



Industry Information Food Industry

Measurement technology for
modern food production

Looking Forward **VEGA**



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Responsibility for people and products

The VEGA range of services and products for measurement of level, point level and pressure is setting the standard in the food industry. This is because VEGA systematically combines the latest technologies with comprehensive, industry-specific knowledge, and above all else stands by the company's guiding principle: long-term, fair co-operation based on high esteem for products and people.

The right technology for every application

The VEGA measuring instruments provide reliable data on volumes, levels and pressures. They measure in bulk solids, in sticky media and in liquids, such as dairy products that are stored and processed in a protective atmosphere. Even if abrasive additional ingredients like nuts, berries or grains are mixed in, VEGA sensors still measure reliably and accurately.

Modular and cost effective: plics®

plics® is the VEGA unique modular instrument system. It allows the user to assemble a tailor-made combination of sensor, process fitting, electronics and housing. The customer gets exactly the measurement technology needed and can put it into operation quickly through a simple, standardized procedure.

Safety and hygiene for the food industry

- CIP and SIP capable sensors for cleaning and sterilization processes
- Process fitting design according to 3A standard and EHEDG
- Electro-polished process fittings for heightened surface requirements
- Sealing materials in compliance with FDA and 3A guidelines
- Elastomers for applications with fat content > 3 %
- Pressure transmitter with protection rating IP 69K for protection during high-pressure cleaning

Partnership for a demanding industry

In the last ten years, food manufacturers have switched over to letting complete production processes run fully automatically in closed, so-called inline, processes. This guarantees a lower risk of contamination and thus higher product quality. The necessary cleaning processes place heavy demands on measurement technology.

Measurement under changing conditions

In preparation or stirring vessels in the food industry, the properties of the base product as well as the final product often change with respect to density, consistency, reflective characteristics and conductivity. Vessels are alternately filled with products of widely different compositions, cleaning processes are adapted and changed. VEGA instruments offer reliable and safe measurement for all processes.

Hygiene for process and measurement technology

VEGA sensors are designed to withstand all cleaning processes without loss of performance or damage. Fully automatic, closed SIP and CIP processes as well as external cleaning places extremely high requirements on housings, electronics and sensors. No problem for VEGA instruments, because all components are designed exactly for the expected conditions. Process fittings free of dead spaces permit up-to-date and environmentally harmless cleaning and sterilization methods.





Optimally adapted process fittings

When designing a process adaption for vessels or pipelines, it is important to select a flawless, hygienic process fitting suitable to the application.

Diameter, volume and form determine size and type of the fitting; medium, temperature and pressure the possible measuring principle. VEGA offers for all measuring principles hygienic standard and special fittings that can be optimally cleaned.

Materials for the food industry

All established certificates like 3A, FDA or EHEDG are available for the instruments used in the food industry. 316 L and Alloy are commonly used base materials.

The implemented elastomers are all approved for the food industry. Special elastomers are available for applications with a high fat content > 3 %. All wetted surfaces as well as those close to the process can resist the cyclic cleaning and sterilization temperatures.

plics[®] – easy is better

Indicating and adjustment module

- PLICSCOM
- VEGACONNECT

Electronics

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

Housings

- Plastic
- Stainless steel
- Aluminium
- Plastic Double chamber
- Stainless steel Double chamber
- Aluminium Double chamber

Process fittings

- Thread
- Flange
- Hygienic fitting
- Customer-specific

Sensors

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

Explosion protection (Ex)

Safety standards (SIL)

Hygiene standards (Hyg)

Ship approvals (Anchor icon)



Trend-setting measurement technology orientates itself around the people who use it, that is why we developed plics® – the world's first modular product construction kit. Each of our sensors is built individually from plics® components and thus optimally fulfils the requirements of the customer and the application.

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® therefore starts early on in the planning stage.

