



**Paper Industry Information**

Measurement technology for  
reliable paper production

Looking Forward **VEGA**



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# Responsibility for people and products

**VEGA's comprehensive offering of products and services for level, switching and pressure measurement is setting the standard in the paper industry. Because VEGA is systematically combining new technologies with extensive industry-specific knowledge and above all else, following its guiding principle: long-term, fair cooperation based on high esteem for products and people.**

## **A complete line-up of measurement technology**

Since the 1990's, VEGA has been the undisputed technological leader in the area of radar level measurement. Additional measuring principles, like ultrasonic, guided microwave, nucleonic and capacitive measurement, round out the company's line-up of level and switching instrumentation. VEGA pressure transmitters measure hydrostatic pressure as well as process and differential pressure.

## **Modular and cost efficient: plics®**

plics® is VEGA's unique modular instrument system. It allows a customized combination of sensor, process fitting, electronics and housing for the user, who thus gets exactly the measurement technology he really needs. What is more, it puts the instrument quickly into operation through amazingly simple, standardized adjustment procedures.

## **Reliability for the paper industry**

- Robust, leak-proof housings for application in rough and damp environmental conditions
- Active measuring components of highly abrasion resistant materials for direct use in product current
- Absolutely front-flush pressure transmitters, thus no influence on product flow
- Highest instrument quality, thus totally reliable function under the typical application conditions of the paper industry
- Instruments with SIL classification, thus highest availability and operational safety
- Instruments with protection rating IP 68 for extremely damp areas

# Partnership for a demanding industry

**Paper is the information carrier with the longest tradition and thus far unequalled durability. It is therefore an indispensable material even in the age of electronic media. The methods of paper manufacture have developed from early manual papermaking to the automated production processes of today's paper industry. VEGA's trend-setting measurement technology can handle even the extremely demanding operating conditions of the modern paper and cellulose industry.**

## **Reliability in all processes**

Level measurement applications extend from stock chests with agitators to black liquor tanks at high temperatures. The areas of application for point level detection are just as diverse: from simple dry run protection for slurry pumps to complete instrumentation of safety-relevant measurement chains. Besides differential pressure measurement in the deculator, there are numerous pressure applications in the sorters, cleaners and pipelines. In all these processes one thing is certain: VEGA measurement technology fulfils the highest requirements on reliability and availability.

## **Productivity under extreme conditions**

Plants in the paper industry must have a high degree of availability. Besides extremely accurate, the chosen measurement technology must be robust, stable over long periods and service friendly. No problem for VEGA measurement technology, because all instruments are designed for rough conditions like pressure surges, abrasion, strong vibration and dirt. The robust housings are designed to resist the dampest environments and the standard cleaning processes.





### **Independent of the properties of the paper stock**

The proportions of waste paper, cellulose or woodpulp can vary depending on the type of paper or cardboard produced. Fibres and auxiliary materials are also accordingly added in different amounts. These factors affect density, consistency, reflective properties and conductivity of the paper suspension. Instrumentation from VEGA offers a maximum of functional reliability even under these changing measuring conditions.

### **Paper-specific solutions**

VEGA delivers exactly the solutions that the industry needs. Whether for pulp storage towers, cleaners, pressure screening systems, the standpipes of MC pumps or the headbox – the wide range of physical measuring principles can solve almost any measurement problem. The available process fittings range from flange connectors of high-resistance materials for the digester to front-flush tube connectors for the headbox.

# plics<sup>®</sup> – easier 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

**Ex** Explosion protection

**SIL** Safety standards

**Hyg** Hygiene standards

**Anchor** 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 construction kit. Each of our sensors is built individually from plics® components and thus optimally fulfils the requirements of the customer and his 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® 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 design, wiring and setup of all VEGA instruments are always the same, so whoever knows this can readily install and operate any plics® device and measuring technique.

### **Making things easier for the user**

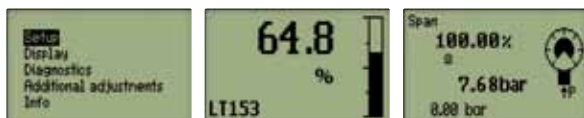
plics® convinces people in daily use because of its high operational reliability, simplified maintenance and reduced replacement part stocks resulting from designs that use many identical components. In this area, too, the consistency of technology and operation simplifies and accelerates work with changing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

### **With plics®, the paper keeps running**

For us, the requirements of production with regard to reliability and availability are of the highest priority. That's why plics® instruments come with high resistance materials for process fittings and housings as well as all relevant approvals. Equipped with these features and its reliable and exact readings, plics® provides the fundamental performance for highest machine speed and maximum paper quality.

