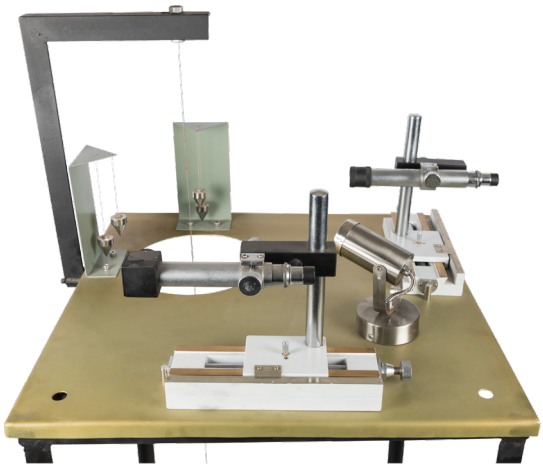
ENCARDIO RITE
METASENSING FOR MEGA STRUCTURES

PLUMB LINE NORMAL & INVERTED

DATASHEET

MODEL EDS-50/EDS-51 WITH MANUAL READOUT



OVERVIEW

The Encardio-rite models EDS-50 (Normal) and EDS-51 (Inverted) plumb lines with manual readout systems are reliable and precise tools designed for measuring long-base rotation, tilt, and relative displacement in critical civil engineering projects. These systems are widely used in high-rise buildings, concrete and masonry dams, nuclear plants, and other vital infrastructure. They provide essential data for monitoring structural stability and deformation, especially in projects affected by excavation, tunneling, and dewatering activities.

These plumb lines are particularly valuable for tracking the vertical rotation of retaining walls, the inclination and rotation of dams, piers, and piles, as well as evaluating the stability of structures in landslide-prone areas. Their ability to deliver continuous, real-time measurements makes them a reliable choice for monitoring crucial buildings and utilities

The **Normal Plumb Line (EDS-50)** utilizes a wire fixed through a collet arrangement at the top of the structure. A heavy weight at the lower end is submerged in an oil-filled tank, effectively damping any oscillations caused by vibration or shock. The **Inverted Plumb Line (EDS-51)** monitors displacement between the structure base and the rock foundation. The plumb wire is anchored between the rock foundation and a float submerged in a water tank, where the water serves as a damping medium.

Both systems detect tilt or displacement, with readings captured by the **Portable Optical Readout System.** These plumb lines provide superior accuracy and reliability, making them ideal for frequent, precise monitoring, particularly in situations where traditional methods, such as theodolite surveys, are insufficient.

FEATURES

- **High precision:** Accurate tilt and displacement measurements for structural monitoring
- **Damping mechanism:** Oil (EDS-50) and water (EDS-51) damping to reduce oscillations and ensure stable readings.
- **Dual application:** EDS-50 tracks structure tilt; EDS-51 measures foundation displacement.
- **Portable readout system**: Two travelling telescopes for quick, error-free X and Y axis measurements.
- **Real-time monitoring:** Continuous tracking of tructural stability.
- **No re-alignment needed:** Dual telescopes eliminate the need for frequent adjustments.
- **Durable design:** Built to withstand harsh environments and tough conditions
- **Quick setup:** Easy to install and operate for efficient data collection.
- **Versatile:** Ideal for high-rise buildings, dams, foundations, and more.

PRODUCT OFFERINGS

Normal Plumb Line - Model EDS-50

The EDS-50 Normal Plumb Line consists of a plumb line wire fixed through a collet arrangement, centered on a rectangular collet bar located at the top of the structure or dam. A heavy weight is clamped at the lower end of the wire, which is submerged in an oil-filled tank. This damping system effectively prevents any oscillatory movement of the plumb caused by vibrations or shocks. When a tilt occurs in the structure or dam, it causes a shift in the weight, which is then measured using a Portable Optical Readout System. This system provides accurate displacement readings, enabling real-time monitoring of structural stability.

Inverted Plumb Line - Model EDS-51

The EDS-51 Inverted Plumb Line monitors displacement between the structure or dam base and the rock foundation. The plumb wire is anchored between the rock foundation (at the bottom of a drilled hole) and a float submerged in a water tank in the observation area. Tension is maintained in the plumb wire, while the float is free to move. The water in the tank serves as a damping medium, minimizing the effects of vibrations. Any tilt or displacement in the foundation leads to a shift in the float, which is measured by the Portable Optical Readout System. This system provides precise displacement data, helping to monitor the stability of the foundation and the overall structure.

