

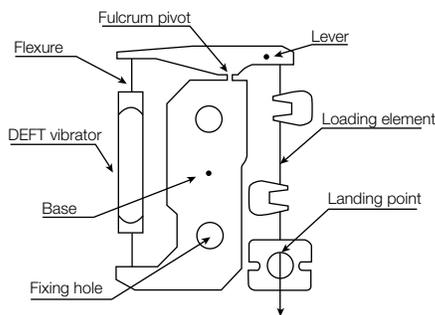
Rice Lake Balances Technical Bulletin

Understanding Tuning Fork Technology

Tuning fork balances have consistently outperformed traditional load cell-based balances. This bulletin describes tuning fork technology and the benefits it provides.

Tuning Fork Sensor

The tuning fork sensor is constructed from an alloy material and consists of a double-ended tuning fork vibrator (DETF), a fulcrum point, a lever, a loading element, and a base with fixing holes.

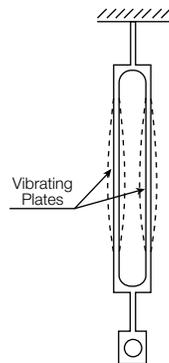


The sensor establishes the amount of force applied to the balance by measuring the resonant frequency generated on the DETF vibrator.

The vibrating element consists of a pair of rectangular flat plates symmetrical to the center axis and parallel with each other; they oscillate at a fundamental frequency with the symmetrical mode shown by the broken line.

Two Piezo ceramic transducer elements are placed close to the lower end of the vibrating plates.

One Piezo ceramic element connects to the output terminal and the other to an amplifier input terminal. Together, they establish a stimulation and detection circuit to maintain vibration: one for exciting and the other for sensing.



Superior Performance

To achieve high accuracy, a balance must compensate for the influence of temperature fluctuation at the force sensor. The temperature range of a tuning fork based balance is extremely small. This is due to the tuning fork sensor's superior heat capacity and conductivity.

The DETF vibrator requires a very small amount of excitation energy, allowing it to have very simple temperature and heat transfer characteristics.

Additionally, the tuning fork sensor doesn't require any A-D converters, analog circuits, or magnetic circuits which cause complex temperature vibrating-plate characteristics.

This allows Rice Lake balances to maintain incredibly long-term stability. Since the tuning fork sensor measures force by reading changes in resonant frequency, the possibility of hysteresis is practically eliminated.

Easy to Maintain

Outdated technologies are often a hassle to fix or find parts for; however, that's not the case with Rice Lake's tuning fork balances. They are incredibly durable, but if they are damaged due to an accident, repairs are inexpensive and easy. Additionally, they do not incorporate an internal magnetic coil, enabling them to remain virtually free from damaging dust.

Make the switch

If you're tired of dealing with problems inherent to load cell based balances, consider switching to Rice Lake tuning fork balances. Their superior characteristics make an ideal choice for light industrial applications such as weighing dyes, pharmaceuticals and jewels, as well as quality control applications.

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