Side Illuminated Photoelectrochemical Cell With Quartz Window And Hermetic Gas Purge System

Item Number: PL-DJ21

Introduction

This high-performance side-illuminated photoelectrochemical cell features a premium high-transmittance quartz window, absolute hermetic sealing with gas purge control, and temperature-jacketed options, engineered to deliver exceptional reliability and accuracy for demanding laboratory and spectroscopic research applications.

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Application	Description	Key Benefit
Photoelectrochemical Water Splitting	Evaluates photoanodes and photocathodes for solar hydrogen production under simulated solar light, requiring precise side-illumination directly on the semiconductor surface.	Direct optical path with >95% transmittance maximizes light absorption, while the hermetic seal prevents atmospheric oxygen contamination of produced gases.
Carbon Dioxide Reduction (CO2RR)	Evaluates electrocatalytic pathways to convert CO2 into liquid fuels or carbon monoxide, utilizing constant sub-liquid CO2 gas purging and absolute hermetic isolation.	Continuous aeration saturates the electrolyte efficiently, and the airtight construction ensures accurate gas chromatography analysis of products.
Photocatalyst Characterization	Analyzes the quantum efficiency and transient photocurrent response of advanced light-harvesting materials deposited on conductive substrates (FTO/ITO).	360-degree rotating PTFE core allows exact alignment of the photo-electrode relative to the light beam, minimizing geometric errors.
Dye-Sensitized Solar Cells (DSSC)	Tests liquid-junction solar cells and advanced photovoltaic interfaces under continuous illumination while maintaining a controlled temperature.	Double-jacketed variant actively circulates heated/chilled water, eliminating thermal drift caused by intensive excitation lasers.
Nitrogen Reduction Reaction (NRR)	Investigates ammonia synthesis under ambient conditions, demanding absolute elimination of ambient nitrogen contamination.	Vacuum degassing to -0.1 MPa and hermetic sealing prevent false-positive nitrogen readings from ambient leakage.
Corrosive Media Electrochemistry	Tests material degradation and photo-induced corrosion of alloys or coatings in highly acidic, alkaline, or saline environments.	Premium high-borosilicate glass and fluoropolymer construction resist chemical attack, protecting the cell's structural integrity.

Parameter	Model PL-DJ21-S (Single-Layer)	Model PL-DJ21-D (Double-Jacketed)
Primary Function	Standard temperature, side-illuminated photoelectrochemical reactions	Temperature-controlled, side-illuminated photoelectrochemical reactions
Thermal Regulation	Ambient operation	Double-jacketed glass envelope for circulating water bath
Chamber Volume Options	30 mL, 50 mL, 100 mL, 150 mL, 250 mL, 500 mL (Custom sizes available)	30 mL, 50 mL, 100 mL, 150 mL, 250 mL, 500 mL (Custom sizes available)
Cell Body Material	High-Borosilicate Glass (GG-17)	High-Borosilicate Glass (GG-17)
Optical Window Material	High-Purity Optical Quartz (SiO2)	High-Purity Optical Quartz (SiO2)
Light Transmittance	> 95% in the Ultraviolet and Visible Spectrum	> 95% in the Ultraviolet and Visible Spectrum
Window Attachment	Quick-change lock-ring mechanical joint	Quick-change lock-ring mechanical joint
Airtight Sealing Design	External glass thread + 360° rotating PTFE inner core	External glass thread + 360° rotating PTFE inner core

Parameter	Model PL-DJ21-S (Single-Layer)	Model PL-DJ21-D (Double-Jacketed)
Outer Cap Material	High-rigidity Polyoxymethylene (POM)	High-rigidity Polyoxymethylene (POM)
Electrode Sealing Port	Internal audio-jack pin plugs in the custom lid	Internal audio-jack pin plugs in the custom lid
Electrode Compatibility	Requires custom-sized Working, Counter, and Reference electrodes	Requires custom-sized Working, Counter, and Reference electrodes
Atmospheric Protection	Sub-liquid aeration/bubbling tube with high-vacuum control valves	Sub-liquid aeration/bubbling tube with high-vacuum control valves
Negative Pressure Limit	≤ -0.1 MPa (Thorough vacuum degassing supported)	≤ -0.1 MPa (Thorough vacuum degassing supported)
Positive Pressure Limit	≤ 0.5 MPa (Slight pressurization permitted)	**0 MPa / Strict ambient pressure only** (Pressurization strictly prohibited due to thin inner glass wall)
Product Extraction	Optional integrated liquid/gas sampling port (extra charge applies)	Optional integrated liquid/gas sampling port (extra charge applies)