Clear advantages for the plant builder

Short delivery times, uncomplicated fitting, fast setup and commissioning save the plant builder a lot of time and expense. The design, wiring and setup of all VEGA instruments is always the same, so whoever knows this can readily install and operate any plics® device and measuring technique.

Making things easier for the user

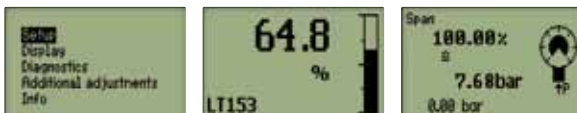
plics® convinces people in daily use because of its high operational reliability, simplified maintenance and reduced replacement part stocks resulting from designs that use many identical components. In this area, too, the consistency of technology and operation simplifies and accelerates work with changing plics® instruments. Adjustment always follows the same menu-driven procedures and is carried out on PLICSCOM, alternatively using PC based adjustment software for setup on-plant or via the control room.

plics® is like the icing on the cake

plics® offers the best prerequisites for maximum product quality through reliable and exact measurements. To ensure responsible handling of all kinds of foodstuffs, plics® instruments come with all relevant instrument and material certificates of the food industry.

- Approvals for hazardous areas
- Protection rating IP 68 also for compact instruments with on-site adjustment
- Plastic and stainless steel housings for severe chemical and mechanical exposure
- Instruments with SIL classification for highest operational safety

Where man and machine meet: adjustment and system integration

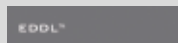
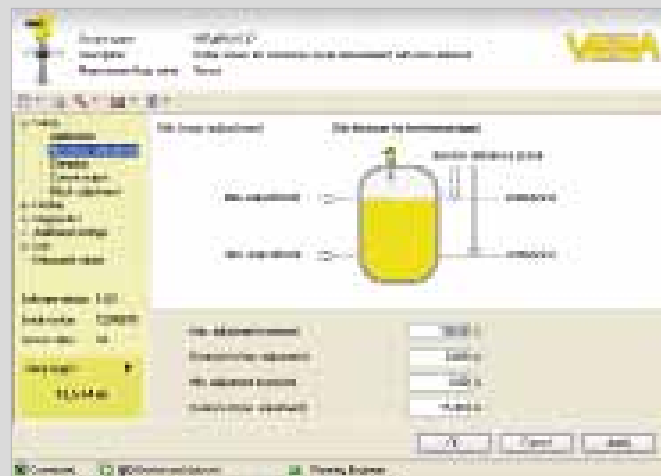


Instrument adjustment on site with PLICSCOM

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 is saved by pressing a key on 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 measurement data transmission to field bus technologies like Profibus PA or Foundation Fieldbus to wireless transmission. For level detection, the selection ranges from contactless switch to relay and transistor right through to NAMUR signal.

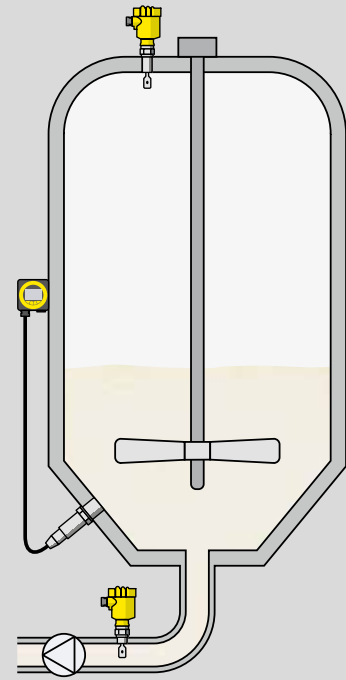
Communication at all levels

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

Raw milk

Milk – a highly sensitive product

Before it is further processed, the delivered raw milk is subjected to comprehensive quality checks in the dairy. It is the base product for the production of milk, yoghurt, cheese, ice cream and many other products. The milk is stored at a temperature of approx. +4 °C and gently stirred until it is fed into various production processes. A protective atmosphere at approx. +0.5 to +2 bar gauge pressure protects the milk from contamination. Legal regulations ensure that the hygienic requirements applying to the milk industry are adhered to.