- Splash water protection also during adjustment
- Protection of settings in the adjustment module
- Housing materials for severe chemical and mechanical loads
- Protection rating IP 68 also for compact instruments with on-site adjustment

# Where man and machine meet: adjustment and system integration



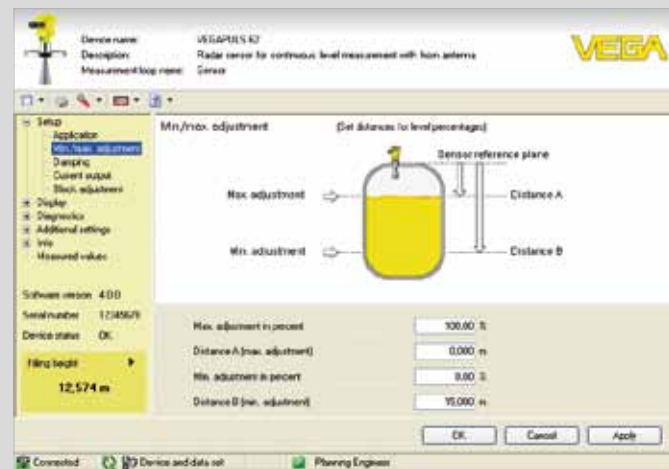
## On-site instrument adjustment with PLICSCOM

The indicating and adjustment module PLICSCOM can be installed on any plics® instrument at anytime. It functions as measured value indication on the instrument and as an on-site adjustment tool. The structure of the adjustment menu is clearly ordered and makes setup and commissioning as easy as child's play. Status messages are also displayed in clear readable text. When an instrument is exchanged, PLICSCOM ensures that the measuring point is quickly up and running again: all sensor data are saved with a single keystroke in PLICSCOM and later copied into the replacement sensor.



## Instrument adjustment via PC and control system

DTM/FDT technology is the manufacturer-independent, innovative description technology for field instruments. With it, highly complex field instruments can be operated with mobile laptops and PCs just as well as with the usual engineering and operating environments of control systems. With the help of DTMs, the sensors are configurable in every detail and important adjustments can be carried out quickly and easily. As a system-independent operating system for DTMs, PACTware is the first choice for many field instrument manufacturers. VEGA also delivers appropriate 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 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.

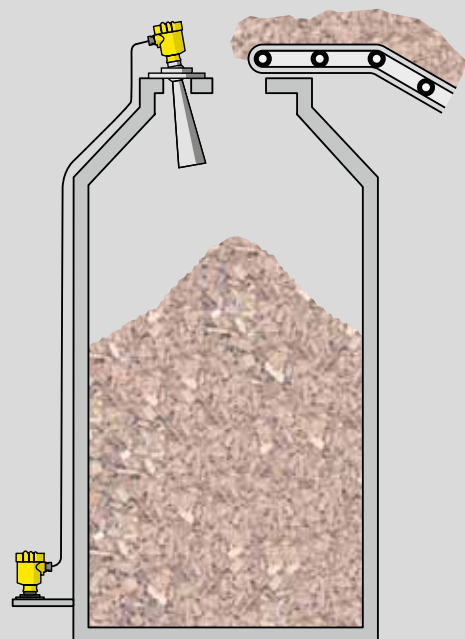
## Communication at all levels

VEGA supports all leading standards for consistent, centralized field device operation. If the measuring instruments are integrated in supervisory management or control systems, they can be accessed via the infrastructure for purposes of adjustment, maintenance and diagnosis. The DTM as well as the EDD description language are supported, depending on the system provider.

# Cellulose production

## Wood chip silo

Wood chips are the raw material for producing cellulose and mechanical pulp. They are made from debarked logs that are shredded on chippers or bought in as sawmill waste. The chips are fed via conveyor belts into silos up to 25 m high. After that they are sorted by size and quality and transported to the pulp digester or the TMP (Thermo Mechanical Pulp) system. The wood chip silos are filled and emptied in batch quantities, which creates material cones, large amounts of dust as well as bridges that can collapse during emptying.



## Level measurement with VEGAPULS 68

The optimal solution for level measurement is the bulk solids radar sensor VEGAPULS 68. Compared with conventional radar sensors, the instrument has a considerably higher signal sensitivity, which ensures that the measurement works reliably even during filling. This continuous monitoring means dependable logistics planning is possible. Further applications for VEGAPULS 68 are in the bark silos as well as the blowing tank following the pulp digester.

## Indication and adjustment with VEGADIS 61

VEGADIS 61 can be mounted up to 50 m away from the sensor. This feature allows safe and convenient on-site indication and adjustment.



