

VIBRATING ROD

Vibrating Level Sensors



**Simple.
Rugged.
Reliable.**

- Unique single "Rod" probe design
- Insertion length from 7.37" to 19'
- Strong stainless steel construction
- Detects extremely light, fluffy materials
- LED status indicator light
- No calibration required
- Three sensitivity adjustments
- Wear and maintenance-free
- Auto sensing power supply
- Dual conduit entries
- Switch selectable high/low fail-safe
- High temperature units available
- Remote electronics available
- Suitable for high & low level indication, or plugged chute detection
- Optional hazardous location approvals

BINMASTER[®]

www.binmaster.com

Vibrating Rod

Introduction

Description

BinMaster's vibrating rod is a piezoelectric driven vibration type level switch that detects high, mid and low levels in bins, silos, and hoppers filled with powders or dry bulk solid materials.

High performance and reliability

- The single rod design with its sharp edged vibrating blade prevents bridging of material typically associated with the "tuning fork" design. The sword shaped blade also lets material easily flow by, and thus prevents material buildup.



- Material sticking on the vessel wall has no influence on the function of the vibrating rod. All vibrating rod sensors are tip sensitive, allowing them to overlook sidewall buildup.
- No false alarms due to rat-holing around the active sensor. The vibrating rod is driven with very low energy and will not dig a hole and cause false alarms.
- Fine tuning the vibrating system enables the instrument to reliably detect extremely light material with densities down to 1.25 lb./cu. ft.

Not affected by material characteristics

BinMaster's vibrating rod principle of operation overcomes difficulties associated with changes in dielectric constant, humidity, temperature, and material density. There are three sensitivity settings selected by a sensitivity switch on the sensor board:

- Position A: High sensitivity for light and fluffy materials
- Position B: Medium sensitivity
- Position C: Low sensitivity for materials that may form a deposit on the rod and heavier materials

Single blade design eliminates bridging

Applications

- | | | |
|-----------------|------------------|---------------|
| • Salt | • Beans | • Styrofoam |
| • Flour | • Sugar | • Cellulose |
| • Spices | • Coffee Beans | • Glass |
| • Pellets | • Peanuts | • Granulars |
| • Animal Foods | • Tobacco | • Clays |
| • Carbon Black | • Grain | • Polystyrene |
| • Chemicals | • Wood Shavings | • Gravel |
| • Foundry Sands | • Chalk | • Sawdust |
| • Powdered Milk | • Paper Products | • Coal |

How it works

BinMaster's vibrating level sensors are piezoelectric devices with a single blade shaped vibrating element. The blade of the sensor vibrates if there is no material covering the active element. When the blade is covered, the vibration is dampened by material and an electronic circuit forces a relay to switch indicating a covered condition. When the blade is uncovered, the vibration will restart and the relay will indicate an uncovered condition. The blade design is carefully balanced to provide a very low loss "tip sensitive" vibrating system and requires a very small amount of energy to keep the system vibrating. In application, the vibrating blade is driven by a piezo crystal excited by the electronics system. The driving signal changes the physical shape of the piezo crystal which causes the mechanical vibration of the blade, much like a piezo type loudspeaker. The perfectly balanced mechanical system then resonates at the frequency of the drive signal. A second piezo crystal is used to detect the vibration of the blade, in turn signaling to the electronics if the blade is covered or not.



