

Vegaswing 63

A practical guide to vegaswing 63, covering the reader intent, the relationship to vegaswing 63, 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 landscape of industrial automation, point level detection serves as a critical safeguard for process integrity. Among the various technologies available, the vibrating level switch—exemplified by the Vegaswing 63—is widely regarded as a versatile and robust solution for liquid media. This engineering guide examines the operational principles, technical specifications, and practical application considerations for the Vegaswing 63, providing a reference for engineers tasked with selecting level measurement instruments for water treatment, chemical processing, and oil and gas applications.

| Measurement Principle of Vibrating Level Switches

The Vegaswing 63 operates on the principle of the vibrating fork. This technology is classified as a "point level" sensor, meaning its primary function is to detect the presence or absence of a medium at a specific height within a vessel, rather than providing a continuous percentage of the total volume.

| The Piezoelectric Drive

At the heart of the instrument is a tuning fork-shaped sensor element. This fork is piezoelectrically energized and vibrates at its mechanical resonance frequency in the air—typically around 1,200 Hz. The piezoelectric crystal converts electrical energy into mechanical movement to maintain this oscillation.

| Frequency Shift Detection

When the vibrating fork becomes covered by a liquid medium, the frequency of the vibration changes. The density of the liquid acts as a damping force, causing the resonance frequency to drop. This frequency shift is detected by the integrated electronics and converted into a switching command. Because the device relies on a physical change in vibration rather than electrical properties like conductivity or dielectric constants, it is largely unaffected by the chemical or physical properties of the liquid.

| Technical Characteristics and Capabilities

The Vegaswing 63 is designed as a universal level switch for liquids. Its construction allows it to function reliably under conditions that might cause other sensors, such as float switches or ultrasonic sensors, to fail.

| Media Independence

The device is independent of the following product properties:

Dielectric Constant: Unlike capacitive sensors, it does not require the liquid to have a specific electrical permittivity.

Conductivity: It functions equally well in demineralized water and highly conductive acids.

Pressure and Temperature Fluctuations: The mechanical resonance is stable across a wide range of process conditions.

Foam and Bubbles: The high-frequency vibration is generally not dampened by surface foam, preventing false switching in turbulent tanks.

| Physical Specifications

Standard configurations for this type of instrument typically include:

Process Temperature: -50 °C to +250 °C (-58 °F to +482 °F).

Process Pressure: -1 to +64 bar (-100 to +6400 kPa).

Viscosity: Suitable for liquids with a viscosity up to 10,000 mPa·s.

Density: Standard versions detect media with a density > 0.7 g/cm³, with high-sensitivity options available for densities as low as 0.5 g/cm³.

| Selection Criteria and Configuration

Choosing the correct version of a vibrating level switch requires an assessment of the installation environment and the chemical compatibility of the wetted parts. For a comprehensive overview of available industrial sensors, engineers may Review product options and application support to align instrument specifications with specific project requirements.

| Material Selection

The vibrating fork is most commonly manufactured from 316L stainless steel (1.4404/1.4435). For highly corrosive environments involving aggressive acids or bases, coatings such as PFA (Perfluoroalkoxy) or materials like Alloy C22 are utilized to ensure long-term durability.

| Extension Lengths

The Vegaswing 63 is frequently supplied with a tube extension. This allows the switching point to be positioned deep within a tank or sump. Standard lengths can range from 80 mm up to 6,000 mm. For horizontal installations, a short version is typically used to minimize the torque applied to the process connection.

| Output Options

Depending on the control system architecture (PLC, DCS, or simple relay logic), various electronics modules can be integrated:

Relay (DPDT): For direct switching of pumps or valves.

Transistor (NPN/PNP): For high-speed digital inputs.

Two-wire (8/16mA): For integration into loop-powered systems.

NAMUR: For intrinsically safe applications in hazardous zones.

