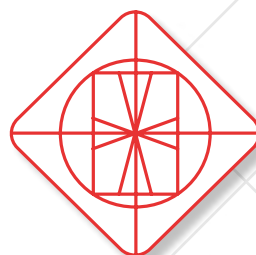




High precision Optical Collimator



www.pizzi-instruments.it

Instruments and Systems for Geotechnical and Structural

High precision Optical Collimator



Description

The optical alignment collimator is an instrument produced by Pizzi Instruments and designed especially for monitoring movement at dam crests.

The instrument, of notable optical-mechanical characteristics, with an objective lens of 80mm diameter and 60X magnification, allows optical alignment between two points considered fixed, this alignment defines a fixed vertical plane which allows the detection of movement of points in the structure aligned with it.

The collimator is always positioned at the same station point thanks to special bases which allow repeat placing in the exact same position.

On the opposite side to the points being monitored, a target is positioned on a special base, fitted with three special supports to allow precise positioning.

The mobile target is equipped with a special trolley carrying the screen, which can move horizontally with respect to the base; the extent of the translation is read on special decimal vernier placed between the trolley and the base. By means of a special knob, placed on the target, it moves the carriage until the screen is located centered on optical alignment; at this point it is possible to take the measure on the vernier of the target. The difference between the measure previously detected and the last one detected represents the displacement of the controlled point with respect to fixed alignment and therefore the movement of the structure

Applications

The high precision optical collimar allows detection of movement of one or more points of the dam with respect This instrument is mainly used for **monitoring concrete and earthfill dams**. It can also be used for monitoring:

- **Bridges**
- **Bulkheads**
- **Tunnels**
- **Embankments**
- **Viaducts**
- **Mines**
- **Other**

Features and benefits

- High resolution optical system
- High precision measurements
- Sturdiness and stability
- Easy to use
- Rapid precision measurements



Measurement principle

The instrument is very simple; the collimator allows the measurement of the relative displacement of several points along an optical alignment fixed and invariable over time; the alignment is defined by the collimator and a fixed reference target. The collimator is installed at a point known as the “station point”, generally in one of the shoulders of the dam crest, and such that it is not affected by possible movement of the dam body.

The points to be monitored on the dam body are formed by fixed bases for the mobile target which is positioned there during the monitoring phase; The fixed reference target, compared to the points to be monitored, is located opposite the collimator on the other shoulder of the dam. Measurement consists of measuring variations in position of points being monitored with regard to the alignment. The amount of movement will be equal to the movement required for the mobile target to return to its original alignment.

When the point, where movement is to be monitored, is not at the same height as the station point and the fixed target, that is the reference line, the mobile target can be observed by turning the telescope on its own horizontal axis. The collimation axis defines a vertical plane, allowing interception of the mobile target and measurement of its displacement in respect of that plane. The collimator is supported by three spherical feet, two with leveling screws, on a fixed base cemented in place, located externally to the structure on a special pillar.

The micrometric movements of the collimator have been designed to facilitate pointing also at great distances. The high quality of the optical system and the sturdiness of the instrument ensure high precision measurements . The objective lens has a resolution of 1.5 “. The pointing system, according to which the operator centers the micrometer wire between the references of the reference targets, increases the resolution to 0.32 “.

As above explained, the instrument lay on, with the three spherical feet, on the support tablets of the base. These tablets, made of stainless steel, tempered and rectified, recall the instrument with great accuracy always in the same station point; the collimator can then be removed after each series of observations.

The base is walled up at the station point and is protected by a watertight lid.

Technical specifications

Collimator	
Diameter of the lens	80 mm
Magnification	60x
Zenithal Rotation	$\pm 35^\circ$
Azimuthal Rotation	360°
Weight of the instrument	21 Kg
Housing	Watertight trolley in polypropylene
Dimension of the housing	670 x 510 x h 370
Weight of the housing with the instrument	32 Kg

Accessories and spare parts

To create a collimation system, in addition to the collimator, various accessories are needed such as:



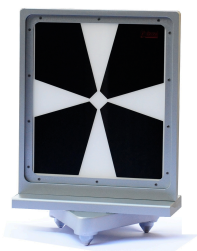
Support base for collimator

Base for the univocal positioning of the collimator.



Base for removable targets

Base for the univocal positioning of movable targets (measuring points) same base as the fixed target.



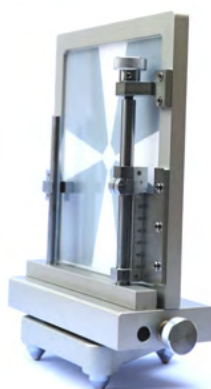
Fixed removable targets

For alignment with the collimator, removable, to be placed on relevant bases.