### VEGAPULS 68

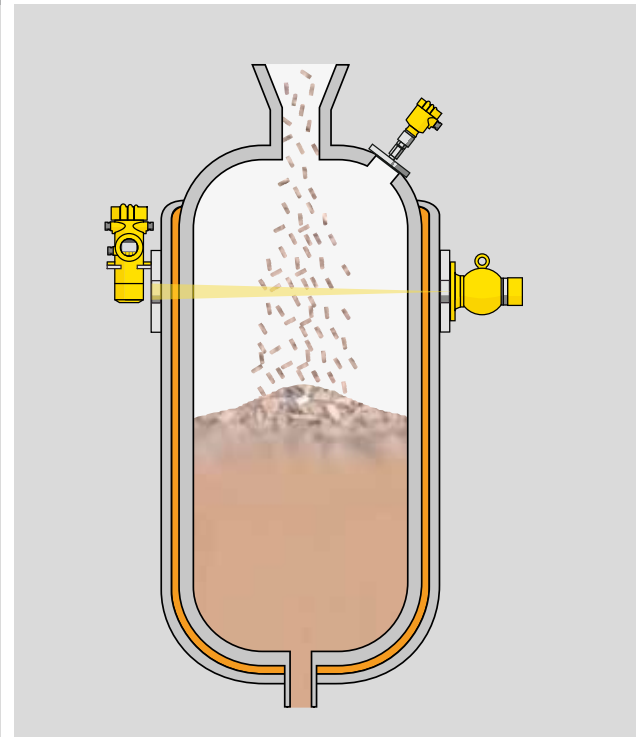
- Reliable function even during filling
- Swivelling holder for optimal orientation to material cone

### VEGADIS 61

- Mounting up to 50 m distant from sensor
- No additional power supply required

## Pulp digester

To extract the cellulose from the wood chips, the natural binder lignin must be removed and the cellulose fibres laid bare. This is carried out in the pulp digester with chemical decomposition methods. In the alkaline sulphate method, the fibers are fed into the digester by means of steam pressure at +180 °C. The subsequent cooking process using caustic soda, sodium carbonate and sodium sulphate is carried out at a temperature of +170 °C and under pressures up to 8 bar. Automatic operation of the digester requires exact monitoring of the level during filling and also of the pressure during the entire process.



## Point level detection with MINITRAC 31

When the maximum value is reached, the screw conveyors must be switched off. Due to the process conditions, this measurement must be absolutely reliable and maintenance free. The radiometric level switch MiniTrac 31 fulfils these requirements.



### MINITRAC 31

- Non-contact measurement through container wall and insulation
- Reliable function even under extreme process conditions
- Simple retrofit installation

## Source holder SHLD

The source holder holds the radioactive source and focuses the radiation beam. It provides the best possible shielding at low container weight.



### Source Holder SHLD

- Focuses radioactive radiation on the detector
- Protects the surroundings from gamma rays

## Pressure measurement with VEGABAR 51

Due to the high temperatures and extremely corrosive media, VEGABAR 51 with isolating diaphragm system is used here.



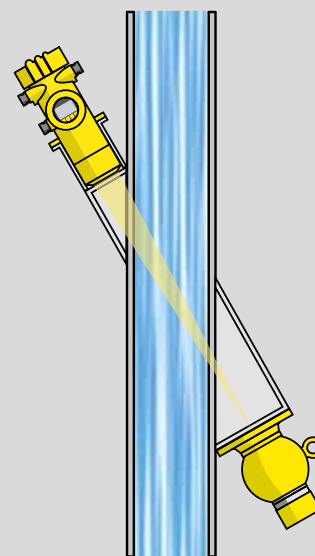
### VEGABAR 51

- Diaphragm materials with high chemical stability
- Isolating diaphragm system with capillary line
- Electronics protected from vibration and pressure shocks

# Cellulose production

## Liquor regeneration

The black liquor resulting from the pulp cooking process contains valuable chemicals as well as organic substances. It is therefore treated in the chemical recovery plant and returned to the digester. The liquor regeneration encompasses thickening to black liquor, incineration in the liquor recovery unit, reduction of the chemicals, dilution to green liquor, caustic processing to white liquor and filtration. The processes are carried out at temperatures up to +130 °C and pressures up to +3 bar, the media are highly corrosive and partly abrasive.



## Density measurement with MINITRAC 31

Environmentally harmless and energy efficient liquor regeneration requires exact information about the concentration, i.e. density, of the media. Due to the process conditions mentioned above, radiometric density measurement with MiniTrac 31 is the first choice for instrumentation. The device measures with high precision directly and contactlessly through the pipes – no intrusion into the closed system is necessary.

## Source holder SHLD

The source holder holds the radioactive source and focuses the radiation beam. It provides the best possible shielding at low container weight.



### MINITRAC 31

- Density measurement from the outside through the pipe
- Reliable function even under extreme process conditions
- Maintenance-free



### Source holder SHLD

- Focuses radioactive radiation on the detector
- Protects the surroundings from gamma rays

## Bleaching process

To achieve the desired degree of whiteness, the pulp must be bleached. For this purpose it is fed into bleaching towers up to 25 m high via pumps, stock distributors or screw conveyors, depending on the density of the material. The bleaching process runs continuously at temperatures up to +95 °C with bleaching chemicals such as oxygen, ozone or peroxide. The bleached pulp is then discharged via screw conveyors. Due to its enormous size, the bleaching tower is never emptied. Similar bleaching processes are used for mechanical pulp bleaching and waste paper de-inking.



### Level measurement with VEGAPULS 68, overfill protection with VEGACAP 64

Optimal bleaching quality requires a constant level in the bleaching tower. This is guaranteed through a level measurement in conjunction with automatic discharge control. The powerful radar sensor VEGAPULS 68 provides reliable measuring results, even under the difficult measuring conditions in the bleaching tower. And the capacitive level switch VEGACAP 64 serves as an additional safeguard against overfilling.

