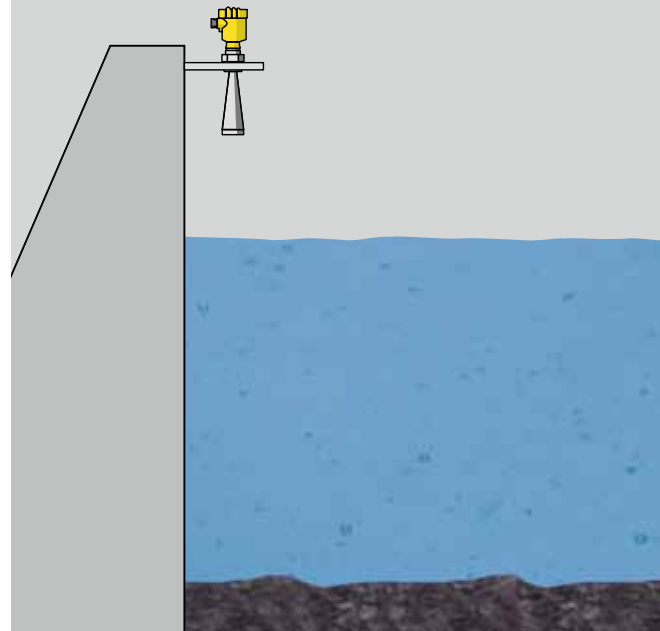
- Maintenance-free operation through non-contact measurement method
- Fast measurement data acquisition ensures high reliability
- Simple, one-person installation thanks to small dimensions and light weight of sensor

Hydroelectric power

Pumped storage power plant

Pumped storage power plants can store large amounts of energy and feed it very quickly into the power grid when necessary. The measurement technology deployed must be extraordinarily reliable, because the sensors are often installed at remote locations.

One important measurement is the height of the water level in the reservoir. It indicates the quantity of energy stored and the storage volume still available in pumping mode.



Level measurement with VEGAPULS 68

In many reservoirs, radar instruments can be easily fastened to existing structures. VEGAPULS 68 measures the water level in the reservoir with high accuracy without direct physical contact to the medium. Unaffected by temperature changes, wind and weather, it operates maintenance-free and with great reliability up to a range of 70 m.

On curved dams, mounting a radar sensor is sometimes not possible for structural reasons. The measurement is then carried out alternatively with the suspension pressure transmitter VEGAWELL 52. Its rugged ceramic measuring cell has high long-term stability and guarantees maintenance-free operation of the facility.



VEGAPULS 68

- High accuracy over the entire measuring range
- Excellent long-term stability due to wear-free measurement
- Unaffected by temperature, rain or snow

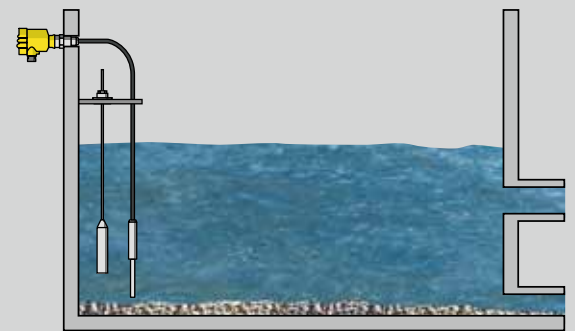


VEGAWELL 52

- Robust sensor design ensures high availability
- Wear-free ceramic measuring cell minimizes maintenance costs
- Simple installation and setup

From the water catchment to the reservoir

When the natural flow of water into the reservoir is not sufficient for optimal energy production, additional water is fed in through tunnels from water catchment basins that are in some cases several kilometres away. A heavy grating holds back coarse gravel in the water catchment. Smaller stones and sand can accumulate in the discharge basin in front of the tunnel. Detection of the level of stones and sand in the basin thus prevents detritus from getting into the tunnel system.



