Industry Information – Power Generation

Measurement technology for efficient power generation

Looking Forward VEGA

Contents

VEGA sets the standard in the energy industry

VEGA's range of products and services for the measurement of level, point level and pressure are setting the standard in all processes of the energy industry. That's because VEGA systematically combines the latest technologies with comprehensive industry-specific knowledge. The company's guiding principle has absolute priority: long-term, fair collaboration, based on high esteem for products and people.

The right technology for every application

Instruments from VEGA provide reliable data on volume, level and pressure. From the storage of bulk coal and supplementary combustibles, to water extraction from rivers, water treatment and water catchment at the hydro-electric power station, VEGA instruments are used in all processes of power generation. For safety-related applications, such as the monitoring of feedwater vessels or level measurement in storage containers holding acids and lyes, SIL-qualified instruments are also available.

Modular and cost effective: plics®

plics® is VEGA's unique modular instrument system. It allows the user to create a tailored combination of sensor, process fitting, electronics and housing. With this system you can choose exactly the measurement technology you really need. The simple, standardized adjustment system helps you put the instrument into operation quickly and efficiently.

Reliability for power generation

- Robust housings of plastic, aluminium and stainless steel for use under rough environmental conditions
- All sensors available with Ex ia or Ex d approvals
- Instruments with SIL classification for highest availability and operational safety
- All common mechanical and electrical process interfaces available
- Extensive information memory and asset management functions in the sensors for anticipatory servicing and maintenance
- Solutions for remote data transmission (wireless)

Partnership for a demanding sector

Uninterrupted availability of electrical energy is one of the most important factors for a successful economy. Consequently, very heavy demands are placed on instrumentation. Reliability, safety and profitability – those are the most important demands made of measuring instruments. VEGA instruments fulfil these requirements and provide high availability, operational safety and profitability in production.

Always the right measurement technology

As a traditional manufacturer with decades of experience in the area of level, point level and pressure measurement, VEGA offers measurement technology optimized for this industrial sector. With a background of proven service, VEGA sensors lend themselves very well for instrumentation in new plants, as well as modernization projects. Self-monitoring sensors with asset management functions increase availability and operational reliability over the long term.

Reliability under adverse conditions

The energy industry places very high demands on housings, electronics and sensors. Because all components can be configured specifically for the expected conditions, this is no problem for VEGA. The robust housings deliver a convincing performance in the operating environment. The sensors and antennas withstand temperatures up to +400 °C and are highly resistant against acids and alkalis. The basis for this performance is the use of high resistance materials like stainless steel, Hastelloy, tantalum, PTFE or enamel.

Reliability also in changing media

Whether the media are liquids, bulk solids or gases – the properties of the measured media couldn't be more different. From coarse, fine, caking or abrasive bulk solids to viscous, adhesive, corrosive or ultra-pure liquids, to cold or hot gases, VEGA can always provide a customized solution that delivers reliable measurement data.

Measurement technology that fits

Whether in simple storage tanks, above open basins, in bunkers or in process vessels – the wide spectrum of physical measuring principles allows any measurement problem to be solved. VEGA also offers suitable process fittings for any type of vessel or pipe. In addition, all current standards for signal transmission are available for the sensors.

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

Customer-specific

Sensor

Radar

Ultrasonic

Guided microwave

Capacitive

Vibration

Microwave barrier

Process pressure

Hydrostatic

Differential pressure

Explosion protection

Safety standards

Hygienic standards

Ship approvals

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 optimally fulfils the requirements of the industry and its specific applications.

Simpler planning with plics®

Being able to select and combine sensor, process fitting, electronics and housing without restrictions simplifies instrument selection and engineering for applications in machines and systems. Cost reduction with plics® thus starts already in the planning stage.

Clear advantages for the plant builder

Short delivery times, uncomplicated connection and fast setup and commissioning save the plant builder a lot of time and expense. The construction, wiring and setup of VEGA instruments are always the same, so whoever knows this can readily install and operate any plics® measurement technology and application.

Assistance for the user

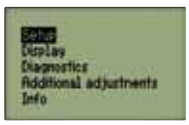
plics® delivers a convincing performance in daily use because of its high operational reliability, simplified maintenance and the reduced replacement part stocks resulting from designs using many identical components. In this area, the consistency of technology and operation simplifies and accelerates work with different plics® instruments. Adjustment always follows the same concept and is carried out via the menu-driven procedures in PLICSCOM, via on-site adjustment with a PC or via the control room.

plics® – bundled energy

Particularly in the energy industry, safety, profitability and uninterrupted availability are considered the most important criteria for the selection of sensors. plics® offers the best prerequisites for maximum product quality, as well as reliable and exact measurements. Perfectly adapted to the needs of the industry, the measurement instrumentation makes a significant contribution to safeguarding energy supplies.

