

# ENCARDIO RITE



## VIBRATING WIRE PUSH-IN PIZOMETER

Model EPP-50V

### INTRODUCTION

The Encardio-rite model EPP-50V push-in vibrating wire piezometer is specially designed to measure pore water pressure in soft soil, clays and landfills in earth fill dam foundations & structures. It provides significant quantitative data on the magnitude and distribution of pore pressure & its variations with time. It also helps in evaluating the pattern of seepage, zones of potential piping & the effectiveness of seepage control measures undertaken. Proper evaluation of pore pressure helps in monitoring the behavior during and after construction and indicates potentially dangerous conditions that may adversely affect the stability of the structure, its foundation and appurtenant. It also provides basic data for design improvement that will promote safer and more economical design and construction. Push-in piezometers are not suitable for all sites. The limitation of depth varies, especially with type of soil conditions and the installation method used.



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### OVERVIEW

The Encardio-rite piezometer incorporates the latest vibrating wire technology to provide remote digital readout of fluid and/or water pressure. Piezometer is used in soft clays, organic and fine grained cohesion soils. Sensor is also ideal for slope stability investigation and leachate extraction. The piezometer unit is designed for easy field assembly.

### OPERATING PRINCIPLE

Encardio-rite pore pressure meter basically consists of a magnetic, high tensile strength stretched wire, one end of which is anchored and the other end fixed to a diaphragm which deflects in some proportion to the applied pressure. Any deflection of the diaphragm changes the tension in the wire, thus affecting the resonant frequency of the vibrating wire.

### FEATURES

- ♦ Reliable, accurate, low cost and simple to read.
- ♦ Protected against lightning spikes.
- ♦ Easy installation in soft soil, clays and landfills in earth fill dam foundations, ideal for soil fill work.
- ♦ Hermetically sealed under a vacuum of 0.001 Torr; stainless steel construction.
- ♦ Thermistor provided for additional temperature measurement.
- ♦ Can measure negative pressure.
- ♦ Very small time lag.
- ♦ Transmission of signal as a frequency over long cable lengths.

### APPLICATIONS

- ♦ To determine the flow pattern through earth and embankments.
- ♦ Measuring the elevation of ground water in soft soil, clays and landfills.
- ♦ Hydrological investigation, construction control, stability investigation and monitoring of earth dams, foundations, shallow underground works and surface excavations.
- ♦ Monitoring & control of de-watering & drainage.

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The resonant frequency with which the wire vibrates can be accurately measured. Encardio-rite model EDI-51V VW readout logger or ESCL-10VT single channel data logger or EDAS-10 data acquisition system are available for monitoring pore pressure at site.

## DESCRIPTION OF EQUIPMENT

Long term stability is ensured in the model EPP-50V Encardio-rite pore pressure meter by:

- ✦ Pressure and thermal cycling
- ✦ Unique method of wire clamping
- ✦ By generating a vacuum of around 1/1000 Torr inside the sensor by electron beam welding. This results in effect of oxidation, moisture, environmental conditions and any ingress of water being completely eliminated.

The vibrating wire pressure sensing capsule is sealed under high vacuum. The capsule and coil magnet assembly is housed in a stainless steel body. The model EPP-50V vibrating wire push-in piezometer has a pointed cone at one end and drill rod threads (EW drill or M28) at the other end. When threaded into a drill rod, the piezometer can be pushed into soft soil directly. The cable attached to the piezometer is passed through the drill rod. The piezometer must be monitored to ensure that the pressure created during installation does not exceed the maximum rated pressure.

The piezometer model EPP-50V is supplied with the required length of cable attached.

The pore pressure meter is individually temperature compensated making the requirement of a thermistor for temperature correction redundant. However a thermistor is provided for monitoring temperature.

## EPP-50V/1 Stainless steel sensor

The vibrating wire and coil magnet assembly is enclosed in corrosion resistant stainless steel body which is electron beam welded to the diaphragm.

## EPP-50V/2 Metallic filter

A low air entry value stainless steel filter of 40 micron porosity is provided. High air entry filters are also available as an option. The filter can be taken out for saturation. A locking nut holds the filter in position through a suitable 'O' ring.

## SPECIFICATIONS

<b>Type</b>	Vibrating wire
<b>Range (MPa)</b>	0.35, 0.5, 0.7, 1.0, 2.0
<b>Accuracy</b>	± 0.2 % fs normal ± 0.1 % fs optional
<b>Non linearity</b>	± 0.5 % fs
<b>Temperature limit Operational</b>	-20 to 80°C
<b>Over range limit</b>	150 % of range
<b>Thermistor</b>	YSI 44005 or equivalent
<b>Dimension (φ x L)</b>	35 x 166 mm

\* All specifications are subject to change without prior notice.

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