



LEA_IT_PND3201001



Laser Telependulum

www.pizzi-instruments.it
Instruments and Systems for Geotechnical and Structural Monitoring

Laser Telependulum



Description

The automatic coordinometer is used for measuring the position of the wire of direct and inverted pendulums in the two Cartesian coordinates in the horizontal plane. Pizzi Instruments produces three different types of automatic coordinometers which differ in mode of operation, measuring ranges and precision.

They are:

- 1. The electromechanical tracking model**
- 2. The laser model**
- 3. The image-processing model**

The Laser model LAC3000, has no moving parts and is easily used both in a fixed locked position, and in a removable fixed position, either with its own feet or using the specific location/housing on a specific base. This feature allows the

use of bases currently in use for other coordinometers on numerous dams of Italian ENEL Group, thus enabling easy interchangeability.

The instrument is precise, solid, reliable, appropriately protected from dripping and humidity.

It ensures stable and safe results over time. The instrument is of the electronic type and is centralizable through our acquisition unit CUM3000 and other units able to accept 4-20mA signals.

Together with direct and inverted pendulums and our other coordinometers, these are essential instruments for the measurement and monitoring of translation and rotation in large structures such as dams, towers, bell towers etc ..

Applications

For the monitoring of dams, the use of pendulums and collimation using horizontal stretched wire has become increasingly frequent in recent years

Their use allows the measuring of horizontal movements of the dam body for monitoring and health status evaluation.

Typical use for this instrument is the measurement of horizontal movements in:

- **Concrete dams**
- **RCC dams**
- **Foundations**
- **Skyscrapers**
- **Bridges, jetties**
- **Large buildings**
- **Monuments**
- **Towers and smokestacks**
- **Minarets**
- **Nuclear power plants**
- **Other applications**



Features and benefits

- **High resistance in harsh environments**
- **Compatible with the support plates of many coordinometers already present in many Italian dams**
- **High long-term repeatability**
- **Long system life**
- **High precision**
- **Automatable measures**
- **No moving parts**
- **Reduced maintenance over time**
- **Control of the measured data**

Measurement principle —

The position of the wire, materialized through a special enlargement of the wire itself, is detected by three laser sensors, in the not visible range, arranged at 120 ° from each other.

The three measured distances are processed by electronic equipment which provides readings of the two coordinates, orthogonal to each other (X and Y) and a series of tests validating the measurements.

The system is completely static. The test of the measures is possible thanks to the redundancy of the measures. With this project, an innovative coordinometer has been created, with very simple technology and able to survive harsh environmental conditions.

The device is completely devoid of moving parts. The laser sensor comes from current industrial production and was developed for the monitoring of industrial processes.

This instrument has been designed and manufactured taking into account the size of instruments already in use

in many dams (see relevant notes below)

To replace any existing coordinometers, with compatibility of the base, just unclip the pendulum wire, remove the old coordinometers, replace with the new ones and reconnect the plumb wire.

Regarding the sensor, before being used in the new instrument, it was subject to various tests, designed to select the most suitable product for the specific requirements, with particular regard to accuracy, repeatability and inherent strength.

Inside the instrument are three heaters to heat the measuring environment and avoid the formation of condensation.

The prototype has been subjected to trial tests simulating the instrument's normal working conditions, with long-term tests directly in the dam.

On the micrometer bench, repeatability and accuracy of measurement has been properly tested.

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.

Technical specifications

N° sensors	3
Material of the housing plate of sensors	Anticorodal 6082
Measured size	Planimetric displacement on the two coordinates of the plumb wire
Method of measurement	Measure without contact with distance sensor
Range	± 25 mm in the two directions Mountains Valley and Left and Right (you can reach ± 35mm with less accuracy)
Resolution	0,01 mm
Linearity	≤ ±0,1mm
Global error of measurement	± 0,2 mm
Operating temperature of the laser	-5 ÷ +50 °C
Storage temperature	- 25°C ÷ +65°C
Power Supply	- Electronic board: 24Vdc e/o 24Vca - Heater group: 24Vac
Absorption	- Electronic board: 10 VA - Heater group: 60 W
Output signal	- n. 2 analogue output (one for each axis): 4-20mA - digital: RS232 o RS485 o RS422
Enlargement of the plumb wire	80 mm
Dimensions	420 x 385 mm
Level	Present

Support base

Material	Stainless steel AISI 316
Possible displacements to center the instrument	± 15 mm

Alarm signals

Output relay, close contact, shows one of the following problems

On output relay, with closed contact, it shows one of the following problems: open circuit, (laser or thermistor), measurement out of tolerance, laser signal overflow, laser signal or temperature underflow, measurement or temperature overflow, A/D converter out of range, anti-condensation heater faulty, A/D converter faulty

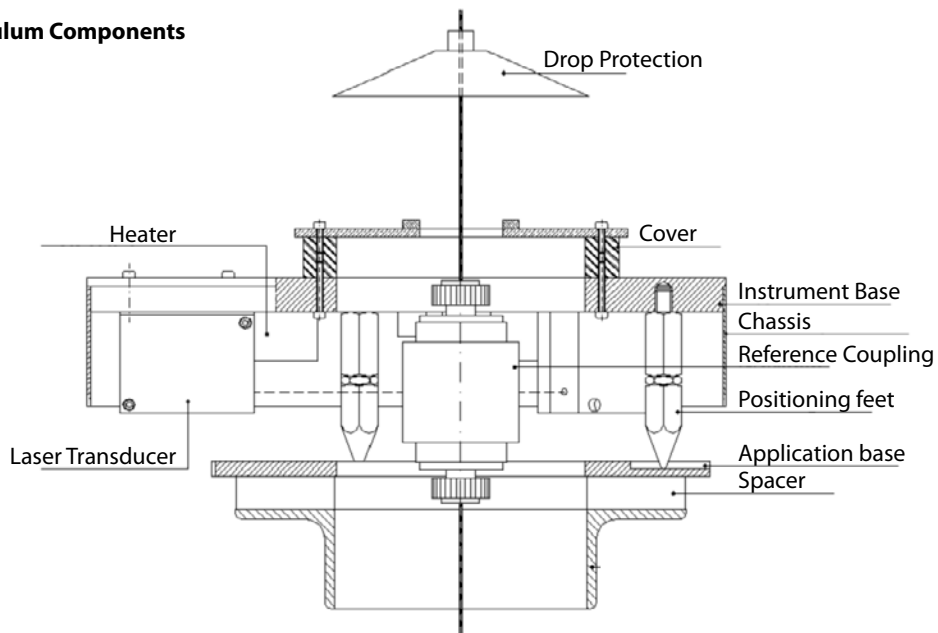
Accessories and spare parts

Support Base	For new application
Device for wire junction	In case it would be possible to remove the wire without cutting it
Support conical feet	Spare parts or accessories for the application of the coordinometer in removable fixed position
Laser Sensor	Spare element of the sensor group

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

Laser Telependulum Components



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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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