### Level measurement with VEGABAR 54

The level measurement in the extraction area is realized via the pressure transmitter VEGABAR 54 with ceramic CERTEC® measuring cell in a ball valve fitting.



#### VEGAPULS 68

- Non-contact, maintenance-free measurement
- Reliable function even with high stock densities
- Not influenced by steam and buildup



#### VEGACAP 64

- Insensitive to buildup
- Robust and maintenance-free



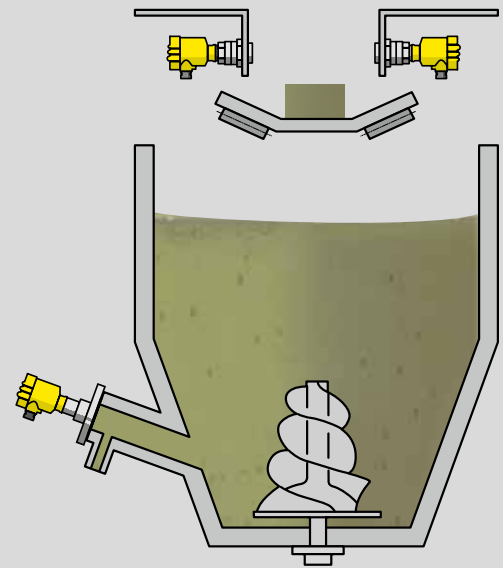
#### VEGABAR 54

- Front-flush installation in ball valve fitting
- Installation and removal of pressure transmitter without emptying bleaching tower

# Waste paper and stock preparation

## Dissolution of waste paper and cellulose in the pulper

Waste paper or cellulose bales are transported into the pulper via a conveyor belt and dissolved there through the addition of process water. Through the mechanical action of agitators, the fibres are separated for the further steps of stock preparation. The process conditions in the pulper are characterized by strong pressure shocks from falling bales, vortex formation from fast rotating agitators as well as heavy abrasion from foreign substances such as wires, glass, stones, etc.



## Belt monitoring with VEGAMIP 61

The microwave level switch VEGAMIP 61 contactlessly detects the loading height on the conveyor belt. Possible blockages are also detected, thus ensuring the automatic operation of the system.



### VEGAMIP 61

- Reliable detection of loading height
- Non-contact measurement
- Wear and maintenance-free

## Level measurement with VEGABAR 52

The hydrostatic level measurement monitors the correct proportion of waste paper or cellulose to process water. A VEGABAR 52 pressure transmitter with a robust CERTEC® measuring cell is implemented here. The gauge is mounted in a socket inclined in the direction of rotation and equipped with a rinsing facility.



### VEGABAR 52

- Ceramic CERTEC® measuring cell
- High overload resistance against pressure surges
- High resistance to abrasion

In pulpers for water-resistant paper with low pH value, VEGABAR 55 with a metallic, highly chemically stable METEC® measuring cell is used.

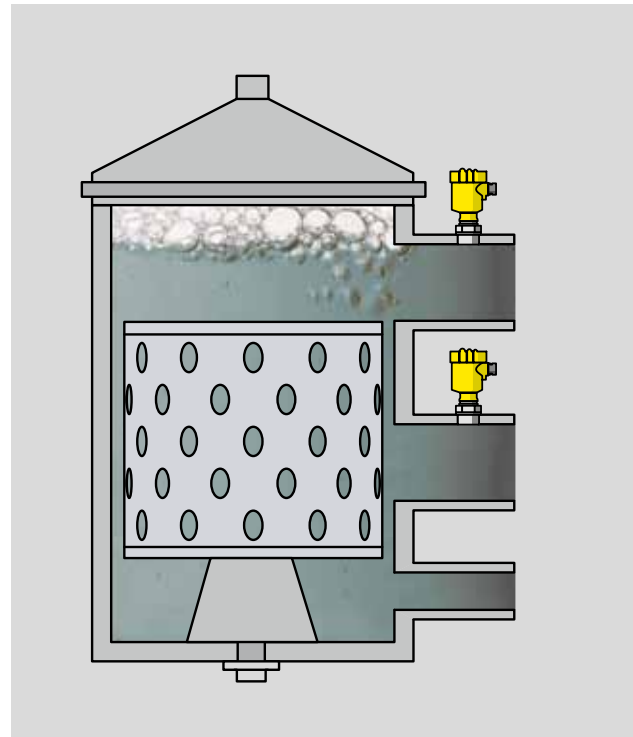


### VEGABAR 55

- Metallic METEC® measuring cell
- Resistant also with low pH values in pulper
- Fully welded, no elastomer seal

## Fibre separation in the pressure screen

Pressure screens serve to filter out contaminants and foreign matter as well as separate the fibres. The aqueous fibre suspension is pumped through the screen at pressures and temperatures of approx. +2 bar and +50 °C respectively. A rotating sieve basket inside causes the desired sorting effect. The systems have a feed inlet for the suspension, an outlet for the good material (accept) and an overflow outlet for the sorted-out material (reject). The process conditions are characterized by pressure surges and abrasion as well as contaminants in the suspension.



