



Technologies, Solutions, and Applications

Radiation-based Density

Looking Forward

VEGA



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Leadership in Radiation-based Density

VEGA is the industry leader in nuclear product development and refinement. The latest in radiation-based measurement systems is ProTrac®, which is the culmination of 60 years of application experience and engineering research and development. ProTrac is the answer to the process industries' demands for modern, compact instruments that provide highly accurate measurements, even in the toughest conditions that require radiation-based measurement systems.

Advanced Design and Development

The MiniTrac®, part of the ProTrac series, consists of a scintillation detector and a one-piece set of electronics in a small, lightweight housing. This 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 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 MiniTrac is the smallest, lightest, and most modern radiation-based density system available.

The MiniTrac non-contact, continuous measurement system is suitable for pipelines and vessels with a diameter from 2 inches (50 mm) up to more than 36 inches (94 mm). Each MiniTrac detector is mounted on a pipe or vessel with a gamma source positioned on the opposite side. The measuring principle is independent of viscosity, conductivity, and chemical properties of the medium. Temperature influences are compensated electronically.

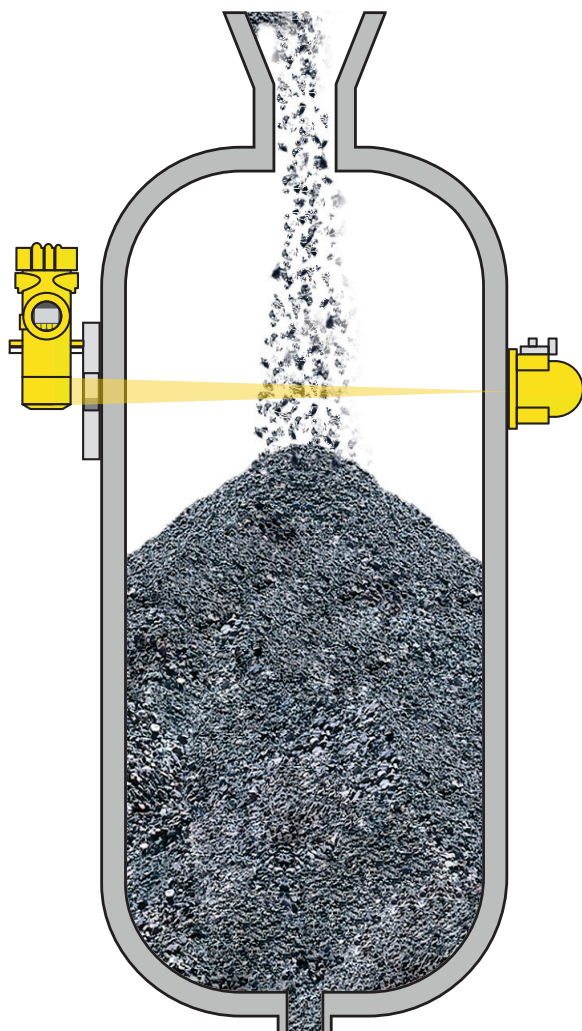
Certifications

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

- ATEX
- CSA
- FM
- GOST-R/B
- 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.



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 or pipe. A cesium-137 or cobalt-60 isotope is the source of gamma radiation, and is passed as a collimated beam through the process vessel toward the detector. The gamma rays are dampened when penetrating the vessel wall and the medium. The NaI crystal or PVT detector on the opposite side of the tank infers the density based on the amount of radiation received.

MiniTrac 31

The MiniTrac 31 measures the density or mass per volume of liquids and slurries through a pipe or vessel without contact with the material. The MiniTrac 31 uses a sodium iodide (NaI) crystal to provide accurate measurement.

MiniTrac 32

The MiniTrac 32 uses a large PVT scintillator to provide extra sensitive measurement of density or mass per volume of liquids and slurries through a pipe or vessel without contact with the material.

