Vibratory Point Level Sensor
Model PZP

❖ Extremely Versatile
❖ Exceptional Sensitivity
❖ Single-Prong Probe Design
❖ No Calibration
❖ Universal Power Supply
❖ Piezoelectric Technology
❖ Multiple Configurations
The PZP vibratory level sensor provides reliable point level detection in a wide variety of process control applications within the powder and bulk solids market.

The PZP offers many advantages over alternative technologies. The vibrating probe principle eliminates problems associated with temperature, humidity and material changes, while providing state-of-the-art electronic reliability and accuracy that requires no calibration. The unique single-prong probe design is diamond shaped and eliminates material packing problems and false signaling typically associated with the dual-prong “tuning fork” design.

The PZP’s ability to detect a wide variety of material densities, including very lightweight materials, makes it an attractive solution for many applications.

**PRINCIPLE OF OPERATION**

The PZP utilizes piezoelectric technology to create a vibration and then constantly monitors the presence or absence of that vibration. Two piezoelectric crystals are located in the base of the probe. A signal is applied to one crystal at the frequency corresponding to the probe’s self-resonance. The electrical excitation causes physical deformation of the crystal resulting in probe vibration. With no material present, the vibration of the probe is felt by the second crystal. This vibration causes physical deformation of the second crystal which generates a voltage to be analyzed by the electronic circuitry. With material present around the probe, the vibration is dampened, thereby minimizing the voltage generated by the second crystal. The output voltage is analyzed by the circuitry and the relay status changes accordingly.

**APPLICATIONS**

The PZP is often applied in ultra lightweight applications due to its exceptional sensitivity to materials as light as 1.25 lb/ft³ (20 kg/m³). However, the PZP is also a proven performer for materials up 100 lb/ft³ (1600 kg/m³). Current applications range from 1.25 lb/ft³ (20 kg/m³) EPP (expanded polypropylene) beads to 100 lb/ft³ (1600 kg/m³) clay. The PZP is ideal for applications where vessel content changes are common, since no calibration is required when material changes are made. The PZP can also provide dust collector back-up protection.

**FEATURES**

**VERSATILITY**

The unique design makes the PZP immune to changes in many different variables including:

- Vessel contents
- Moisture content
- Material composition
- Temperature
- Density of material
- Pressure
- Dielectric constant
- Humidity
- Particle size

**EASE OF USE**

The PZP offers maximum ease of use to its users. PZP set-up involves simply selecting the sensitivity and fail-safe settings, and requires no calibration.
SUPERIOR PROBE DESIGN
The unique diamond shaped single-prong probe design minimizes material packing problems and false signaling that are typically associated with the dual-prong “tuning fork” design. The diamond shape easily sheds material. Also, the vibration acts as a self-cleaning effect which can further eliminate problems. The reinforced stainless steel probe construction allows use with a wide range of materials.

FAIL-SAFE
A jumper permits selection of either high or low fail-safe. In the event of a power system failure, the relay drops into the mode which denotes an alarm condition. This alarm provides security during a power failure against overfilling or emptying of a vessel.

UNIVERSAL POWER SUPPLY
The PZP’s electronic module is a universal power supply configuration capable of operating off 20 - 250 VAC 50/60 Hz and 20 - 250 VDC.

AVAILABLE CONFIGURATIONS
DIMENSIONS ARE SHOWN IN INCHES WITH MILLIMETER EQUIVALENT IN BRACKETS

STANDARD PROBE
The standard probe is approximately 7’ (178mm) in length and is suitable for both top and side mount applications. It mounts to the vessel via a 1-1/2” mounting gland.

PIPE EXTENSION PROBE
For high and low level applications that extend beyond the length of a standard probe, Monitor offers a pipe extension probe. This configuration is intended for top mount applications only. The extension is constructed of 1” NPT stainless steel pipe which provides structural strength and affords a means to secure the assembly to the vessel. Available in lengths up to 12’ (3.6m), this unit is factory sized to the customer’s specifications.

FLEXIBLE CABLE EXTENSION PROBE
The cable extension configuration extends the detection length beyond the standard probe length. This self-contained unit is for use in top mount applications and can be used for both high and low level detection. A polyurethane sheathed, steel rope reinforced cable is used for the extension, and is available in lengths up to 20’ (6.1m). The unit mounts to the top of the vessel via a 1-1/2” mounting gland.