## Pressure measurement with VEGABAR 52 or VEGABAR 54

High screening efficiency requires a defined pressure difference between inlet and outlet. The measurement is realized with the pressure transmitters VEGABAR 52 or 54. Thanks to the ceramic CERTEC® measuring cell, the instruments are highly abrasion resistant and can be installed flush with the vessel wall.

Further typical applications for these pressure transmitters in stock preparation are level and pressure measurement in the cleaners, in the flotation system and on the disc filter.



### VEGABAR 52

- Ceramic CERTEC® measuring cell
- Front-flush, thus self cleaning
- High abrasion resistance



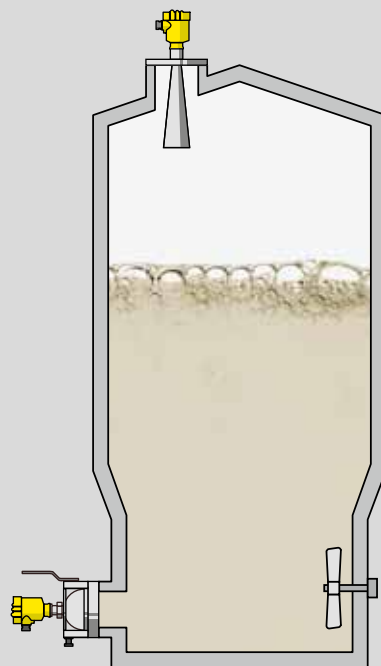
### VEGABAR 54

- Small ceramic CERTEC® measuring cell
- Front-flush, thus self cleaning
- High abrasion resistance

# Stock preparation

## Pulp storage and discharge towers

Large quantities of prepared stock are required for the continuous operation of paper mills. This material is stored in large storage towers up to 30 m high with capacities up to 2000 m<sup>3</sup>. The stock coming directly from the pulper also goes into intermediate storage in large pulper discharge towers. Characteristics for these towers are the large throughput and agitators that ensure a homogeneous stock. Vast amounts of steam form due to the heat of the stock, the surface is turbulent due to the action of pumps.



## Level measurement with VEGAPULS 62

The level measurement must provide reliable information about the contents of the towers. Notwithstanding the difficult measuring conditions, the radar sensor VEGAPULS 62 with large horn antenna is especially suitable for the measurement in the upper area of the storage tower.

## Level measurement with VEGABAR 52 or VEGABAR 54

The hydrostatic level measurement in the lower area measures the pulp suspension, which is thinned down with process water to facilitate out-pumping. This additional measurement prevents the agitators from running dry. A pressure transmitter with CERTEC® ceramic measuring cell in conjunction with a ball valve fitting is implemented here.



### VEGAPULS 62

- Non-contact level measurement
- Good signal focussing
- Unaffected by temperature, steam clouds and stock density



### VEGABAR 52

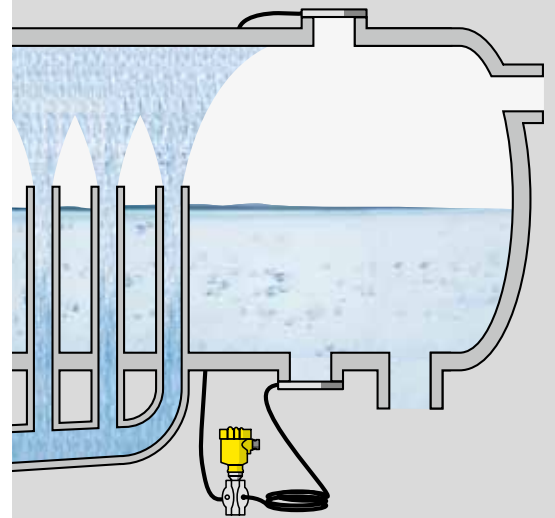
- Front-flush installation in ball valve fitting
- Installation and removal of pressure transmitter without emptying bleaching tower



# Process stabilization in the approach system

## Stock deaerators

The approach system connects the stock preparation plant with the paper machine. In this area, the pulp is thinned down to concentrations of 0.2 ... 1.4 % and its flow is stabilized. Among other things, the quantity and the flow speed of the pulp are regulated and the remaining contaminants are removed in screens and cleaners. An especially important element are the stock deaerators in front of the headbox. Under vacuum they remove the residual air and ensure steady machine operation and constant quality parameters.



## Level measurement with VEGADIF 65

To operate effectively, the stock deaerator must always be kept at a defined, millimetre-exact level. The continuous level measurement guarantees this and also protects the downstream stock pump against dry run damage. Since the level amounts to only several hundred millimetres with superimposed vacuum, the differential pressure transmitter VEGADIF 65 is used here. Front-flush flange isolating diaphragms avoid deposits, and bilateral capillary lines inhibit thermal effects on the measurement.



