



Technologies, Solutions, and Applications

Radiation-based Level

Looking Forward

VEGA



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Leadership in Radiation-based Level

VEGA is proud to offer the ultimate in radiation-based level detection. With point level switching and continuous level detectors, virtually every challenging application is measurable. These products allow VEGA to excel in providing customers optimal solutions for their measurement needs.

ProTrac Series

Radiation-based measurement is a proven technology with thousands of installed applications. Unlike most other level technologies, nuclear instruments avoid contact with process material. Processes with extreme temperature, pressure, or corrosive properties have no adverse effects on nuclear detectors.

The needs of process industries have evolved, with a demand for compact instruments that provide more accurate measurements — especially in tough conditions that require radiation-based measurement systems. The FiberTrac® and SoliTrac® are the ProTrac series offerings for non-contact, radiation-based level measurement that meet the need for modern nuclear technology. The compact, modular plics® design enables ease of installation and user access. The unique electronics, potted for resistance to vibration and shock, provide superior measurement stability and improved output response time.

ProTrac builds on the success of the technology with new features and benefits never before realized in radiation-based measurement. Different detector models make ProTrac instruments so flexible that they can readily be adapted to the most difficult measurement tasks; for example, the FiberTrac is a flexible detector for level measurement in round and conical vessels. The PVT rod detector SoliTrac is the specialist for straight sided containers.

ProTrac offers a host of additional features, including a modernized interface between the instrument and the user's control system that improves accessibility to the measurement.

The detectors meet IEC/EN 61508 requirements for SIL2 in continuous level applications. A local display module allows for setup and configuration directly at the detector, while FDT/DTM and EDD options are available for remote access. ProTrac's features and benefits make radiation-based measurement as easy to use as other conventional technologies, while performing the most difficult measurements in the process industries.

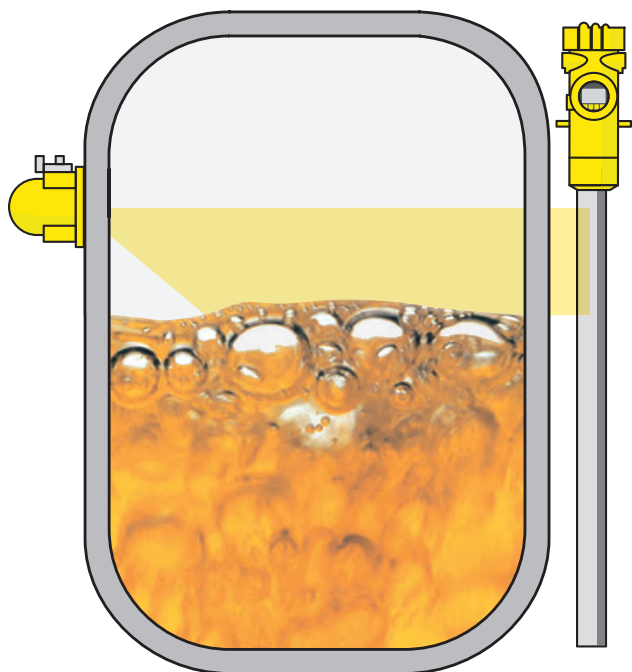
Certifications

Radiation-based level instrumentation is designed for certification compliance with the following programs:

- ATEX Standard
- CSA
- FM Standard
- GOST-R/B Standard
- SIL2
- IECEx
- CEPEL/INMETRO (Brazil)
- JIS (Japan)
- KTL (Korea)
- NEPSI (China)

Principle of Operation

Radiation-based measurement is non-contact and unaffected by process pressure, temperature, or corrosive properties. In turn, the radiation passed through the process vessel does not affect the measured material. All systems can be mounted external to the vessel and do not require process downtime for installation.

