Oil & Gas Industry — Refining Information

Measurement Technology for Modern Refining

Looking Forward VEGA

Contents

Responsibility for People and Products

VEGA's comprehensive offering of products and services for the measurement of level, switching, pressure, and density is setting the standard in the refining industry. That is because VEGA systematically combines different measuring principles and the latest technologies to meet the demands of modern instrumentation.

A Complete Measurement Solutions Provider

VEGA is the undisputed technological leader in the area of radar level measurement. Additional measuring principles, such as guided microwave, vibrating level switches, capacitive, and radiation-based measurement round out the company's offering of level, switching, and density instrumentation. For pressure measurement, VEGA offers transmitters that measure process, hydrostatic, and differential pressure.

Modular and Cost-Effective: The plics Instrument System

plics® is VEGA's unique modular instrument system. It allows a customized combination of sensor, process fitting, electronics, and housing for the user, creating the exact measurement technology they really need. Additionally, the system quickly puts the instrument into operation through simple, standardized setup and adjustment procedures.

Reliability for Refining

- Robust instrumentation for applications with high pressure and temperature conditions
- Continuous level and point level detection protect against overfill, even in tank farms with floating roof vessels
- Instrumentation setup, calibration, and service provided by highly trained field service team
- Non-contact instrumentation available that installs externally without interruption to the process
- High quality instruments with SIL, FM, ATEX, and CSA qualification to guarantee operational safety
- Instruments that are insensitive to dust, vapor, or buildup
- Wear- and maintenance-free transmitters reduce downtime

Partnership for a Demanding Industry

With advanced electronics and technology, VEGA products are equipped to handle the increased demands of modern refining methods used to process both light and heavy crude. VEGA's diverse product offering delivers overfill protection and redundant systems for the most challenging applications, even with extreme temperature and pressure. These advanced products enable greater efficiency and accuracy within the refinery.

Every Type of Tank and Process Connection

From simple thread and flange connections to complex custom solutions, VEGA sensors offer an applicable process fitting. VEGA solutions give confidence in all areas of installation, regardless of measuring principle or application. Across refining units and varying process conditions, the measurement possibilities are nearly endless.

VEGA's compact instrumentation is easily mounted on a single flange when space is limited.

Reliability Under Extreme Conditions

Refineries place heavy demands on the measurement technologies used within the facilities. The instruments are exposed to difficult process conditions, including extreme heat and pressure. Volatile and corrosive products make level, pressure, and density measurement a challenge for any instrumentation. The new plics generation of instruments meets this challenge with reliable, tried-and-tested sensor and housing technologies, providing unit operators with the accurate measurement data they need to safely and efficiently run their processes.

Meeting Each Measurement's Needs

Measurement solutions from VEGA are chosen based on the specific requirements of each application. Process conditions, connection requirements, installation, and setup are all variables that are considered in the selection of the proper measuring technology and device for a refinery application. Every VEGA instrument installed in a measurement application provides optimal, uncompromising performance for the refining facility.

Complete Engineered Solutions

VEGA is proud to offer engineered solutions that enhance the output of refineries. The Multi-Point Density Array and Coke Drum systems provide unique and accurate engineered solutions for measuring traditionally tough applications. Extensive history and experience in the refining industry enables VEGA to provide a complete application solution that addresses all the needs of the customer.

plics– Easier is Better

Indicating & Adjustment Module

PLICSCOM

VEGACONNECT

Electronics

4 … 20 mA/ HART

Profibus PA

Foundation Fieldbus

Level Switch

Housings

Plastic

Stainless Steel

Aluminum

Plastic Dual Chamber

Stainless Steel Dual Chamber

Aluminum Dual Chamber

Process Fittings

Thread

Flange

Sanitary

Custom Design

Sensors

Radar

Guided Microwave

Ultrasonic

Capacitive

Vibration

Microwave Barrier

Process Pressure

Hydrostatic

Differential Pressure

Explosion protection

Safety standards

Trend-setting measurement technology evolves to meet the needs of people who use it. That is why we developed plics — the world's first modular product system for instrumentation. The modularity allows for easy component selection to meet individual application requirements. Because every one of our sensors is custom built from plics, the system fulfills the requirements of any industry and its specific applications.

Simpler Planning with plics

The choice and combination of sensors, process fittings, electronics, and housings simplifies instrument selection and engineering. With plics, cost reduction starts right at the planning stage.

Clear Advantages in Plant Construction

Short delivery times, simple wiring, and fast setup and commissioning save the plant builder significant time and costs. The configuration, wiring, and setup of VEGA instruments are always the same, so a single experience with the process is repeated with any plics measuring principle and application at any time.

Assistance for the User

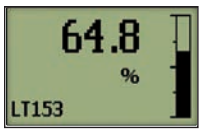
plics gives a convincing performance in daily use because of its high operational reliability, simplified servicing, and reduced spare part stocking through the use of many identical components. The consistency of technology and operation simplifies and accelerates work with different plics instruments.

plics — The World's Only Modular System

plics provides the best basis of reliable instrumentation for all level, switching, pressure, and radiation-based measurements. Experience, refined technology, and robust construction form this basis of measured value reliability. For worldwide use in refineries, the sensors are tested and approved by leading classification organizations.