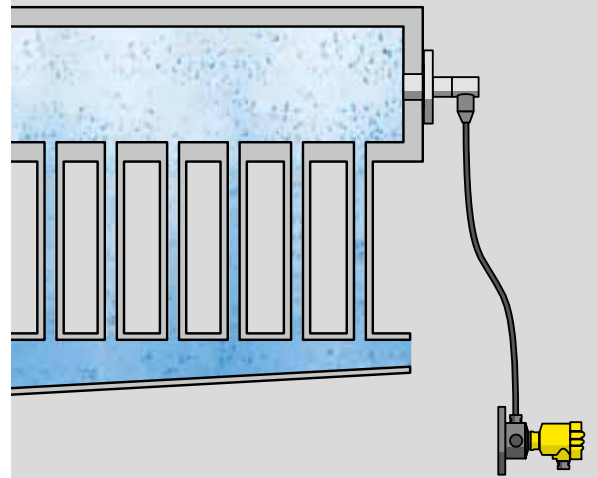
### VEGADIF 65

- Differential pressure transmitter with front-flush flange isolating diaphragms
- High measuring precision
- Reliable function even with foam generation

# Paper and paperboard machine

## Headbox

After being deaerated, diluted and screened in the approach system, the suspension consisting of fibres, additives and water is pumped into the headbox of the paper machine. With hydraulic headboxes, the material reaches the sieve via a tapered cross-flow distributor as well as several pipe manifolds leading to the slice outlet. The exit speed from the slice is adjusted to the speed of the wire mesh conveyor via the headbox pump pressure. The area around the headbox is extremely damp and warm.



## Pressure measurement with VEGABAR 52

A pressure measurement in the hydraulic headbox is used for direct speed control of the stock feed pump. It must be very precise and is thus implemented redundantly. The measuring points are located near the slice on the tender side and drive side of the machine. The optimal solution is VEGABAR 52 in absolutely front-flush version, with accuracy class 0.05 and high protection rating IP 68.

In headboxes with superimposed air cushion, stock flow is often regulated via the level. The ideal solution here is the radar sensor VEGAPULS 63. It can be installed front-flush from above, has an encapsulated antenna system and measures with millimetre precision.



### VEGABAR 52

- Absolutely front-flush pressure measurement
- No effect on stock application
- No flushing pipes required

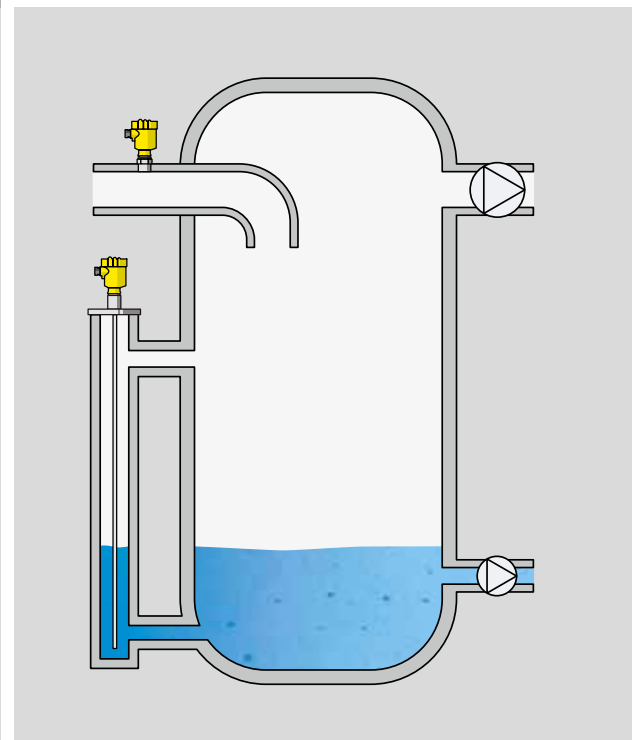


### VEGAPULS 63

- Non-contact, millimetre precise level measurement
- Front-flush installation
- Encapsulated antenna system

## Water trap

In the press and wire section of the paper machine, the paper web is dewatered via suction rollers and boxes. The extracted liquid water, which is drawn away through pipes under vacuum, must be prevented from reaching the vacuum pump itself. To ensure this, water traps are built into the pipeline leading to the vacuum pump. The collected water is drained from the trap by a separate water pump.



## Vacuum measurement with VEGABAR 52 or VEGABAR 54

Either VEGABAR 52 with large or VEGABAR 54 with small ceramic CERTEC® measuring cell is implemented for vacuum measurement in the pipe. The measured values are used to control the vacuum pumps, and thus ensure continuous removal of water from the paper web. The measuring diaphragm is largely protected from deposits due to the front-flush installation.

## Level measurement with VEGAFLEX 61

The optimal solution for level measurement in the water trap is VEGAFLEX 61 which uses guided microwave technology. It operates unaffected by the vacuum and delivers reliable measurement data, even with a low level, for controlling the separate water pump.



