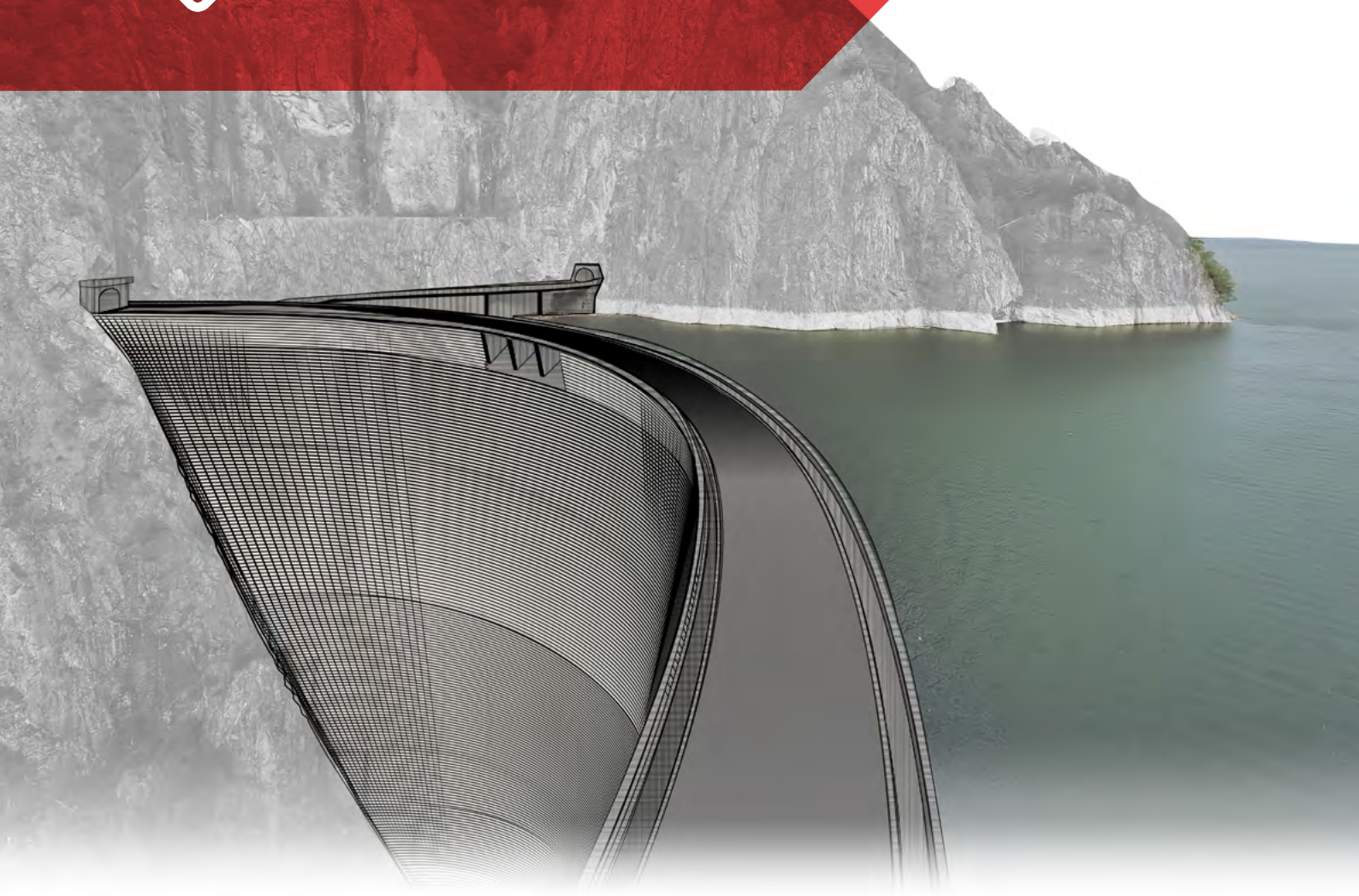
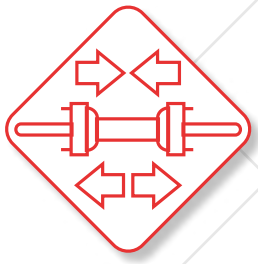
pizzi instruments



Spot Weldable Strain Gauges



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Instruments and Systems for Geotechnical and Structural

Spot Weldable Strain Gauges

Description

The spot weldable strain gauge is generally used to control surface deformation in metal structures, such as centering, reinforcing bars , piles, pipes etc and in structural monitoring and load tests.

Easy to apply, by means of induction welding directly to the structure to be monitored, these instruments are measured from a distance with our portable units (DEC5 or DEC3000) or with our data acquisition systems and remote centralization (mod. DAC3000). The spot weldable strain gauge comes ready positioned on a zero value in the middle of the scale; on request we can provide spot weldable strain gauges with a different value to zero and therefore with a different factory pretension.

Features and benefits

The SPOT Weldable Strain Gauges have the same features of the vibrating wire instruments, that are:

- **Wire tensioned mid-scale or as requested**
- **Flange for long welding for better adhesion of the sensor**
- **Robust**
- **High sensitivity and reliability over time**
- **No drift**
- **Accuracy**
- **Ease of installation**
- **Integrated temperature measurement**
- **Integration into centralized monitoring systems**

Applications

For monitoring of:

- **Pipelines and gas pipelines**
- **Tunnel centering**
- **Metal bridges**
- **Reinforcement bars**
- **Trusses**
- **Metal structures**

Model with internal magnets

The strain gauges with integrated magnets have been projected to measure deformations over the steel structure surface. This model is composed by a stretched steel wire between two fixing plates. The two plates are fixed to the object to be monitored by weldings. The deformation of the structure under load determines a movement between the two plates relative to one another with a consequent change in the strain of the vibrating wire and a corresponding variation of the resonance frequency of the same. The frequency of vibration of the wire is acquired by means of an electronic coil and the magnets which are housed on top of it