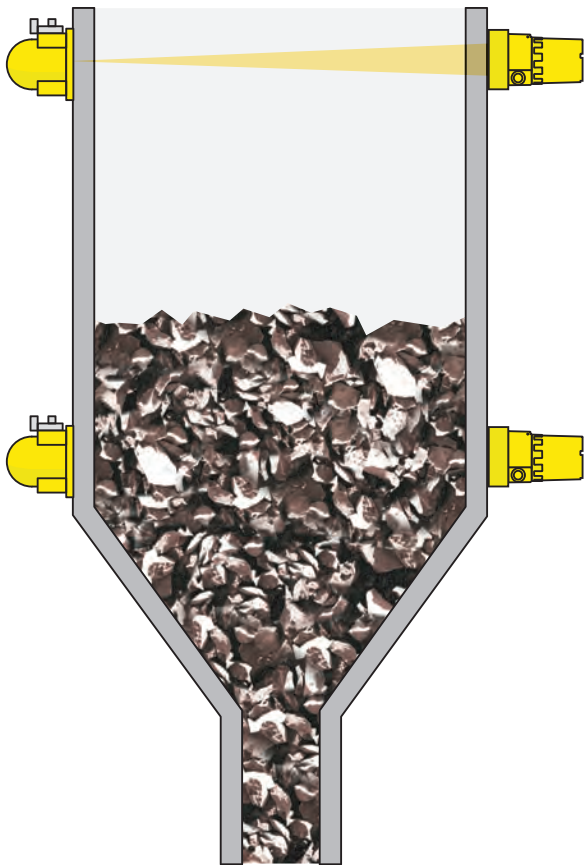


Continuous Level

All systems in the ProTrac series operate on the same principle of radiation-based measurement. A source holder and detector are mounted on opposite sides of the process vessel. A cesium-137 or cobalt-60 isotope is used as the source of gamma radiation that is passed as a collimated beam through the process vessel and material toward the detector. As the process level rises, it shields the detector from the radiation. The more radiation the detector receives, the lower the process level. The less radiation detected, the higher the process level. Process level is provided in the form of a current output.



“At VEGA, we engineer detector solutions for every application. We work with each client to specify the right detector and the minimum source energy for their measurement.”



Point Level Detection

For point level detection, a focused beam of gamma radiation is directed at a small detector that senses the presence or absence of the beam. When process material in the vessel blocks the gamma radiation, the detected drop is used to energize (or de-energize) a relay. A second relay may be used as a redundant process indicator or for diagnostic alarm purposes.

For non-intrusive point level indication, the GM-17 utilizes proven Geiger-Mueller tube technology in a package less than half the weight of its predecessor. The lightweight aluminum housing and small envelope dimensions make the GM-17 extremely easy to handle and install.

Continuous Level Models & Versions



FiberTrac 31

Radiation-based sensor for continuous level measurement

- Standard approvals include ATEX, CSA, FM, IEC
- Output signals include 4 ... 20 mA/HART, Profibus PA, or Foundation Fieldbus
- Cast aluminum or stainless steel housing with flexible plastic detector

| | |
|----------------------|-------------------------------|
| Measuring Range: | Up to 23 ft (7 m) |
| Process Temperature: | -4 ... +122°F (-20 ... +50°C) |
| Enclosure Rating: | NEMA 4X, IP 66/67 |



FiberTrac 32

Radiation-based sensor for continuous level measurement

- Standard approvals include ATEX, CSA, FM, IEC
- Output signals include 4 ... 20 mA/HART, Profibus PA, or Foundation Fieldbus
- Cast aluminum or stainless steel housing with flexible plastic detector
- 4 times the scintillating volume of the FiberTrac 31 for increased sensitivity in low fields

| | |
|----------------------|-------------------------------|
| Measuring Range: | Up to 23 ft (7 m) |
| Process Temperature: | -4 ... +122°F (-20 ... +50°C) |
| Enclosure Rating: | NEMA 4X, IP 66/67 |



SoliTrac 31

Radiation-based sensor for continuous level measurement

- Standard approvals include ATEX, CSA, FM, IEC
- Output signals include 4 ... 20 mA/HART, Profibus PA, or Foundation Fieldbus
- Cast aluminum or stainless steel housing with highly sensitive PVT scintillator

| | |
|----------------------|--------------------------------|
| Measuring Range: | Up to 10 ft (3 m) |
| Process Temperature: | -40 ... +140°F (-40 ... +60°C) |
| Enclosure Rating: | NEMA 4X, IP 66/67 |

Point Level Switch Models & Versions



GM-17



Point level radiation detector

- Standard approvals include ATEX, CSA, FM, GOST-R
- Relay output signal
- Cast aluminum housing

Process Temperature: -40 ... +158°F (-40 ... +70°C)