- Robust sensors also for rough environments
- Extensive self-monitoring and qualification up to SIL2
- All common interfaces for connection to existing processes
- Time savings through simple setup and commissioning with intuitive user surface

Where man and machine meet: Adjustment and system integration

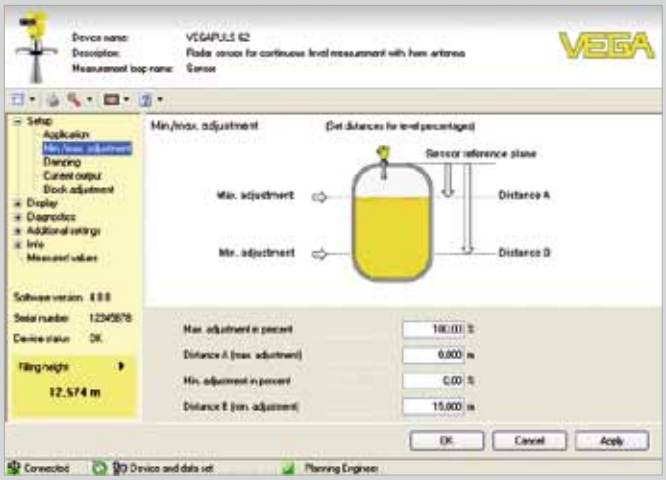


On-site instrument adjustment with PLICSCOM

The indicating and adjustment module PLICSCOM can be plugged into any plics® instrument at any time. It functions as a measured value indication on the instrument and as an on-site adjustment device. The structure of the adjustment menu is clearly organized and makes setup and commissioning easy. In addition, the status messages are displayed in clear, readable text. When an instrument is exchanged, PLICSCOM ensures fast availability of the measuring point: all sensor data are saved by pressing a key on the PLICSCOM and later copied into the replacement sensor.

Instrument adjustment via PC and control system

FDT/DTM technology is an innovative, manufacturer-independent description technology for field instruments. 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 description technology.



All current standards for measurement data transmission

VEGA offers practice-oriented solutions: from the proven 4 … 20 mA/HART measured value transmission to fieldbus technologies like Profibus PA or Foundation Fieldbus to wireless transmission. When it comes to point level detection, the selection ranges from contactless electronic switch to relay, transistor and NAMUR signal.

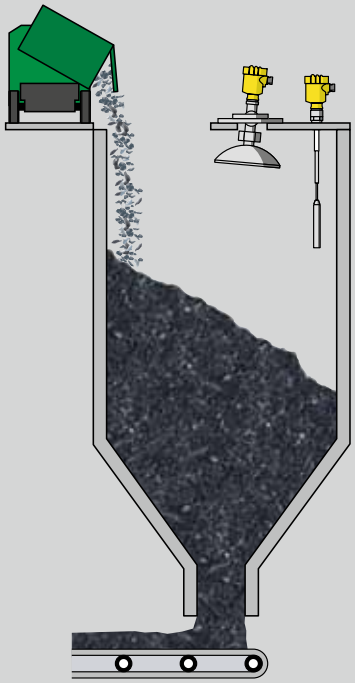
Communication at all levels

VEGA supports all important standards for uniform, centralized field instrument operation. If the field instruments are integrated in primary management or control systems, they can be accessed for adjustment, servicing and diagnosis purposes via the existing infrastructure. Both DTM as well as EDD description technologies are supported.

Fuel storage

Coal bunker in a power station

Hard coal and brown coal are the main energy carriers in coal-fired power plants. Delivered by ship or by train, the coal is unloaded into bunkers up to 30 m high. The coal is transported from these bunkers to the stockpiles of the power plant via overground or underground conveyor belt systems. Additional conveyor belts feed, often via intermediate bunkers, pulverizer mills where the coal is converted into a fine dust for subsequent combustion in the furnace. Reliable level measurement guarantees uninterrupted feeding of the furnaces and point level sensors prevent overfilling in the bunkers.



Level measurement in the coal bunker with VEGAPULS 68

The radar sensor VEGAPULS 68 is just the right thing for places where there's a lot of dust and no contacting measuring technique holds up for any length of time. Developed especially for measuring bulk solids, it offers all the advantages of non-contact level measurement. VEGAPULS 68 measures the level reliably even under conditions of extreme dust generation. Several VEGAPULS 68 are implemented depending on the size and number of the loading points.

Overfill protection with VEGACAP 65

Ruggedness is extremely important in the coal bunker. That's why capacitive measurement technology lends itself well here for overfill protection. VEGACAP 65 stands out due to its stable, hard-wearing mechanical construction and simple setup and commissioning. Neither condensate nor buildup can affect its reliability as an overfill protection device.

VEGAPULS 68

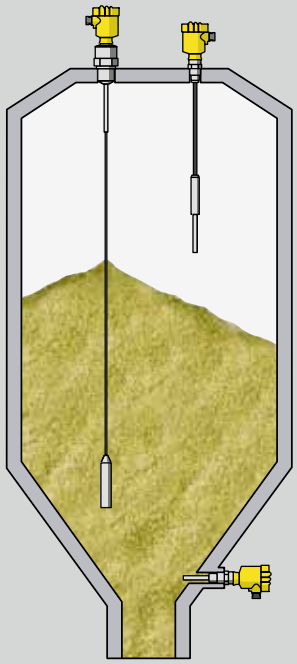
- Non-contact measurement
- Setup and commissioning without filling
- Insensitive to dust
- Measuring range up to 75 m

VEGACAP 65

- Simple setup and commissioning
- Robust construction
- Shortenable cable measuring probe
- Insensitive to buildup

Silos for supplementary fuels

Whether in the coal power station or in the waste incineration plant: meat and bone meal and dried sewage sludge now form an integral part of electricity generation and district heating systems. About 5 % meat-and-bone meal and approx. 2 % dried sludge are added to the coal dust. These supplementary fuels are stored in silos. A continuous measurement of the silo contents ensures uninterrupted feeding of the combustion chambers. Minimum and maximum sensors detect overfilling, blockages or empty operation.



