



LEA_IT_PND3101000



Electromagnetic Telependulum

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Instruments and Systems for Geotechnical and Structural Monitoring

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Electromagnetic Telependulum



Description

The automatic coordinatometer is used to measure the position of the wire of the direct and inverted pendulums in the two cartesian coordinates in the horizontal plane; the measuring range is 100 mm for the X coordinate and 50 mm for the Y coordinate.

Entirely designed and built by Pizzi Instruments, it ensures high resistance and reliability, combined with good sensitivity and accuracy; these characteristics are guaranteed by results obtained over a very long time with numerous installations, including those in harsh environmental conditions.

The resolution and accuracy obtainable is of a tenth of a millimeter (0.1mm) for both coordinates.

The instrument is electromechanical and is centralizable through our acquisition unit CUM3000.

Together with direct and inverted pendulums, and other models of coordinometers of the manual type, automatic coordinometers are essential instruments for measurement and monitoring of translations and rotations in large structures such as dams, towers, bell towers etc.

Applications

For the control of dams in traditional concrete and RCC, the pendulum has always been considered one of the most important instruments for checking the health status of the structure.

Typical applications of this instrument are the control of movements or rotations of:

- **Dams in traditional concrete and RCC**
- **Large Buildings**
- **Historical buildings and monuments**
- **Towers**
- **Chimneys**
- **Other**

Features and benefits

- **Robustness and precision**
- **High long-term repeatability**
- **Long service life of the system**
- **Very low wear and tear**
- **Ridotta manutenzione nel tempo**
- **Reduced maintenance over time**
- **Easy installation**
- **Easy management of data**
- **Possibility to locally read the measured data**
- **Protected against condensation and dripping**
- **Equipped with Gray encoder of type absolute**

Measuring principle

The coordinometer of a "tracker" type is composed of a base plate with two slides, controlled by micrometer screws which move in orthogonal direction to each other. Each slide is equipped with a pair of polar extensions; the thread of the pendulum passes between this pair of extensions and in its equilibrium position balances the magnetic field generated by them.

Each displacement of the plumb line causes an imbalance in the magnetic field; this imbalance, by means of suitable electronic circuits, is converted into an impulse for the two step-motors which activate the drive screws of the slides to move and follow the wire until the two magnetic fields balance.

The number of revolutions and fractions of a revolution made by the micrometer screws, are counted by a mechanical counter for local reading and by an absolute encoder for data transmission (one for each coordinate).

The encoder is 10-bit and digitizes the coordinate value in absolute GRAY code.

Protective microswitches for the end of stroke and a heating element to prevent the formation of condensation are also fixed to the base plate.

The whole mechanical assembly which is rigidly fixed to beams or shelves, is protected by a robust stainless steel cover, leaving a window for movement of the plumb line. An umbrella is installed over the plumb line as protection from drips.

All mechanical components are of stainless materials or protected by appropriate galvanised treatments.

As detailed, the coordinometer is provided with electronic circuitry able to detect the thread equilibrium position between the transducers, to drive the servo motors to restore the equilibrium position and transmit in code the data related to the measurements. This group of circuits, known as the electronic servers is enclosed in a specific container and maintained at a constant temperature by a thermostatted heater.

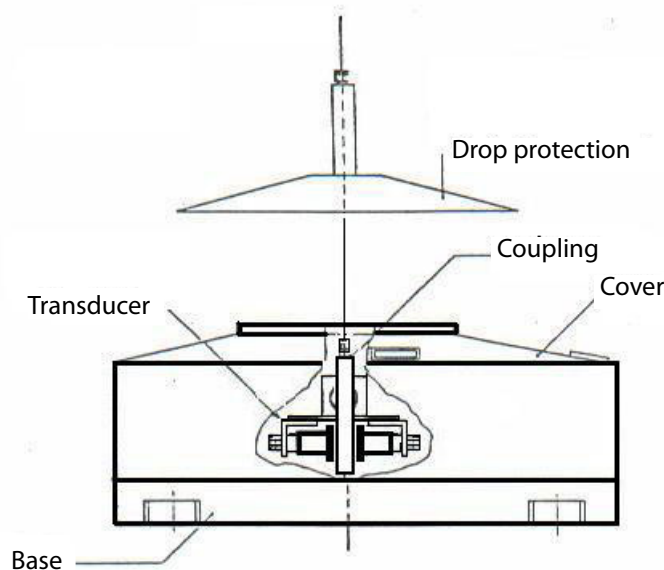
The electronic equipment is realized with solid state components on printed circuits.

On each board are LEDs for signalling the most significant alarms in the system.

There are also accessible bushings and test-points for the control of the most significant voltages of the various groups.

The coordinate values and alarm signals are usually transmitted by:

- **A shielded cable with 13 conductors (for each axis) for transmission of data in parallel format.**
- **A shielded 2-wire cable for the transmission of data in serial format.**
- **Optical fiber (the instrument must be equipped with an appropriate converter).**



Technical specifications

Sensor	Coordinometer XY (cod. PND3101001)	Coordinometer X (cod. PND3101002)
Range	100 mm for X coordinate 50 mm for Y coordinate	100 mm for X coordinate
Resolution	0,02 mm	0,02 mm
Resolution of the mechanical counter	0,01 mm	0,01 mm
Absolute GRAY Encoder	10 bit	10 bit
Precision	0,1 mm	0,1 mm
Operating temperature	From -20°C to +60°C	From -20°C to +60°C
Power Supply	24 V a richiesta: 220 V o 100 V o 12 V (±10%)	24 V a richiesta: 220 V o 100 V o 12 V (±10%)
Absorption	60 VA without heaters 160 VA with heaters	60 VA without heaters 160 VA with heaters
Output	Standard: Serialized data in current loop 0/20 mA (in digital form) Optional: 19 conductor cable with remote data transmission and alarm signals in GRAY code	Standard: Serialized data in current loop 0/20 mA (in digital form) Optional: 19 conductor cable with remote data transmission and alarm signals in GRAY code

Accessories and spare parts

Support device

Device manufactured on specific requirements

Related products

EGS-2C Portable Electronic
Telependulum

Removable electronic and optical instrument for manual measurements

Base for EGS-2C Telependulum

Support base for EGS-2C telependulum

Optical Coordinometer

Removable optical instrument for manual readings

Pair of tablets for optical
coordinometer

To manufacture the base of the optical coordinometer

Control Bench for optical
coordinometer

Bench for the periodic control and the calibration of optical
coordinometer

Technical assistance _____

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.

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The product information may be subject to variations at any time.
Please carefully check the release and contact Pizzi Instruments for further details.

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