Models & Versions



MiniTrac 31

Radiation-based sensor for level detection and density measurement

- Output signals include 4 ... 20 mA/HART, Profibus PA, or Foundation Fieldbus
- Cast aluminum or stainless steel housing with NaI crystal scintillator

Measuring Range:	Application-specific
Ambient Temperature:	-40 ... +140°F (-40 ... +60°C)
Enclosure Rating:	NEMA 4X, IP 66/67
Standard Approvals:	ATEX, CSA, FM, IEC



MiniTrac 32

Radiation-based sensor for level detection and density measurement

- Output signals include 4 ... 20 mA/HART, Profibus PA, or Foundation Fieldbus
- Cast aluminum or stainless steel housing with PVT scintillator

Measuring Range:	Application-specific
Ambient Temperature:	-40 ... +122°F (-40 ... +50°C)
Enclosure Rating:	NEMA 4X, IP 66/67
Standard Approvals:	ATEX, CSA, FM, IEC

Radiation-based Density 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



NaI crystal



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.

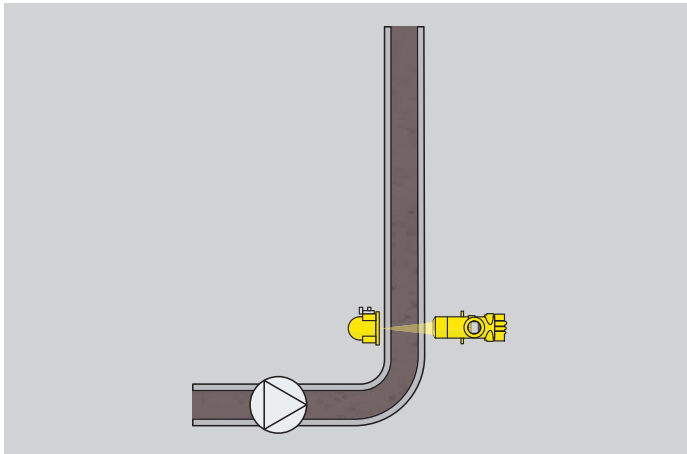
plics Advantages for Density

ProTrac detectors utilize all the advantages of the modular system:

- Aluminum or stainless steel housings for any application
- Standardized electrical connection concept
- Fast setup and commissioning through application-specific, menu driven operation
- USB interface adapter permits local and remote configuration with PACTware
- Compact, modular plics design promotes ease of installation and access for maintenance
- Different detector types for optimal adaptation to the specific application
- Measurement data memory for service and diagnosis
- Simple electronics exchange
- Standard setup and configuration modes include FDT/DTM via laptop, EDD via HART handhelds and AMS, and non-powered remote display module

Density Application Areas

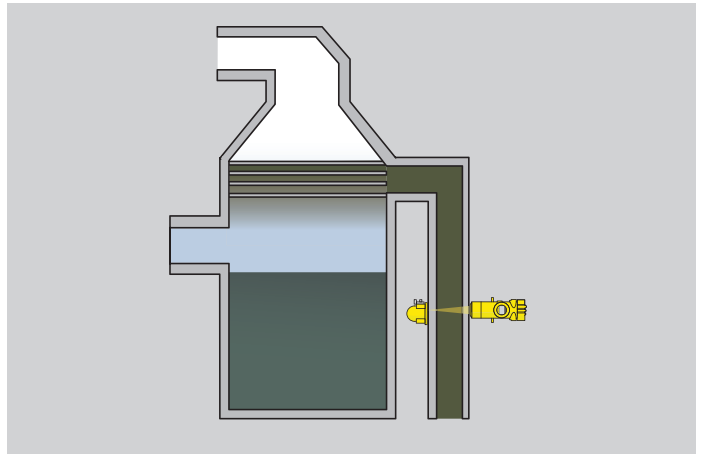
The MiniTrac measures the density, or mass per unit volume, of liquids and slurries contained in pipes or process vessels. The MiniTrac's non-contact, radiation-based measurement principle is unaffected by product viscosity or other properties. The density measurement allows the operator to monitor percent solids in a slurry or track an interface level within the process, making the MiniTrac an ideal detector in many industries.



Slurry Flow

To ensure that a process is running at optimum capacity, mining facilities require accurate tracking of percent solids in their slurry pipelines. A MiniTrac reliably monitors the amount of radiation seen from its paired source holder, and translates that into a percent solids output.

