

Vegabar 82

A practical guide to vegabar 82, covering the reader intent, the relationship to vegabar 82, key evaluation criteria, common risks, and the information the intended project audience should confirm before taking the next step.



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In the field of industrial process automation, pressure and level measurement are foundational to operational safety and efficiency. The Vegabar 82 is a robust pressure transmitter designed for the measurement of gases, vapors, and liquids. Known primarily for its ceramic measuring cell, this instrument is a staple in industries where abrasive, corrosive, or high-vacuum conditions would compromise standard metallic diaphragms.

As a versatile tool for hydrostatic level measurement and process pressure monitoring, understanding the technical nuances of the Vegabar 82 is essential for engineers selecting instrumentation for demanding environments. This guide explores its measurement principles, technical advantages, selection criteria, and practical installation considerations.

| Measurement Principle: The Ceramic-Capacitive Cell

The core of the Vegabar 82 is the CERTEC® ceramic-capacitive measuring cell. Unlike traditional pressure transmitters that use a metallic diaphragm and an internal transmission oil (piezoresistive principle), the ceramic cell is a "dry" measuring system.

| How it Works

1. **Structure:** The cell consists of a ceramic base body and a ceramic diaphragm. These two components are fused together with a glass solder at high temperatures.
2. **Capacitance Change:** On the inner surfaces of the base body and the diaphragm, gold electrodes are applied. When pressure is applied to the diaphragm, it deflects slightly, changing the distance between the electrodes.
3. **Signal Conversion:** This change in distance results in a measurable change in capacitance. The integrated electronics convert this capacitance into a standardized output signal (such as 4...20 mA, HART, Profibus PA, or Foundation Fieldbus).

| Advantages of the Dry Cell

The absence of oil filling is a significant advantage. In food and pharmaceutical applications, there is no risk of process contamination if the diaphragm is damaged. Furthermore, the ceramic material (Al₂O₃ 99.9%) is exceptionally hard and resistant to abrasion, making it ideal for media containing sand, sludge, or crystals.

| Technical Specifications and Capabilities

The Vegabar 82 is engineered to handle a wide range of process conditions. Its modular design allows for customization based on the specific needs of the application.

| Pressure Ranges

The instrument can measure pressures from vacuum levels up to 100 bar (1,450 psi). Small measuring ranges as low as 0...0.1 bar (0...1.45 psi) are possible, providing high resolution for level measurement in shallow tanks.

| Process Temperatures

Standard configurations typically handle process temperatures between -40°C and +130°C (-40°F to +266°F). For specialized applications, such as steam cleaning or high-temperature chemical reactions, versions capable of withstanding up to +150°C (+302°F) are available.

| Accuracy and Stability

With an accuracy of up to < 0.05%, the Vegabar 82 provides the precision required for inventory management and critical process control. The ceramic cell is also known for its excellent long-term stability, reducing the frequency of required re-calibrations.

Practical Selection Criteria

Choosing the right pressure transmitter requires an evaluation of the media, the environment, and the mechanical requirements. The following table provides a comparison of key factors when considering the Vegabar 82 for your project.

Feature	Specification / Capability
Measuring Cell	CERTEC® (Ceramic-capacitive)
Measuring Range	-1...+100 bar (-14.5...+1,450 psi)
Smallest Range	0.025 bar (0.36 psi)
Process Temperature	-40...+150°C (-40...+302°F)
Materials (Wetted Parts)	PVDF, 316L, Hastelloy C22, Ceramic
Output Signal	4...20 mA/HART, Profibus PA, Foundation Fieldbus
Overload Resistance	Up to factor 200 (depending on range)

When to Choose Ceramic Over Metal

Abrasive Media: If the liquid contains solids (e.g., wastewater sludge, lime milk), a metal diaphragm will erode quickly. Ceramic is significantly harder and more durable.

Vacuum Applications: Metallic diaphragms can be prone to "ballooning" or permanent deformation under high vacuum. The rigid ceramic base of the Vegabar 82 supports the diaphragm, ensuring stability.

Aggressive Chemicals: Ceramic is chemically inert to a vast range of acids and alkalis where even high-grade alloys like Hastelloy might fail.

| Electronic Differential Pressure (eDP)

A unique application for the Vegabar 82 is its use in electronic differential pressure systems. Traditional DP measurement requires capillary tubes and a single sensor body, which can be difficult to install and susceptible to temperature drifts.

