



Industry Information – Cement

Measurement technology
for a lasting industry

Looking Forward **VEGA**



Contents

Responsibility for people and processes	3
Partnership for a demanding industry	4
plics® – easy is better	6
Adjustment and system integration	8
Application examples:	
In the quarry	10
Belt transfer station	11
Blending bed	12
Additives and raw meal	13
Clinker cooler	14
Clinker silo	15
Pneumatic conveying	16
Cyclone preheater	18
Mechanical conveying	19
Fuels	20
Truck loading	22
Instrument overview	23

Responsibility for people and processes

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

A complete line of trend-setting measurement products

VEGA provides optimal solutions from a single source for process instrumentation for level measurement, 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 and efficient measuring techniques now and in the future.

Modular and cost-efficient: The instrument system plics®

VEGA's unique modular instrument system plics® allows the user to create a customized combination of sensor, process fitting, electronics and housing. Thus the user gets, at optimal cost, exactly the measurement technology they need and are able to put it into operation quickly thanks to the simple, standardized functions and adjustment procedures.

Reliability for hard everyday use

- Robust instrument technology for use in harsh environments
- Process fittings optimised for applications in the bulk solids industry
- Non-contact measurement methods reduce maintenance work, as there is no mechanical wear on the sensors
- Instruments have all approvals for operation in hazardous areas

Partnership for a demanding industry

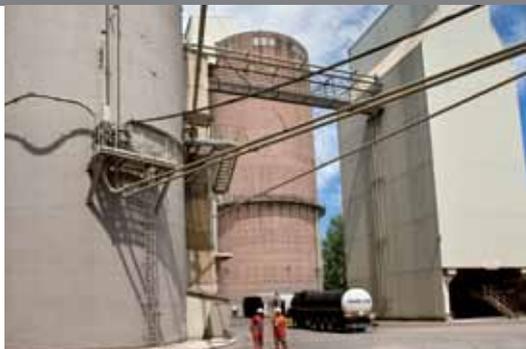
Cement is one of the most important raw materials for the construction of buildings, roads, bridges, airfields and is essential for the development of infrastructure. Designing cement production optimally from an economic point of view requires measurement technology that can meet the rigorous demands of the industry.

Always the right measurement technology

For many decades now, VEGA has been a supplier of robust, innovative technology tailored to the requirements of the cement industry. Apart from the everyday applications such as level and point level measurement, VEGA also offers sensors for pressure and differential pressure measurement. There are also radiation-based sensors for ascertaining material density and level externally to the production processes, to round out the product range.

Rugged sensors for extreme conditions

In the harsh operating environments of the cement industry, sensors are required that can hold up to the most extreme punishment. Dust, high mechanical stresses due to vibration, and sometimes very high temperatures, are typical process conditions in this industry. The robust mechanical construction and the non-contact measuring principle, which is not subject to wear, contribute significantly to the long service life of the sensors and their reduced need for maintenance.





Measurement technology for every application

Measurement technology from VEGA is used in a wide range of applications: for level measurement or point level detection of fine powder or large rocks or anything in between, also for adhesive as well as abrasive media. VEGA's state-of-the-art radar technology allows solutions that were unthinkable a few years ago – reliable and accurate measurement unaffected by dust, noise and high temperatures without any physical contact to the product. Then there are the tried and trusted capacitive probes, which are also used for point level detection. These are still the first choice for applications with heavy buildup and abrasion.

Long-term, reliable operation

To ensure the long-term, reliable operation of VEGA sensors, they are designed to be adapted to suit the measuring task in the best possible way. Adaptation begins with a suitable process fitting or mounting bracket, and continues with a suitable housing of plastic, aluminium or solid stainless steel and concludes with setup and commissioning. This is achieved through the easy selection of the appropriate application parameters. That means sensors are optimally set up for the measuring task, without having to know how the measurement technology works in detail.

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

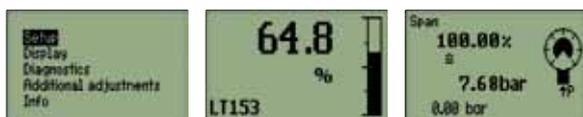
plics® instruments deliver a convincing performance in everyday operation thanks to high operational reliability, simplified maintenance and reduced replacement part stocks. The consistency of the technology and handling simplifies and accelerates work with the sensors. Whether performed directly on 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.

Maximum product quality with plics®

In the cement plant, reliability and operating efficiency mean continuous availability. The more demanding the measuring task, the more important the reliability of the instrumentation. plics® measurement technology provides the best prerequisites for maximum product quality through reliable, accurate readings.