Monitoring detritus with VEGAVIB 62

The vibrating level switch VEGAVIB 62 detects the accumulated stones under water and triggers a flushing cycle when a certain level is reached. This ensures cost-efficient operation, since the flushing process is initiated only when needed.

Level measurement in the water trap with VEGAWELL 52

Before the water is allowed to run into the reservoir or pressure tunnel leading to the power plant, it is fed into a water trap. Here, the water level is measured with the suspension pressure transmitter VEGAWELL 52. The ceramic measuring cell of the sensor guarantees a reliable measurement and long-term stability.



VEGAVIB 62

- Reliable level measurement independent of detritus composition
- Rugged design ensures reliable operation
- Low-maintenance operation reduces servicing costs



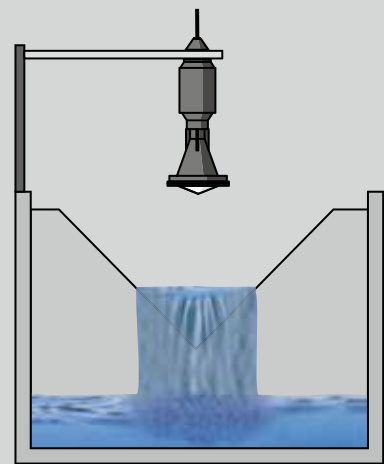
VEGAWELL 52

- Wear-resistant ceramic measuring cell ensures high availability
- Simple mounting and setup reduces installation costs
- High resistance to abrasion from foreign bodies

Hydroelectric power

The dam

Water that seeps through the walls of the dam is collected in pipes and channels. The quantity of the leaking water allows the operator to gain information about the condition of the dam. Another indicator of the condition of the dam is the turbidity of the leakage water. It is therefore examined and assessed visually in an open channel. The flow rate is measured via the level.



Flow measurement in open channels

The flow rate of the leakage water is measured via the liquid level in an open channel, either inside the dam or in catchment basins. Completely unaffected by temperature fluctuations and condensation, radar level measurement with VEGAPULS WL61 guarantees reliable measurement data and maintenance-free operation.

If the ambient temperature is constant, the ultrasonic level sensor VEGASON 61 can be used as an alternative here. VEGASON 61 also measures the level of leakage water in open channels contactlessly.



VEGAPULS WL61

- High measuring accuracy allows very precise flow measurement
- Reliable measuring result is unaffected by environmental influences
- Simple installation and setup reduces installation costs



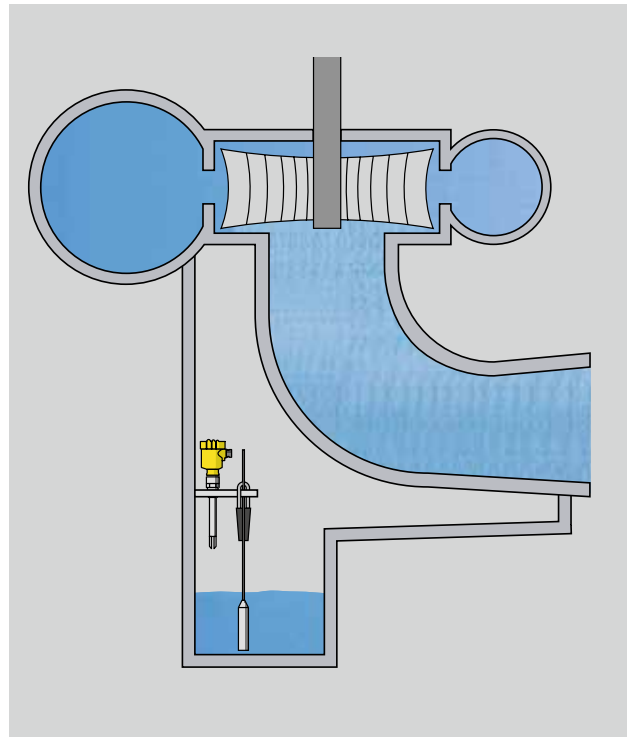
VEGASON 61

- Non-contact measurement guarantees maintenance-free operation
- Simple setup and commissioning reduces costs
- Built-in flow characteristics for easy system integration

Turbine house

To ensure reliable operation of the generators and turbines, a large number of sensors is required. They monitor electrical variables, the pressure in hydraulic lines, the lubricant supply for the turbine shaft bearings and the leakage water sump in the machine room.