VEGAFLEX 62 for level measurement

The robust construction of VEGAFLEX 62, which permits tensile forces of up to three tons, allows its use in up to 60 m high containers and silos for supplementary fuels. Being completely insensitive to buildup and strong dust generation, VEGAFLEX 62 is the ideal sensor for continuous level measurement. Already calibrated to the sensor length at the factory, the instrument requires no adjustment on site.

VEGAVIB 62 for level detection

The VEGAVIB 62 is used for level limitation in the meat-and-bone meal silo. This overfill protection system with suspension cable extension renders reliable service here.

VEGAVIB 61 as minimum sensor

The VEGAVIB 61 is installed laterally and used as low-level indicator in the meat-and-bone meal silo. It also takes on an important role in blockage detection at the transfer stations of the conveyance systems.

VEGAFLEX 62

- Setup without adjustment
- Insensitive to dust and baked-on deposits
- Shortenable cable measuring probe up to 60 m long

VEGAVIB 61

- Ideal rod design for bulk solids
- Setup without filling
- Can be installed in any position
- Reliable function monitoring

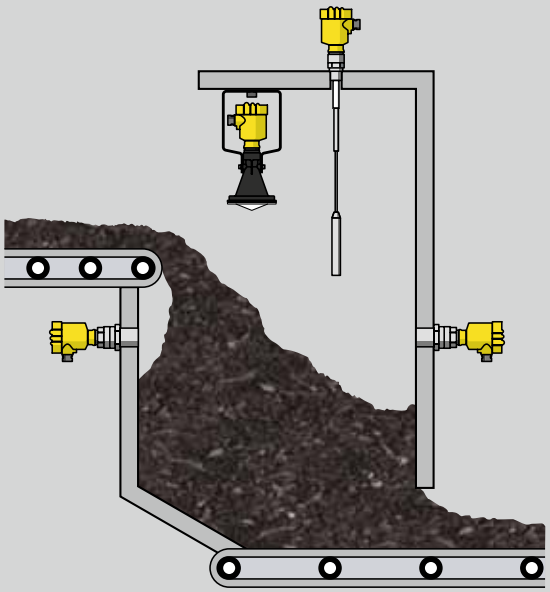
VEGAVIB 62

- Overfill protection system with suspension cable extension
- Ideal rod design for bulk solids
- Setup without filling

Fuel transport

Belt transfer point

The coarse and fine bulk solids are in most cases transported within the power station via conveyor belts. To achieve an even volume flow, belt transfer points are integrated in the conveyor system. There, the incoming coal is stored for a short time in a buffer silo. Level monitoring at the belt transfer point is extremely important for conveyor belt and production control.



Level monitoring at the belt transfer point with VEGAPULS 67

Due to the good focusing properties of the radar sensor VEGAPULS 67, the filling stream does not have any influence on the measurement. Even in case of intense dust generation the measurement is absolutely reliable.

VEGAPULS 67

- Non-contact measurement
- Simple setup and commissioning
- Insensitive to dust, noise and process conditions

Point level monitoring with VEGAMIP T/R 61

Non-contact level detection is realized with the microwave barrier VEGAMIP. The instrument guarantees absolutely maintenance and wear-free operation. Changes in moisture content, granulation or coal type have no influence on its reliable function.

VEGAMIP T/R 61

- Independent of product properties
- Insensitive to dust
- Wear and maintenance-free

Flexible overfill protection with VEGACAP 65

If a lateral installation isn't possible, VEGACAP 65 is the right solution. Its robust construction permits its use also in coarse, heavy bulk solids and guarantees a long service life.

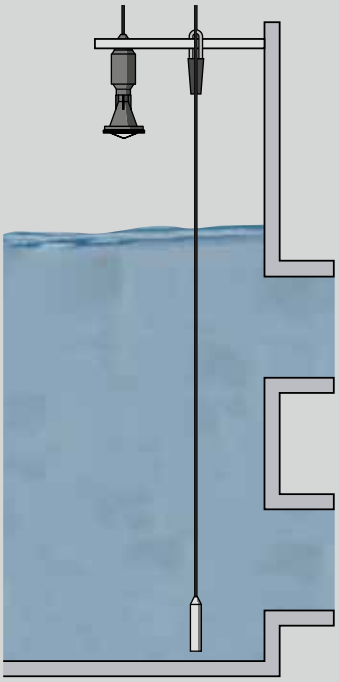
VEGACAP 65

- Very robust construction
- Simple setup and commissioning
- Shortenable cable electrode
- Insensitive to buildup

Fresh water extraction

Water for cooling and feeding

Most thermal power stations are situated close to rivers. One of the most important components for power generation can be found there: water. Without water, the thermal energy generated in the combustion process couldn't be converted into electricity or heating transfer. It is used for cooling and for driving the turbines as well as for transporting heat to the end consumer. So it is important that there is always a sufficient supply of that precious resource. Therefore, measurement of the river water level plays an important role in the process of power generation.



Level measurement at the water extraction point with VEGAWELL 52

The ceramic diaphragm of VEGAWELL 52 makes the instrument extremely robust and long-term stable. The virtually front-flush measuring cell guarantees reliable operation. Even when heavily soiled or after a long period of dryness, the measuring cell can clean itself due to its surface quality and front-flush design.