- Cost-effective instrumentation through customised device configuration
- Housing materials for extreme mechanical stress
- Simple planning and fast setup thanks to consistent technology and operation
- Parameter backup in adjustment module or PC

Where man and machine meet: adjustment and system integration



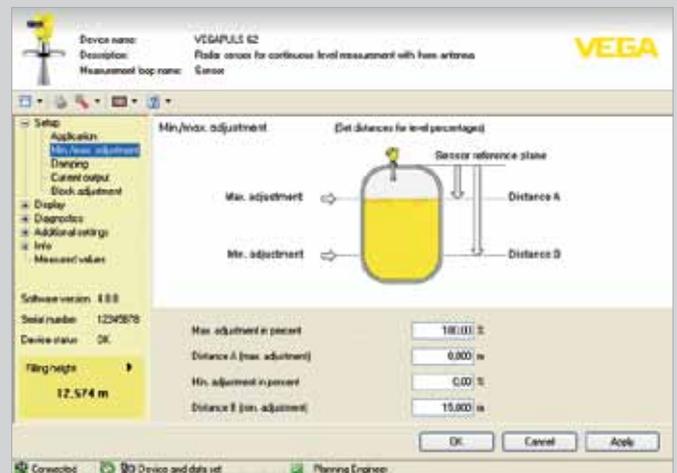
On-site instrument adjustment with PLICSCOM

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 practice-oriented solutions: from the proven 4 ... 20 mA/HART measured value transmission to field-bus 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.

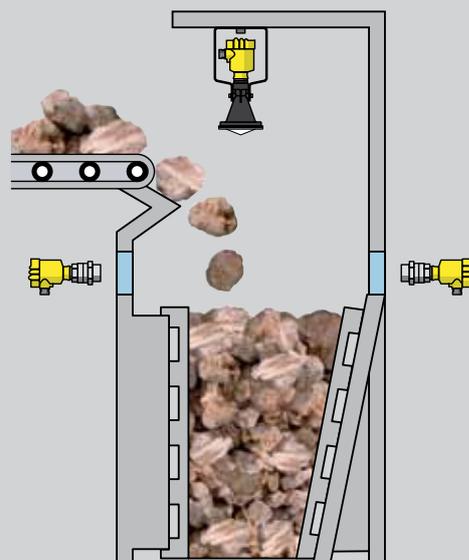
Communication at all levels

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

Crusher in the quarry

Crushing the rocks

Large pieces of rock are freed from the solid bedrock through blasting. They are then reduced to a small, uniform size by primary and secondary jaw and roller crushers. To keep wear on the crushers as low as possible and guarantee efficient operation, the charging of the crushers must be carefully monitored. Depending on the type and the method of crusher feeding, either a continuous level monitoring or point level detection system is required.



Continuous level monitoring in the crusher with VEGAPULS 67

Mounted over the crusher, the radar sensor VEGAPULS 67 provides continuous measurement for keeping the level within the ideal range. Uninfluenced by wind, weather, abrasion and especially the intense dust generation, it continuously keeps watch the feed rate to the crusher. The ear-splitting noise in the crusher, which can incapacitate most ultrasonic sensors, doesn't bother the non-contact radar sensor at all.

Overfill protection with VEGAMIP 61

This microwave barrier detects the point level in the crusher from the outside through thick plastic or ceramic windows. The transmitted microwaves penetrate non-conductive materials and are totally unaffected by dirt and buildup.



VEGAPULS 67

- Non-contact measurement is immune to dust, noise and process conditions
- Simple setup and commissioning saves time
- The two-wire sensor is installed quickly and easily



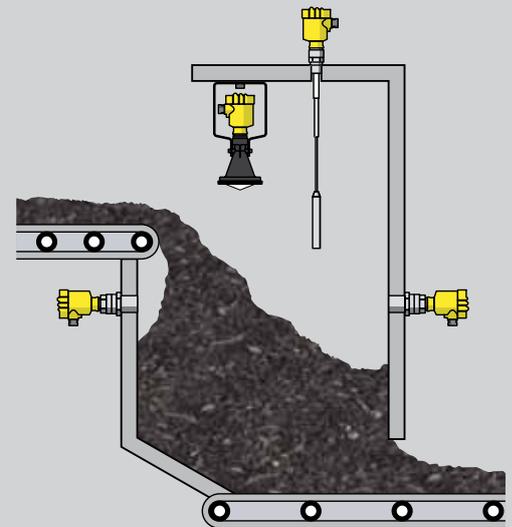
VEGAMIP 61

- Non-contact level detection ensures maintenance-free operation
- Always reliable measurement, because robust and non-sensitive to dirt and dust
- Simple installation and easy adjustment in the shortest time

Belt transfer station

Transport

The crushed aggregates are usually transported within a production facility via conveyor belts. To achieve a steady throughput and smooth out fluctuations in quantity, transfer stations are integrated at different points in the conveyor line. At these stations, the incoming bulk solids are temporarily stored in a buffer hopper and transferred to the next conveyor belt. To control and protect the conveyor belts and ensure optimal material flow, the fluctuating level, or at least the limit level, in the buffer hoppers is monitored by sensors.