Cooling water from generators and leakage water from the Kaplan or Francis turbines is collected in the sump at the lowest point of the facility. To prevent the sump from overflowing and consequently flooding the turbine house, the sensors are installed redundantly and, for good measure, the highest permissible level is also monitored by a limit switch.



Level measurement with VEGAWELL 52

Hydrostatic level measurement with a VEGAWELL 52 sensor is particularly suitable for monitoring the water level in the sump. The continuous level measurement enables optimal pump operation. A high degree of redundancy and protection is achieved through the use of two sensors.

Level detection with VEGASWING 63

Since overflowing in the sump must be prevented under all circumstances, a VEGASWING 63 vibrating level switch is additionally deployed. The continuous self-monitoring of the sensor ensures maximum safety and dependability and offers significant advantages over mechanical float switches.



VEGAWELL 52

- Highly resistant ceramic measuring cell ensures high availability
- Excellent long-term stability reduces maintenance requirements
- Simple installation and setup reduces installation costs

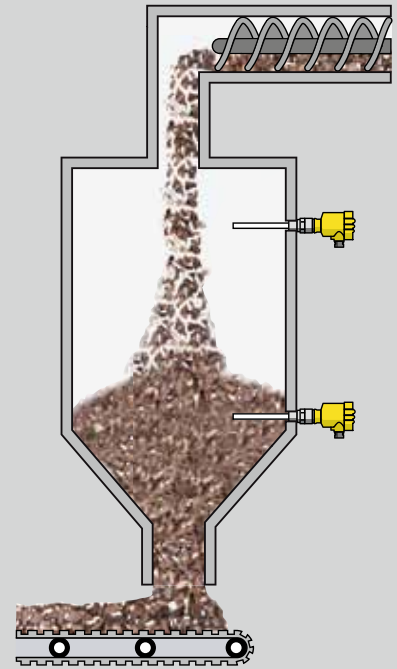
VEGASWING 63

- High switching reliability through continuous self-monitoring
- Maintenance costs are reduced due to wear-free measuring principle
- Simple setup and commissioning thanks to adjustment-free sensor version

Energy generation from wood

Production of wood pellets

To be able to produce wood fuel pellets profitably, an automated production process is required. In such a process, the wood is cut, dried and pressed into small pellets under high pressure. Reliable point level sensors ensure efficient production and ensure a reliable supply of an environmentally friendly fuel to customers.



Level detection with VEGACAP 64

The delivered pellet material is dried in a belt drying machine, in which the charging process is monitored by two VEGACAP 64 sensors. The still moist material has a strong tendency to build up on surfaces, making it necessary to use a robust limit switch that works reliably under all conditions. A VEGACAP 64 capacitive level switch, which is immune to the effects of product buildup, guarantees optimal filling of the drying machine.

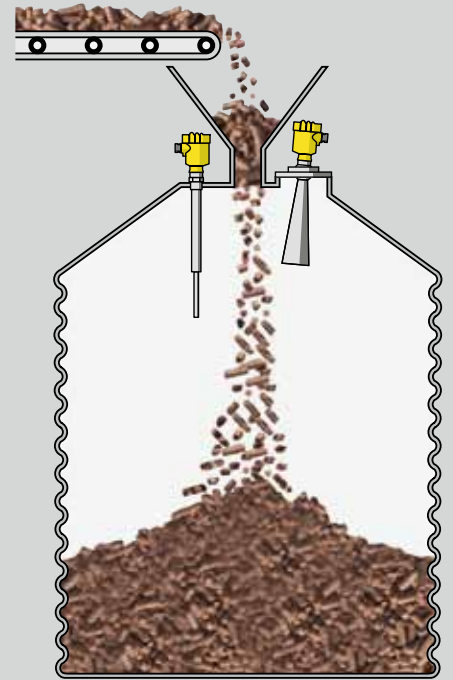


VEGACAP 64

- Sensor function is completely unaffected by product deposits
- Adjustment-free setup minimizes costs
- Rugged construction ensures maintenance-free operation