Non-contact level measurement with VEGAPULS WL 61

Level measurement with radar is not affected by environmental factors such as wind, fog, condensate or snowfall. The radar sensor VEGAPULS WL 61 is therefore the ideal solution for non-contact level measurement at the cooling water intake of power stations. It can be simply fastened to the channel wall with a mounting bracket.

VEGAWELL 52

- Robust construction
- Extremely long-term stable
- Wear and maintenance-free
- Simple setup and commissioning

VEGAPULS WL 61

- Independent of weather conditions
- Compact construction
- Simple setup and commissioning
- High protection rating IP 66/68 (2 bar)
- High accuracy

Feedwater

Feedwater treatment

The water, which is usually taken from rivers, cannot be fed untreated into the steam turbine loop. It has to be purified through a series of filtering systems, ionizers and degasers. The pH value of the water must also be correct to avoid chemical reactions and deposits in the pipeline systems. To this end sodium hydroxide (NaOH) or hydrochloric acid (HCL) is added to the water for neutralization. The reliable level measurement and level detection in the tanks ensures high availability of the feedwater.

Level measurement of hydrochloric acid with VEGAPULS 63

In applications with aggressive substances, VEGAPULS 63 is protected from the medium by a surface of PTFE. Thus, acids and alkalis cannot harm it. With flange sizes from DN 50, the instrument fits on any rubberized or plastic storage container in the water treatment system. In the case of plastic containers, VEGAPULS 63 can also measure right through the container ceiling.

Overfill protection with PFA coated VEGASWING 63

The PFA coating of VEGASWING 63 allows it to fend off any chemical attack. Its millimetre-exact, reproducible switching point provides security and protects against overfilling. Moreover, the recurring check according to WHG (Water Resources Act) that can be carried out by a simple keystroke on the instrument increases the profitability of the system.

VEGAPULS 63

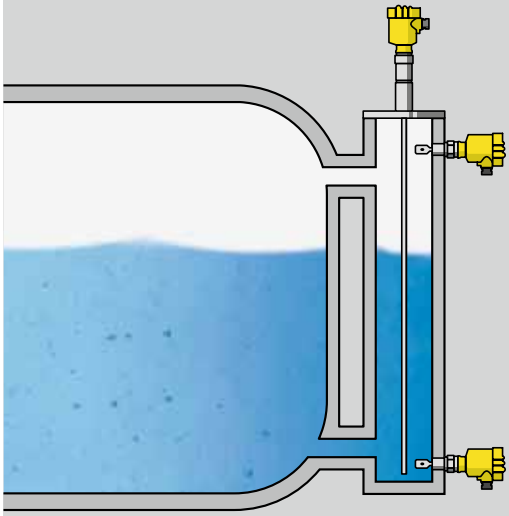
- Setup without filling
- Highly resistant, dense PTFE
- Measurement also through plastic vessel tops
- Suitable for applications up to SIL2

VEGASWING 63

- Process-independent switching point
- High reliability and functional safety
- Recurring check via keystroke possible
- Also ECTFE coated or enameled

Feedwater for the turbine

Feedwater is necessary for all of the circulatory processes in the power station. After being vaporized by circulation through the boiler, it is fed into the turbine under high pressure. If sufficient feedwater is not available, the production of electrical power comes to a standstill. That's why measurement instrumentation is often installed redundantly in the feedwater tank. In addition, a gauge glass can be integrated in case a fault results in loss of electrical power.



Level measurement in the feedwater tank with VEGAFLEX 66

Unaffected by condensate as well as high process temperatures and pressures, VEGAFLEX 66 guarantees very high measuring certainty and reliability in the bypass. As a part of the safety instrumented system (SIS), it can also be redundantly interconnected with VEGASWING 61 up to SIL3. Safety-related implementation allows both overfill and dry run protection.

Redundant dry run protection with VEGASWING 61

To provide absolutely reliable monitoring of the minimum level in the tank, often two, or even three, VEGASWING 61 vibrating level switches are installed. As a single device it can be used as dry run protection in safety-related systems up to SIL2 – in case of redundant use up to SIL3.

VEGAFLEX 66

- Independent of product and process characteristics
- Setup without filling
- High functional safety (SIL2)

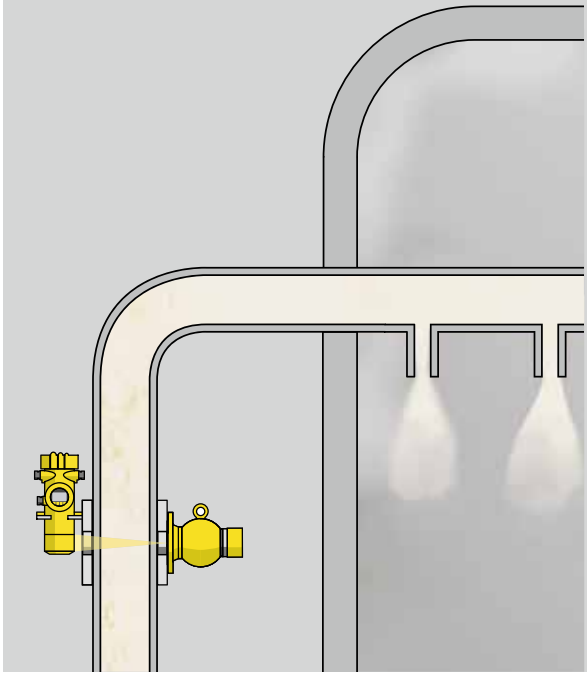
VEGASWING 61

- Process independent switching point
- Setup without filling
- High functional safety (SIL2)
- Recurring check via keystroke possible