- Cost-effective instrumentation with customized instrument configurations
- Low maintenance needs result from highly resistant, robust instrumentation construction
- Quick process integration through simple planning, fast setup, and commissioning
- Easy servicing made possible by the backup feature of the adjustment module

Adjustment and System Integration

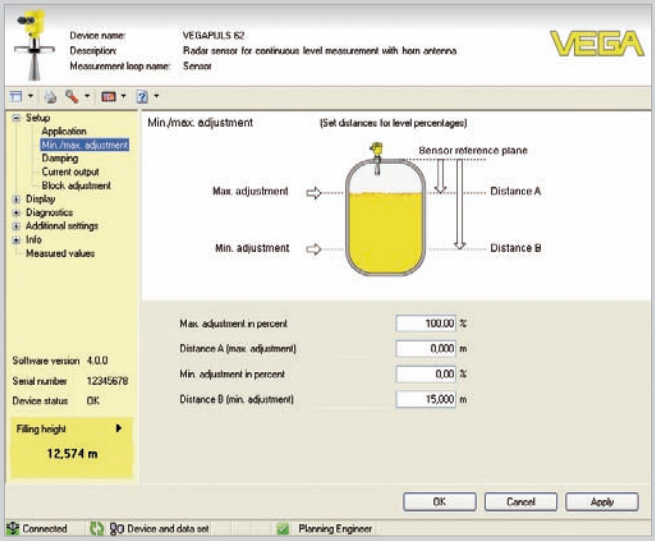


Instrument Adjustment with PLICSCOM

The PLICSCOM indicating and adjustment module plugs into any plics instrument. It functions as a measured value indicator on the instrument and as a local adjustment device. The structure of the adjustment menu is clearly organized and makes setup and commissioning easy. In addition, the status messages are displayed directly on the screen. When an instrument is exchanged, PLICSCOM ensures fast availability of the measuring point — all sensor data is saved by pressing a key on the PLICSCOM and later copied into the replacement sensor.

Instrument Adjustment through a PC or Control System

FDT/DTM technology is an innovative, manufacturer-independent description technology for field instruments. Complex field instruments operate with laptop computers and PCs as easily as with the current engineering and operating environments of control systems. With DTMs, the sensors are easily configurable and important adjustments can be carried out quickly. As a system-independent operating platform for DTMs, PACTware is the first choice for many field device manufacturers. VEGA delivers the corresponding field device descriptions for system environments that require EDD description technology.



Current Standards for Data Transmission

VEGA offers proven, reliable solutions, including 4 … 20 mA/HART measurement data transmission, Fieldbus technologies like Profibus PA or Foundation Fieldbus, and wireless transmission. For level detection, the selection includes contactless switch, relay, transistor, mA step change, and NAMUR signal.

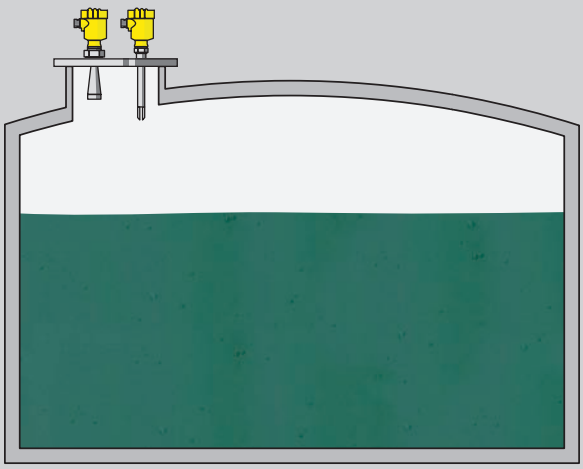
Communication at All Levels

VEGA supports all main standards for uniform, centralized field instrument operation. If the instruments are integrated in primary management or control systems, the field instruments are accessible for adjustment, servicing, and diagnosis purposes through the existing infrastructure. Both DTM and EDD description technologies are supported.

Tank Farms in the Refinery

Level Monitoring of Fixed-Roof Storage Tanks

Level measurement of bulk liquids storage tanks in a refinery is necessary for inventory management and control as well as custody transfer situations. The VEGAPULS 62 radar adapts to meet existing process connections to continuously monitor the liquid level in the storage tank. A second radar instrument can be paired for redundant level control, without the risk of cross-talk. For high level control, a VEGASWING 63 vibrating level switch provides overfill protection. These multiple measurement points fit into a small connection, reducing the cost of implementation for the system.



Level Monitoring of Floating-Roof Storage Tanks

The floating-roof style of storage tanks proves to be a difficult measurement. The VEGAPULS 62 brings the advantages of radar, and mounts onto a swing arm that is accessible from the platform at the top of the storage vessel. The radar tracks the level of the roof as it rises with the stored material, and reports the information through various standard communication protocols.

VEGAPULS 62

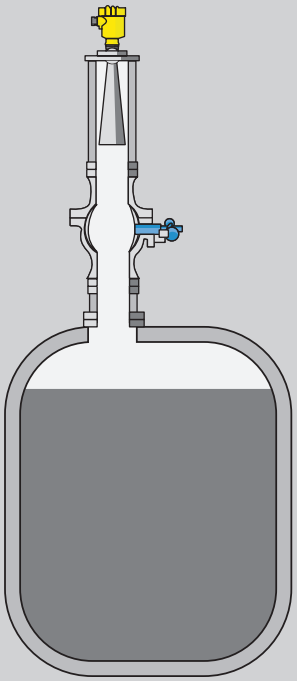
- Non-contact measurement for liquids
- Small, lightweight design makes installation easy
- Simple retrofit capability utilizes existing process connections

VEGASWING 63

- High level switch provides redundancy
- Varying insertion lengths meets specific application requirements
- Fail-safe design through continuous self diagnostic fault monitoring
- Easy function test by pressing test key

Spill Prevention, Control, and Countermeasure

Conformance with the environmental regulation Spill Prevention, Control and Countermeasure plans is achievable with a VEGA system. The VEGAPULS 62's advanced diagnostics make it the technology of choice to produce a safety high level signal, protecting against overfill situations. Actual data from the measurement can be verified against the initial setup data to confirm the quality of the return signal. This verification is SIL-approved, and ensures that the actual level measurement is serving its intended purpose of creating a safety high level signal. The radar is also mountable on a ball valve assembly, which can be closed to isolate the radar for service and access.



Level Measurement in Storage Spheres

The pressurized vessels of some finished products, such as liquefied petroleum gas, creates a measurement challenge. A VEGAPULS 62 radar withstands the difficulties of level measurement in the sphere, capable of measuring products with a dielectric value as low as 1.5. Isolation ball valves are used for safe access in applications with aggressive products.