Storage of wood pellets

Until required for delivery, the finished pellets are stored in corrugated sheet metal silos over 30 m high. With such a large storage capacity, the supplier can respond to the increased demand during the heating season and utilize their production facilities to the full extent throughout the year. To be able to plan material logistics optimally, reliable measurement of the silo contents is paramount.



Level measurement with VEGAPULS 68

VEGAPULS 68 is perfect for measuring the level in the pellet silo. Unaffected by dust, temperature fluctuations and the corrugated container walls, it detects the filling height of the pellets with great reliability and accuracy.

Level detection with VEGAIB 63

If an additional level alarm in the storage silo is required, VEGAIB 63 is the ideal solution. The rod form of the robust vibrating level switch keeps the pellets from jamming and thus contributes to a reliable, maintenance-free limit level detection.



VEGAPULS 68

- Wear-free thanks to non-contact measurement
- Mounting from above simplifies installation and setup
- Reliable measurement even during filling



VEGAIB 63

- Reliable level signal under all operating conditions
- Maintenance-free, no mechanical wear
- Adjustment-free and easy to install

Ethanol from renewable raw materials

Fuel

In modern ethanol plants, commodities such as grains, sugar cane or sugar beets are processed into alcohol and ethanol. Even the by-products and waste materials of the process are completely utilised. The ethanol is later blended with gasoline. Through the use of renewable resources for fuel, the consumption of crude oil is reduced and the carbon footprint of this energy is significantly lessened.



Level measurement with VEGAPULS 68

The different varieties of grain are stored for subsequent processing in silos over 20 m high. The non-contact radar sensor VEGAPULS 68 continuously measures the level in the silo. It ensures optimal filling without effect from the huge quantities of dust generated and without any cables stressing the silo mechanically.

Level detection with VEGAVIB 62

The vibrating level switch VEGAVIB 62 is particularly suitable as an additional level detection system. The rod-shaped probe can be used for practically all solid bulk materials.



VEGAPULS 68

- Reliable measurement even with changing media
- Mounting from above simplifies installation and setup
- Reliable measurement even during the filling process



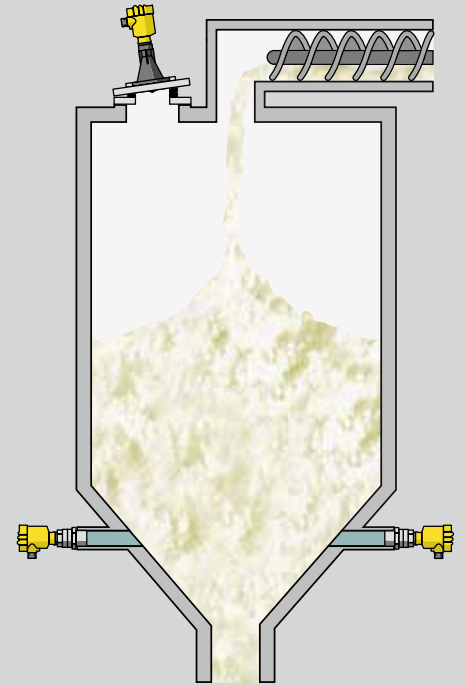
VEGAVIB 62

- Maintenance-free, no mechanical wear
- Adjustment-free and easy to install
- Dependable level signal even with changing media

Buffer vessel

To ensure that there is always enough material for subsequent processes, the crushed or shredded materials are held ready in buffer tanks.

When grain is used for the production of ethanol, the raw material goes directly from the mills into the flour silos for temporary storage. The large throughput of material puts heavy mechanical loads on the silo and its internal components. The sensors implemented ensure continuous production and cost-efficient operation of the facility.