Enclosure Rating: NEMA 4X, IP 66

Geiger-Mueller tubes: 2 standard, up to 6

Radiation-based Level in the plics System

Terminals



Removable

Electronics



4 ... 20 mA/
HART



Profibus PA



Foundation
Fieldbus

Housings



Aluminum
Double
Chamber



Stainless Steel
Double
Chamber

Indicating & Adjustment Module



PLICSCOM



VEGACONNECT

Sensors



Solid scintillator



Flexible plastic
scintillator



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

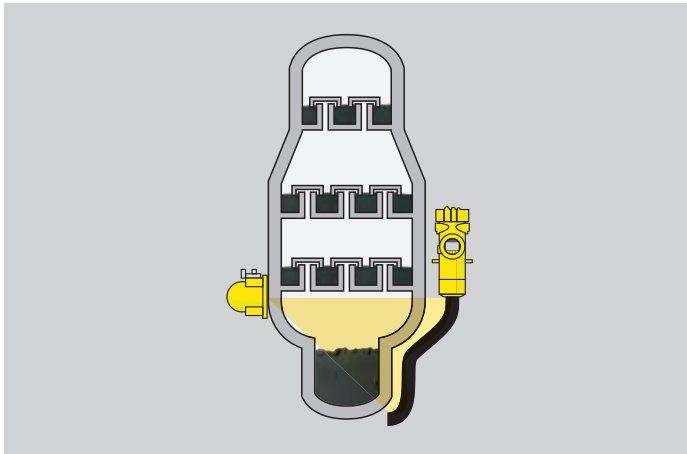
Short delivery times, simple wiring, and fast setup and commissioning save the plant builder significant time and costs. The configuration, wiring, and setup of VEGA instruments are always the same, so a single experience with the process is repeated with any plics measuring principle and application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

Continuous Level Application Areas

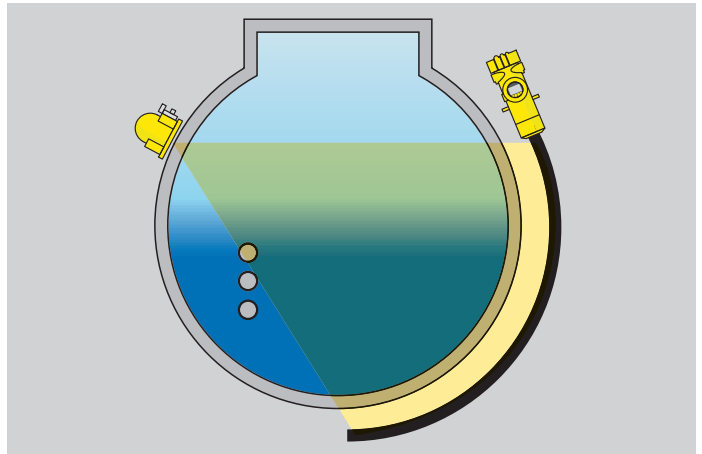
For continuous level measurement over long spans or on curved vessels, the FiberTrac flexible radiation-based detector is an ideal solution. The detector conforms to the contour of the process vessel, eliminating the need for multiple detectors. The FiberTrac is extremely versatile, suitable for an array of applications involving liquids, bulk solids, sludge, and suspensions.



Curved Vessels

Level measurement in a curved vessel can be difficult due to the vessel geometry. The flexible FiberTrac 31 detector follows to the contour of the vessel, allowing a single source holder and detector combination to produce the measurement.