Level monitoring with VEGAPULS 67

VEGAPULS 67 measures the level in the belt transfer station without contacting the product. It ensures a reliable measurement even under conditions of extreme dust generation and thus regulates the conveyor belts and the production flow.



VEGAPULS 67

- Non-contact measurement guarantees maintenance-free operation
- Rapid detection of the level ensures optimum production control

Flexible overflow protection with VEGACAP 65

VEGACAP 65 is outstandingly robust and thus ideal for use in heavy bulk solids. Its gravity weight, of standard or high-grade steel, resists the hardest blows and ensures a long service life.



VEGACAP 65

- Simple installation and setup
- Long service life with robust, shortenable cable probe

The non-contact level switch VEGAMIP 61 demonstrates its strengths in extreme applications. It guards against overflowing without direct contact with the medium and is thus completely wear-free.



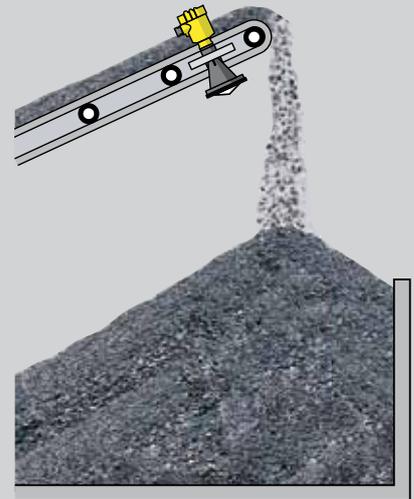
VEGAMIP 61

- Non-contact point level detection ensures maintenance-free operation
- Always reliable measurement, because rugged and non-sensitive to dirt and dust

Blending bed

Mixing the raw materials

To attain high quality and uniform material consistency in the finished cement, the raw material is homogenized in a blending bed. The crushed rock is distributed evenly over the blending bed with a spreader and material is removed in reverse order with the help of a scraper. The profile of the bulk solid surface has to be monitored to ensure that the inflow of material is as uniform as possible.



Height measurement in the blending bed

This measurement is carried out by a non-contact radar sensor installed directly at the discharge point of the spreader. Undisturbed by filling, dust and noise, the radar sensors reliably detect the product surface. VEGAPULS 67 is the ideal solution for measuring ranges up to 15 m. The small and extremely light sensor can be mounted on the spreader and aligned to the product surface with the help of a mounting strap.

For larger measuring ranges and applications which require exceptionally good signal focusing, VEGAPULS 68 is deployed. Available with different antenna versions, it is the best solution for reliable measuring results.



VEGAPULS 67

- Reliable operation, because measurement is unaffected by dust and noise
- The two-wire sensor is installed quickly and easily
- Simple setup and commissioning saves time



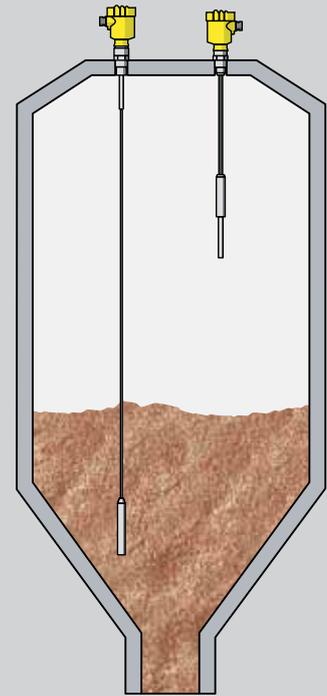
VEGAPULS 68

- Non-contact measurement guarantees maintenance-free operation
- Wide variety of antenna designs for optimal adaptation to local conditions

Additives and raw meal

Storage of additives and raw meal

Before undergoing burning in the rotary kiln, material from the blending bed, together with additives, is crushed to fine raw meal in large mills. Reliable monitoring of the stock levels of both the additives and the raw meal is vital for continuous production. These blended, pulverised materials are transported by means of pneumatic conveying systems. This causes extreme dust generation during the filling of the storage silos.



Continuous level measurement

VEGAFLEX 61 is the ideal solution for continuous measurement in additives silos up to approx. 10 m high. The guided microwave measuring principle (TDR) is not influenced by product quality, dust generation or the shape of the material heap and always delivers reliable level information.

In the raw meal silos, which are generally larger, the non-contact sensor VEGAPULS 68 is used. Despite the extremely dusty conditions, the sensor is able to measure the levels in silos up to 75 m high reliably and accurately.

Overfill protection with VEGAWAVE 62

To provide additional protection against overfilling in the silos, the vibrating level switch VEGAWAVE 62 is implemented. Since the device has virtually no moving parts, it is not subject to wear. The flexible suspension cable avoids mechanical loads that can arise through product movement. Setup and commissioning does not require a filling of the silo.