By using two Vegabar 82 units—one at the bottom of a pressurized tank and one at the top—the sensors can communicate digitally. The "Master" sensor subtracts the top pressure (gas phase) from the bottom pressure (total head) to calculate the hydrostatic level. This setup eliminates the need for oil-filled capillaries and is much easier to maintain in tall vessels.

| Installation and Engineering Considerations

Proper installation is critical to ensuring the longevity and accuracy of the sensor. Engineers should follow these guidelines during the design phase:

| Mounting Position

The Vegabar 82 can be mounted in any orientation. However, for liquid applications, it is generally recommended to mount the sensor on the side or bottom of the tank to ensure the diaphragm is always submerged. For gas applications, mounting at the top prevents condensate from accumulating on the sensor face.

| Avoiding Pressure Spikes

While the ceramic cell is highly resistant to overpressure, extreme water hammers or mechanical impacts directly on the diaphragm should be avoided. In pipelines with high-velocity flow, the use of a siphon or a damping mechanism may be necessary.

| Sealing and Process Connections

The Vegabar 82 supports a wide variety of process connections, including threaded, flanged, and hygienic fittings (Tri-Clamp, Varivent). It is vital to select a seal material (such as FKM, EPDM, or FFKM) that is compatible with the process medium and temperature. For comprehensive technical support on selecting the right configuration for your specific application, you can Review product options and application support.

| Limitations and Prohibitions

While the Vegabar 82 is highly versatile, there are specific scenarios where it may not be the optimal choice:

1. **Extreme Temperatures:** If the process temperature consistently exceeds 150°C (302°F), specialized high-temperature transmitters or remote seal systems with metallic diaphragms may be required.
2. **High Pressure:** For applications exceeding 100 bar (1,450 psi), the ceramic cell's physical structure reaches its limit. Metallic strain-gauge sensors are typically used for high-pressure hydraulics or oil-well applications.
3. **Physical Impact:** Ceramic is brittle. While it resists abrasion well, a direct hit from a heavy tool or a large stone during installation can crack the diaphragm.

| Maintenance and Calibration

The Vegabar 82 is designed for low maintenance. However, in applications involving buildup (such as wastewater or crystallization), periodic cleaning of the diaphragm is necessary.

Cleaning: Use a soft cloth and a compatible solvent. Never use sharp metal tools to scrape the ceramic diaphragm.

Zero Point Adjustment: Over time, or after installation in a specific orientation, a zero-point adjustment may be required to account for the mounting position and atmospheric pressure. This can be done via the integrated display/adjustment module (PLICSCOM) or via HART communication.

| Frequently Asked Questions (FAQ)

Q: Can the Vegabar 82 handle hydrogen permeation?

A: Yes. Hydrogen atoms are small enough to diffuse through many metallic diaphragms, leading to measurement drift or cell failure. Ceramic is significantly more resistant to hydrogen diffusion, making the Vegabar 82 an excellent choice for hydrogen-rich environments.

Q: What is the benefit of the "dry" cell in food production?

A: In food and beverage processing, the primary concern is the risk of contamination. If a metallic diaphragm fails, the internal filling oil (even if food-grade) enters the product. Since the Vegabar 82 uses a dry ceramic cell, there is no oil to leak, ensuring higher process safety.

Q: How does the Vegabar 82 handle condensation?

A: The electronics are typically housed in robust plastic, aluminum, or stainless steel housings with high IP ratings (IP66/IP67 or IP68). Furthermore, the CERTEC cell is moisture-insensitive, though the housing must be properly vented to atmospheric pressure for gauge pressure measurements.

| Conclusion

The Vegabar 82 stands out in the industrial market due to its high-purity ceramic measuring cell, which offers superior abrasion resistance, vacuum stability, and chemical compatibility compared to traditional metallic sensors. Whether used for simple pressure monitoring or complex electronic differential pressure level measurement, it provides a reliable and low-maintenance solution for modern process plants.

When designing a level or pressure measurement system, it is important to consider the full range of available technologies. For more information on radar, ultrasonic, and hydrostatic measurement instruments, visit the Main Page to explore a complete portfolio of industrial solutions tailored to your specific industry needs.