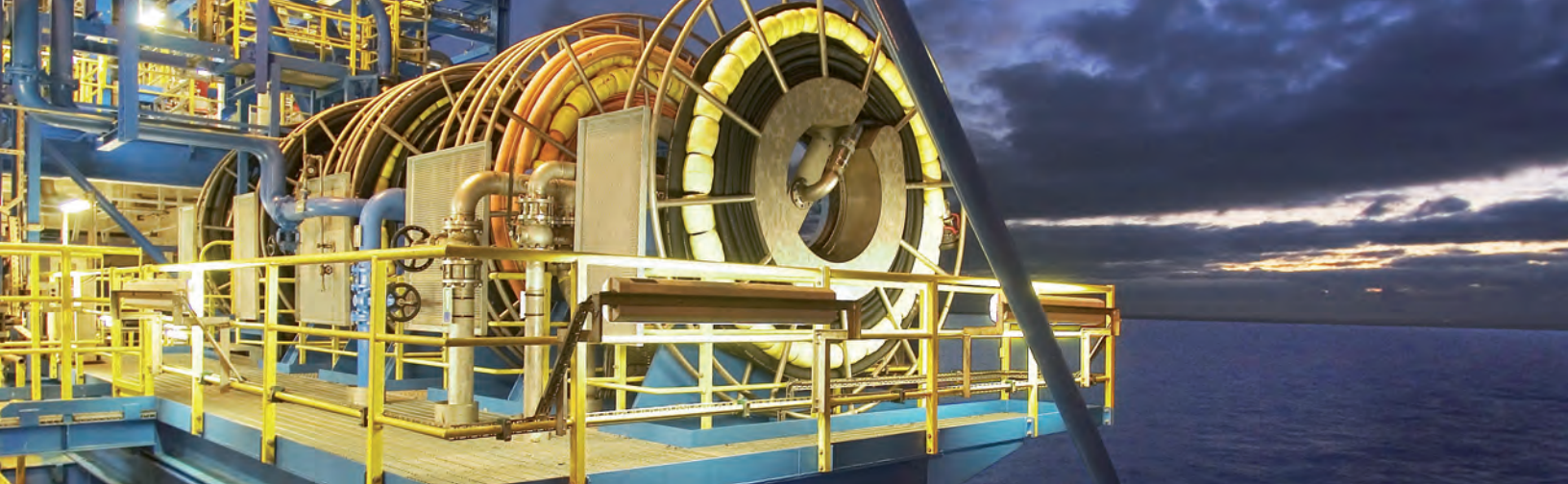
- Single source holder/detector combination minimizes cost
- Single system measures up to 23 feet of level



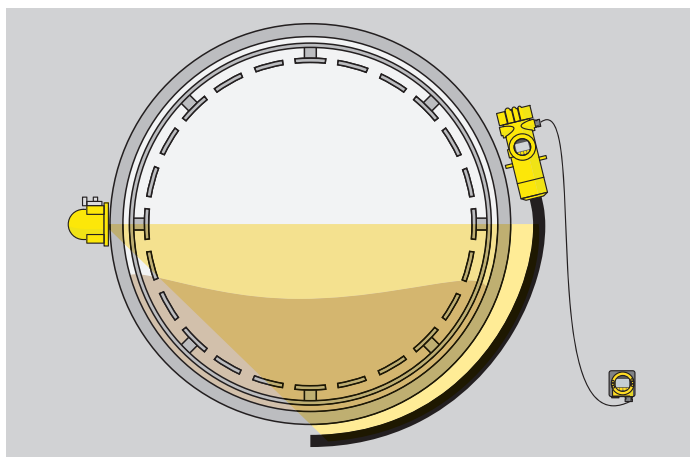
Hydrolyzers

The conversion of urea to ammonia for desulfurization is highly corrosive and takes place in a bullet-shaped vessel, presenting a challenge for accurate level measurement. Non-contact measurement is the best option to avoid high maintenance and replacement costs that come with technologies that contact the corrosive material. A single FiberTrac 31 and source holder system conforms to the contour of the curved vessel and provides an accurate, non-contact level measurement.

- Flexible detector eliminates need for multiple detectors
- Non-contact measurement is unaffected by corrosive process properties



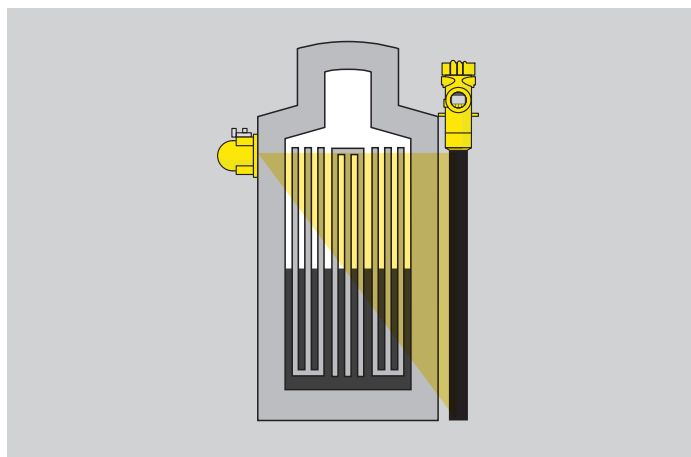
“Our patented flexible detector technology has revolutionized radiation-based continuous level measurement. Our customers appreciate its reduced weight and ability to follow contours or avoid obstructions.”