Model with pick-up

As already said the “wire” group is fixed on the structure to be controlled by means of welding and the group “excitation coil” is applied on this metal band by means of screw or gluing.
Even these strain gauges, like all our other vibrating wire instruments are interrogated with the portable readout unit as our DEC5 or similar, as well as our automatic acquisition systems, which are connected by 4×0,32mm2 shielded cable.
The “coil assembly” can, in this case, be applied to the “wire” group also only at the time of measurement, and then be removed and applied on a second “wire” group for the control of a second point, and so on. This possibility allows a considerable economization in the case of many points to be checked non-automatically; it is sufficient in this case to apply the wire group and then proceed to the various measures by moving, with the “coil” group, in the various points controlled.
For measurements with automatic data acquisition systems, they will be used complete units, at each point to check. The thermal expansion coefficient of the entire instrument is very close to that one of the concrete and / or steel for which, in the case of application of these materials, the thermal variations do not alter the validity of the measure.

Measuring principle

SPOT vibrating wire strain gauges consist of two basic groups:

- **the “wire” group**
- **the “excitation coil” group**

The wire is fixed to the final part of a 50mm long steel tube.
The tube is welded to a thin sheet, also in stainless steel, which allows the application of the strain gauge thus composed to the structure to be checked, again by spot welding. The coil group, separated from the body of the wire, allows, once applied above the tube, to excite the wire itself by putting it in vibration and to detect its frequency; frequency whose square is proportional to the elongation of the wire itself. There are also models with only flanges to be welded instead of a band that takes the entire length of the body.

We also point out that one of the most important characteristics of vibrating wire instruments is the absence of drift over time and with temperature.

SPOT weldable strain gauges are offered in standard form with a base of about 50 mm; they are supplied either complete with an excitation coil (model with integrated magnets) or as a single “wire” group or as a “coil group” only (model with pick-up).

Technical features

Technology	Vibrating Wire
Vibration Frequency	1600-2500 Hz
Coil resistance	36 Ohm
Range	3000 microstrain
Gauge Factor	0,81 με/Hz2x10-3
Resolution	0,1% f.s.
Linear Expansion Coefficient	10.8 x 10-6 °C
Sensitivity	1 μstrain
Operating Temperature	-30 ~ 105 °C
Temperature sensor	Thermistor NTC 3KOhm
Wire length	58 mm
Signal cable	L= 2mt standard; Other lengths available on request
String tensioning	Pretensioned at mid-scale or any other required position.

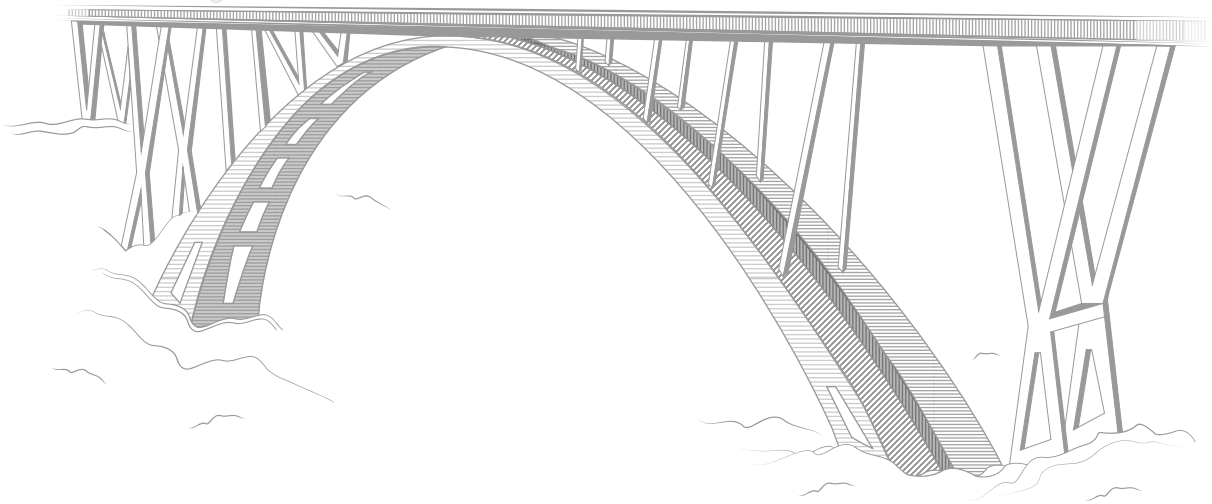
Related products

Junction Boxes	Available in different models for the connection of different instruments
Selection and Measurement Box	Measure Box complete with MUX Cards for automatic selection
Measurement Box	Simple measurement Box
Multipolar Cable	Available with different conductors for the connection of different sensors to one cable
DEC5	Portable readout unit
DEC3000	Portable Datalogger
CUM3000	Multichannel Datalogger
MUX	Multiplexer per la connessione di diversi sensori al Datalogger

The Company

For over 40 years we have been producing precision and large facility monitoring instruments sold throughout the world.

Accuracy in design, efficiency in construction, reliability in management; these are the prerogatives that every major work must have and that Structural Monitoring Systems must guarantee.



Technical assitance

If you have any requests or questions about our instruments or if you have special needs that require different solutions from the standard, please contact us. Our team will provide all the necessary information and will be very happy to work with you to study, develop and customize instruments and solutions suitable for your specific needs.

Pizzi Instruments S.r.l.
Via del Fornaccio, 46
50012 - Vallina - FI - Italia

Phone/Fax : +39 055 6810722
info@pizzi-instruments.it
www.pizzi-instruments.it