DuraVibe™
Model PZP Vibratory Level Sensor

FEATURES & ADVANTAGES
- Exceptional Durability for powders and bulk solids
  - Patented steel gusset reinforced design provides industry-leading probe strength.
  - Stainless steel probe construction for durable, maintenance-free performance.
- Excellent Versatility
  - Varying moisture, temperature, material composition? No problem!
  - Unaffected by dust clouds and agitation.
  - Detects very light (1.5 lb/ft³) to heavy, dense materials with proper protective baffling.
  - Pipe extension, cable extension and high-temp units are available.
- Peace-of-mind Reliability
  - Self-cleaning diamond shape probe eliminates false signals found with “tuning fork” designs.
  - Fail safe feature provides alarm in case of a power failure.
- “Set it and forget it”
  - No calibration required! Easy installation and commissioning.
  - Three sensitivity settings for optimum performance.
  - External status LED provides visual indication. (Ord. Loc. units only)
- Superior third party approval compliance
  - Ordinary and Hazardous location approvals.
  - Intrinsically safe probe for ultimate hazardous location protection.

PRINCIPLE OF OPERATION
The Model PZP point level sensor is a mechanical resonance system that is excited at a resonance by an electrical circuit. Two piezoelectric crystals are mounted internally at the probe’s base. The electronic module generates an electrical signal that has an equivalent frequency to the probe’s resonant frequency; this signal is applied to one crystal, which causes the probe to vibrate. The vibration is monitored by the second crystal which provides an electrical signal back to the electronic module. When material contacts and surrounds the probe, the vibration is dampened and the signal from the second crystal is reduced. This signal reduction is detected by the electronic module, which reacts by providing a signal out of the module through the relay contacts. The sensitivity for the PZP is selectable. The single probe design prevents material bridging, which is common with the dual-blade (“tuning fork”) design.

PRACTICAL APPLICATIONS
- Ideal choice for reliable detection of materials whose physical characteristics are variable, such as, changes in moisture, temperature, composition or geometric shape.
- Suitable for storage vessels where material is regularly changed. For example, one day corn is stored and then another day beans are stored.
- Excellent for extremely lightweight materials with densities as low as 1.5 lb/ft³ (24 kg/m³); with a maximum particle size about 1.6 inches (40 mm).
- Acceptable for installations where material clings to sidewall as probe is tip-sensitive and unaffected by material build-up near mounting base.
- Level detection / back-up protection for dust collection hoppers.
- Successful applications include: sugar, flour, spices, salt, powdered milk, tea/leaf, whole or ground coffee beans, rice, peanuts, feed & grain, tobacco, ice chips, sawdust, wood shavings, chalk, chemicals, polystyrene beads, Styrofoam®, plastic pellets, cellulose, glass, powdered clay, carbon black, foundry sand, gravel, cement, fly ash and more.

OPTIONS
- Pipe Extensions
  - For high and low level applications that extend beyond the length of a standard probe.
  - Top-mount is intended primarily for high-level applications and is suitable for lengths up to 12’ (3.6m).
  - Side-mount is acceptable for short lengths and where probe is properly supported.
- Cable Extensions
  - For top-mount, high-level applications where head clearance prohibits mounting of pipe extension or where free-hanging weight is preferred.
  - Suitable for lengths up to 20’ (6.1m).
- High Temperature / Remote Electronics
  - For applications where it is necessary to keep the electronics away from the vessel due to excessive temperatures or vibration.
  - Interconnection of sensing probe and electronics is done by a conduit.
  - Standard separation distance is 6’ (1.8m).
**SPECIFICATIONS**