Pressure and level measurement with VEGABAR 53 in the stirring vessel

The measurement technology is exposed to arduous conditions during the cleaning cycles: the empty container is cleaned with a 2 % to 5 % acid or lye solution at +60 °C (CIP) and then sterilized with steam at a temperature of +125 °C (SIP). VEGABAR 53 is particularly suitable for level measurement because its diaphragm of stainless steel or Alloy is resistant to aggressive cleaning agents and withstands cleaning temperatures up to +150 °C.

Level detection with VEGASWING 61

VEGASWING 61 is used for monitoring the upper and lower limit level. The sensor, which works according to the tuning fork principle, reliably detects the limit level both under process and cleaning conditions. The tuning fork made of 316L can be optimally cleaned since it is welded absolutely gap-free to the process fitting.



VEGABAR 53

- Fully welded measuring cell
- Vacuum resistant
- Cleaning temperatures up to +150 °C
- Insensitive to ambient humidity



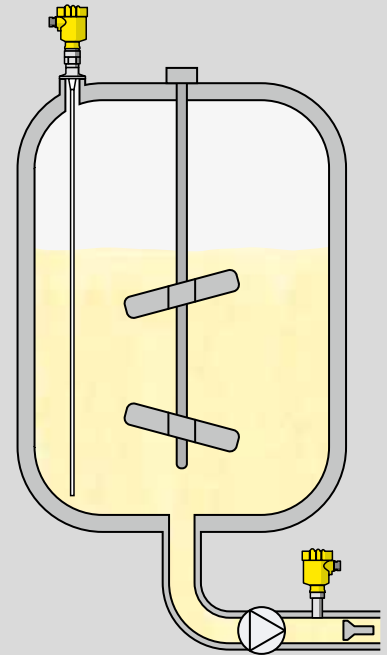
VEGASWING 61

- Product-independent switching point
- Fully welded
- Gap and elastomer-free
- Maintenance-free
- Good cleanability

Ice cream production

Ingredients for ice cream

The ingredients for ice cream are milk, sugar and fat or water, sugar and fruit juices. According to the type of ice cream, the ingredients are accurately weighed, fed into a stirring vessel, the so-called "premix" and then mixed. After that the product is homogenized at a pressure of approx. +140 bar and pasteurized at +80 °C. The mix is then cooled down within one minute to +4 °C and put into interim storage for 6 hours.



Level measurement with VEGAFLEX 63 in the premix and interim storage tank

VEGAFLEX 63 is the right solution for level measurement in the approx. 1.5 m high vessels. The guided microwave measuring principle is completely immune to the temperature shocks and pressure changes. It performs the measuring task simply and reliably within the cramped installation conditions as well as the changing consistency of the sometimes foamy ice cream mass.

Monitoring the pressure of the homogenization process with VEGABAR 53

The pressure transmitter VEGABAR 53 is used to monitor the +140 bar pressure necessary for homogenization. The robust diaphragm masters the high pressures and resists the vacuum shocks that occur during the cleaning cycle.



VEGAFLEX 63

- Setup without adjustment
- Unaffected by foam formation
- High precision



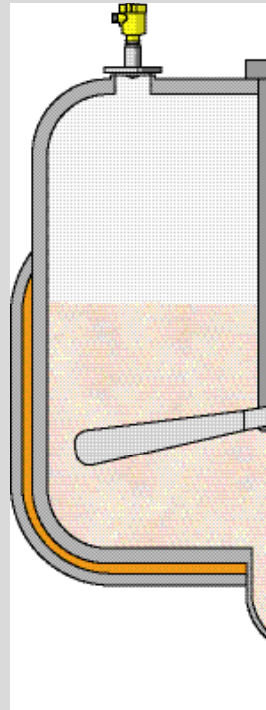
VEGABAR 53

- Measuring ranges up to +200 bar
- Small hygienic process fitting
- FDA listed oil filling

Yoghurt – born of milk

Fruit yoghurt – a sour milk product

By adding bacteria cultures and slowly warming the milk to approx. +45 °C, the lactose present in the milk is converted into lactic acid. This coagulates the protein component – the milk is “curdled” and gets its sour taste. The yoghurt is then chilled down so that no further lactic acid is created. For further processing to fruit yoghurt, berries, nuts or grain components are stirred in.