- Density detector continuously reports percent solids measurement
- Lightweight detector system reduces mounting requirements



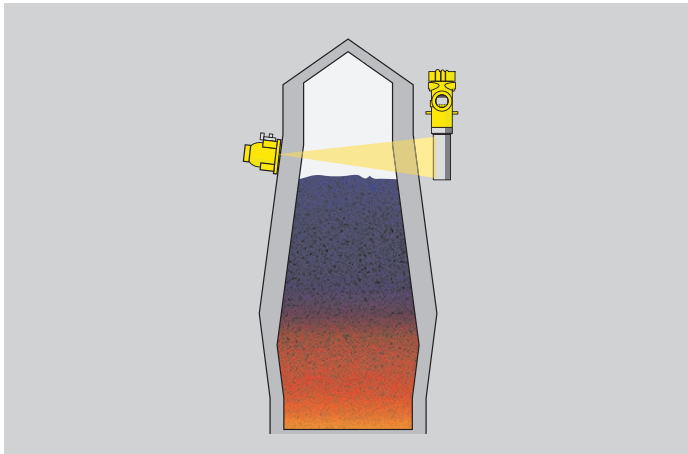
Flue Gas Scrubber

Accurate tracking of the lime slurry pipeline in a fossil fuel power plant's scrubber system is imperative to reduce sulfur dioxide emissions. The MiniTrac 31 tracks the density of the lime slurry in the pipeline to maintain the efficiency of the scrubbing process.

- No moving parts vastly reduces maintenance requirements
- Reliable density measurement is produced, even under extreme process conditions

Point Level Application Areas

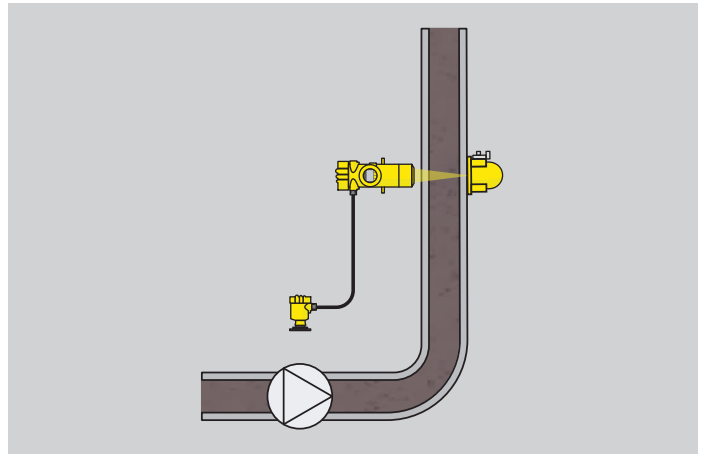
Based on the same principle of radiation-based measurement, the MiniTrac provides point level detection. The system mounts with the same bracketing system as with the density measurement, and provides discrete level monitoring and plugged chute detection.



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 MiniTrac 31 provides a point 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 measure through vessel walls and insulation



Remote Monitoring

Many applications require the mounting of level or density detectors in areas that are difficult to access. A VEGADIS 61 provides remote measured value indication and adjustment of MiniTrac 31 detectors at a distance of up to 82 feet (25 meters) from the mounted detector's location. The cable connection carries communication and power directly from the MiniTrac 31 to the VEGADIS 61.

- VEGADIS 61 remote display requires no additional power
- Remote adjustment and diagnostic procedures occur at ground level or a safely accessed location

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

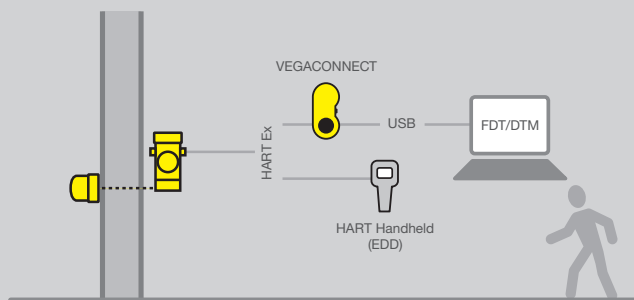
An external indicating and adjustment unit with integrated PLICSCOM can be connected to the sensor with a standard cable up to 25 meters long. It allows setup of the measuring point, even in difficult to access locations, and requires no external power.

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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Looking Forward

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