Flue gas scrubber

Lime milk density measurement

To lower their emissions, conventional power stations operate complex flue gas scrubbing systems. Many of these systems use a “wet method”, in which lime in the form of a lime milk suspension is used as a “detergent”. The untreated flue gas is sprayed with the lime milk suspension in a scrubbing tower. The sulphur dioxide contained in the exhaust fumes is largely absorbed through a chemical reaction, the end product of which is gypsum. For an efficient flue gas scrubbing process, it is important that the concentration – therefore the density – of the lime milk remains constant.



Density measurement with MINITRAC 31

The fine particles in the lime milk are very abrasive, so a non-contact density measurement with MINITRAC 31 is the ideal solution. The instrument measures with high precision directly and contactlessly through the pipeline without any intervention in the closed system being required.

Source holder VEGASOURCE 31

This source holder serves as a receptacle for the radioactive source. It offers the best possible shielding and allows the focussed radiation to exit in only one direction. The medium, the pipeline and the source holder itself are not contaminated by the weak gamma radiation emitted.

MINITRAC 31

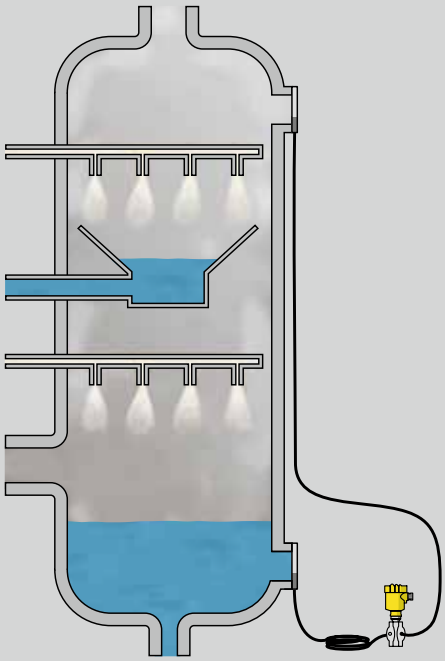
- Measurement of density from outside the pipe
- Reliable function even under extreme process conditions
- Maintenance-free

VEGASOURCE 31

- Focuses the radioactive radiation in the direction of the medium
- Protects the surroundings from gamma rays

Flue gas scrubbing in the washing column

In the waste incineration process, many pollutants are set free through the flue gas. The gas must therefore be cleaned before it is released into the environment. Harmful acidic gases like sulphur dioxide are dissolved out in the flue gas scrubber. This is done by spraying lime-water solution into the gas in a washing column. The lime residues are filtered out of the washing water and used as a raw material, e.g. for the production of gypsum plasterboard. A constant level is required in the flue gas scrubber for a continuous cleaning process.



Level measurement with VEGADIF 65

Due to the difficult process conditions in the washing column, such as turbulent medium surface, negative pressure and aggressive substances, the differential pressure transmitter VEGADIF 65 is used for level measurement. This instrument is especially suitable since it operates completely unaffected by these process conditions. The version with chemical seal system and capillary lines also allows front-flush installation and the use of high-resistance diaphragm materials.

VEGADIF 65

- High chemical stability through tantalum diaphragm
- Reliable function even with turbulent medium surface
- Front-flush mounting

Flue gas scrubber

Lime and fly ash silo

Lime for the production of lime milk for flue gas desulphurization must be stored in silos. The fly ash filtered out of the flue gases must also be stored in large silos. Silo heights of up to 60 m are not uncommon. Depending on their composition and consistency, the media has a tendency to adhere to system equipment. A reliable level measurement is thus absolutely essential for trouble-free storage and material planning.

Level measurement in the fly ash silo with VEGAPULS 68

The ash particles in the flue gas are filtered out with large electrostatic filters and stored in part in very large silos. In those silos that can be up to 75 m high, non-contact measurement of the contents with a VEGAPULS 68 radar sensor is the ideal solution. All types of fly ash can be measured reliably with it.

Level measurement in the lime silo with VEGAFLEX 61

Due to extreme dust generation during filling and fluctuating moisture content, the microwave measuring technique is ideally suited for level measurement in the lime silo. The VEGAFLEX 61 is a simple and cost-effective solution for containers up to 15 m height.

To avoid the excessive loads on silo roof and measuring equipment that are associated with higher silos, the implementation of a non-contact measurement setup with VEGAPULS 68 is recommended.

VEGAPULS 68

- Non-contact measurement
- Setup without filling
- Measuring range up to 75 m

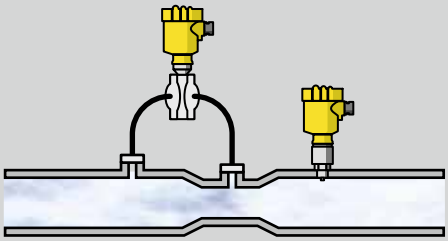
VEGAFLEX 61

- High chemical stability
- High functional safety (SIL2)
- Setup without filling

Energy production from waste

Feed system for waste incineration

In the waste incineration process, a defined quantity of waste material is transported through the furnace on a combustion grate. To ensure that the waste is completely burned, a temperature of +1000 °C must be reached and a defined quantity of air supplied to the combustion chamber. The air quantity and the air pressure must be measured exactly to regulate the furnace.