Level measurement with VEGAPULS 63 in the stirring and batch tanks

The radar measuring principle is particularly well suited for level measurement. VEGAPULS 63 measures the level reliably without being affected by the density changes of the product. The contactlessly measuring sensor is not influenced by the abrasive grain components and fruits in the yoghurt. The front-flush antenna allows optimal CIP and SIP cleaning. It is impervious to the waterjet pressure of the cleaning head and resists the extreme temperature fluctuations.

Overfill protection with VEGASWING 63

A VEGASWING 63 vibrating level switch mounted in the lid of the container ensures that the filling process is switched off at the right time. The stainless steel tuning fork is impervious to the cleaning processes and provides protection against abrasion and product buildup.



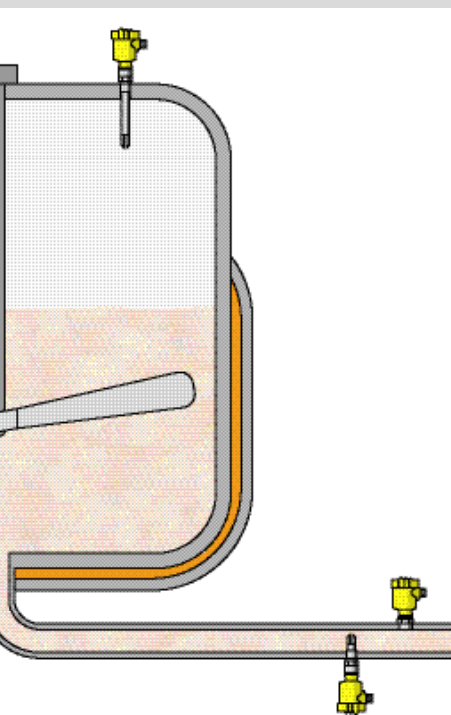
VEGAPULS 63

- Impervious to pressure and temperature fluctuations
- Absolutely front-flush antenna
- CIP and SIP capable



VEGASWING 63

- Product independent switching point
- Maintenance-free, no moving parts
- Simple installation
- Polished tuning fork



Dry run protection with VEGASWING 61

To ensure a reliable switching off of the feed pump, a VEGASWING 61 is mounted directly in the pipeline. The stainless steel tuning fork is impervious to the cleaning processes and provides protection against abrasion and product buildup.



VEGASWING 61

- Product independent switching-point
- Wear free
- Small process fitting and short tuning fork

Monitoring the feed pressure with VEGABAR 54

The pressure transmitter VEGABAR 54 is used to guarantee a continuous flow rate. With its ceramic measuring cell it resists both the abrasive fruits or nuts in the yoghurt and the pressure and vacuum shocks in the pipes.



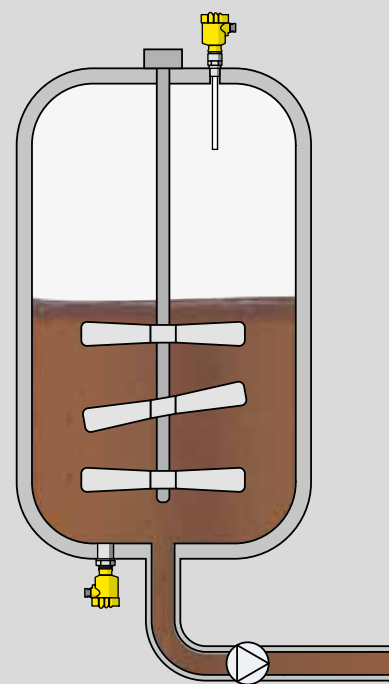
VEGABAR 54

- Highly resistive solid ceramic measuring cell
- Hygienic process fittings from DN 15
- Stainless steel housing