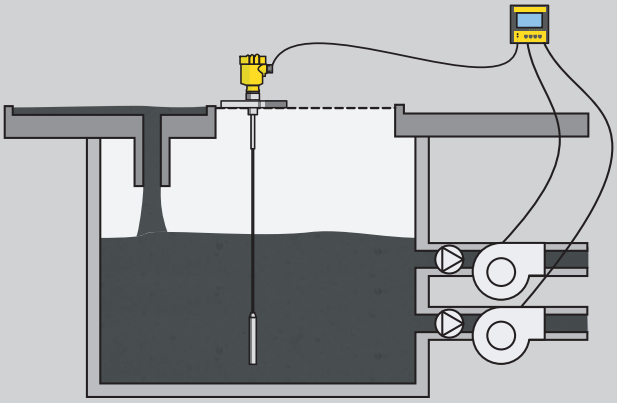
VEGAPULS 62

- Non-contact measurement is ideal for floating-roof measurements
- Integral self-monitoring significantly reduces maintenance costs
- Operation verification conducts without process interruption and system downtime

Sumps

Sump Level Measurement

Level measurement in sump and pump control are often a maintenance challenge. Historically, floats, bubblers, ultrasonic, and capacitive probes were used to provide level control. These technologies have proven to be maintenance-intensive primarily due to buildup, plugging, and foam. The VEGAPULS 67 radar or VEGAFLEX 61 guided microwave sensor provide reliable continuous level measurements. Both instruments are unaffected by viscosity and product variance. The VEGAFLEX 61 works particularly well in applications with foam. By using more reliable technology such as radar or guided microwave, maintenance costs are reduced significantly.



Local Pump Control

When a radar or guided microwave sensor is used in conjunction with a VEGAMET 391, the system provides efficient monitoring of the process level. This decreases the risk of overfill, downstream contamination, and pump overuse. With up to six relays, the VEGAMET 391 provides lead/lag-changeover control of the pumps, allowing the controller to maintain consistent usages throughout the system.

VEGAFLEX 61

- Robust construction and materials resist product buildup
- Guided microwave technology measures product level through foam
- Non-moving parts eliminate maintenance needs associated with floats and bubblers

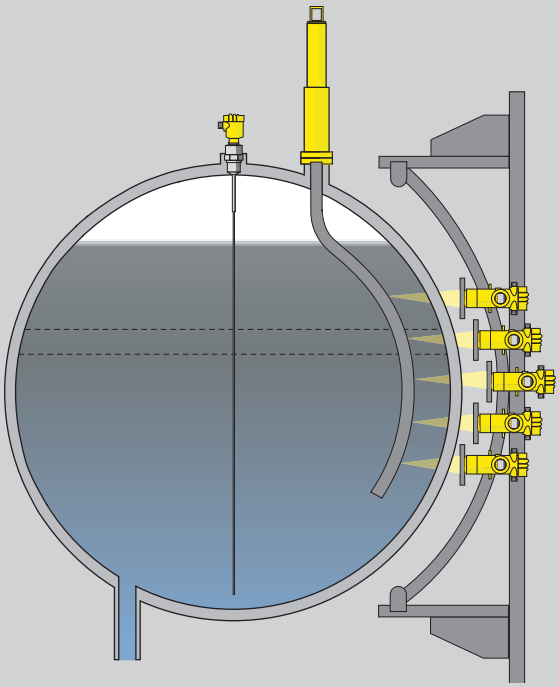
VEGAMET 391

- Comprehensive adjustment functions for scaling, linearization, pump control, and flow measurement
- Integrated web server publishes measurement values for remote viewing
- Measured value and message transmission via e-mail
- Suitable for data exchange with VEGA's WEB-VV software

Desalters

Interface Tracking in the First Stage Desalter

To prevent corrosion to downstream equipment following the desalter, it is important that the desalter unit runs efficiently. When the crude oil mixes with the emulsifying chemicals and water, the resulting emulsion layer makes it difficult for standard level measurement technologies to reliably track the interface. The Multi-Point Density Array provides a fixed density profile over the measurement range in the desalter, using several density detectors across the desalter's span. This allows the unit operator to track the emulsion layer and changing interfaces within the process. This reporting provides a clear picture for the operator to efficiently run the desalter and maximize throughput.



Total Level Control in the Second and Third Stage Desalters

To maximize efficiency of the electrostatic grid as it removes contaminants within the second and third stage desalters, control of the oil and water interface is held just below the grid. To monitor this level, a VEGAFLEX 67 guided microwave sensor sends pulses down its rod probe to the interface level and translates the time of the pulse's return into a level output. Reliable monitoring of this level increases efficiency of the unit and ensures the quality of the feed moving into the next process unit.

Multi-Point Density Array

- Reliably tracks emulsion layer to keep the process stream efficient
- Adjustable measurement span accommodates changing process properties
- Remains online even when replacing a detector to eliminate downtime

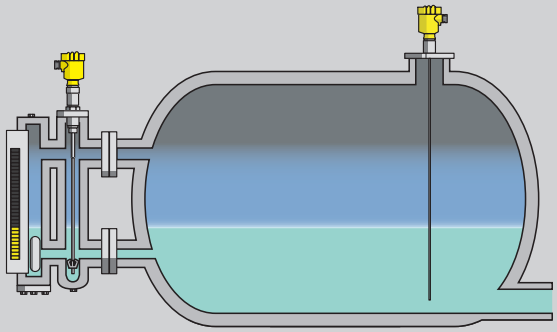
VEGAFLEX 67

- Simple setup expedites installation
- Unaffected by viscous process properties
- Rigid rod probe prevents interference with electrostatic grid

Separators

Two-Phase Interface Level Measurement

Accurate interface measurement in refinery separators is critical to product quality because it confirms there is complete separation. For liquid-liquid interface monitoring in a separator, the VEGAFLEX 62 guided microwave sensor provides an ideal level measurement that installs easily and offers a low maintenance schedule. The accurate measurement of the VEGAFLEX 62 helps control the quality of the separator's output and thus helps to extend equipment life in the following units by avoiding potentially expensive operating issues.