**Detects extremely light
and fluffy materials**

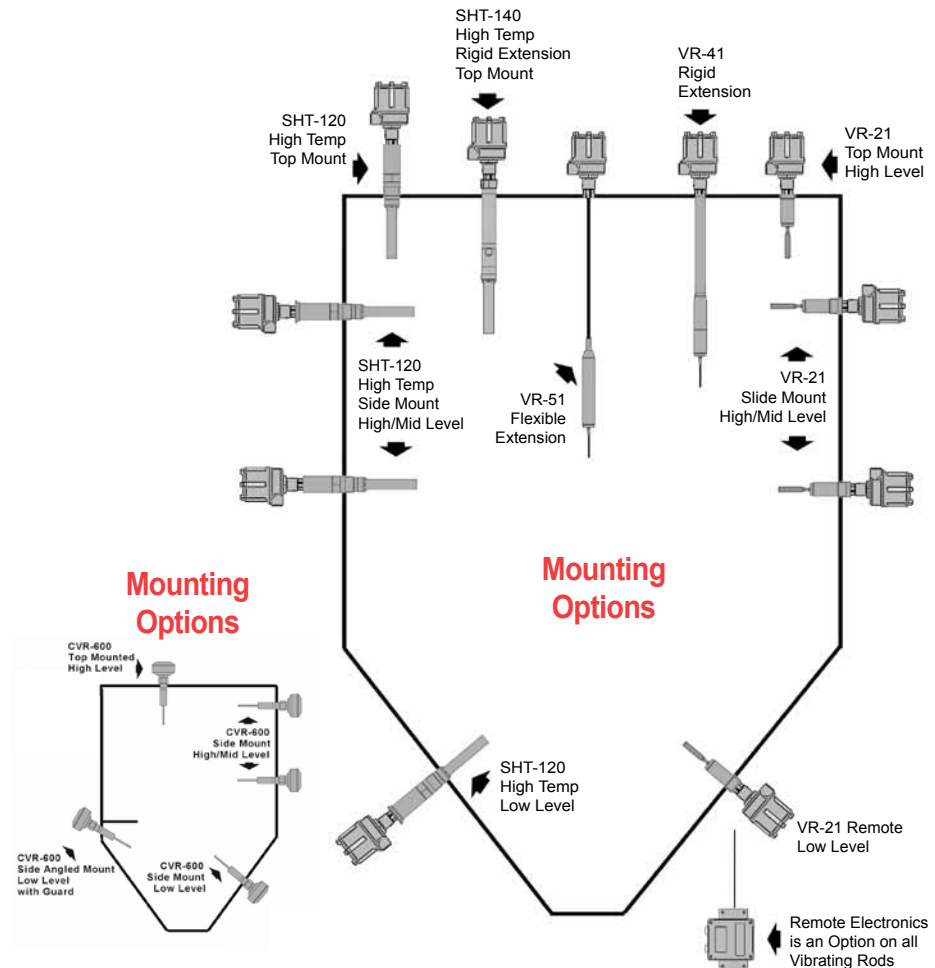
Vibrating Rod Advantages

Mounting Flexibility, Various Configurations



VR-41 & VR-51 Extended Vibrating Rods

These two vibrating rods have been designed to allow extended insertion lengths of up to 19'. These configurations are intended for top mount applications. The VR-41 uses a rigid 1" pipe extension made with galvanized or stainless steel available in lengths up to 13'. The VR-51 uses a steel rope reinforced cable and allows insertion lengths of up to 19'. Both of these units are factory sized to customer specifications.



VR-21 Standard Vibrating Rod

The VR-21 is the standard model and has an insertion length of approximately 7". This model is suitable for both top and side mount applications. It mounts to the vessel with a 1-1/2" mounting socket. The VR-21 has optional CSA hazardous location approvals for Class II, Groups E, F and G.



CVR-600 Mini Vibrating Rod

The CVR-600 compact vibrating rod is an economical, single rod, compact point level control that has been designed for use in small bins and hoppers. The small, yet rugged design allows you to use the CVR-600 where other level sensors simply won't fit. Overall insertion length is 6".



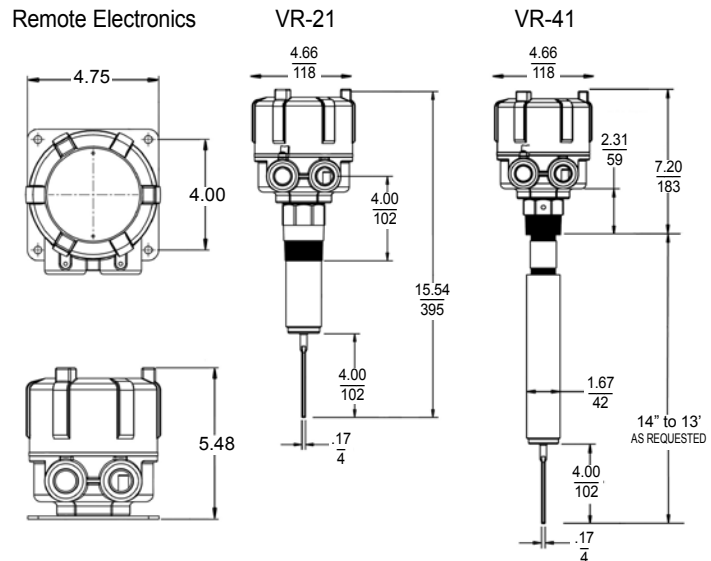
SHT-120 & 140 High Temperature Vibrating Rod

The SHT-Series has been built specifically for higher process temperatures up to 482°F (250°C). The SHT-120 has a standard insertion length of 7.24". The SHT-140 can be extended into a vessel from 13" to 13' with a rigid pipe extension.