### VEGABAR 52

- Ceramic CERTEC® measuring cell
- Front-flush, thus self cleaning
- High abrasion resistance



### VEGABAR 54

- Ceramic CERTEC® measuring cell
- Front-flush, thus self cleaning
- High abrasion resistance



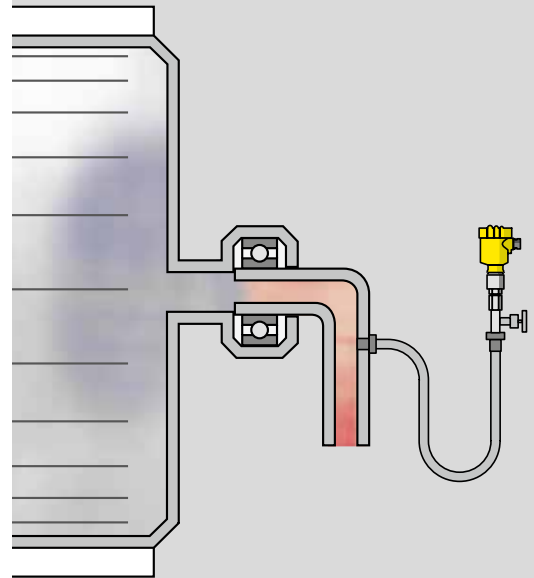
### VEGAFLEX 61

- Level measurement with reliable function in vacuum
- Setup without adjustment
- Simple installation from above

# Dry section

## Gentle and effective drying

When the paper is pressed, a dry content of approx. 55 % can be achieved. The remaining moisture is removed by a steam-heated cylinder in the dry section of the paper machine. Heat transfer to the paper is carried out through direct contact with the outer wall of the cylinder. The drying process uses thermal energy from the steam, which causes a condensate film to form on the inside wall of the cylinder. This water film affects the heat transfer to the paper and it must therefore be continuously removed via a syphon system.



## Pressure measurement with VEGABAR 52

The right amount of heat transfer from the drying cylinder to the paper is monitored via pressure measurement with VEGABAR 52 respectively at the inlet and at the outlet. This separated measurement is a particularly economic solution because it saves the installation of differential pressure pipes. VEGABAR 52 delivers exact individual pressure values to the control system and ensures the required operational reliability through the highly overload resistant CERTEC® measuring cell, even when pressure surges occur in the pipeline.

An alternative is the classic differential pressure measurement with VEGADIF 65 via differential pressure pipes and valve manifolds.



### VEGABAR 52

- Direct pressure measurement without differential pressure pipes
- Economic solution with difference generation in the control system
- High measuring precision



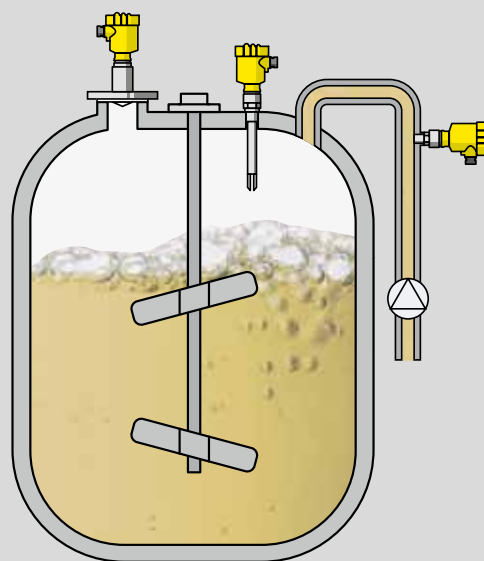
### VEGADIF 65

- Difference generation directly at the measuring point
- High measuring precision

# Chemicals and auxiliary materials

## Storage containers for chemicals and auxiliary materials

The production process and quality of the paper are supported through the systematic addition of chemicals and auxiliary materials. Typical substances used in stock preparation are hydrogen peroxide, sodium hydroxide, sodium silicate, fatty acids and soap as well as fillers and starch. Other chemical additives added prior to the head-box are special polymers, defoamers as well as fixing agents and retention agents. Some of the chemicals are aggressive, produce gases and have temperatures up to +95 °C. They are therefore stored in stainless steel or GRP containers.



## Level measurement with VEGAPULS 63

The optimal solution for level measurement in this area is the radar sensor VEGAPULS 63. It remains uninfluenced by the process conditions and provides exact measuring results even with agitators in the vessel.



### VEGAPULS 63

- Non-contact level measurement, suitable for all media and vessels
- Antenna system completely PTFE encapsulated
- No mounting boss required

## Overfill protection with VEGASWING 63

The vibrating level switch VEGASWING 63 together with the signal conditioning instrument VEGATOR 636 is used as overfill protection according to WHG (Water Resources Act). The yearly WHG check is carried out with a simple push of a button on the signal conditioning instrument.