Plastic Production

The high heat and pressure required in the production of polyethylene or polystyrene plastics create a barrier for many measurement principles. By measuring through the vessel's walls, the FiberTrac 31 detector continuously tracks the process level. An optional VEGADIS 61 remote display can be used to provide an easily accessible way to view outputs and to perform basic adjustments when the detector is difficult to reach.

- External mounting is unaffected by process pressure and temperature
- Optional VEGADIS 61 provides remote adjustment and diagnostics



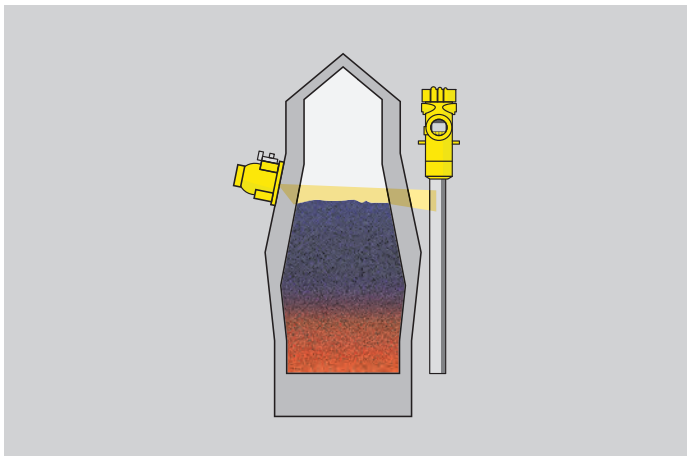
Reactors

Variables such as high temperature and pressure conditions, along with internal structures, make level measurement within a reactor difficult. The sensitive FiberTrac 32 and source holder system measures through the vessel and its inherent structures to continuously track the level, eliminating the difficulty of making the measurement under the extreme conditions.

- Non-contact principle measures through vessel walls and internal obstructions
- Thicker fiber bundle provides extra sensitivity

Continuous Level Application Areas

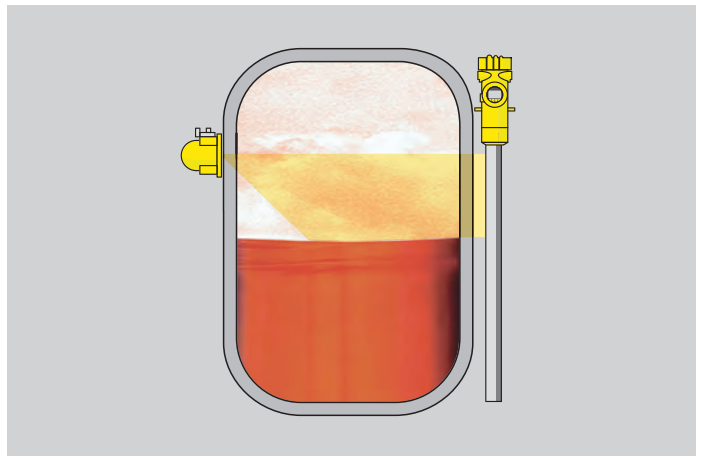
The highly sensitive SoliTrac produces accurate continuous level measurement with minimal source size requirements. Because the system is non-contact, it installs without process downtime or vessel alterations in most cases. Typical applications include retrofits, and where extreme process conditions such as high temperature, pressure, and agitation are present.



Thick Walled Vessels

Due to extreme conditions such as high temperature and pressure, some processes require vessels to have thick walls or layers of insulation. The SoliTrac 31 and SH-F source holder system provides a continuous level measurement through the vessel walls and insulation. The sensitivity of the system allows for the lowest source activity levels possible to make the measurement.

- Source is protected within fireproof holder
- Highly sensitive system measures through vessel walls and insulation



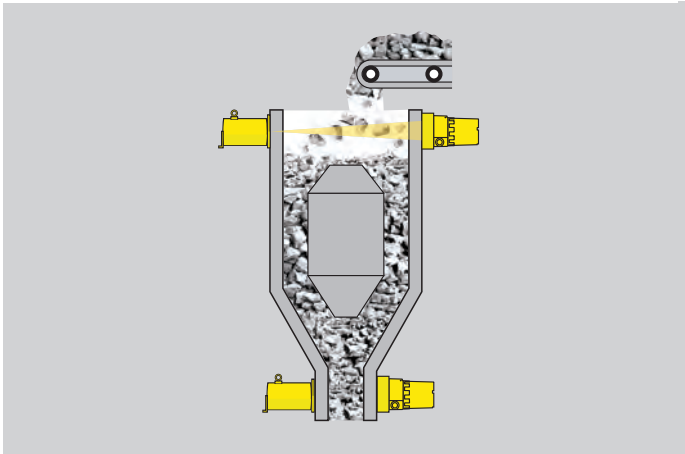
Retrofit Applications

In applications where small source sizes are required, a sensitive scintillation technology is necessary. The SoliTrac 31 is an ideal solution for these applications. It retrofits older scintillation technologies and ion chambers, while utilizing the existing source installation.