Fixed target for walls (as an alternative to fixed removable targets)

To create the optical alignment axis with the collimator; to fix to the wall.



Mobile target with one or two movements

For measuring deviation from the optical reference axis or plane.

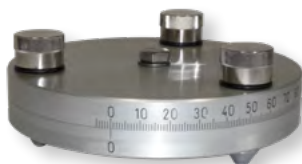
Range X=95 mm - Range Y=60mm

For special applications



Adapter between collimator base and target

For installation of removable fixed targets on the collimator base; recommended for long collimation distances, when alignment from both fixed locations is required. A version 70 cm or 100 high is also available



Rotating adapter between collimator base and targets

For 180° rotation of the target screen; to be used when monitoring of both fixed locations is intended.



Rotating adapter between target base and targets

For use on bases for targets when the same target is subject to observation by two misaligned alignments.

Sliding adapter between target base and target; H = 700mm To raise the target with respect to the support base, height adjustable from 50cm to 70cm with steps of 5cm (other heights and steps on request).

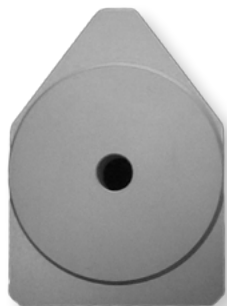
Fixed adapter between target base and target H = 50cm or 100cm

To raise the target with respect to the support base (other heights and steps on request).

Sliding adapter between the head element of the USBR settlement gauge column and collimation targets. For installing of a collimation target on the USBR settlement gauge column. Adjustable height in steps of 5cm, total max height 700mm, (other heights and steps on request).

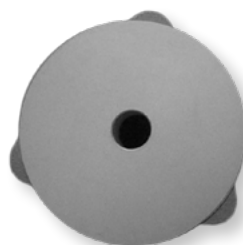
Fixed adapter between the head element of USBR settlement column and collimation targets. For the junction connection between the USBR settlement gauge column and the collimation target, max height 700mm (other heights on request).

For topographical measurements



Adapter between collimator base and total station , leveling benchmark, prism and signal rod

For the use of devices for topographic measurement on the collimator base.



Adapter between target base and total station, leveling benchmark, prism and signal rod

For the use of devices for topographic measurement on the target base.



Fixed base for theodolite complete with fixing screw and lid

For the use of total station in a fixed position, removable.

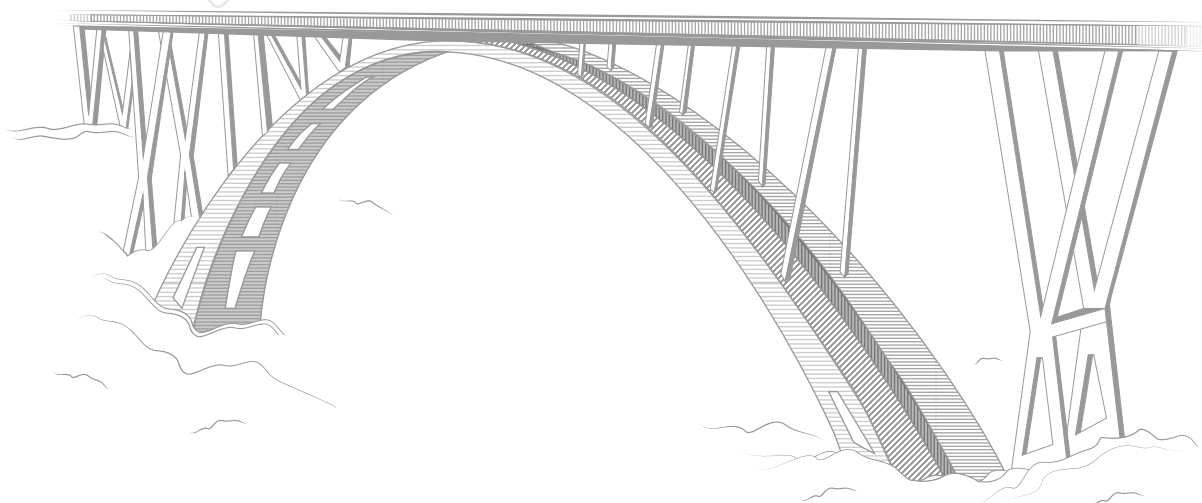
Also available are:

- Fixed and mobile leveling benchmark
- Removable signal rod
- Prisms

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 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.

All data present in the sheets could change without notice.

Please check the release carefully and for more details contact Pizzi Instruments.

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