Chocolate production

Chocolate – food of the gods

Chocolate production equipment consists of a system of vessels with agitators as well as a roller mill, a conche and a pouring machine. After leaving the conche and until it is further processed, the chocolate is stored at a temperature of approx. +45 °C in large containers holding up to 60 tons. An agitator ensures uniform consistency and temperature of the chocolate mass. The containers are heated via room heating.



VEGACAP 63 as overflow protection

VEGACAP 63 is used to provide reliable detection of the upper limit level in the large, closed containers. It is unaffected by buildup or the consistency and temperature of the liquid chocolate. Installation is straightforward and set-up is as simple.

Continuous level measurement with VEGABAR 52

For continuous level measurement, a VEGABAR 52 pressure transmitter with ceramic measuring cell is mounted at the bottom of the container. The absolutely front flush ceramic diaphragm safeguards the sensor from damage through abrasion or gumming.



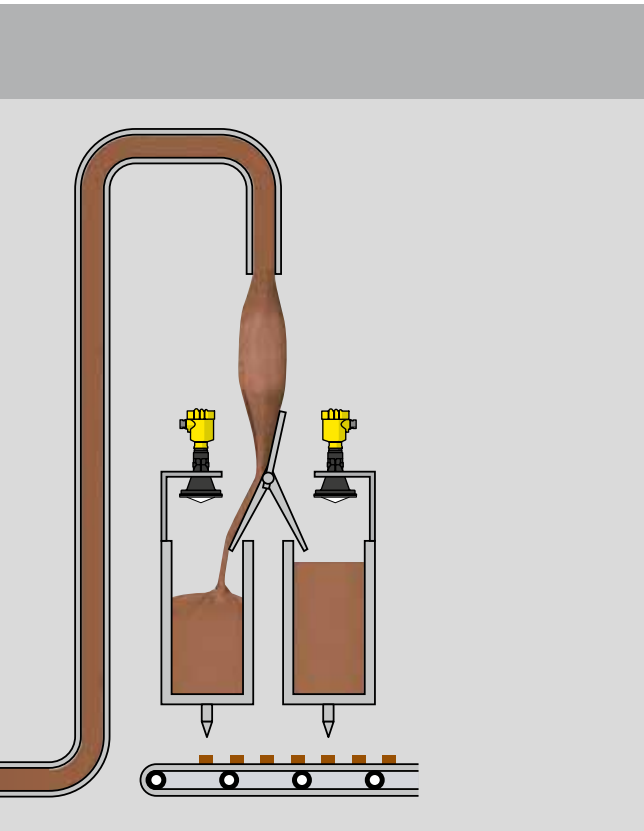
VEGACAP 63

- Independent of temperature and pressure
- Insensitive to buildup
- Simple setup



VEGABAR 52

- Resistant to mechanical stresses
- Absolutely front-flush
- EHEDG certified LA process fitting



Solid chocolate from the pouring machine

After the chocolate has passed through the conching processes, it is pumped into large containers or work vessels for further processing and temporarily stored. The storage temperature as well as the cooling down to the required $+30\text{ }^{\circ}\text{C}$ are decisive for the quality of the chocolate. Fed by two reservoirs, the machine pours five tons of chocolate per hour into pre-cooled forms.

Level measurement in the vessels with VEGAPULS 61

Since cooling and stoppage lead to buildup and clumping of the chocolate, the chocolate mass must be transported and filled in a continuous process. A level-controlled flap guides the chocolate stream alternately into the one or other open reservoir. Continuous level measurement is carried out by two VEGAPULS 61 radar sensors. The non-contact measurement is immune to abrasion by the ingredients and buildup of the chocolate mass.