VEGAFLEX 61

- Setup without adjustment saves time
- Reliable measurement, because immune to dust and buildup
- Flexible cable can be shortened



VEGAPULS 68

- Non-contact measurement is insensitive to dust, noise and process conditions
- Maintenance-free operation reduces servicing costs
- Two-wire sensor for quick and easy installation



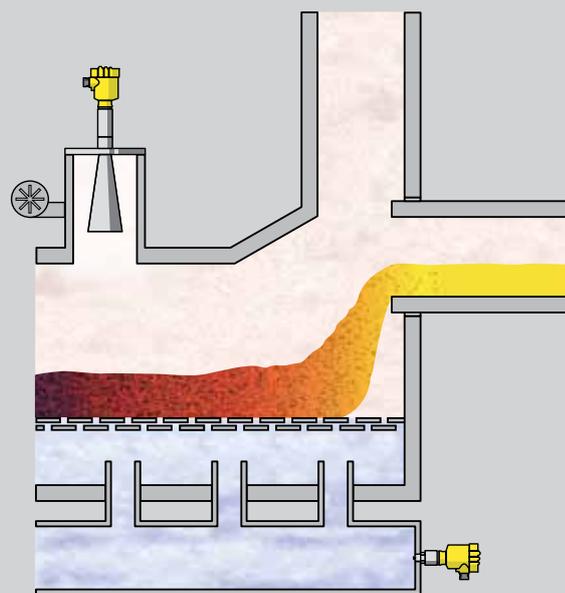
VEGAWAVE 62

- Overfill protection with suspension cable extension adapts flexibly to the movements of the bulk solid material
- Top mounting is simple and fast

Clinker cooler

Optimal cooling of the clinker

In the cement production process, the raw meal is burned to clinker in long rotary furnaces. After leaving the rotary furnace, the clinker has a temperature of up to +1300 °C and must be cooled down to about 200 °C for intermediate storage. This is done by cooling the clinker bed with a continuous stream of air. To make the cooling as effective as possible, it is necessary to determine the thickness of the clinker layer in the cooler. The high product temperatures make this a difficult measuring task.



Level measurement at high temperatures with VEGAPULS 68

Since microwaves propagate independently of process temperature, monitoring of the clinker bed is possible even at extreme temperatures. The radar sensor VEGAPULS 68 itself is continuously rinsed with cooling air via an air connection on the antenna system and on the mounting boss, allowing it to withstand process temperatures of over +1000 °C. Antenna systems of heat-resistant stainless steel ensure maintenance-free sensor operation.

Pressure monitoring with VEGABAR 52

The VEGABAR 52 pressure transmitter is especially suitable for monitoring air pressure in the clinker cooler. Its rugged ceramic measuring cell is highly overload resistant and has exceptional long-term stability.



VEGAPULS 68

- Non-contact measurement is maintenance-free and makes for an efficient process
- Solid antenna of heat-resistant stainless steel withstands high temperatures over long periods



VEGABAR 52

- Robust sensor design ensures high plant availability
- Simple setup and commissioning saves time
- Ceramic measuring cell is wear-free

Clinker silo

The last step to the finished product

After the raw meal is burnt, the emerging clinker of varying consistency is stored for further processing. Not only the huge amounts of dust, but the very high product temperatures and strong abrasion place heavy demands on the measurement technology. Depending on the production capacity of a cement plant, the clinker silos can be of considerable size, often reaching a height of over 50 m and a diameter of over 30 m. They are filled and emptied through different openings. The appropriate measurement technology here ensures the continuous operation of downstream production processes.



Level measurement in the clinker silo with VEGAPULS 68

Due to the highly abrasive properties of the clinker and temperatures up to +200 °C, measuring techniques that have physical contact with the medium are completely out of the question. The non-contact radar sensor VEGAPULS 68 is absolutely wear-free and very simple to install and set up. Its parabolic antenna, providing optimal microwave focusing, is particularly suitable for large silos. In extremely wide containers, several sensors are sometimes deployed to cover the entire profile of the product surface.

Overfill protection with VEGACAP 65

Ruggedness is of utmost importance for applications in the clinker silo. That's why capacitive measurement lends itself well for overfill protection here. The capacitive level probe VEGACAP 65 features a stable, hard-wearing mechanical construction as well as easy setup and commissioning. Neither condensation nor buildup can impair its trustworthiness.