HIGH TEMP/REMOTE ELECTRONICS
This configuration offers a split-architecture design that moves the electronics to a remote mounting location. The furnished cable allows for a 6’ (1.8m) separation between the probe and the remote electronics. This probe is a reliable solution for applications that involve high temperatures (internal bin temperature up to 302˚F (150˚C)) or vibrating vessels. The probe can be top or side mounted for use in high or low level applications. For top mount applications, the probe can be ordered with a pipe extension. Cable extension probes are not available with high temp/remote electronics.

ORDERING INFORMATION

VOLTAGE/ELECTRONIC MODULE
0=Universal 20 – 250 VAC/DC

PROBE TYPE
0=Standard Probe (Approx. 7” (178 mm) in length)
1=Flexible Cable Extension
(13” to 240” (0.3m to 6.1m) overall length)
2=Rigid Pipe Extension
(9” to 144” (0.2m to 3.6m) overall length)
6=High Temp/Remote Electronics w/ Std Probe
8=High Temp/Remote Electronics w/Rigid Pipe Ext

CABLE EXT LENGTH
blank=Std. Probe
10=Lengths b/w 10’ and 20’
(3m and 6.1m)
10=Length ≤ 10’ (3m)

NOTE:
1 Customer must specify exact required overall length to the nearest inch for p/ns 9-8302, 9-8304 and 9-8308
**SPECIFICATIONS**

- **Power Requirements:** Universal 20 – 250 VAC 50/60 Hz 20 – 250 VDC
- **Power Consumption:** 3 VA max.
- **Ambient Temp. Electronics:** -22˚F to 140˚F (-30˚C to 60˚C)
- **Internal Bin Temperature:**
  - **Standard models:** -22˚F to 176˚F (-30˚C to 80˚C)
  - **High Temp. models:** -22˚F to 302˚F (-30˚C to 150˚C)
- **Output Relay:** SPDT dry contact; 5 amps @ 250VAC max
- **Sensitivity:**
  - Jumper selectable:
    - A (High > 1.25 lb/ft^2^) (20 kg/m^2^)
    - B (Medium > 10 lb/ft^2^) (160 kg/m^2^)
    - C (Low, product build-up applications)
- **Time Delay:** Hold-off, fixed delay of 1 second; Hold-on, fixed delay of 2-5 seconds
- **Fail-Safe:** Jumper selectable (high - FH, low - FL)
- **Operating Frequency:** 280 Hz
- **Temperature:**
  - **Standard models:** -22˚F to 176˚F (-30˚C to 80˚C)
  - **High Temp. models:** -22˚F to 302˚F (-30˚C to 150˚C)
- **Probe/Gland Material:** 304 stainless steel
- **Enclosure:** Die cast alum. beige powder coat; NEMA 4; IP65
- **Process Connection:** 1-1/2" NPT
- **Pressure Rating:** 150 PSI (10.4 bar)
- **Wire Entry:** M20 x 1.5 cablegland, remove for 1/2" NPT
- **Indicator:** Red LED - Status dependent on material sensing and fail-safe selection
- **Solid Extension:** 1" pipe, 304ss, 12’ (3.6m) length max. (customer specified length)
- **Cable Extension:** Polyurethane sheathed, steel rope reinforced; 20’ (6.1m) length max. (customer specified length)
- **Remote Electronics Interconnection Distance:** 6’ (1.8m factory installed flexible conduit (high temp models)
- **Weight:** 4.5 lb (2 kg) (standard model only)

**SENSOR MECHANICALS**

DIMENSIONS ARE SHOWN IN INCHES WITH MILLIMETER EQUIVALENT IN BRACKETS

Monitor Technologies LLC warrants each PZP vibratory point level sensor it manufactures to be free from defects in material and workmanship under normal use and service within two (2) years from the date of purchase. The purchaser must give notice of any defect to Monitor within the warranty period, return the product intact and prepay transportation charges. The obligation of Monitor Technologies LLC under this warranty is limited to repair or replacement at its factory. This warranty shall not apply to any product which is repaired or altered outside of the Monitor Technologies LLC factory, or which has been subject to misuse, negligence, accident, incorrect wiring by others or improper installation. Monitor Technologies LLC reserves the right to change the design and/or specifications without prior notice.

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