Three-Phase Interface Level Measurement

When air is present in the separator, dual measurement is needed for reliable interface level control. The VEGAMAG 62 magnetic level indicator and bridle combination integrate the total level and interface level reporting of the VEGAFLEX 67 into the process. The VEGAFLEX 67 is immune to the crude supply density changes making it reliable for continuous level control.

VEGAFLEX 62

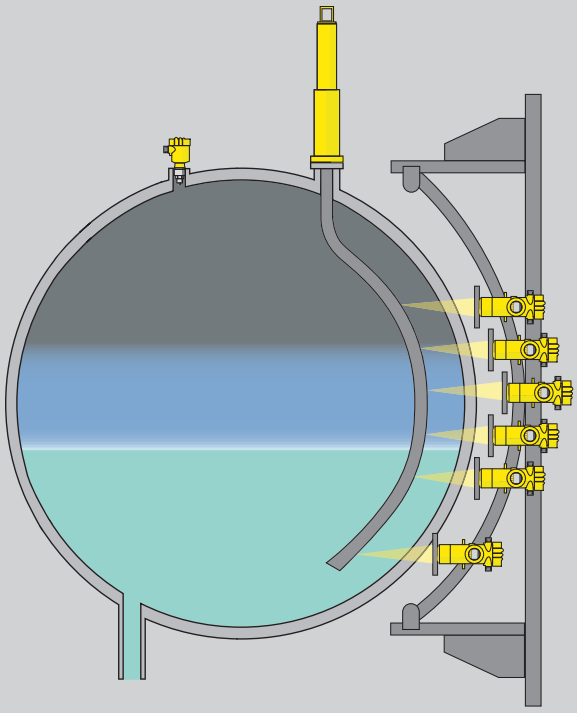
- Application pre-configuration expedites startup
- Non-moving parts reduce maintenance needs
- Robust construction materials are not affected by process conditions

VEGAMAG 62

- MLI and guided wave radar provide redundancy
- Dual measurement capability provides both total level and interface level
- Continuous reporting increases operational efficiency

Multi-Point Interface Tracking

The layers created in separation processes form interfaces that must be tracked to manage the output of the material from the unit. The Multi-Point Density Array reports density on a horizontal plane across the application-specific measurement range, enabling accurate control of the process. The MDA effectively measures even when no clear interface exists. With an external mounting configuration, the detectors can be serviced or taken offline without disruption to the separation process.



Pressure Monitoring

Monitoring the process pressure in the separator is a safety precaution for the unit and refinery itself. The VEGABAR 53 pressure transmitter withstands the process pressures inherent to separation and provides a reliable pressure reading back to the controller. The transmitter's fully welded, metallic measuring cell is extremely rugged and resists the effects of condensation and vibration.

Multi-Point Density Array

- Customizable detector system tracks multiple interfaces
- Non-contact measurement is unaffected by high process temperatures
- Online tracking increases production efficiency

VEGABAR 53

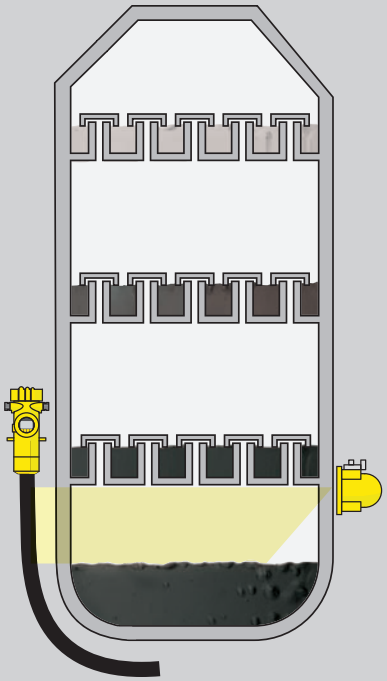
- Strain gauge sensor cell contains no fill fluid to avoid potential leaks
- Numerous connection options fit to existing connections

Resid Levels

Measurement of Column Bottoms

The heavy, highly viscous process material and extreme temperature in the bottom range of many column or tower units cause operational difficulties for most traditional instrumentation. For reliable level control in such conditions, a non-contact technology is necessary.

The FiberTrac 31 radiation-based detector measures through thick insulation and easily adapts to vessel contours. The accurate, repeatable measurement that the FiberTrac provides reduces maintenance needs while providing operators with better control of residual feeds.



FiberTrac 31

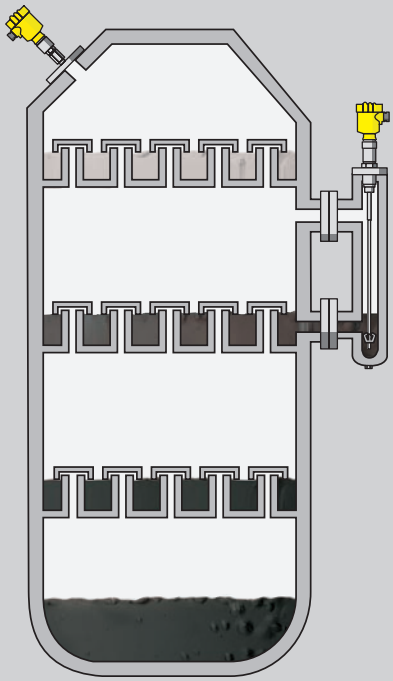
- Flexible detector adapts to vessel shape, minimizing detector quantities
- Detector replacement is online, eliminating process downtime for maintenance
- Lightweight design reduces mounting hardware and structural requirements
- Easy proof test verifies operation without costly process downtime

Tray Levels

Level Control of Column Trays

Accurate level control of column trays in many refinery units ensures product quality of the different cuts of hydrocarbon, but is made difficult due to flashing and other extreme process characteristics. Using a VEGAPASS 61 bridle chamber ensures that the trays are monitored reliably, and the online calibration features of the integral guided microwave sensor provide quick and easy access to the measurement. The technology is immune to product density changes and buildup, producing an accurate measurement through changes in the process.