VEGAPULS 68

- Measurement is non-sensitive to dust and noise, and contributes to reliable plant operation
- Simple installation and setup through top mounting
- Maintenance-free operation reduces servicing costs

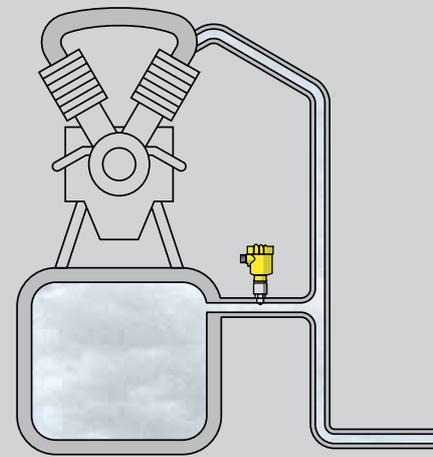
VEGACAP 65

- Exceedingly rugged construction ensures long service life
- Cable electrode can be shortened for any measurement length
- Reliable measurement, because immune to buildup

Pneumatic conveying

Transporting with compressed air

Pneumatic conveying is a very efficient method for transporting the raw meal and cement inside the cement works. To ensure a steady flow of material through the pipes and channels of the conveying systems, reliable monitoring of the compressors and feed pipes is an absolute necessity. During pneumatic filling of silos, the extreme dust generation places heavy demands on the implemented measurement technology. The level must be monitored constantly because material is often also removed from the silo during the filling process.



Pressure measurement on compressors with VEGABAR 14

Whether it's used for pressure monitoring on compressors or directly at the distributed air outlets – VEGABAR 14 delivers reliable information about the actual pressure. With its manometer connection and compact housing, it can be easily adapted to existing applications.



VEGABAR 14

- Compact dimensions allow easy adaptation to existing systems
- Maintenance-free operation thanks to wear-free ceramic measuring cell

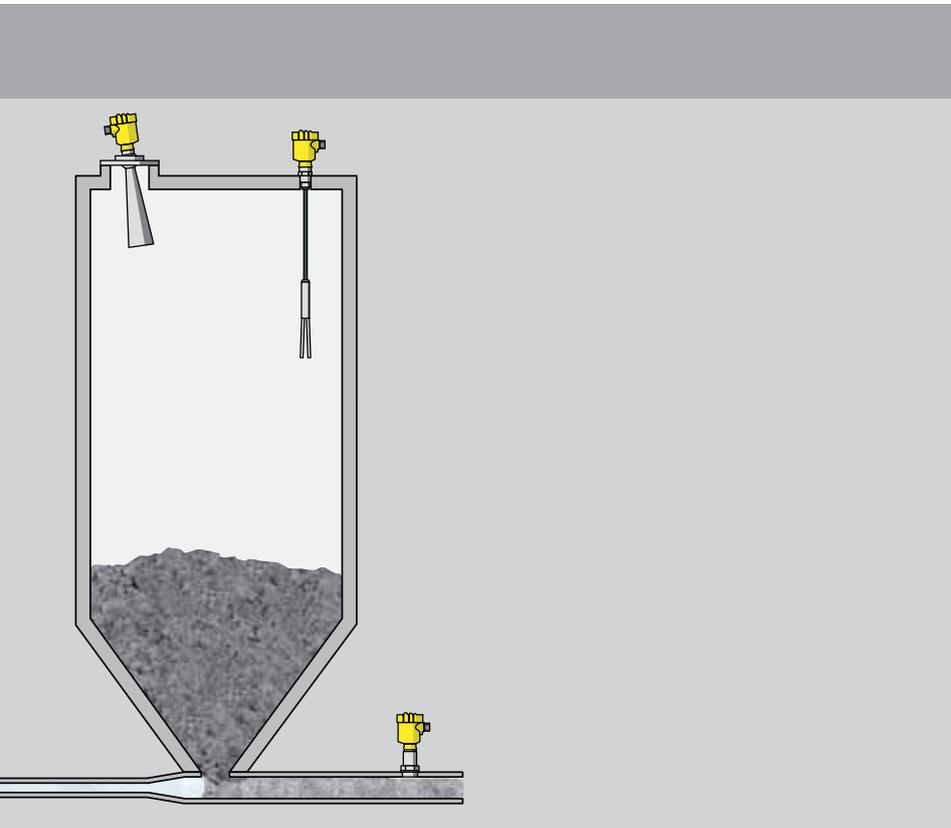
Pressure measurement in conveyor pipes with VEGABAR 52

Measuring the pressure directly in the conveyor pipe requires an exceptionally robust sensor construction. The ceramic measuring cell gives VEGABAR 52 the necessary resistance against abrasion. Thanks to the front-flush design of the measuring cell and the extreme hardness of the ceramic, VEGABAR 52 is well suited for installation in pneumatic conveyor systems.



VEGABAR 52

- High overload capacity ensures long service life
- Maintenance-free operation thanks to wear-free ceramic measuring cell
- Highly resistant to abrasion



Level measurement in cement storage silos

The VEGAPULS 68 radar sensor is used especially in large storage silos that are built up in segments. Its excellent signal focusing ensures a reliable function without interference from the silo walls, even over large measuring ranges.