- Utilization of existing sources reduces retrofit costs
- Highly sensitive detector minimizes source size requirements

Point Level Application Areas

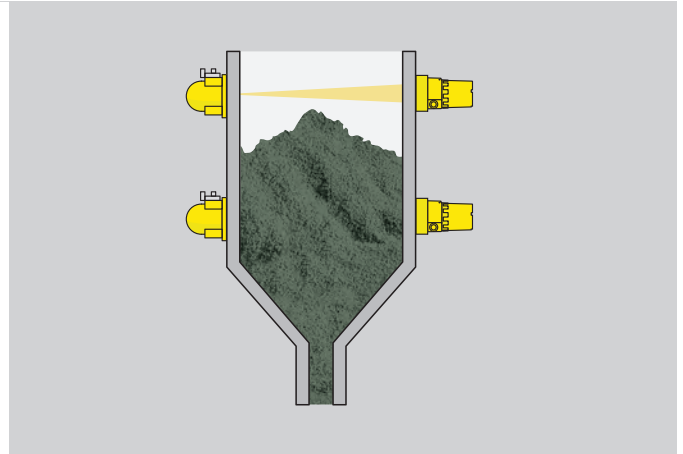
The GM-17 provides point level detection in applications where contacting technologies fail. The external mounting makes the equipment immune to abrasive and corrosive product properties. The system accurately supplies high or low level alarming, as well as plugged chute detection.



Plugged Chute Detection

A reliable solution for plugged chute detection is a VEGA nuclear point level system. Using a radiation source and a GM-17 detector, the system mounts external to the vessel and measures through the vessel walls to detect plugging. Programmed to ignore the common material falling through the chute, the GM-17 activates an alarm when the material backs up or causes a blockage.

- External mounting installs without shutting down the process
- Retrofits older, less sensitive switches, eliminating the need to change gamma sources



Level Indication in Fly Ash Hopper

A GM-17 point switch with an SHLD source holder is an ideal radiation-based high level alarm in a fly ash hopper. The measurement system protects the precipitator process from backup, and is not affected by process conditions.

- No moving parts reduces maintenance needs
- Simple mounting procedure expedites commissioning

Setup and Adjustment



“With VEGA technology, any user can set up a measuring point exactly as the system requires. Remote parameter adjustment with a control system is just as easy and flexible as setup at the sensor.”

PLICSCOM – Multi-Function Ability

The PLICSCOM indicating and adjustment module plugs into any plics instrument on-demand. 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.

External Indicating and Adjustment

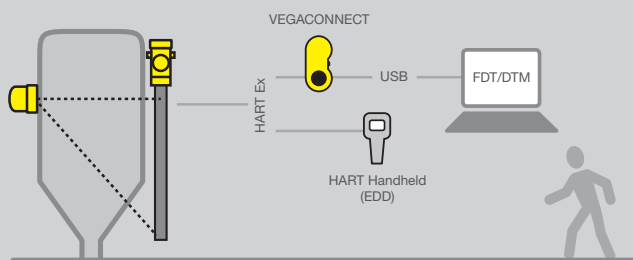
An external indicating and adjustment unit with integrated PLICSCOM can be connected to the sensor with a standard cable up to 25 meters long. It allows setup of the measuring point, even in difficult to access locations, and requires no external power.

PC Adjustment with VEGACONNECT

For increased setup versatility, the mobile VEGACONNECT easily connects VEGA instruments to any PC through the USB interface. The parameter adjustment of these instruments is accomplished by PACTware adjustment software and a DTM. VEGACONNECT also acts as a universal HART modem for sensors of other manufacturers.

Setup with a HART Handheld

A HART Handheld is an additional tool that enables on-site sensor parameter adjustment. To access the HART parameters of a sensor, it connects to the sensor cable through a minimum working resistance of 220 ohms.





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