Feature	Standard Specification	High-Performance Option
Wetted Material	316L Stainless Steel	Alloy C22 / PFA Coating
Temperature Range	-40 to +150 °C	-50 to +250 °C
Pressure Range	Up to 40 bar	Up to 64 bar
Switching Delay	Approx. 500 ms	Adjustable
Density Range	> 0.7 g/cm ³	> 0.5 g/cm ³

| Installation Guidelines and Best Practices

Proper installation is paramount to ensuring the reliability of the Vegaswing 63, particularly in applications involving high-viscosity liquids or potential buildup.

| Orientation of the Fork

When installing the sensor horizontally, the fork blades should be oriented so that the liquid can drain off easily. This is usually achieved by aligning the marking on the process fitting (flange or thread) so that the blades are vertical. This orientation prevents the accumulation of solids or viscous films between the blades, which could cause a "false full" signal.

| Avoiding Turbulence and Inflow

The sensor should not be mounted directly in the path of a filling stream. The mechanical force of the inflowing liquid can cause premature wear or false triggers. If the sensor must be placed near an inlet, a baffle plate should be installed to protect the fork.

| Nozzle Dimensions

When using flanged connections or threaded nozzles, the length of the nozzle should be kept as short as possible. If the vibrating fork is recessed too far into a long nozzle, there is a risk that air pockets or stagnant medium will remain trapped, leading to inaccurate switching.

| Electrical Connection

To prevent moisture ingress, the cable gland must be tightened securely, and the cable should be routed with a "drip loop" before entering the housing. This ensures that condensation or rainwater runs off the cable rather than into the electronics compartment.

| Limitations and Operational Constraints

While the Vegaswing 63 is highly versatile, it is not a universal solution for every process challenge. Understanding its limitations is essential for effective system design.

1. **Solid Buildup:** While the device can handle some coating, extremely sticky substances that bridge the gap between the two fork blades will cause a permanent frequency shift, resulting in a continuous "covered" signal.
2. **Abrasive Media:** In slurries with high concentrations of abrasive solids, the vibrating forks can experience erosion. As the mass of the fork changes due to wear, the resonance frequency shifts, which may eventually lead to device failure.
3. **Large Solids:** In liquids containing large, solid debris, there is a risk of mechanical damage if a large object strikes the fork at high velocity.
4. **Granular Solids:** The Vegaswing 63 is specifically tuned for liquids. For bulk solids or powders, different versions (such as the Vegaswing 61 or specialized vibrating rods) are required, as the damping characteristics of solids differ significantly from liquids.

| Maintenance and Troubleshooting

The Vegaswing 63 is designed to be maintenance-free due to its lack of moving parts. However, periodic functional testing is recommended, especially in safety-critical applications like overfill protection (SIL).

Visual Inspection: Check for signs of corrosion or heavy buildup on the fork blades during scheduled plant shutdowns.

Functional Test: Most modern electronics modules include a test button or allow for a magnetic test through the housing. This simulates a frequency shift to verify that the output relay or transistor is functioning correctly.

Troubleshooting False Signals: If the device indicates "full" when the tank is empty, check for bridging between the forks. If it indicates "empty" when covered, verify that the media density is within the calibrated range of the sensor.

| Frequently Asked Questions (FAQ)

Q: Can the Vegaswing 63 be used in explosive atmospheres?

A: Yes, the device is available with various global approvals (ATEX, IECEx, FM, CSA) for use in hazardous areas, typically utilizing the NAMUR or intrinsically safe electronics options.

Q: Does the sensor require calibration to the specific liquid?

A: In most cases, no. The device is factory-calibrated to detect the difference between air and a standard liquid density. Only extremely light liquids (low-density hydrocarbons) may require a sensitivity adjustment via the onboard DIP switches.

Q: How does the device handle high-viscosity liquids?

A: The vibrating fork can operate in viscosities up to 10,000 mPa·s. However, as viscosity increases, the switching delay may increase slightly as the liquid takes longer to flow off the forks when the level drops.

Q: Can it be used for dry-run protection for pumps?

A: Yes, this is a primary application. By installing the sensor in the suction line or at the bottom of a supply tank, it can trigger a pump shutdown if the liquid presence is lost, preventing mechanical seal damage.

For engineers and procurement professionals, understanding these technical nuances ensures that the selected level measurement solution provides long-term reliability. For further information on integrating these sensors into broader automation systems, visit the [Main Page](#) for technical documentation and product comparisons.