Non-contact level measurement with VEGAPULS 67

The great advantage of a non-contact measuring principle is that it is not subject to mechanical stress. In spite of the intense dust generation within the vessel, the VEGAPULS 67 radar sensor provides reliable measurement data on the level of the flour. If extremely heavy dust deposits build up on the sensor, it can be cleaned cyclically via a rinsing flange.

Level detection with VEGAMIP 61

The microwave barrier VEGAMIP 61 is either installed directly in the vessel wall or mounted on a plastic-filled mounting socket. It is adapted to local conditions on site via built-in adjustment elements. The instrument guarantees a reliable empty signal, without influence from material deposits on the silo wall.



VEGAPULS 67

- Non-contact level measurement means no wear on the sensor
- Reliable measurement even under conditions of extreme dust generation
- Simple installation and setup saves costs



VEGAMIP 61

- No mechanical wear thanks to non-contact level monitoring
- Simple mounting with different mechanical options
- Maintenance-free operation and simple adjustment

Ethanol from renewable raw materials

Auxiliary materials

To achieve the best possible fermentation of the raw materials, optimal process conditions must be maintained. Beside the temperature, the pH value of the media also plays an important role. It is adjusted by adding acids or alkalis to the process mixtures. The facility, which is operated under hygienic conditions, is cleaned regularly with a sodium hydroxide solution. The levels in the solution tanks have to be closely monitored to ensure continuous operation of the production equipment.

The measured media place stringent demands on the chemical resistance of the sensors deployed: to allow universal application, the sensors should be equally resistant to acids and alkalis.



Level measurement with VEGAPULS 61

The radar sensor VEGAPULS 61 measures the level in the process tank contactlessly. A plastic antenna cover protects the sensor against the aggressive media.



VEGAPULS 61

- Mounting from above simplifies installation and setup
- High chemical resistance thanks to plastic-encapsulated antenna system

Pressure measurement with VEGABAR 52

For hydrostatic pressure measurement in the pipeline, a VEGABAR 52 sensor with a PVDF process fitting and a highly resistant ceramic measuring cell is implemented.



VEGABAR 52

- Ceramic measuring cell ensures high chemical resistance
- High, long-term stability guarantees maintenance-free operation

Level detection with VEGASWING 63

A VEGASWING 63 vibrating level switch prevents vessel overfill. The sensor signals the limit level reliably under all operating conditions and without influence from the medium.



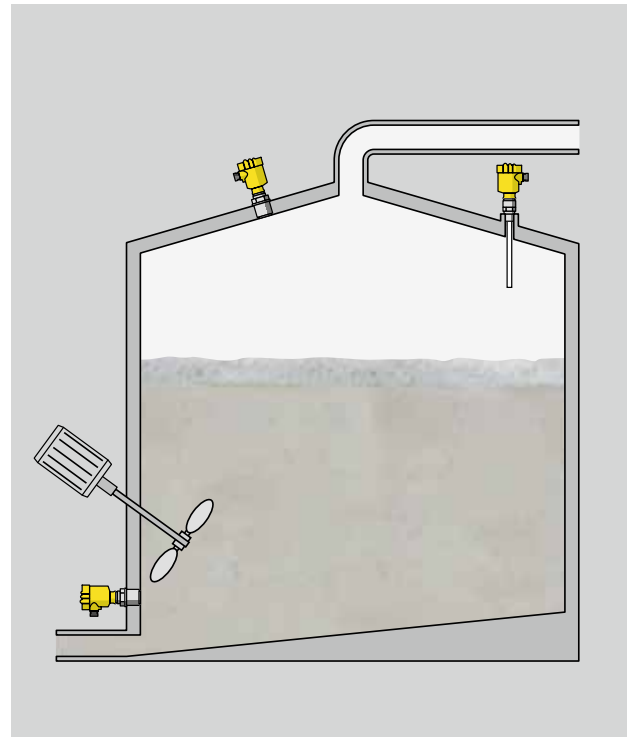
VEGASWING 63

- Universal level detection regardless of medium
- Highly resistant coatings ensure reliable, long-term operation

Fermentation

The heart of the ethanol plant is the fermentation process. This is where the sugar contained in the mash is converted into alcohol, which is subsequently distilled down to 99.9 % purity.