VR Series Specifications

Input Voltage: Wide range 20 - 250V AC/DC
Power Consumption: 3VA
Relay: SPDT 5A 250 VAC (option: DPDT)
Time Delay: 1 second from stop of vibration
 2 to 5 seconds for start of vibration
Temperature Range:
 • Ambient for electronic: -4°F to +140°F
 • Process Temperature: -4°F to +176°F
Min. Material Density: From 1.25 lb./cu. ft.
Max. Granular Size: 1-1/2"
Max. Pressure: 145 psi
Conduit Entry: 3/4"
Mounting: 1-1/2" NPT
Enclosure: NEMA TYPE 4X, 5 and 12
Rod: AISI 304 Stainless Steel
Options: CSA hazardous location approvals
 for Class II, Groups E, F & G
 for VR-21 and VR-41 only

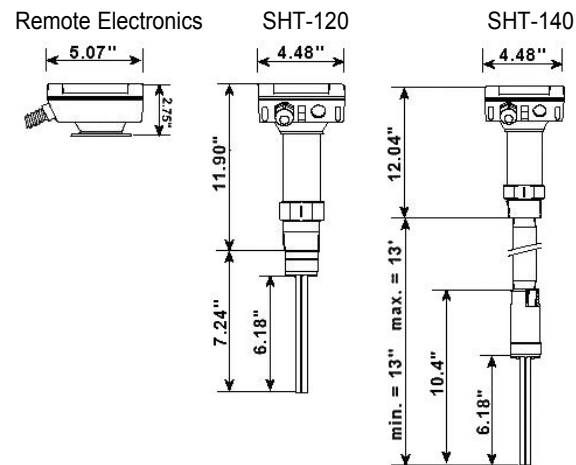
Dimensions



SHT Series Specifications

Input Voltage: Wide range 20 - 250V AC/DC
Power Consumption: 3VA
Relay: SPDT 5A 250 VAC (option: DPDT)
Time Delay: 1 second from stop of vibration
 2 to 5 seconds for start of vibration
Temperature Range:
 • Ambient for electronic: -4°F to +140°F
 • Process Temperature: -4°F to +482°F
Min. Material Density: From 1.25 lb./cu. ft.
Max. Granular Size: 1-1/2"
Max. Pressure: 145 psi
Conduit Entry: 1/2"
Mounting: 1-1/2" NPT
Enclosure: Diecast aluminum NEMA 4
Rod: AISI 304 Stainless Steel

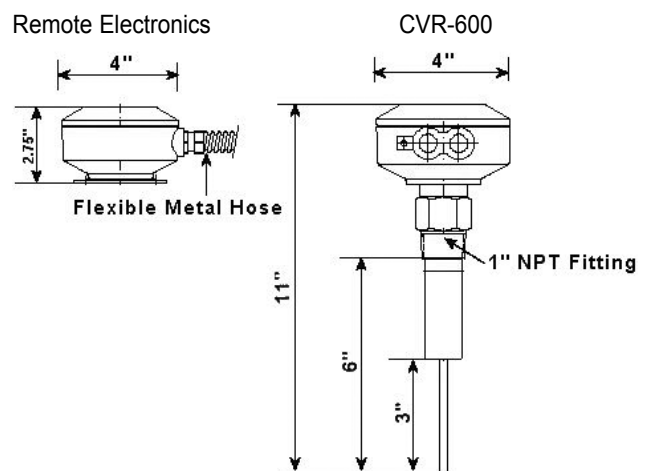
Dimensions



CVR Series Specification

Input Voltage: Wide range 20 - 250V AC/DC
Power Consumption: 3VA
Relay: SPDT 5A 250 VAC (option: DPDT)
Time Delay: 1 second from stop of vibration
 2 to 5 seconds for start of vibration
Temperature Range:
 • Ambient for electronic: -4°F to +140°F
 • Process Temperature: -4°F to +300°F
Min. Material Density: From 3.5 lb./cu. ft.
Max. Granular Size: 1-1/2"
Max. Pressure: 145 psi
Conduit Entry: 1/2"
Mounting: 1" NPT
Enclosure: Die cast aluminum NEMA 4
Rod: AISI 304 Stainless Steel

Dimensions



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