

# Best-fit pressure measurement solutions for process control



MechChem Africa speaks to Clint Viviers of VEGA Instruments South Africa about the company's comprehensive range of pressure measurement options available to suit both conventional and demanding pressure measurement applications.

status, a ring of coloured LEDs displays the on-off status of the switch from a distance and from any direction – 256 colours options can be selected, and switching pressures are fully programmable,” he notes, adding that the units are all Bluetooth enabled to permit parameters to be set and changed via any Bluetooth-enabled smartphone or tablet.

For these instruments, both metallic and ceramic measuring cells are available. “When put under pressure, the cells produce a very small movement on the sensor that creates a signal to the electronics which is used to calculate the pressure applied by the fluid in the pipe or tank.

“Ceramic pressure measuring cells have far more abrasion and impact resistance, and they offer minimal drift, which means they do not need routine calibration. Also, they are solid, so they offer very high overload resistance,” notes Viviers, adding that pressure overload occurs in pipelines due to water hammer when valves are opened or closed and pumps are started or stopped in an adverse sequence.

Metallic sensors on VEGA pressure instruments, he explains, have a metal bellows membrane that moves under pressure. This movement transfers pressure via an oil-filled capillary to the electronic sensor inside the instrument. They are much more sensitive to

**VEGA's Ceramic pressure measuring cells have excellent abrasion and impact resistance. They also offer minimal drift, which means they do not need routine calibration.**

water hammer, and the metallic bellows can be damaged by abrasive and larger particles in the flow. “If the capillary inside the pressure sensor is damaged, the instrument becomes irreparable. But these sensors can accommodate non-abrasive gas, vapour or liquid pressure at temperatures of up to 130 °C,” he says.

## The VEGABAR PRO Series 80

As with the Basic Series, the VEGABAR PRO Series 80 pressure transmitters can be fitted with either metallic or ceramic sensing elements.

The VEGABAR 81, for example, has a metallic pressure element that is fitted with a chemical seal system, making it suitable for use at elevated temperatures and aggressive media. A wide range of diaphragm materials and coatings are available to make this pressure transmitter particularly suitable for the chemical and petrochemical industries:



feedback control systems; protecting equipment and continuous monitoring of process pressure in reactors; exhaust pressures of flue gases such as in waste incineration; for pipeline pressures in dairies; steam pressure control in steam drums; and pressure monitoring in LNG tanks, for example.

“Our flagship VEGABAR 82 is a robust all-rounder with an innovative flush mounted ceramic measuring cell that is also manufactured by VEGA. This versatile instrument handles temperatures up to 150° C with an overload factor of 200, which is unique to the market. The VEGABAR 82 covers 80% of all applications in the process industry and is well equipped for use in all areas of industry,” Viviers points out.

With ceramic measuring cells, the temperature of the process can also be measured and transmitted as a secondary variable.

Some typical applications include:

- Monitoring feed pressure in sewage pipelines.
- Overload-resistant level and gauge pressure measurement in pressurised batch vessels.
- Level measurement of paper pulp in bleaching towers, protecting against dry-run damage to the discharge pumps.
- Monitoring of negative pressure – down to absolute vacuum – in distillation col-

umns in the petrochemical industries.

## Differential pressure monitoring

To accurately determine the pressure, level, flowrate or density in process applications where the parameters vary, it is often necessary to measure the differential pressure, which is the difference in pressure between two points in the system: two liquid levels in a closed tank, two points along a pipeline, or two points on either side of a filter, for example.

The VEGADIF 85 is a universal differential pressure transmitter with two measuring cells built into the same body. For reverse osmosis systems in desalination plants, for example, one VEGADIF 85 can be used to determine the differential pressure ( $\Delta P$ ) across the RO membrane/filter: to protect the membrane and to optimise the efficiency of water purification process. “VEGADIF is a highly reliable and precise instrument that can sense very low differential pressures,” says Viviers.

“Differential pressure can also be determined using any two VEGABAR series 80 instruments, with one set up as the primary instrument and the other as the secondary. This system is known as the Electronic Differential Pressure (EDP) system. If using this system for filter monitoring of a desalination plant, for example, one VEGABAR 82 can be set up on the seawater inlet side of the reverse osmosis filter and a second on the desalinated water flow line. Connected via a communication cable, the two instruments talk to each other continuously, enabling the electronics to generate and track the  $\Delta P$  values,” Viviers explains. The VEGABAR Series 80 range of pres-



**The compact VEGABAR 38 pressure measuring device from VEGA's Basic Series. These have a built in switching function and LED ring lighting to communicate the instrument's switching status from a distance.**

sure instruments can be configured to suit a host of measurement needs and connected to any PLC or plant controller for process control and optimisation, data analysis and trending.

“As a global manufacturer of state-of-the-art sensors for measuring level, point level and pressure as well as devices and software for integrating them into process control systems, we at VEGA Instruments South Africa can offer best-fit solutions for any process-measurement need, from conventional to complex,” concludes Clint Viviers.

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**Differential Pressure (Electronic, EDP) can be determined using any two VEGABAR series 80 instruments (left) or directly using the VEGADIF 85 universal differential pressure transmitter (right).**

## Mastering ethanol production with VEGABAR DP pressure instruments

In the intricate world of industrial processes, achieving accurate level measurements in tanks with agitators has been a persistent hurdle. Enter the VEGABAR 82, an electronic differential pressure (EDP) level measurement solution that defies turbulence and delivers unwavering reliability. This solution demonstrates the transformative impact



**A VEGABAR 82 installed at AlconCP in Durban for electronic differential pressure (EDP) level measurement: a solution for accurately monitoring the liquid level in a mixing tank.**

the VEGABAR 82 can make on tank-level measurements in complex industrial settings.

For AlconCP, a multinational corporation based in KwaZulu-Natal, South Africa, VEGA instrumentation has been a trusted ally since 2017. AlconCP's diverse customer base spans industries such as beverages, cosmetics manufacturing, food, and medical sectors, relying on sustainably cultivated maize to produce neutral ethanol products and Distillers Dried Grains with Solubles (DDGS), a high-protein animal feed.

Shon Roopnarain, Control Systems Engineer at AlconCP, said they faced challenges with previous instrumentation, which lead them to choose VEGA for their differential pressure measurement needs. VEGA was initially introduced for challenging level measurement applications at the evaporator plant with mixes of high/low temperatures, clean in place (CIP) chemicals, vacuum pressures and sticky, slurry type products.

Sensor-barrels were customised with

extended lengths and double seals to ensure flawless measurement, and coupled with the world class Foundation Fieldbus communication system with AMSTM and electronic differential pressure (EDP) capability. This proved to be the perfect choice, with the added benefit of a competitive price point.

As a result, when the fermentation plant was due for an upgrade it was a no brainer to continue using EDP devices in a slightly less demanding process environment, which also saw these VEGABAR EDPs rolled out in our distillation plant.

Ethanol production relies on accurate pressure measurements for efficient and safe production. AlconCP, equipped with the VEGABAR 82 and supported by VEGA's expert service team, now experiences heightened efficiency and peace of mind.

In partnership with VEGA, AlconCP continues to master the chemical process of turning grain into sustainable products.

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