This solution for level control of trays is applicable in many refinery applications, including distillation columns, vacuum towers, fractionators, debutanizers, depropanizers, and deethanizers.



Column Pressure

Monitoring head space pressure at the upper end of refinery columns is important to ensure that the process is operating under ideal pressure conditions. A VEGABAR 51 pressure transmitter operates effectively during temperature fluctuations caused by operational phases to report the column's pressure to the unit operator. The operator can thus control the pressure to ensure efficiency and stability of the column's process.

VEGAPASS 61

- Non-moving parts are immune to mechanical failure
- Low maintenance requirements reduce downtime and costs
- Single rod probe prevents plugging and results in a reliable measurement
- Overfill protection ensures safe practices
- Easy proof test verifies operation without interruption of the process saves maintenance and downtime costs

VEGABAR 51

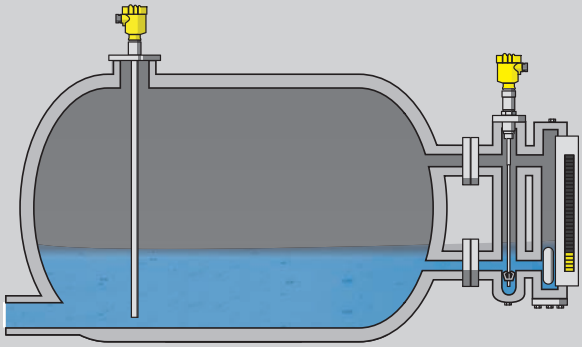
- Isolated diaphragm increases temperature resistance
- Unobtrusive sensor is unaffected by foam generation
- Tough diaphragm materials provide excellent chemical resistance

Process Drums

Internal Interface Level Measurement

To ensure that reflux is properly cycled back to the distillation column, effective separation of product and water must occur in the reflux drum. Tracking the level of the separation's interface ensures that the correct process material exits the reflux drum without contamination.

The VEGAFLEX 67 guided microwave sensor produces the interface measurement regardless of density changes in the crude supply and the high process pressures involved in the separation. It easily retrofits onto existing displacer bridles and also installs directly in the vessel.



Bridle Interface Level Measurement

For field visualization and continuous level tracking, the VEGAMAG 62 provides a complete solution. A magnetic level indicator and guided microwave sensor in a bridle chamber can mount to existing process connections, such as those used by a displacer system. The reliable measurement ensures output quality and lengthens the life of the equipment, reducing maintenance time and cost.

VEGAFLEX 67

- Continuous, online tracking maximizes operator control
- Reliable measurement ensures product quality
- Non-moving parts eliminate maintenance needs

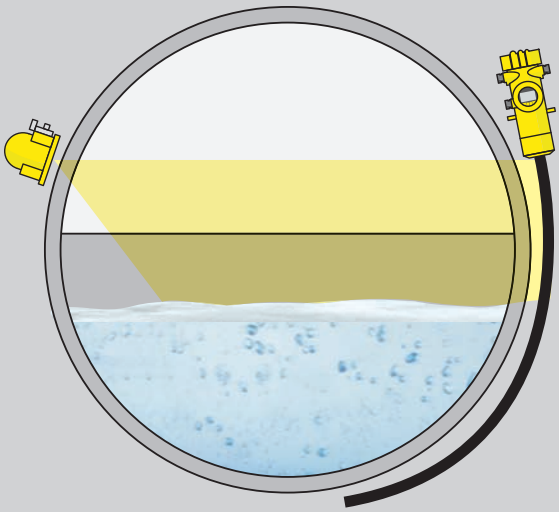
VEGAMAG 62

- MLI and guided wave radar provide redundancy
- Robust material options are resistant to extreme process conditions
- Guided wave radar measures accurately during a fully flooded chamber or vapor layer

Reboilers

Level Control for Extreme Conditions

Proper control of the level in the reboiler ensures efficient operation of the unit. Due to extreme process conditions, non-contact, radiation-based level detection is the most reliable solution for level control. The FiberTrac 31 mounts external to the reboiler without process shutdown and measures the level in the reservoir. Proper monitoring and control of the level ensures that liquid is maintained over the heating coils. This maximizes the reboiler's efficiency and output, and thus the efficiency of the tower to which the reboiler feeds.



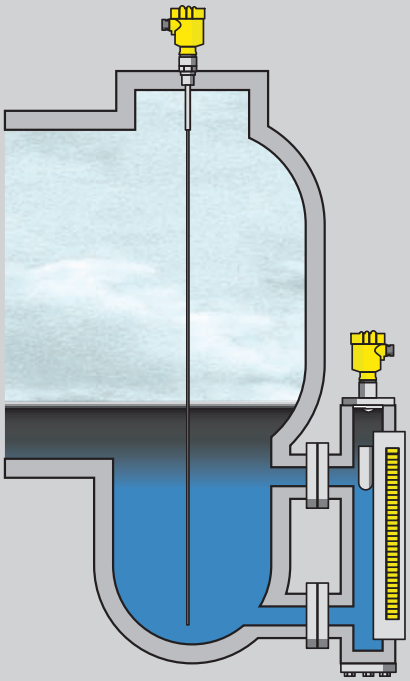
FiberTrac 31

- Non-contact operation is unaffected by process temperature
- Lightweight detector eliminates need for cranes or special rigging
- Small bend radius of flexible detector mounts to vessel shape

Flare Knockout Drums

Continuous Level Monitoring

The flare knockout drum requires continuous, accurate level monitoring to keep liquids from reaching the flare and creating a potential fire hazard. In order to ensure safety by performing this critical measurement, a VEGAFLEX 67 guided microwave sensor tracks the total process level over the span of the knockout drum, as well as the vessel's interface level. The information is continuously reported to the operator for proper control. The VEGAFLEX 67 has no moving parts, reducing maintenance requirements.



Bridle Level Measurement

For level measurement in the boot of the flare knockout drum, a VEGAMAG 63 provides remote reporting and local visualization. The accuracy of the measurement provided by the VEGAMAG 63 helps the operator determine the liquid level in the drum, recovering water to be sent to the water treatment plant and keeping entrained liquid from reaching the flare. The small size of the VEGAMAG 63 allows it to easily fit within mounting constraints, even when space is limited.