- **Power Requirements:** 22 - 27VDC (+10%); 22-232VAC (+10%), 50/60 Hz
- **Power Consumption:** ≤ 4VA (AC); ≤ 3W (DC)
- **Ambient Temp. Electronics:** -22° F to 149° F (-30° C to 65° C)
- **Process Temperature:** Standard probes: -22° F to 176° F (-30° C to 80° C)  
  High Temp. probes *: -22° F to 302° F (-30° C to 150° C)
- **Output Relay:** VAC: SPDT isolated; 3 amps @ 250VAC max  
  VDC: SPDT isolated; 3 amps @ 30VDC max
- **Sensitivity:**
  - A: High, ≥ 1.5 lb/ft² (24 kg/m²)
  - B: Medium, ≥ 10 lb/ft² (160 kg/m²) or
  - C: Low, Product build-up applications
- **Time Delay (Fixed):** Hold-off (stop of vibration), delay of 1 second; Hold-on (start of vibration), delay of 2-5 seconds
- **Fail-Safe:** Switch Selectable: High or Low
- **Max. Vertical Load at Probe End:** 225 lbs [102 kg] - Standard & Pipe Ext.
- **Max. Horizontal Load at Probe End:** 34 lbs [15.4 kg] - Standard & Pipe Ext.
- **Max. Tensile Load of Cable:** 440 lbs [200 kg] - Cable Ext. Version
- **Operating Frequency:** 286 Hz (+/-1 Hz)

**ENCLOSURE:**

- **Enclosure:** Powder coated die-cast aluminum: NEMA 4X. ENCLOSURE TYPE 4X: IP66
- **Probe Material:** 304 Stainless Steel
- **Process Connection:** 1-1/2" NPT (F2P), 1-1/2" NPSC (Vessel); 304 SS
- **Pressure Rating:** 145 PSI (10 bar) - Std Probe & Pipe Ext. Probe
- **Conduit Connections:** (2) 1/2" NPT, (3) 1/2" NPT for Remote Elec

**ORDERING INFORMATION**

- **Pipe Extension:** 1’’ pipe, 304SS (Customer specified length - max. 12’’ [3.66m] for top mount, 2’ [0.61m] for side mount)
- **Cable Extension:** Polyurethane Jacketed Cable; 20’ (6.1m) length max. (Customer specified length)
- **Approvals:** CSA: Northern Montreal, Canada; CE Marking - EN 50081-1, EN 50082-2
- **Standard-Temp & Remote Electronics:** ATEX: II 2 Ex db [ia] Da IIC T75˚C Db
  IECEx: Ex ib ia IIC T75˚C Db
- **Remote Probe:** ATEX: II 2 Ex ib ia IIC T90˚C Da
  IECEx: Ex ia IIC T90˚C Da
  (See Bulletin # 564K regarding specific conditions of use.)

**DIMENSIONS ARE SHOWN IN INCHES WITH MILLIMETER EQUIVALENT IN BRACKETS**

**DuraVibe™ PZP Vibratory Level**

- **Select Model Series:** 7, 7P, 7X Series
- **Select Probe Configuration:**
  1. Standard Probe
  2. Cable Extension Probe - Specify Length 13” to 240” (0.33m to 6.1m)
  3. Pipe Extension Probe - Specify Length 9” to 144” (0.23m to 3.66m)
- **Select Temperature Grade:**
  1. Standard Temperature
  2. High Temperature w/ Remote Electronics 2,3,4
- **Select Environment/Approvals:**
  1. Ordinary Locations
  2. Hazardous Locations - N. America
  3. Hazardous Locations - ATEX/IECEx
- **Select Operating Voltage:**
  1. 22 - 27VDC (10%) 22-232VAC (10%) 50/60HZ
  2. 20’ (6.1m)

**ACCESSORIES:**

- **Part #** 9-0027 3
  - 1/2” Flexible Conduit Assy, Liquid-Tight, 6ft/1.8m for Remote Elec. (Ord. Loc. units only)
  - 9-1005 1
  - Interconnect Cable w/ Pins at each end, 96in/2.2m for Remote Elec. (Ord. Loc. or Haz. Loc. units)
  - 9-0019
  - Mounting Flange, 150° ANSI, Painted Carbon Steel, 1-1/2” NPT
  - 16-0407
  - Mounting Flange, K-style, Flat, Aluminum, 1-1/2” NPT

**NOTE:**

1. Customer must specify exact required overall length to the nearest inch for Cable or Pipe Extension versions. Overall length is the distance from end of threaded hub to the end of the sensor probe.
2. 22 High Temperature w/ Remote Electronics is NOT available on Cable Extension Probe.
3. Conduit (96ft/1.8m) length for Remote Elec. is sold separately.
4. Remote Elec. includes Part #9-1005, Interconnect Cable w/ Pins at each end, 96in/2.2m that augments 6ft/1.8m span between Remote Probe and Remote Electronics. Customer specified length(CSL) interconnect cable, no pins (Part #9-3014-008) is sold separately.