For silos with average dimensions up to 30 m, the guided microwave sensor VEGAFLEX 62 is a robust and reliable optional solution. Its strong cable probe withstands tensile forces up to 3 tons and can thus be used for measuring heavy bulk solids like cement.

Overfill protection with VEGAWAVE 62

Absolutely wear and maintenance-free, the vibrating level switch VEGAWAVE 62 always provides reliable level detection. Its robust tuning fork guarantees a positive switching function for the full or empty signal, even when there is heavy buildup on the instrument.



VEGAPULS 68

- Reliable measurement even in very large silos
- Accurate readings regardless of strong dust generation
- Maintenance-free operation reduces servicing costs



VEGAFLEX 62

- Setup without adjustment saves time
- Economical and independent of product properties
- Very robust construction withstands tensile loads up to 3 t



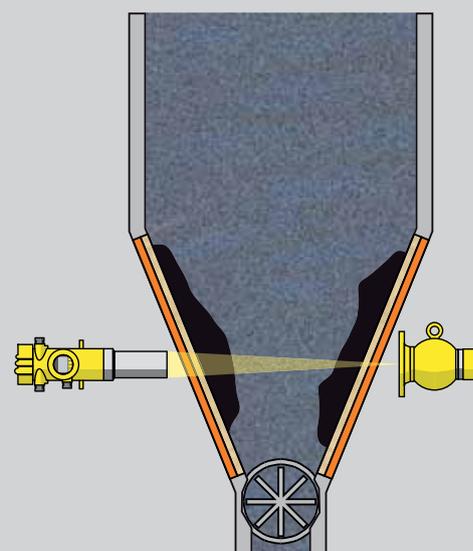
VEGAWAVE 62

- Setup without medium possible at any time
- Exceptionally rugged construction minimizes maintenance costs
- Reliable protection against overfilling

Cyclone preheater

Preparation for burning

Before the raw meal enters the kiln to be turned into clinker, it is pre-heated up to +800 °C in the cyclone using waste heat from the kiln. The cyclone is lined with fireproof brick to enable it to withstand the high temperatures and the abrasive medium. During the process, buildup forms on the lined walls in the lower part of the cyclone. The thickness of these deposits must be monitored continuously to avoid blockage.



Level detection with POINTRAC 31

The radiometric sensor POINTRAC 31 measures the thickness of the buildup from outside right through the wall of the cyclone. When a certain thickness is reached, this is detected by the sensor, which in turn triggers pneumatic cleaning with air guns.

The source holder VEGASOURCE 31 houses the radioactive source, which is optimised for the application. Its rugged construction ensures reliable protection of the environment.

In applications where it is possible to create an opening in the metal wall of the cyclone, the use of a microwave barrier is an interesting alternative solution. Mounted on the cyclone via a high temperature adapter, VEGAMIP 61 detects the limit level with the microwave signal passing right through the lining.



POINTRAC 31

- Ideal for extreme application conditions
- Simple retro installation on the outside of the cyclone



VEGASOURCE 31

- Radiation focussed in the direction of the detector
- Protects the environment from gamma rays



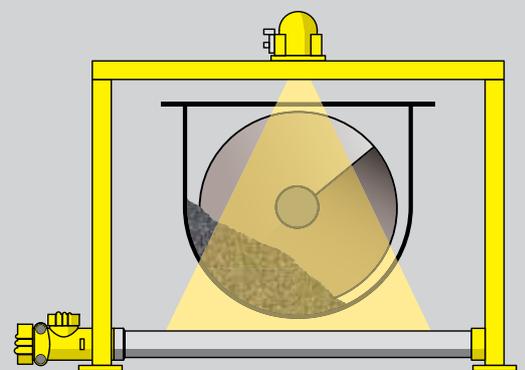
VEGAMIP 61

- Robust and maintenance-free, because non-contact measurement
- Simple adjustment saves maintenance effort

Mechanical conveying

Mass flow measurement of solids

In many production processes, bulk goods are transported on screw, belt or drag conveyors. The weight or the amount of transported bulk material has to be determined for precise control of these processes, as well as for necessary business accounting. Due to the prevailing harsh conditions, mechanical measuring systems are subject to increased wear. Non-contact measurement of the moving material ensures economical operation of the plant.



Quantity measurement with WEIGHTRAC 31

WEIGHTRAC is the non-contact alternative to the mechanical belt scale. Mounted on conveyor belts or screw conveyors, the radiation-based method delivers reliable data about the mass flow rate as well as the total throughput of bulk solids. WEIGHTRAC can be retrofitted to existing conveyor systems without great cost and effort. It is completely wear and maintenance-free. The source holder contains the radioactive source necessary for the application. Its rugged construction guarantees reliable protection of people and the environment.