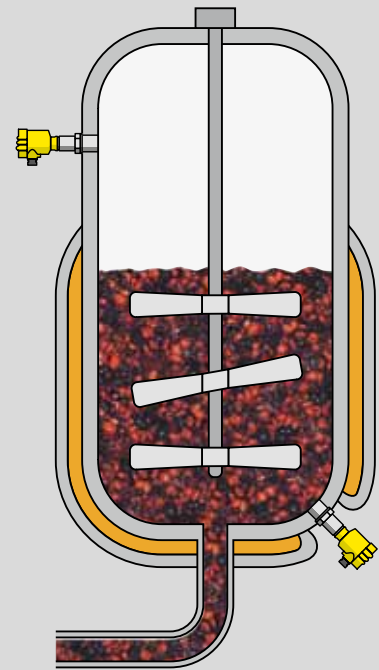
VEGAPULS 61

- Non-contact measurement
- Small compact design
- Simple installation

Fruit processing

Jam – fruit in its sweetest form

Jam must be composed of at least 45 % fruit and in its finished state contain recognizable pieces of fruit. The fruits are fed into the actual production process only after going through an in-depth quality control. The seeded fruits and other ingredients are weighed, filled into a kettle and gently heated. To preserve product quality, the cooking process takes place in a closed vacuum kettle at a temperature of +65 °C to +85 °C. The fruits thus keep their flavour and their appearance.



Gentle cooking under vacuum with VEGABAR 55

A VEGABAR 55 pressure transmitter is implemented here to monitor and control the vacuum in the kettle. The instrument is absolutely vacuum proof and has excellent temperature characteristics. The patented self-compensating behaviour of the METEC® measuring cell makes a reliable and exact measurement possible even while the medium is being heated up.

For the level measurement in the kettle, another VEGABAR 55 is mounted to the tank bottom. The instrument measures the hydrostatic pressure and the superimposed vacuum. With the help of the control system, the exact level can be determined from the difference between the two sensors.



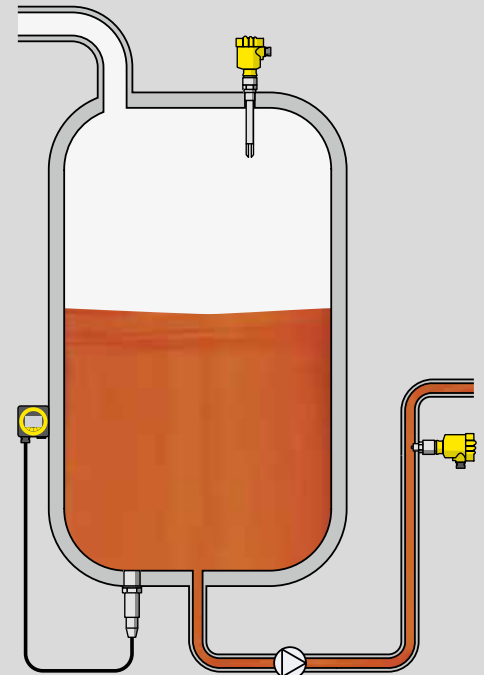
VEGABAR 55

- Absolutely vacuum resistant
- CIP and SIP capable
- Characteristics deviation 0.075 %

Alcohol as an additive

Alcohol supply station

Various alcoholic beverages can be added to confections to improve their flavor. These liquids are stored in separate rooms and, when needed, pumped over a ring main with approx. +1.4 bar pressure directly to the appropriate stirring vessel. Due to the high alcohol content as well as the storage and processing temperature of +20 °C, the alcohol storage area is classified as a hazardous zone (Ex zone 1).



Level measurement in the alcohol tank

The level in the 1.5 m high alcohol tanks is measured hydrostatically by a VEGABAR 53 pressure transmitter mounted at the bottom. Due to the remote housing, the sensor can be adjusted and its measured values read out even in this explosion-endangered environment.