The CO₂ gas resulting from the fermentation process is captured and used for carbonation in the beverage industry. To keep the fermenter operating smoothly and profitably, reliable monitoring of process parameters and levels is required.



Level measurement and pressure monitoring with VEGABAR 52

One VEGABAR 52 pressure transmitter detects the lower pressure in the gas space above the mash while a second VEGABAR 52 measures the hydrostatic pressure at the bottom of the mash – the difference between the two measurements corresponds to the level in the tank. This makes it possible to run the system continuously in the optimal range, ignoring any foam formation during the fermentation process.

Overfill protection with VEGACAP 64

If foam generation is extremely intense, a VEGACAP 64 is additionally used for limit level detection. This capacitive sensor detects the foam or the product with great certainty and guarantees reliable system operation even if product deposits build up on the probe.



VEGABAR 52

- Ceramic materials guarantee high abrasion resistance
- Measuring cells available for any specific pressure range
- Front-flush measuring cell makes cleaning easy



VEGACAP 64

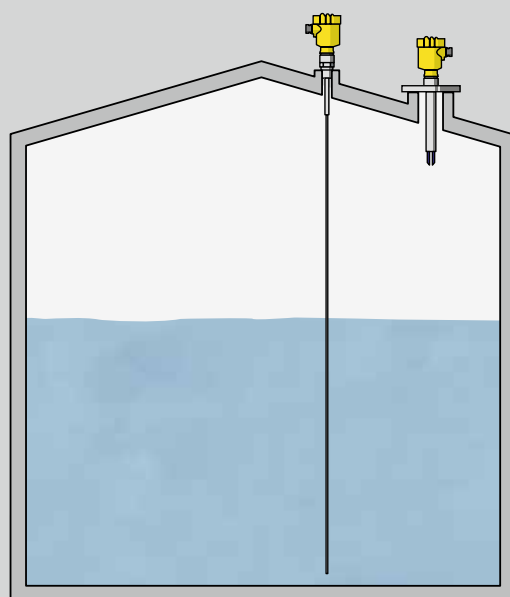
- Reliable foam detection regardless of consistency
- Not affected by heavy product deposits
- Adjustment-free setup minimizes the costs

Ethanol from renewable raw materials

Bio-ethanol storage tanks

After running through all process steps, the ethanol is ready for delivery to the consumer and is stored in a tank storage depot. Accurate measurement of the tank contents is a prerequisite for reliable logistics planning and ensures the supply to customers.

Since the tanks often cannot be emptied after an initial filling, maintenance-free operation is an important criteria when selecting a suitable measurement technology.



Level measurement with VEGAFLEX 61

Level measurement in storage tanks is an ideal application for the VEGAFLEX 61 guided microwave sensor. The measuring result is affected neither by temperature fluctuations nor alcohol vapours in the gas phase. The sensor offers high accuracy and exceptionally high reliability. Since VEGAFLEX 61 is mounted from above, installation and adjustment can also be carried out on a completely filled tank.

Level detection with VEGASWING 63

The VEGASWING 63 vibrating level switch detects the threshold level unfailingly and can be used as an approved overfill protection system. Because it is a self-monitoring sensor, it provides a high degree of reliability and guarantees maintenance-free operation of the tank storage depot.