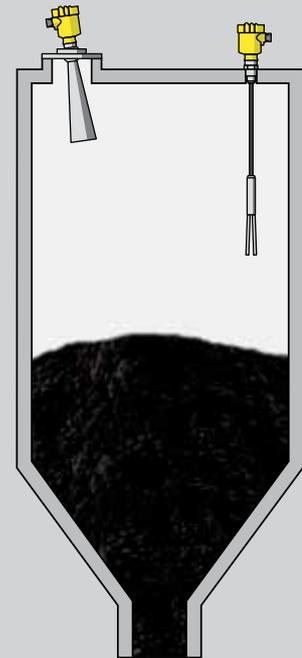
WEIGHTRAC 31

- Low maintenance due to non-contact measurement
- Simple installation by means of measuring frame
- The highly sensitive PVT detector allows the use of a low activity source

Fuels

No cement production without fuel

Large amounts of energy are needed to burn the clinker in the rotary kiln. Alternative fuels, such as dried sewage sludge, old tyres, waste oil and solvents are increasingly being used in addition to conventional energy sources like gas, oil or coal. The required energy represents a significant cost factor in cement production, making accurate measurement of the implemented fuels absolutely necessary.



Level measurement with VEGAPULS 68

Non-contact radar technology is also the ideal solution for level measurement of solid fuels stored in silos.

VEGAPULS 68 reliably measures the product surface without interference from the thick clouds of dust that are often generated. The differing properties of fuels such as coal or bone meal have no influence on the measuring results.

Level detection with VEGAWAVE 62

In silos requiring additional overflow protection, the vibrating level switch VEGAWAVE 62 is just the right solution. Operating completely independent of product characteristics, the instrument signals the limit level in the container and thus guards reliably against overfilling.



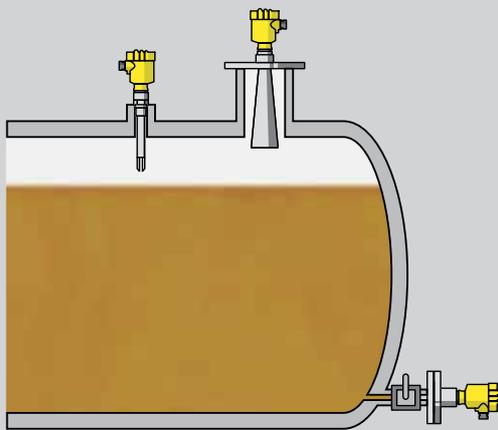
VEGAPULS 68

- Non-contact measurement is possible even under extreme conditions
- Measurement independent of product properties ensures uninterrupted plant operation
- Approval according to ATEX



VEGAWAVE 62

- Exceptionally rugged construction minimizes maintenance costs
- Overflowing is avoided, because unsusceptible to buildup and condensation
- Approval according to ATEX and SIL



Level measurement with VEGAPULS 62

The radar sensor VEGAPULS 62 delivers very exact and reliable results in all level measuring tasks involved with the storage of liquids. This allows millimetre precise stock inventory of liquid fuels – regardless of the product and the process conditions.



VEGAPULS 62

- Non-contact measurement increases plant availability
- Simple installation allows rapid deployment
- Reliable measurement independent of product properties

Weight measurement with VEGABAR 52

Hydrostatic pressure measurement with VEGABAR 52 provides direct information about the weight of the fuel in the tank. The rugged ceramic measuring cell of the sensor ensures high chemical resistance in all kinds of products.



VEGABAR 52

- High chemical resistance ensures high plant availability
- Long-term stability in dynamic processes

Point level detection with VEGASWING 63

The vibrating level switch VEGASWING 63 operates completely independent of product properties and ensures reliable protection against overfilling or dry running of pumps.



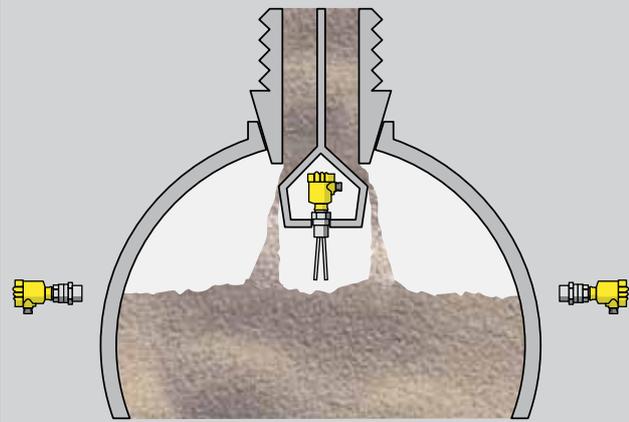
VEGASWING 63

- Product-independent switching point for reliable level detection in all media
- Maintenance-free operation reduces servicing costs

Truck loading

Loading systems

The loading of cement and ready-mixed mortar into transport trucks uses automated, closed loading systems, which are required in order to minimize dust generation. This also shortens the loading and waiting times and increases throughput and thus the profitability of the entire plant. While the loading quantity is being determined by a weighing system, other systems must ensure that the truck is in the correct position and does not get overfilled. Robust and reliable level detection instruments take care of this job.