Flow metering of combustion air with VEGADIF 65

The Venturi section of the main air tube is a defined constriction in which the pressure decreases by a few millibars. A VEGADIF 65 with small measuring range measures this pressure drop with high accuracy and calculates the air flow quantity from it.

Pressure measurement of combustion air with VEGABAR 52

A slight underpressure is continuously maintained in the furnace so that sufficient air is sucked in for the combustion process. This is controlled by measuring the air pressure in the respective main air tube with a VEGABAR 52 pressure transmitter. Pressures between 25 and 60 mbar are measured here.

VEGADIF 65

- Metallic differential pressure measuring cell
- Small measuring ranges down to 10 mbar
- Accuracy class 0.1 (SIL2)

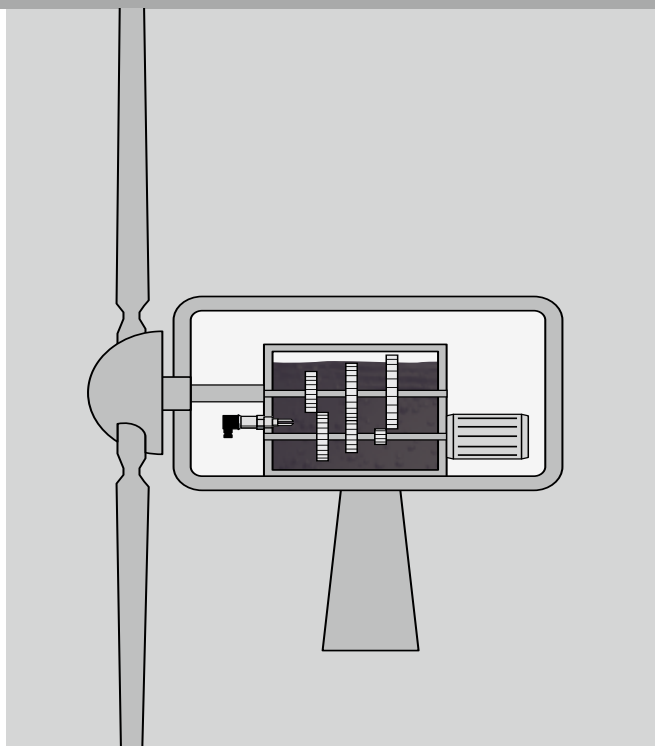
VEGABAR 52

- High overload resistance
- Exceptional vibration resistance

Wind energy

Gear oil sump

Wind turbines with a diameter of 70 m are no rarity these days. Whether in the sea, on level plains or on the hills of low mountain ranges, these giants are popping up almost everywhere. The large investments required for these plants are only worthwhile when the internal power generating equipment has a high availability and a long service life. Lubrication of all moving parts is one of the most important functions in the generator housing. If it fails, the service life can be considerably reduced, and with it, the profitability of the entire system.



Dry run protection with VEGASWING 51

The great weight of the rotor places heavy demands on all components of the bearings and gear train assembly. Dry run or even inadequate oil lubrication of the gear mechanism would have catastrophic effects on the service life of the entire system. VEGASWING 51 offers a cost-effective way to safeguard the system from dry run damage. With its only 40 mm long tuning fork, the instrument fits into any oil container, regardless of what design. Its exact switching function is millimetre precise and ensures lasting, maintenance-free operation of the wind power plants.

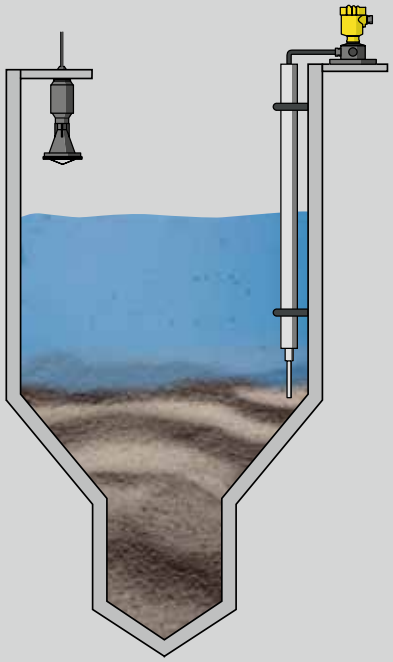
VEGASWING 51

- Process-independent switching point
- Setup without adjustment
- High reliability
- Extensive function monitoring

Hydroelectric energy

Coarse and fine sediment in the water catchment

In some countries, water power makes a very large contribution to the total electricity production. Hydroelectric power stations are supplied with water from kilometre-long tunnels or pipelines from lakes, reservoirs and rivers in the surrounding area. In order to extend the service life of the turbines as long as possible, sediment and debris carried by the water must not be allowed reach the turbine. The debris is separated from the water in a sedimentation basin by means of rakes and spillways. To realize automatic flushing out of the settled debris, a reliable underwater detection system is required.