Overfill protection with VEGASWING 63

A VEGASWING 63 is installed in the lid of the stainless steel tank to monitor the upper limit level. The maintenance-free tuning fork switch reliably detects the switch-off point without being affected by the consistency of the various alcohols.

Pressure monitoring in the ring main

A VEGABAR 54 is used to monitor the feed pressure in the pipeline. The sensor allows small process fittings on the pipe and is resistant to the dynamic CIP and SIP cleaning processes.



VEGABAR 53

- Fully welded measuring cell
- Small process fittings
- CIP and SIP capable
- External display and adjustment



VEGASWING 63

- Setup without adjustment
- Not affected by foam generation
- High accuracy and reproducibility



VEGABAR 54

- Long-term stable
- Ceramic measuring cell MINI-CERTEC®
- Pressure and vacuum resistant
- CIP and SIP capable

Food ingredients

Preprocessing

Sugar and flour serve as the basic ingredient of many types of foods. These bulk solids are stored in silos up to 20 m high. Filling and emptying is frequently carried out via pneumatic systems which transport the product with a feed pressure of approx. +0.7 bar from the large outer silos to the decentralized production lines. Once the products arrive there, they are stored in smaller, 4 m high containers and kept ready for further processing.



Continuous level measurement in the outdoor silos with VEGAPULS 68

A VEGAPULS 68 radar sensor is deployed for continuous level measurement in the high outdoor silos. The non-contact radar measuring principle is immune to dust and noise, even during filling.



VEGAPULS 68

- Non-contact measurement
- Not affected by dust generation and noise

Monitoring the pressure in the pneumatic conveyer with VEGABAR 52

Conveying speed and line pressure are regulated with the help of a VEGABAR 52 pressure transmitter. Due to the abrasive medium, the VEGABAR 52 with ceramic measuring cell is especially suitable for this task. The front-flush installation also avoids clogging of the pressure fitting.

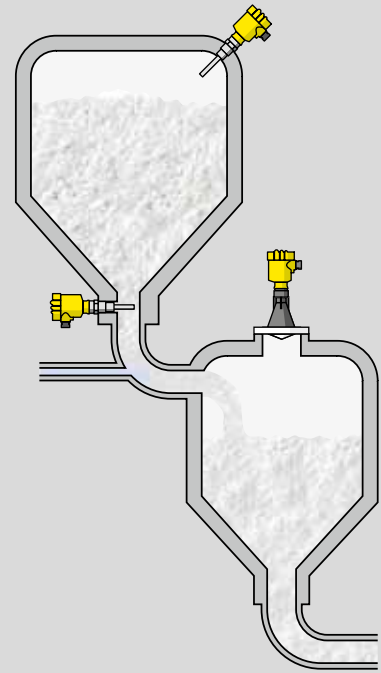


VEGABAR 52

- Abrasion resistant
- Unaffected by vacuum and pressure shocks
- Long-term stable

Bread – variety in form and taste

Bread is one of the most important and common foods worldwide. The offered selection of shapes and tastes is correspondingly large. The number of recipes is practically unlimited. Large bakeries put breads with new tastes or ingredients on the market practically every day. The ingredients, mainly flour, yeast, salt and water, are stored in small containers.



Level detection in the intermediate silos with VEGAVIB 61

In the smaller silos that serve as temporary storage, the minimum and maximum levels are detected by two VEGAVIB 61 vibrating level switches. The rod form of VEGAVIB 61 prevents product deposits from collecting and allows installation near the discharge or filling openings.

Level measurement in small vessels with VEGAPULS 67

VEGAPULS 67 is the ideal solution in the two to three metre high containers holding baking ingredients because it is immune to dust and the effects of changing mediums and measures the level with perfect reliability. Its simple installation and setup saves time and money.