VEGAFLEX 67

- Continuous, online tracking maximizes operator control
- Reliable measurement ensures product quality
- Non-moving parts eliminate maintenance needs

VEGAMAG 63

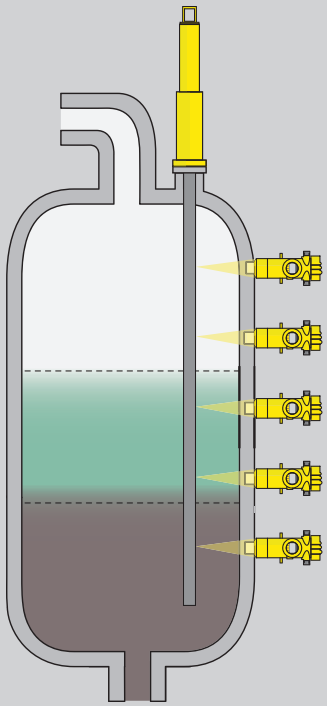
- Overfill protection
- Tracking level of float-top eliminates problems associated with low dielectric values
- Robust material options are resistant to extreme process conditions

Catalyst Bed Reactors

Continuous Density Measurement

As with many other refining applications, the catalyst bed reactor has an optimum level that is critical to maintain for efficiency. This application presents the challenges of high temperature and the need for low-maintenance instrumentation.

The non-intrusive MiniTrac 31 density detector provides accurate and reliable measurement of layers within the reactor while remaining unaffected by product variation. The MiniTrac 31 provides a continuous density or point level measurement; employing multiple detectors produces both continuous and point level measurements across the span of the reactor.



By tracking the density in the reactor with MiniTrac, the output provides insight to the operator so that they can optimize control. Maintaining the proper level in the vessel ensures that the expensive catalyst is used at the highest level of efficiency without waste.

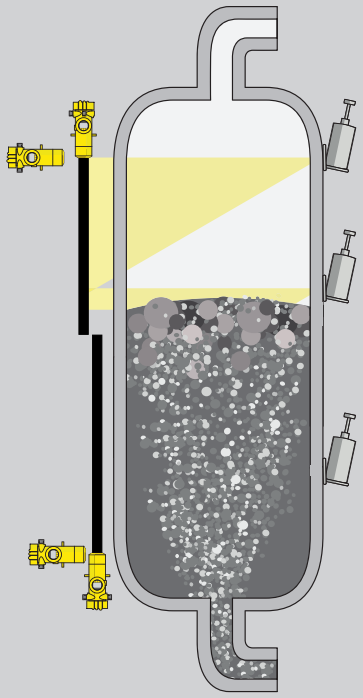
MiniTrac 31

- Compact and lightweight detector mounts easily
- External mounting does not interrupt the process
- Non-contact technology measures through vessel walls and obstructions

Coke Drums

Continuous Level for Coke Drums

Delayed coking units generate extreme heat during operation, making radiation-based measurement the ideal solution for tracking level. FiberTrac level detectors provide reliable continuous measurement of the coke drum. The VEGA Coke Drum system permits optimization of the coking cycle while reducing the negative impact on other functions in the refinery. Benefits include antifoam reduction, minimized outage with reduced risk of foam overs, and quench water control. Multiple FiberTrac continuous level instruments may be used together to create a custom measuring range for tall coke drum units.



Enhanced Monitoring for Coke Drums

Coke drums are a critical step in the refining process, where downtime due to overfill is not an option. The VEGA coke drum system is enhanced by one or more MiniTrac density detectors. By monitoring upper vapor phase density, the MiniTrac allows operators to reduce antifoam carry-over and improve continuous level measurement accuracy. A MiniTrac installed at the measurement bottom improves accuracy by automatically re-zeroing the system on each cycle. All MiniTrac detectors use the RS-485 gauge to gauge communication network for extensive diagnostics, increasing up time and saving time in troubleshooting problems in the field.

FiberTrac 31

- Lightweight construction eliminates need for cranes or special rigging for mounting
- Long detector length minimizes the need for additional platform construction
- Low weight enhances personnel safety and reduces shipping costs

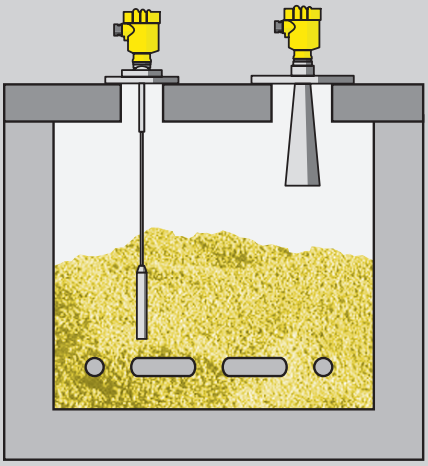
MiniTrac 31

- Non-contact measurement unaffected by fluid viscosity, deflection, or refractive properties
- Monitors anti-foam injection effectiveness to reduce costs

Sulfur Pits

Level Measurement in the Sulfur Pits

Molten sulfur that is contained in subterranean tanks or sulfur recovery pits creates a harsh, corrosive environment for tracking of the unit's level. The VEGAFLEX 62 guided microwave sensor produces a reliable measurement even when sulfur buildup is present, and requires very little maintenance. Its sensitive electronics thoroughly process the instrument's return signal to provide a clear measurement of the sulfur level. It ensures reliability and accuracy in this difficult application and maximizes unit efficiency in processing and emission control.



Durability for Harsh Conditions

Non-contact, radar is another excellent solution for sulfur pits, as it avoids contact with the sulfur and its physical properties. A VEGAPULS 68 radar utilizes a low frequency range that allows it to produce a clear measurement even in these harsh conditions. The VEGAPULS 68 is able to measure through the extreme buildup seen in sulfur pits.