Detection of settled debris with VEGAVIB 62

VEGAVIB 62 is ideal for solid matter detection under water and therefore a real alternative to radiation-based level detection. When the vibrating rod is covered with sediment under water, a switching command is issued. Through this the flushing process can be automated. Cyclic flushing can thus be eliminated, which contributes to optimal turbine exploitation. The vibrating rod is provided with a cover to protect it against abrasion and impact from rocks in the sediment.

Level measurement at the intake with VEGAPULS WL 61

The VEGAPULS WL 61 sensor measures how much water is in the catchment. Mounted over the inlet to the catchment, it measures the current level with high precision. An absolutely wear and thus maintenance-free operation is guaranteed through the non-contact measurement.

VEGAVIB 62

- Setup without adjustment
- Ideal rod construction avoids jamming
- Suspension cable up to 80 m long
- Available with external electronics

VEGAPULS WL 61

- Unaffected by temperature fluctuations
- High accuracy
- Compact design
- Simple setup and commissioning

Instrument overview

VEGAPULS 62

Radar sensor for continuous level measurement of liquids

- Non-contact measurement
- Simple installation
- Wear and maintenance-free
- Unaffected by pressure, temperature, gas and dust
- High measuring precision

Process temperature:	-200 … +450 °C (-328 … +842 °F)
Process pressure:	-1 … +160 bar (-100 … +16000 kPa)
Process fitting:	Thread G1½ A or 1½ NPT Flange from DN 50 or ANSI 2"
Measuring range:	up to 35 m (115 ft)

VEGAPULS 63

Radar sensor for continuous level measurement of liquids

- Non-contact measurement
- Encapsulated antenna system
- Front-flush installation
- Wear and maintenance-free
- High measuring precision

Process temperature:	-200 … +200 °C (-328 … +392 °F)
Process pressure:	-1 … +16 bar (-100 … +1600 kPa)
Process fitting:	Flanges from DN 50 or ANSI 2"
Measuring range:	up to 35 m (115 ft)

VEGAPULS 67

Radar sensor for continuous level measurement of bulk solids

- Non-contact measurement
- Encapsulated antenna system
- Wear and maintenance-free
- Unaffected by pressure, temperature, gas and dust
- High measuring precision

Process temperature:	-40 … +80 °C (-40 … +176 °F)
Process pressure:	-1 … +2 bar (-100 … +200 kPa)
Process fitting:	Flanges from DN 80 or ANSI 3" or mounting strap
Measuring range:	up to 15 m (49 ft)

The pictured instruments are standard models.

VEGAPULS 68

Radar sensor for continuous level measurement of bulk solids

- Non-contact measurement
- Simple installation
- Wear and maintenance-free
- Unaffected by pressure, temperature, gas and dust
- High measuring precision

Process temperature:	-200 … +450 °C (-328 … +842 °F)
Process pressure:	-1 … +160 bar (-100 … +16000 kPa)
Process fitting:	Thread G1½ A or 1½ NPT Flanges from DN 50 or ANSI 2"
Measuring range:	up to 75 m (246 ft)

VEGAPULS WL 61

Radar sensor for continuous level measurement of liquids

- Non-contact measurement
- Simple installation
- High protection rating IP 66/68 (2 bar)
- Wear and maintenance-free
- Unaffected by pressure, temperature, gas and dust

Process temperature:	-40 … +80 °C (-40… +176 °F)
Process pressure:	-1 … +2 bar (-100 … +200 kPa)
Process fitting:	Thread G1½ A Flanges from DN 80 or ANSI 3" or mounting strap
Measuring range:	up to 15 m (49 ft)

VEGAFLEX 61

TDR sensor for continuous level measurement

- Setup without adjustment
- Independent of product properties
- Insensitive to dust, steam, buildup and condensate
- Wear and maintenance-free
- High measuring precision

Process temperature:	-40 … +150 °C (-40 … +302 °F)
Process pressure:	-1 … +40 bar (-100 … +4000 kPa)
Process fitting:	Thread from G¾ A or ¾ NPT Flanges from DN 25 or ANSI 1"
Measuring range:	Cable up to 32 m (105 ft) Rod up to 4 m (13 ft)

Explosion protection SIL Safety standards Hyg Hygienic standards

Instrument overview

VEGAFLEX 62

TDR sensor for continuous level measurement of heavy bulk solids

- Setup without adjustment
- Independent of product properties
- Insensitive to dust, steam, buildup and condensate
- Wear and maintenance-free
- High measuring precision

Process temperature:	-40 … +150 °C (-40 … +302 °F)
Process pressure:	-1 … +40 bar (-100 … +4000 kPa)
Process fitting:	Thread from G1½ A or 1½ NPT Flanges from DN 50 or ANSI 2"
Measuring range:	Cable up to 60 m (197 ft) Rod up to 6 m (20 ft)

VEGAFLEX 66

TDR sensor for continuous level measurement

- Setup without adjustment
- Independent of product properties
- Insensitive to dust, steam, buildup and condensate
- Wear and maintenance-free
- High measuring precision

Process temperature:	-200 … +400 °C (-328 … +752 °F)
Process pressure:	-1 … +400 bar (-100 … +40000 kPa)
Process fitting:	Thread G¾ A or ¾ NPT Flanges from DN 40 or ANSI 2"
Measuring range:	Cable up to 32 m (105 ft) Rod up to 6 m (20 ft) Coax up to 6 m (20 ft)

VEGAVIB 62

Vibrating level switch with suspension cable for granulated bulk solids

- Setup without adjustment
- Product-independent switching point
- Optimal rod construction avoids deposits and jamming
- Simple cleaning
- Wear and maintenance-free

Process temperature:	-40 … +150 °C (-40 … +302 °F)
Process pressure:	-1 … +16 bar (-100 … +1600 kPa)
Process fitting:	Thread from G1 A or 1 NPT Flanges from DN 32 or ANSI 1½"
Probe length:	up to 80 m (262 ft)

The pictured instruments are standard models.