Portable Optical Readout System

The Portable Optical Readout System is a highly efficient and manual solution for measuring displacement in plumb line applications. It features two travelling telescopes, one for the X-axis and one for the Y-axis, enabling precise displacement measurements. These telescopes are mounted at right angles to each other, eliminating the need to realign the telescope, plumb line, and reference plumb whenever a reading is required along either axis.

This dual-telescope configuration significantly reduces observation time while minimizing the potential for measurement errors. Additionally, to ensure seamless observation from the same direction, one of the telescopes is equipped with a right-angle prism placed before the objective lens. This innovation simplifies the measurement process and enhances accuracy, making the system ideal for environments where quick and reliable measurements are critical.

The Portable Optical Readout System offers a flexible and straightforward manual solution for applications requiring precise tilt and displacement monitoring. It is especially suitable for environments where portability and ease of use are essential.

SPECIFICATIONS

Normal plumb line

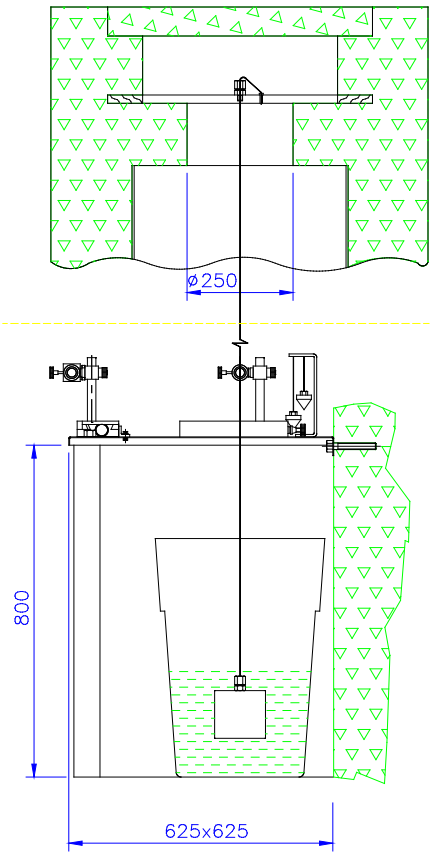
Table size	625 mm x 625 mm
Stainless steel wire	1 mm dia x 60 m long (other lengths available)
Wire suspension	Collet on a rectangular bar grouted at the top
Suspension wt.	10 kg
Tank (PVC)	40 litre capacity
Damping oil	S.A.E. 40

Inverted plumb line

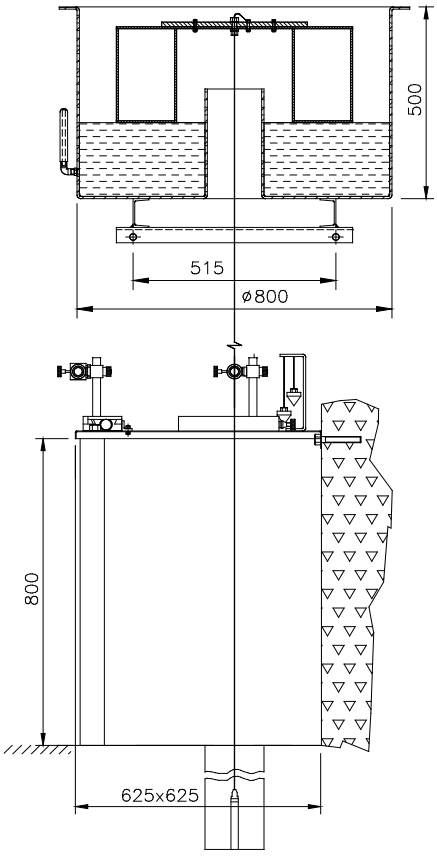
Table size	625 mm x 625 mm
Stainless steel wire	1 mm dia x 60 m long (other lengths available)
Wire suspension	Collet on a rectangular bar grouted at the top
Suspension wt.	8 kgf
Tank (Fiber glass)	800 mm Ø x 500 mm long
Float material	PVC

Portable optical readout system (manual)

Telescope focus range	250 mm to 500 mm
Resolution	0.01 mm
Accuracy	0.05% fs



Normal plumb line.



Inverted plumb line.

Typical mounting arrangement of normal and inverted plumb lines with portable optical readout unit.

*All specifications are subject to change without prior notice

DATASHEET | 1099-13 R4

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