VEGAFLEX 62

- Non-moving parts reduce maintenance needs
- Sensitive electronics produce a clear measurement even through buildup

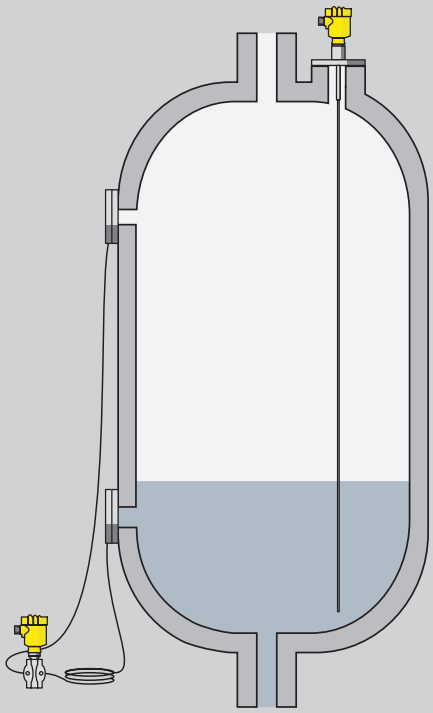
VEGAPULS 68

- Wetted parts provide excellent resistance to corrosion
- Non-contact operation reduces signal attenuation caused by product buildup
- Low frequency range measures through process vapors

Compressor Knockout Drums

Water Level Control

The vapor-liquid separation that occurs in the knockout drum protects the waste or cooling stream from process vapors and the compressor from water, which requires constant level monitoring. The VEGAFLEX 62 guided microwave sensor monitors this crucial level without being influenced by the high volume of vapor created in this vessel, and is easily installed. The reliability of the VEGAFLEX 62 ensures that there is no water carryover to the compressor, avoiding the extremely expensive downtime that results from an upset.



Establishing Redundancy

An alternate level measurement technology is recommended for the knockout drum in order to establish redundancy. The VEGADIF 65 transmitter provides an output that is equal to the difference in pressure exerted by the high side and low side of the measurement. The differential output can be used to effectively monitor the liquid level of the process. The differential pressure technology of the VEGADIF 65 is an ideal accompaniment to the guided microwave technology of the VEGAFLEX 62.

VEGAFLEX 62

- Single rod probe is unaffected by vapor presence
- Reliable measurement directly in the drum or in a bridle
- Continuous reporting provides real-time data for control

VEGADIF 65

- Chemical seal assemblies are overload resistant
- Front-flush mounting is insensitive to buildup and abrasion

Acid Slurries

Acid Level Control

Acid slurries in the alkylation unit create an aggressive environment that require robust, highly resistant level measurement instrumentation to withstand the conditions. The corrosive properties of the acid cause binding issues for mechanical level measurement technologies, so measurement with no moving parts is ideal. The VEGAPULS 63 radar has no direct contact with the process and contains no moving parts. It accurately reports the process levels, ensuring that there is ample acid available for proper execution of the alkylation process.

Pressure Monitoring

Vapor recovery is an extremely corrosive process that is difficult to properly monitor with most measurement technologies. The VEGABAR 52 pressure transmitter monitors pressure in vapor recovery lines. The transmitter's CERTEC® ceramic measuring cell is a superior chemical seal to competitive technologies, and is much more cost-effective than exotic alloys. The material is resistant to corrosive properties inherent to acid processes and continuously reports pressure information for proper operator control.

VEGAPULS 63

- Simple adjustment with PLICSCOM, HART handheld or PC
- Non-moving parts eliminate maintenance needs

VEGABAR 52

- Online calibration and reporting ensures reliability and accuracy
- CERTEC measuring cell contains no fill fluid

Instrument Overview

VEGAPULS 62

Pulse radar sensor for level measurement of liquids under difficult conditions

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

Process temperature:	-200 … +450°C (-328 … +842°F)
Process pressure:	-1 … +160 bar (-14 … +2,320 psi)
Process fitting:	Thread G1½, 1½ NPT Flange from DN 50, ANSI 2"
Measuring range:	up to 35 m (115 ft)

VEGAPULS 63

Pulse radar sensor for sanitary or highly corrosive conditions

- Non-contact measurement
- Front-flush installation
- Simple installation
- Wear and maintenance-free
- Independent of pressure, temperature, gas and dust
- High measuring precision

Process temperature:	-200 … +200°C (-328 … +392°F)
Process pressure:	-1 … +20 bar (-14 … +290 psi)
Process fitting:	Flange from DN 50, ANSI 2"
Measuring range:	up to 35 m (115 ft)

VEGAPULS 68

Pulse radar sensor for level measurement of bulk solids

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

Process temperature:	-200 … +450°C (-328 … +842°F)
Process pressure:	-1 … +160 bar (-14 … +2,320 psi)
Process fitting:	Thread G¾, ¾ NPT Flanges from DN 50, ANSI 2"
Measuring range:	up to 75 m (246 ft)

The pictured instruments are standard models.

VEGAFLEX 61

TDR sensor for continuous level measurement

- Simple setup without adjustment
- Unaffected by product properties
- Insensitive against dust, vapor, buildup and condensation
- Wear and maintenance-free
- High measuring accuracy

Process temperature:	-40 … +150°C (-40 … +302°F)
Process pressure:	-1 … +40 bar (-14 … +580 psi)
Process fitting:	Thread G1½, 1½ NPT Flange 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

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

Process temperature:	-40 … +150°C (-40 … +302°F)
Process pressure:	-1 … +40 bar (-14 … +580 psi)
Process fitting:	Thread G1½, 1½ NPT Flange from DN 50, ANSI 2"
Measuring range:	Cable up to 60 m (197 ft) Rod up to 6 m (20 ft)

VEGAFLEX 67

TDR sensor for continuous interface measurement

- Simple setup without adjustment
- Unaffected by product density
- Insensitive against vapor and condensation
- Wear and maintenance-free