Hyg

VEGASWING 51

Vibrating level switch for liquids

- Setup without adjustment
- Product-independent switching point
- Very high reproducibility
- Wear and maintenance-free
- Very small installation dimensions

Process temperature:	-40 … +150 °C (-40 … +302 °F)
Process pressure:	-1 … +64 bar (-100 … +6400 kPa)
Process fitting:	Thread from G¾ A or ¾ NPT

Ex SIL Hyg

VEGASWING 61, VEGASWING 63

Vibrating level switch for liquids (VEGASWING 63 with tube extension)

- Setup without adjustment
- Product-independent switching point
- Very high reproducibility
- Wear and maintenance-free

Process temperature:	-50 … +250 °C (-58 … +482 °F)
Process pressure:	-1 … +64 bar (-100 … +6400 kPa)
Process fitting:	Thread from G¾ A or ¾ NPT Flanges from DN 25 or ANSI 1"
Probe length:	Version VEGASWING 63 up to 6 m (20 ft)

Ex SIL

VEGACAP 65

Capacitive cable measuring probe for point level detection

- Service-proven, robust and maintenance-free
- High functional reliability
- Simple installation and commissioning
- Shortenable measuring probe

Process temperature:	-50 … +200 °C (-58 … +392 °F)
Process pressure:	-1 … +64 bar (-100 … +6400 kPa)
Process fitting:	Thread from G1 A or 1 NPT Flanges from DN 25 or ANSI 1"
Measuring range:	up to 32 m (105 ft)

Ex Explosion protection SIL Safety standards Hyg Hygienic standards

Instrument overview

VEGAMIP T/R 61

Microwave barrier for point level detection in bulk solids and liquids

- Non-contact measurement
- Ideal for rough process conditions
- Unaffected by changing product properties
- Wear and maintenance-free
- Simple instrument adjustment

Process temperature:	-40 … +80 °C (-40 … +176 °F)
Process pressure:	-1 … +4 bar (-100 … +400 kPa)
Process fitting:	from G1½ A or 1½ NPT Collar flange ANSI 3"

VEGABAR 52

Pressure transmitter with CERTEC® measuring cell

- Dry, ceramic-capacitive sensor element
- High measuring precision
- Extremely high overload and vacuum resistance
- Very small measuring ranges

Process temperature:	-40 … +150 °C (-40 … +302 °F)
Process fitting:	Manometer connection G½ A Thread from G½ A or ½ NPT Flanges from DN 25 or ANSI 1" Fittings for the food and paper industries
Measuring range:	+1 … +72 bar (+100 … +7200 kPa)

VEGAWELL 52

Suspension pressure transmitter for level measurement of liquids

- Dry, ceramic-capacitive CERTEC® measuring cell
- High abrasion and overload resistance
- Integrated overvoltage protection

Process temperature:	-20 … +80 °C (-4 … +176 °F)
Process fitting:	Straining clamp Threaded fitting G1 A or 1 NPT and G1½ A or 1½ NPT Thread G½ A or ½ NPT and G1 A or 1 NPT
Measuring range:	+0.1 … +25 bar (+10 … +2500 kPa)

The pictured instruments are standard models.

VEGADIF 65

Differential pressure transmitter with metallic measuring diaphragm

- Very good reproducibility and long-term stability
- Measurement deviation < 0.075 %
- High-resistance diaphragm materials

Process temperature:	Basic version	-40 … +85 °C (-40 … +185 °F)
	Chemical seal	-40 … +400 °C (-40 … +752 °F)
Process fitting:	Basic version	NPT ¼-18 acc. to IEC 61518
	Chemical seal	Flanges from DN 32 or ANSI 2"
	Hygienic fittings from DN 32 or ANSI 2"	
Δp measuring range:	0.01 … 40 bar (1 … 4000 kPa)	

MINITRAC 31

Radiation based sensor for density measurement and point level detection

- NaI detector integrated in the sensor housing
- Non-contact measurement
- Reliable measurement under extreme process conditions
- Simple retro-installation without interrupting the process

Process temperature:	any
Process pressure:	any
Ambient temperature:	-50 … +60 °C (-58 … +140 °F)
Measuring precision:	±0.1 %

VEGASOURCE 31

Source holder for radioactive source

- Best possible shielding with low container weight
- Simple exchange of radioactive source
- Focusing of radioactive radiation on the detector
- Optional with pneumatic switching on and off
- Also available as fire-proof version

Process temperature:	any
Process pressure:	any
Process fitting:	Flange DN 100 or ANSI 4"
Ambient temperature:	-40 … +200 °C (-40 … +392 °F)

Explosion protection SIL Safety standards Hyg Hygienic standards

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Looking Forward

VEGA