### VEGASWING 63

- Product-independent and adjustment-free point level detection
- Chemically resistant ECTFE coating

## Pressure monitoring with VEGABAR 53

The pressure transmitter VEGABAR 53 with metallic diaphragm monitors the pressure in the pipeline and protects the chemicals pump from running dry.



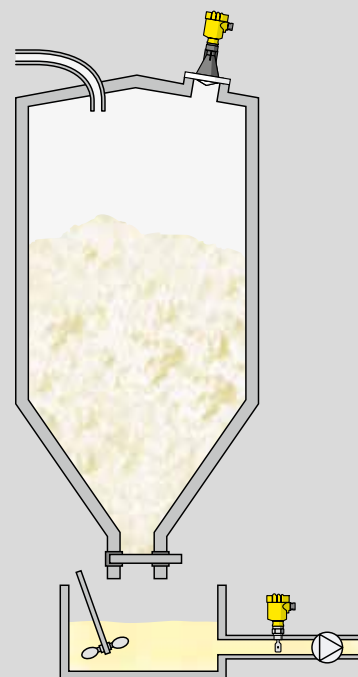
### VEGABAR 53

- Pressure measurement with chemically resistant measuring diaphragm
- Small, front-flush process fitting

# Chemicals and auxiliary materials

## Starch liquefaction

Starch is an important additive for increasing the strength of the paper. It is usually applied as surface starch via a glue or film press but is also mixed into the pulp mass on the wet end of the paper machine. The starch processing system includes the starch silos, the liquefaction process, the starch cooker as well as the stations on the machine where the starch is applied. The raw starch is stored in narrow, tall silos. Filling here is carried out pneumatically, generating large amounts of dust. The starch is emptied directly into the slurry production process below the silo. Finished slurry is pumped into the starch cookers by using eccentric pumps which must not run dry.



## Level measurement with VEGAPULS 67

Because of strong dust generation in the silo, the bulk solids radar sensor VEGAPULS 67 is quite the perfect solution for this level measurement. With its high signal sensitivity and narrow transmission beam, it can deliver reliable measurement data even during the filling process.



### VEGAPULS 67

- Non-contact level measurement with reliable function even during filling
- Optimal orientation via adjustment seal

## Dry run protection with VEGASWING 61

Dry run can cause damage or even complete breakdown of the eccentric pumps. For that reason, the slurry flow is monitored with a VEGASWING 61 vibrating level switch.



### VEGASWING 61

- Universal level detection for liquids
- Adjustment free
- Small process fitting and short tuning fork

# Instrument overview



## VEGAPULS 62



### Radar sensor for continuous level measurement

- 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 35 m (115 ft)



## VEGAPULS 63



### Radar sensor for continuous level measurement

- 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 connection: 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

Measuring range: Up to 15 m (49 ft)

The instrument photos show the standard version of the instrument types.

Explosion protection

Safety standards

Hygiene standards

# Instrument overview



## 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: -40 ... +450 °C (-40 ... +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 61



### TDR sensor for continuous level measurement

- Simple setup and commissioning 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 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)



## 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 G¾ A or ¾ NPT  
Flanges from DN 50 or ANSI 1"

Probe length: VEGASWING 63 up to 6 m (20 ft)

The instrument photos show the standard version of the instrument types.





## 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)



## VEGAMIP T/R 61



### Microwave barrier for level measurement in bulk solids and liquids

- Non-contact measurement
- Insensitive to contaminants
- Unaffected by changing product properties
- Wear and maintenance-free
- Simple adjustment

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

Process pressure: -1 ... +4 bar (-100 ... +400 kPa)

Process fitting: from G1 $\frac{1}{2}$  A or 1 $\frac{1}{2}$  NPT  
Compression flange ANSI 3"



## VEGABAR 52



### Pressure transmitter with CERTEC® measuring cell

- Dry, 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 connection G $\frac{1}{2}$  A,  $\frac{1}{2}$  NPT  
Thread from G1 A or 1 NPT  
Flanges from DN 25 or ANSI 1"  
Process fittings for the food and paper industries

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

# Instrument overview



## 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 connection: Manometer fitting G½ A  
Thread from G½ A or ½ NPT  
Hygienic fittings

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



## VEGABAR 54



### Pressure transmitter with MINI-CERTEC® measuring cell

- Dry, 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 or ½ NPT  
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)

The instrument photos show the standard version of the instrument types.



## VEGADIF 65



### Differential pressure transmitter with metallic measuring diaphragm

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

Process temperature:	Basic version	-40 ... +85 °C (-40 ... +185 °F)
	Isolating diaphragm	-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 (0.145 ... 4000 kPa)		



## MINITRAC 31



### Nucleonic sensor for density measurement and level detection

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

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

## VEGASOURCE 31



### Protective container for radioactive source

- Best possible shielding at low container weight
- Simple exchange of radioactive source
- Optional pneumatic or electrical on/off switching
- Focussing of radioactive radiation on detector

Process temperature:	any
Process pressure:	any
Process fitting:	Flange DN 100 or ANSI 4"
Ambient temperature:	-50 ... +100 °C (-58 ... +212 °F)



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