VIBRATING ROD ADVANTAGES

How it works – The BinMaster Vibrating Rod is a vibration type level control instrument. The rod of the sensor vibrates if there is no material covering the active rod. When the rod is covered with material, the vibration is dampened and an electronic circuit forces a relay to switch. When the blade gets uncovered, the vibration will restart and the relay will switch back. The rod is fixed at two points in a way that it forms a perfect swinging system with very low mechanical losses (also called transversal vibration). If you hit the end of the rod, it will vibrate on its resonance frequency and ring like a tuning fork. In action, the vibration is driven by a piezoelectric system, which gets electrical pulses from the electronics. These electric pulses enlarge the size of the piezos which leads to a bowing of the rod. Since the pulses are exactly on the frequency where the rod is in resonance, the whole rod starts swinging. A second piezo electric system works as a swinging detector. If the piezo gets distorted, it gives a voltage signal to the electronics. This way, the electronics can check if the rod is vibrating or not.

High Sensitivity – One of the technical advantages of the Vibrating Rod is its high sensitivity. Why is the BinMaster Vibrating Rod so sensitive? The idea of its design is to bring a very small portion of energy into the rod. This is accomplished by a vibrating system which swings exactly on its resonance frequency. The system does not lose any energy (e.g. to the wall of the bin) and therefore, only a very small amount of energy is needed to keep the rod vibrating. Since the amount of energy in the rod is so small, it is very easily absorbed by the material that is around it. Of course, it is easier to detect heavy material with Vibrating Rods as heavy material can absorb vibrations very easily; it is hard to "push away" heavy material (like sand, for example). Light material is easy to "push away" (think of polystyrene) and therefore, cannot absorb heavy "pushes"; it can only absorb small amounts of energy. Because the BinMaster Vibrating Rod brings in only a small amount of energy and therefore only pushes very lightly, it can detect very light material. The high sensitivity, however, has no influence on the ability to detect heavy materials as well. Without adjusting, you can detect light and heavy materials.

Single Rod Design – The biggest advantage of the single rod design is . . . well, it's a single rod. The typical (still popular, but very old-fashioned) fork design has a lot of trouble with material buildup. In between the two rods of the fork the material can be pressed together and build a bridge. Especially, in low-level alarm applications this happens a lot. The high pressure of material piled above the rod can press material in between the two rods. When the material level sinks under the level where the fork is installed, the fork will still be on "full" status, because the material bridged in between the fork will dampen the vibration. The user will only realize that there is a problem when the bin is empty and its process is disturbed. The same thing happens if a rock or some other large diameter material is jammed between the two rods. The fork can not vibrate anymore, which means the sensor has failed! With a single rod, bridge building and jammed material is not possible and therefore, not a problem.

Double-Edged Sword – The rod of the BinMaster Vibrating Rod is formed like a double-edged sword. This is due to one simple, but very important reason; there is no chance that material can build up onto the blade. The blade is so sharp, that all material will flow around it. This avoids the problems that round-shaped, single rods have. The bigger the surface, the higher the risk of having material accumulate on it. With the sword design, material will definitely not deposit on the rod! The most sensitive part of the rod is the tip. The body of the probe is not sensitive at all and the buildup of material on this surface has no influence on the vibration. This helps with material that may stick to the sidewall. In cases where there is material buildup on the vessel wall, other

HVS
PRECONISATEUR DE SOLUTIONS DEPUIS 1985
2 rue René Laennec 51500 Taissy France
Fax: 03 26 85 19 08, Tel : 03 26 82 49 29
E-mail:hvssystem@hvssystem.com
Site web : www.hvssystem.com

sensors need a separate extension in order to extend further away from the vessel wall. A BinMaster Vibrating Rod does not need this. Even though the BinMaster Vibrating Rod is compact in comparison to other sensors, its design is very robust. The heart of the vibrating drive, the piezosystem, is located in an isolated area. The way it is fixed to the rod keeps it from being damaged through outside forces. Even heavy forces directly on the membrane or the sensing rod will not destroy the piezosystem.

No risk of hollow spacing – We spoke earlier about larger Vibrating Rods having a problem with material building up on them and dampening the vibration when they are actually in an uncovered state. The bigger the diameter, the bigger the problem. The only way to compensate for this is by making the amplification of the driver stronger. Higher amplification, however, means more energy in the vibration, which makes the instrument less sensitive. But the biggest problem with high amplification is that the rod forms a hollow space in the material by pressing the material aside and building a tunnel around it. This happens especially with light powders like flour. The result is that the sensor can vibrate in the hollow space that it has formed, causing a false alarm. The BinMaster Vibrating Rod doesn't have this disadvantage. Because of its sword shaped rod, material cannot build up on it to dampen the vibration and therefore, the amplification can be kept very small. So the risk of hollow spacing is extremely low and only a theoretical possibility.

No problem with material changes – Environmental changes have no effect on the function of the BinMaster Vibrating Rod. The detection depends on the ability of the material to absorb energy. That is not a matter of pressure, temperature or humidity. Quite to the contrary to the relative permittivity (e) of the material is unaffected by material changes. As long as the material has a minimum density of 20g/L (1.25 lb./ft. 3), as does light polystyrene, it will be detected by the BinMaster Vibrating Rod, no matter what kind of material it is. Bins where material changes from time to time are no problem for the Vibrating Rod.

Unaffected by dust clouds and agitation – The Vibrating Rod only measures the dampening of the vibration. Dust clouds or agitations will not keep the rod from vibrating. Therefore, dusty materials are no problem for the BinMaster Vibrating Rod.

No maintenance or calibration required – The Vibrating Rod does not need any kind of maintenance or calibration. The installation of the Vibrating Rod is very simple and quick. Other systems (like capacitance) need to be calibrated which makes installation more complicated and require recalibrating from time to time. The Vibrating Rod only detects the dampening of its vibration, and fine tuning is not necessary.

Stainless Steel Construction – All parts that are in contact with the material or the bin are made out of stainless steel. That makes the Vibrating Rod usable for all kind of materials, even in the food industry.

Fail-Safe Relay Outputs – The BinMaster Vibrating Rod has a relay output which can switch up to 5A (250V / 1250VA). With a simple connection you can build a PNP or NPN output. The fail-safe circuit drops into an alarm position in the case of a power loss.

The unique design of the BinMaster Vibrating Rod makes it superior to competitive vibrating rods and tuning forks. It is the result of a "form-follows-function" concept. The rod does not end at the body. It is a long rod that goes all the way through the body and ends in the thread. The function principle is the rod is fixed by its swinging knots. If the rod is vibrating now, only a small amount of energy is needed to keep it swinging. Because the two fixing points are built synchronically, there is no energy lost to the fixing points of the rod. This principle makes the BinMaster Vibrating Rod very sensitive. What you see on the outside is just the "cover"; it does not vibrate and therefore can not be dampened. The thin tip keeps material from building up on it.

BINMASTER®

Distribué par :

HVS
PRÉCONISATEUR DE SOLUTIONS DEPUIS 1995

2 rue René Laennec 51500 Taissy France
Fax: 03 26 85 19 08, Tel : 03 26 82 49 29

Email : hvssystem@hvssystem.com
Site web : www.hvssystem.com