Process temperature:	-200 … +400°C (-328 … +752°F)
Process pressure:	-1 … +400 bar (-14 … +5,800 psi)
Process fitting:	Thread from G¾, ¾ NPT Flange from DN 25, ANSI 1"
Measuring range:	Cable up to 60 m (200 ft) Rod up to 6 m (20 ft) Coax up to 6 m (20 ft)

Explosion protection SIL Safety standards Hyg Hygienic standards

Instrument Overview

VEGASWING 63

Vibrating level switch for liquids 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 (-14 … +928 psi)
Process fitting:	Thread from G¾, ¾ NPT Flanges from DN 25, ANSI 1"
Measuring range:	up to 6 m (20 ft)

VEGABAR 51

Pressure transmitter with isolating diaphragm

- Unaffected by foam generation and tank installations
- High chemical resistance due to suitable diaphragm materials
- Large variety of process fittings

Process temperature:	-40 … +400°C (-580 … +752°F)
Measuring range:	-1 … +400 bar (-14 … +5,800 psi)
Process fitting:	Thread G½, ½ NPT, Flanges from DN 25, ANSI 1"
Measuring precision:	< 0.2 %

VEGABAR 52

Pressure transmitter with CERTEC measuring cell

- Dry, ceramic-capacitive sensor element
- High measuring accuracy
- Maximum overload and vacuum resistance
- Smallest measuring ranges

Process temperature:	-40 … +150°C (-40 … +302°F)
Measuring range:	-1 … +72 bar (-14 … +1,044 psi)
Process fitting:	Thread G½ A (EN837) or ½ NPT, Flanges from DN 80 or 3" Hygienic fittings
Measuring precision:	< 0.2 %, 0.1 %, 0.075 %

The pictured instruments are standard models.

VEGABAR 53

Pressure transmitter with metallic measuring cell

- Fully welded, metallic measuring cell
- High measuring accuracy
- Overload and vacuum resistant

Process temperature:	-40… +150°C (-40… +302°F)
Measuring range:	-1 … +1,000 bar (-100… +14,503 psi)
Process fitting:	Thread G½ A (EN837) or ½ NPT, Thread from G½ A (ISO 228-1) completely front flush Flanges from DN 25 or 1" Hygienic fittings
Measuring precision:	< 0.2 %, optionally up to < 0.075 %

VEGADIF 65

Differential pressure transmitter with metal measuring diaphragm

- Very good reproducibility and long-term stability
- Comprehensive isolating diaphragm program
- High resistance diaphragm materials

Process temperature:	-40… +120°C (-40… +248°F)
Measuring range:	up to -40 … +40 bar (-580 … +580 psi)
Process fitting:	NPT 1/4-18 Isolating diaphragm CSB Isolating diaphragm CSS
Measuring precision:	< 0.075 %

VEGAMET 391

Signal conditioning instrument for continuous measurement

- 4 … 20 mA/HART sensor input with transmitter power supply
- Six relay outputs, one scalable current output
- Comprehensive adjustment functions, for example, scaling, linearization, pump control and flow measurement
- Integrated web server
- Measured value and message transmission via e-mail
- Suitable for data exchange with WEB-VV

Input:	1 x 4 … 20 mA/HART sensor input
Output:	1 x 0/4 … 20 mA current output 6 x level relay 1 x fail safe relay

Explosion protection SIL Safety standards Hyg Hygienic standards

Instrument Overview

FiberTrac 31

Radiation-based sensor for continuous level measurement

- Non-contact measurement
- Ideal for all extreme process conditions
- Flexible plastic detector for round and conical vessel forms
- Simple retrofitting

Ambient temperature:	-20 … +50°C (-4 … +122°F)
Measuring range:	1 … 7 m (3.28… 22.97 ft)
Process fitting:	Not required, outside the vessel
Measuring precision:	±0.5%

MiniTrac 31

Radiation-based density and point level measurement

- Non-contact measurement
- Ideal for all extreme process conditions
- Simple retrofitting

Ambient temperature:	-40 … +60°C (-40 … +140°F)
Measuring range:	Fixed point
Process fitting:	Not required, outside the vessel
Measuring precision:	±0.1%

VEGAMAG 62

Combination measuring system — magnetic level indicator paired with bridle and guided wave radar

- SIL2 qualified VEGAFLEX or VEGAPULS; standard version
- Output signals include 4 … 20 mA/HART, Profibus PA, or Foundation Fieldbus
- Used for any application that requires visual and electronic level monitoring
- Mount to most standard tank process connections as well as applications where interface measurements are needed

Measuring Range:	Up to 50 ft (15 m); Consult factory for lengths over 50 ft
Process Temperature:	-320 … 842°F (-195 … 450°C)
Measuring Precision:	± 0.1" (±3 mm)

The pictured instruments are standard models.

VEGAMAG 63

Single-chamber measuring system with magnetic level indication and non-contact radar measurement

- SIL2 qualified VEGAPULS; standard version
- Output signals include 4 … 20 mA/HART, Profibus PA, or Foundation Fieldbus
- Used for processes with low dielectric constant values, flashing, foaming, or in light hydrocarbons
- Compact design provides a smaller installation envelope and lighter weights

Measuring Range:	Up to 50 ft (15 m); Consult factory for lengths over 50 ft
Process Temperature:	-320 … 842°F (-195 … 450°C)
Measuring Precision:	± 0.4" (±10 mm)

VEGAPASS 61

Bridle chamber

- SIL2 qualified VEGAFLEX or VEGAPULS; standard version
- Ideal for installations when mounting on the top of a vessel is not possible
- Manufactured to meet a wide range of pipe specifications
- Unaffected by specific gravity, temperature, or pressure

Measuring Range:	Up to 50 ft (15 m); Consult factory for lengths over 50 ft
Process Temperature:	-320 … 842°F (-195 … 450°C)

40169-US-110329

VEGA Americas, Inc.
4170 Rosslyn Drive
Cincinnati, OH 45209
USA

Toll Free +1 800 367 5383
Phone +1 513 272 0131
Fax +1 513 272 0133
E-mail americas@vega.com
Web www.vega-americas.com

Looking Forward

VEGA