VEGAFLEX 61

- High accuracy independent of medium and product vapours
- Easy mounting from above facilitates retro installation
- High reliability through instrument specification according to SIL2



VEGASWING 63

- Adjustment-free setup and maintenance-free operation
- Function test initiated by the simple press of a button
- Reliable level measurement according to SIL2 and WHG

Instrument overview



VEGAPULS 61



Radar sensor for continuous level measurement of liquids

- Non-contact measurement
- High plant availability, because wear and maintenance-free
- Exact measuring results independent of process conditions

Process temperature: -40 ... +80 °C (-40 ... +176 °F)

Process pressure: -1 ... +3 bar (-100 ... +300 kPa)

Process fitting: Thread G1½, 1½ NPT
Mounting strap
Compression flanges from DN 80, 3"

Measuring range: up to 35 m (115 ft)



VEGAPULS WL61



Radar sensor for continuous level measurement of water and waste water

- Non-contact measurement
- High plant availability, because wear and maintenance-free
- Exact measuring results dependent on product, process and ambient conditions

Process temperature: -40 ... +80 °C (-40 ... +176 °F)

Process pressure: -1 ... +2 bar (-100 ... +200 kPa)

Process fitting: Thread from G1½
Mounting strap
Compression flanges from DN 80, 3"

Measuring range: up to 15 m (49 ft)



VEGAPULS 62



Radar sensor for continuous level measurement of liquids

- Non-contact measurement
- High plant availability, because wear and maintenance-free
- Exact measuring results independent of pressure, temperature, gas and steam

Process temperature: -200 ... +450 °C (-328 ... +842 °F)

Process pressure: -1 ... +160 bar (-100 ... +16000 kPa)

Process fitting: Thread from G1½, 1½ NPT
Flanges from DN 50, ANSI 2"

Measuring range: up to 35 m (115 ft)

The pictured instruments are standard models.



Explosion protection



Safety standards



Hygienic standards

Instrument overview



VEGAPULS 67



Radar sensor for continuous level measurement of bulk solids

- Non-contact measurement
- High plant availability, because wear and maintenance-free
- Reliable measurement independent of vapour, dust and noise

Process temperature: -40 ... +80 °C (-40 ... +176 °F)

Process pressure: -1 ... +2 bar (-100 ... +200 kPa)

Process fitting: Mounting strap
Compression flanges from DN 80, ANSI 3"

Measuring range: up to 15 m (49 ft)



VEGAPULS 68



Radar sensor for continuous level measurement of bulk solids

- Non-contact measurement
- High plant availability, because wear and maintenance-free
- Reliable measurement independent of vapour, dust and noise

Process temperature: -200 ... +450 °C (-328 ... +842 °F)

Process pressure: -1 ... +160 bar (-100 ... +16000 kPa)

Process fitting: Thread G1½ A, 1½ NPT
Flanges from DN 50, ANSI 2"

Measuring range: up to 75 m (246 ft)



VEGAFLEX 61



TDR sensor for continuous level measurement

- Minimum time and cost expenditure thanks to simple setup without medium
- Simple instrument selection, because unaffected by product features
- Low maintenance costs, because wear and maintenance-free

Process temperature: -40 ... +150 °C (-40 ... +302 °F)

Process pressure: -1 ... +40 bar (-100 ... +4000 kPa)

Process fitting: Thread from G¾ A, ¾ NPT
Flanges from DN 25, ANSI 1"

Measuring range: Cable up to 32 m (105 ft)
Rod up to 4 m (13 ft)

The pictured instruments are standard models.



VEGASON 61



Ultrasonic sensor for continuous level measurement

- Non-contact measurement
- Reliable measurement independent of product features
- Price-favourable solution for simple applications

Measuring range:	-40 ... +80 °C (-40 ... +176 °F)	
Process pressure:	-0.2 ... +2 bar (-20 ... +200 kPa)	
Process fitting:	Thread G1½, 1½ NPT	
Measuring range:	in liquids:	0.25 ... 5 m (0.8 ... 16.4 ft)
	in bulk solids:	0.25 ... 2 m (0.8 ... 6.5 ft)



VEGASWING 51



Vibrating level switch for liquids

- Minimum time and cost expenditure thanks to simple setup without medium
- Precise and reliable function due to product-independent switching point
- Low maintenance costs

