

PR 4500 Polarization Resistance Measurement Instrument

PRODUCTS

IR-Drop Compensation for Accurate Measurements in Any Environment

- The new **Model PR4500 Polarization Resistance Monitor** accurately determines polarization resistance even in high resistance environments such as those encountered in soil and concrete.
- Unique IR-Drop Compensation technology enables the independent measurement of the solution resistance, permitting accurate and reliable corrosion rate measurements even under very noisy (AC) conditions.
- The Model PR-4500 can extract a polarization resistance measurement even under conditions in which the solution resistance is significantly greater than the polarization resistance.

The **Model PR4500** employs a notebook computer for self-contained data acquisition and analysis. The personal computer enhances the data analysis capability of the instrument. The PR-4500 has the following capabilities:

- Unique corrosion rate determinations for concrete studies
- A special guard ring counter electrode for concrete studies
- Linear regression analysis and graphical analysis for extraction of maximum information from all data
- On board intelligence for analyzing the system's stability so the quality of the data is maximized
- Automated data logging
- Menu-driven operation

The **Model PR4500 Polarization Resistance Monitor** has the versatility to operate in your laboratory as well as in the field. It adds these excellent qualities:

- Rugged, weather-proof case
- External line power, external 12 VDC power source, or internal 2-hour battery operation

The **Model PR4500** employs two different measurement techniques to determine the



actual polarization resistance at the corroding interface.

- A DC technique determines the total resistance, including solution resistance as well as polarization resistance. The instrument then uses an AC technique to measure the solution resistance.
- At the AC measurement frequency utilized, the double layer capacitance in parallel with the polarization resistance, is an extremely low impedance and nullifies the polarization resistance's effect in the measurement. The difference between the DC and AC measurement is the true polarization resistance.

The user has the flexibility of determining the initial potential for a scan and the scan rate.

The **Model PR4500** will also perform multiple scans at programmed time intervals. With the ability to take 999 scans at 22-day time intervals, the **Model PR4500** becomes an automated, unattended data logger.

The quality of the measurement makes the **Model PR4500** an excellent tool in any application. The built-in intelligence permits the instrument to assess the integrity of the measurement by analyzing the reporting system stability; the **Model PR4500** quantifies potential drift and noise. The user can then identify and correct a problem prior to the collection of significant data.

HARDWARE:

CS 3100 Coupon Test Station

CM 3400-Coupon Monitor

PR 4500 - Polarization Resistance Measurement Instrument

EI-120 Electrochemical Interface

PS-140 Potentiostat

ZR-120 Zero Resistance Ammeter

Inline Separation System

Ultrasonic Monitoring System

SOFTWARE:

pcTUBE™ Software - Life Prediction Software

CreepLife™ Software - Life Prediction Software

CorLAS™ Software - Life Prediction Software

A linear regression manipulation is performed on the raw data. The instrument strives to obtain a regression coefficient in excess of 0.975. The instrument also does a post-test analysis of the data and will recommend a re-run of the test if improved measurements can be made.

The **Model PR4500** will automatically determine a new, initial potential and voltage step size to enhance results further. The Model PR-4500 provides a permanent record of any error messages or overrides that occurred during the test within the stored data file. This permits the engineer to more carefully review and analyze the data taken in the field.

For concrete studies, the new **Model PR-1200 Guard-Ring Counter Electrode** ensures the most accurate measurements possible. A separate guard ring counter electrode surrounds the primary counter electrode. The guard ring confines the primary counter electrode current to the area below the electrode, thus enhancing the accuracy of corrosion rate measurements.

The unique ability to measure and correct for solution resistance errors extends the purview of instantaneous corrosion rate measurements to high resistivity electrolytes that were formerly amenable only to much slower measurement techniques (e.g. weight loss and electrical resistance).

Some of the more important applications that fall within the measurement capabilities of the PR4500 are:

Inherently high resistively electrolytes

- boiler feed water
- soils

Thin film electrolytes

- atmospheric corrosion
- refinery overhead corrosion
- flue gas stack corrosion

Situations where scaling or fouling of electrodes can occur

- oily water
- oil field brines

All the sophistication of the **Model PR4500** is programmed from only four major menu selections. In less than an hour, you take good, quality data in your laboratory or in a harsh environment. The **Model PR4500** can serve all your polarization resistance measurement needs. The built in intelligence greatly minimizes errors with the instrument and makes it possible for even novice users to make good quality measurements.

For more information, please visit our websites.

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