

## Data Sheet



CE

# VIBRATING WIRE PIEZOMETER

**MODEL EPP-30V**

## INTRODUCTION

The piezometer, also known as pore pressure meter, is used to measure pore water pressure in soil, earth/rock fills, foundations and concrete structures. It provides significant quantitative data on the magnitude and distribution of pore pressure and its variations with time.

The sensor helps in evaluating the pattern of seepage, zones of potential piping and the effectiveness of seepage control measures undertaken. The sensor also is used to measure water level in reservoirs, wells and boreholes.

## FEATURES

- Reliable, accurate, low cost and simple to read.
- Protected against lightning spikes.
- Easy installation in standpipes, pressure vessels and ideal for underground work.
- Hermetically sealed under a vacuum of 0.001 Torr; stainless steel construction.
- Thermistor provided for additional temperature measurement.
- Can measure negative pressure. Not limited to depth of water being within 5 m from the observation station as is in case of twin tube piezometers.
- Very small time lag.
- Transmission of signal as a frequency over long cable lengths.



## APPLICATION

- To determine the flow pattern through earth/rock fill and concrete dams and their foundations and to delineate the phreatic line.
- Measuring the elevation of ground water in standpipes, boreholes and wells.
- Hydrological investigation, construction control, stability investigation and monitoring of earth dams, foundations, shallow underground works and surface excavations.
- Monitoring & control of de-watering & drainage.

Proper evaluation of pore pressure helps in monitoring the behavior 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.

## OVERVIEW

The Encardio-rite piezometer incorporates the latest vibrating wire technology to provide remote digital readout of fluid and/or water pressure in standpipes, boreholes, embankments, fully and partially saturated natural soils, rolled earth fills and the interface of retaining structures. It is also used to measure water levels/water table in various applications. The superiority of Encardio-rite diaphragm type piezometers for these measurements is unquestionable.

## OPERATING PRINCIPLE

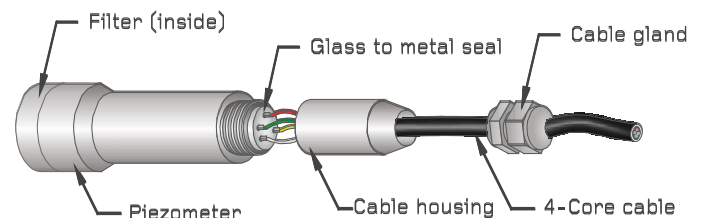
Encardio-rite pore pressure meter basically consists of a magnetic, high tensile strength stretched wire, one end of which is anchored and the other end fixed to a diaphragm which deflects in some proportion to the applied pressure. Any deflection of the diaphragm changes the tension in the wire, thus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

The resonant frequency with which the wire vibrates can be accurately measured by any vibrating wire readout unit. The data can also be automatically collected at desired frequency, stored and transmitted to remote server by a suitable datalogger.

## DESCRIPTION

Long term stability is ensured in the model EPP-30V 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 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-30V/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-30V/2 Metallic/ Ceramic filter

A low air entry value ceramic filter of 40 micron porosity is provided. A locking nut holds the filter in position through a suitable 'O' ring. Other types of filters are available as an option.

### EPP-30V/3 Cable joint housing

Leads from the coil magnet are terminated on a glass to metal seal which is electron beam welded to the stainless steel body of the pore pressure meter. A cable joint housing and suitable cable gland is provided for the cable connection.



## SPECIFICATION

Type	Vibrating wire
Range (MPa)	0.2, 0.35, 0.5, 0.7, 1.0, 1.5, 2.0, 3.5, 5.0, 10.0, specify
Accuracy	$\pm 0.25$ % fs normal $\pm 0.1$ % fs optional
Non linearity	$\pm 0.5$ % fs
Resolution	0.025% fs
Temperature limit Operational Compensated	-20 to 80°C 0 to 80°C
Insulation resistance	Better than 500 M Ohm at 12 V
Over range limit	150 % of range
Long term stability	0.1 % fs
Thermistor	YSI 44005 or equivalent (3 kOhms at 25°C)

## ORDERING INFORMATION

Model: EPP-30V-X (Range) - Filter (LAE/HAE) - Cable housing type (cable 3.5-8 mm or 9-14 mm)

\*All specifications are subject to change without prior notice

DATASHEET | 1182-12 R02



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