Measuring range:	-40 ... +150 °C (-40 ... +302 °F)	
Process pressure:	-1 ... +64 bar (-100 ... +6400 kPa)	
Process fitting:	Thread from G¾, ¾ NPT Hygienic fittings	



VEGASWING 63



TDR sensor for continuous level measurement

- Minimum time and cost expenditure thanks to simple setup without medium
- High reliability through easy cleanability and maximum chemical resistance
- Simple instrument selection, because independent of product features

Process temperature:	-50 ... +250 °C (-58 ... +482 °F)	
Process pressure:	-1 ... +64 bar (-100 ... +6400 kPa)	
Process fitting:	Thread from G¾ A, ¾ NPT Flanges from DN 25, ANSI 1" Hygienic fittings	
Probe length:	up to 6 m (20 ft)	



Explosion protection



Safety standards



Hygienic standards

Instrument overview



VEGAVIB 62



Vibrating level switch with suspension cable for granular bulk solids

- Minimum time and cost expenditure thanks to simple setup without medium
- Reliable function through product-independent switching point
- Low maintenance costs

Process temperature: -50 ... +150 °C (-58 ... +302 °F)

Process pressure: -1 ... +6 bar (-100 ... +600 kPa)

Process fitting: Thread from G1, 1 NPT
Flanges from DN 50, 2"
Hygienic fittings

Probe length: up to 80 m (262 ft)



VEGACAP 64



Capacitive rod electrode for level detection

- Reduced number of cleaning cycles through measurement insensitive to buildup
- Maximum use of the vessel, because measurement over the complete probe length
- Long lifetime and low maintenance requirement through robust construction

Process temperature: -50 ... +200 °C (-58 ... +392 °F)

Process pressure: -1 ... +64 bar (-100 ... +6400 kPa)

Process fitting: Thread from G¾, ¾ NPT
Flanges from DN 50, 2"

Measuring range: up to 4 m (13 ft)



VEGAMIP 61



Microwave sensor for level detection of bulk solids and liquids

- Reliable measurement even with very abrasive products
- Simple adjustment saves time and costs for setup
- Reliable measurement even with changing product features

Process temperature: -40 ... +80 °C (-40 ... +176 °F)
with mounting adapter: +450 °C (842 °F)

Process fitting: Thread G1½, 1½ NPT
Flanges
Clamp

Measuring range: -1 ... +4 bar (-100 ... +400 kPa)

The pictured instruments are standard models.



VEGABAR 51



Pressure transmitter with chemical seal

- Simple adaptation, due to individual configuration
- Reliable measurement up to temperatures of 400 °C
- Reliable measurement independent of foam generation and tank installations

Process temperature: -40 ... +400 °C (-40 ... +752 °F)

Process fitting: Flanges from DN 25, 1"
Hygienic fittings

Measuring range: -1 ... +400 bar (-100 ... +40000 kPa)



VEGABAR 52



Pressure transmitter with CERTEC® measuring cell

- High plant availability by maximum overload and vacuum resistance of the ceramic measuring cell
- Measurement down to the last drop through smallest measuring ranges with high reliability
- Low maintenance costs through wear-free ceramic measuring cell

Process temperature: -40 ... +150 °C (-40 ... +302 °F)

Process fitting: Thread from G1½ A, ½ NPT
Flanges from DN 25, ANSI 1½"
Hygienic fittings

Measuring range: -1 ... +60 bar (-100 ... +6000 kPa)



VEGAWELL 52



Suspension pressure transmitter with CERTEC® measuring cell

- High reliability through maximum overload and vacuum resistance of the ceramic measuring cell
- High plant availability through integrated overvoltage protection
- Versatile use through robust housing and cable design

Process temperature: -20 ... +80 °C (-4 ... +302 °F)

Version: Straining clamp
Threaded fitting from G1½, 1½ NPT

Measuring range:: 0 ... +60 bar (0 ... +6000 kPa)



Explosion protection



Safety standards



Hygienic standards



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Looking Forward **VEGA**