MODEL VP11 VIBRATION LEVEL SENSOR

Features
- Low-cost piezoelectric vibratory level sensor
- Easy to use 26mm proximity style housing
- Not affected by moisture, humidity, or temperature variations
- Standard transistor output
- Relay output optional with PR2100/2200

General Description
The VP 11N is a single point level sensor designed for low-cost, solids state indication and control of powder levels in a small hopper or bin. The VP works best in granular and powdered materials of medium to high bulk density. It is especially useful in applications for detection of high and low level. The VP is an excellent replacement of mechanical rotary paddle level controls that are prone to failure. An example is the high level control in a plastic resin feed hopper used in injection molding. The sensor must not be exposed to high temperatures or excessive abrasion.

Operational Description
The sensor utilizes a piezoelectric vibration element to create a specific vibration frequency. If the vibration diaphragm is vibrated for pulse vibration frequency, the reverberant vibration is occurred. When the material covers the sensor, more reverberant vibration is dampened for a given length of time. The damping of reverberant vibration is detected by a piezoelectric element, and processed through a comparator circuit. The sensitivity is set by the volume of damping for a given length of time.

AC voltage with relay output is optionally available by using our power relay unit, Model PR2100 or PR2200.

Specification

Model	VP11N	VP11F
Drawing		
Measuring Object	Powder, Granular material	
Mounting	G3/4	ISO 1-1/2S
Supply Power	24V DC	
Current Consumption	Approx. 20mA DC Max.	
Relay Output	NPN open collector100mA DC Max. Residual voltage 1V Max.	
Detection Time Delay	Approx. 3 seconds	
Operating Temperature	−10 to 60°C	
Maximum Pressure	500 kPa	
Maximum Humidity	95% RH	
Sensitivity	Aparent density of 0.2g/cm³ Min.	
Material — Body	304SS	
Material — Diaphragm	316SS	
Material — Fastener	Brass	
Cable	ϕ3×2000mm (3×0.2mm³), PVC	
Protection	IP55	
Indication	Green LED for Power status Red LED for Relay status Orange LED for Detected recovery	

Data of measuring object (For reference)

Sample name	Apparent density	Shape	Repose angle	Sensitivity	Detection point	Characteristic of sample
Plastic pellet	0.8	Cylindroid	35°	Middle	10mm	
Rice	0.9	Oval	30°	Middle	10mm	
Rice under water	0.4	Oval	30°	Middle	10mm	
Instant coffee	0.5	Fine power or granuler	40°	Middle	10mm	
Powder suger	0.4 to 0.8	Fine power or granuler	45°	Middle	25mm	Adhesive, Low flowability
Flour	0.5 to 0.7	Fine power or granuler	45°	Middle	25mm	High adherability with moisture
Aluminium hydroxide	0.15		35°	High	35mm	Adhesive, Low flowability

Sample name	Apparent density	Shape	Repose angle	Sensitivity	Detection point	Characteristic of sample
Shampoo	1.08	Syrup	60 P	Middle	10mm	Adhesive
Rinse	1.03	Paste	35 P	Middle	10mm	Low flowability
Honey	1.01	Syrup	120 P	Middle	15mm	Adhesive
Mayonnaise	0.95	Paste	140 P	Low	5mm	Low flowability

*1 The center of adjustable range for sensitivity volume is 12 o'clock.
   High sensitivity: 1 to 3 o'clock. Middle sensitivity: 10 to 1 o'clock. Low sensitivity: 8 to 10 o'clock.
*2 In case of using VP to detect aluminium hydroxide, pay attension to the environmental condition and
   mounting.
*3 The meaning of "P" at viscosity is Poise.