LPR Probes: Real-Time Corrosion Monitoring

Instantaneous Corrosion Rate Measurement for Rapid Response & Optimized Process Control

Corrosion can develop rapidly in industrial systems due to sudden fluctuations in operating conditions such as temperature, pH, oxygen levels, flow velocity, or corrosion inhibitor dosing.

Linear Polarization Resistance (LPR) probes provide continuous, real-time corrosion rate measurements. This allows operators to detect subtle electrochemical changes instantly and take immediate corrective action before severe structural damage occurs.

1. Operating Principle & Performance Advantages

An LPR probe is an electrochemical corrosion monitoring device designed to measure the instantaneous corrosion rate of a metal while equipment remains in full operation. Unlike traditional corrosion coupons that provide only an average rate over weeks or months, LPR probes provide immediate data feedback—making them ideal for dynamic systems where process conditions frequently fluctuate.

- **Instantaneous Corrosion Rate:** Applies a very small electrical perturbation to a metal electrode and measures the resulting current response; the ratio between applied potential and measured current directly indicates the instantaneous corrosion rate.
- **Non-Destructive Accuracy:** Because the applied signal is extremely small, the natural corrosion process remains undisturbed.

> **Key Performance Advantages of LPR Monitoring:** Instantaneous Data • Inhibitor Optimization • Non-Destructive Test • Rapid Upsets Alert

2. Probe Configurations & Metallurgy Compatibility

Available in diverse mechanical designs and electrode setups to match operational needs and replicate actual plant equipment metallurgy.

Category	Available Designs & Operational Capabilities
Flexible Configurations	2-electrode or 3-electrode configurations available as Fixed Length Probes • Adjustable Insertion Length Probes • Retractable Probes (online removal) • High-Pressure Retrievable Probes • Flanged Systems & Lab/Research Probes.

Category	Available Designs & Operational Capabilities
Broad Metallurgy Compatibility	Equipped with easily replaceable electrodes manufactured from a wide variety of industrial metals and alloys—accurately replicating specific pipeline, tank, or vessel metallurgy while simplifying ongoing maintenance routines for a cost-effective long-term corrosion management program.

3. Reliable Data for Corrosion Control & Asset Protection

Combining real-time electrochemical corrosion measurements with process data empowers operators to establish proactive corrosion control:

- **Optimize Chemical Dosing:** Fine-tune corrosion inhibitor usage in real time.
- **Prevent Premature Damage:** Detect corrosivity shifts instantly during process fluctuations.
- **Extend Operational Life:** Maximize the lifespan of critical process assets.
- **Integrate Seamlessly:** Suitable for laboratories, water systems, and high-pressure industrial plants.

Accurate & Continuous Corrosion Monitoring

Whether installed in water treatment, chemical processing, or high-pressure industrial facilities, LPR probes deliver the real-time insights needed to make corrosion predictable, measurable, and manageable.