VEGAVIB 61

- No buildup
- Wear free
- Reliable detection from 0.02 g/cm²
- Switching point independent of product density



VEGAPULS 67

- Unaffected by dust and noise
- Easy adjustment
- Independent of product properties

Instrument overview



VEGAPULS 61

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: -40 ... +80 °C (-40 ... +176 °F)

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

Process fitting: Thread G1½ A or 1½ NPT
Flanges from DN 80 or ANSI 2"
or mounting strap

Measuring range: Up to 20 m (66 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 2"
or mounting strap ANSI 3"

Measuring range: Up to 15 m (49 ft)

The pictured instruments are standard models.



VEGAPULS 68



Radars 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)



VEGAFLEX 63



TDR sensor for continuous level measurement

- Easy setup without adjustment
- Unaffected by product properties
- Immune to dust, pressure, buildup and condensate
- Good cleanability and very high chemical resistance
- High measuring precision

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

Process pressure: -0,5 ... 16 bar (-50 ... +1600 kPa)

Process fitting: Flanges from DN 50 or ANSI 2"
Tri-Clamp from 1½"

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



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: VEGASWING 63 up to 6 m (20 ft)



Explosion protection



Safety standards



Hygiene standards

Instrument overview



VEGACAP 64



Capacitive rod probe for level detection

- Exact switching point even in strongly adhesive media
- Robust and maintenance-free
- High functional reliability
- Highly resistant PTFE insulation

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

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

Process fitting: Thread G $\frac{3}{4}$ A or $\frac{3}{4}$ NPT
Flanges from DN 25 or ANSI 1"

Measuring range: Up to 6 m (20 ft)



VEGAVIB 61



Vibrating level switch with vibrating rod for granulated bulk solids

- Easy setup without adjustment
- Product-independent switching point
- Optimal rod design avoids buildup and jamming of product
- Simple cleaning
- Wear and maintenance-free

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

Process pressure: -1 ... +16 bar (-100 ... +1600 kPa)

Process fitting: Thread G1 A or 1 NPT
Flanges from DN 32 or ANSI 1½"



VEGABAR 52



Pressure transmitter with CERTEC® measuring cell

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

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

Process fitting: Manometer fitting G $\frac{1}{2}$ A,
Thread from G $\frac{1}{2}$ A or $\frac{1}{2}$ NPT
Flanges from DN 25 or ANSI 1"
Process fittings for the food and paper industries

Measuring range: -1 ... +72 bar (-100 ... +1044 psig)

The pictured instruments are standard models.



VEGABAR 53



Pressure transmitter with metallic measuring cell

- Fully welded metallic measuring cell
- High measuring precision
- Overload and vacuum resistant

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

Process fitting: Manometer connection G½ A
Fitting G½ A or ½ NPT, or G½ A front-flush
Hygienic fittings

Measuring range: -1 ... +1000 bar (-100 ... +100000 kPa)



VEGABAR 54



Pressure transmitter with MINI-CERTEC® measuring cell

- Oil-free, ceramic capacitive sensor element
- High abrasion and overload resistance
- High measuring precision

Process temperature: -40 ... +120 °C (-40 ... +248 °F)

Process fitting: Thread from G½ A
Flanges from DN 15 or ANSI ½"
Process fittings for the food and paper industries

Measuring range: -1 ... +72 bar (-100 ... +7200 kPa)



VEGABAR 55



Pressure transmitter with METEC® measuring cell

- Front-flush, metallic diaphragm
- Good cleanability and vacuum resistance
- High chemical stability
- High measuring precision
- Small measuring ranges down to 0.1 bar

Process temperature: -12 ... +200 °C (-10 ... +392 °F)

Process fitting: Thread from G½ A or ½ NPT
Flanges from DN 20 or ANSI 1"
Process fittings for the food and paper industries

Measuring range: -1 ... +25 bar (-100... +2500 kPa)



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Looking Forward **VEGA**