Overfill protection with VEGAWAVE 61

The rugged mechanical construction and small dimensions of VEGAWAVE 61 make it ideal for use in loading facilities. Regardless of the bulk density (from 8 g/l), it switches reliably and reproducibly as soon as the bulk material reaches the maximum filling level. For especially tight mounting situations, a version with external electronics is available. A protective cage prevents the tuning fork from getting damaged due to incorrect operation of the loading system.

Position detection with VEGAMIP 61

The microwave barrier VEGAMIP 61 is actually designed for point level detection of bulk solids. But with its wide range of antenna versions it can also be used for other things, like detecting the position of a truck in the loading station, which it does extremely quickly and accurately. When a truck drives in, VEGAMIP 61 detects and signals in the driver when it has reached the correct parking position.



VEGAWAVE 61

- Universally applicable, because independent of product characteristics
- High availability thanks to robust sensor construction
- SIL rating ensures maximum operational reliability

VEGAMIP 61

- Reliable position detection regardless of weather
- Range up to 100 m
- Fast and accurate detection of the position

Instrument overview



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)



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)

The pictured instruments are standard models.



Instrument overview



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 G $\frac{3}{4}$ A, $\frac{3}{4}$ NPT
Flanges from DN 25, ANSI 1"

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



VEGAFLEX 62



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 G1 $\frac{1}{2}$ A, 1 $\frac{1}{2}$ NPT
Flanges from DN 50, ANSI 2"

Measuring range: Cable up to 60 m (197 ft)
Rod up to 6 m (20 ft)



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 G $\frac{3}{4}$ A, $\frac{3}{4}$ NPT
Flanges from DN 25, ANSI 1"
Hygienic fittings

Probe length: up to 6 m (20 ft)

The pictured instruments are standard models.



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)



VEGAWAVE 61, 62



Vibrating level switch for powders (VEGAWAVE 62 with suspension cable)

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

Process temperature: -50 ... +250 °C (-58 ... +482 °F)

Process pressure: -1 ... +25 bar (-100 ... +2500 kPa)

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

Probe length: VEGAWAVE 62 up to 80 m (262 ft)



VEGACAP 65



Capacitive cable electrode for level detection

- Long lifetime and reduced maintenance through robust mechanical construction
- High flexibility through shortenable probe
- Maximum use of the vessel, because measurement over the complete probe length

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

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

Process fitting: Thread from G1 A, 1 NPT
Flanges from DN 50, ANSI 2"

Measuring range: up to 32 m (105 ft)



Instrument overview



VEGAMIP T/R 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)
+450 °C (842 °F) with mounting adapter

Process fitting: Thread G1½, 1½ NPT
Flanges
Clamp

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



VEGABAR 14



Process pressure transmitter with CERTEC® measuring cell

- High plant availability through maximum overload and vacuum resistance of the ceramic measuring cell
- Price-favourable version with small mounting dimensions
- Low costs for maintenance through wear-free ceramic measuring cell

Process temperature: -40 ... +100 °C (-40 ... +212 °F)

Process fitting: Thread from G½, ½ NPT

Measuring range: -1 ... +60 bar (-100 ... +6000 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 G½ A, ½ NPT
Flanges from DN 25, ANSI 1"
Hygienic fittings

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

The pictured instruments are standard models.



POINTRAC 31



Radiation-based sensor for level detection

- Exact measuring results independent of process conditions
- High process reliability through determination of buildup
- Economical level detection under arduous application conditions

Process temperature:	any
Process pressure:	any
Mounting:	from outside on the pipeline or vessel
Measuring range:	up to 0.3 m (1 ft)



WEIGHTRAC 31



Radiation-based sensor for mass flow determination

- Wear-free, because non-contact measurement
- Exact determination of the delivery volume through simple setup

Process temperature:	any
Process pressure:	any
Mounting:	through the supplied measurement frame
Measurement width:	up to 1.6 m (5.2 ft)



VEGASOURCE 31



Source container for the reception of a gamma radiator

- Reliable shielding allows use without control sections
- Small space requirement and simple mounting
- Reliability through pneumatic switch-ON / switch-OFF

Process temperature:	any
Ambient temperature:	-40 ... +200 °C (-40 ... +392 °F)
Process pressure:	any
Mounting:	Flange DN 100 PN 16



Explosion protection



Safety standards



Hygienic standards



35185-EN-120110

VEGA Grieshaber KG
Am Hohenstein 113
77761 Schiltach
Germany

Phone +49 7836 50-0
Fax +49 7836 50-201
E-mail info.de@vega.com
www.vega.com

Looking Forward **VEGA**