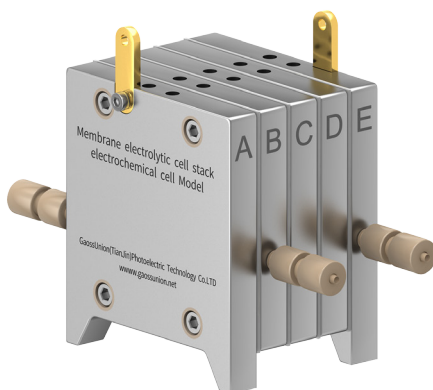
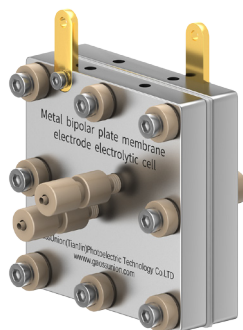
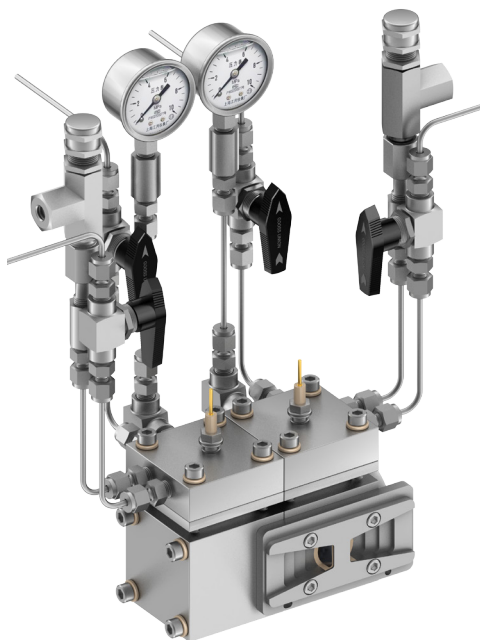


Electrochemical Product Catalogue

Electrolytic Cells Electrode



COMPANY

Company Profile Gaoss Union was established in 2008 in East Lake High-Tech Development Zone of Wuhan, known as "Optics Valley of China".

Ever since its establishment, Gaoss Union has devoted to research, development, production, sales and service of electrochemical products. It is a scientific and technological company with research of electrochemical reactions as well as design and manufacture of electrochemical devices as its major businesses.

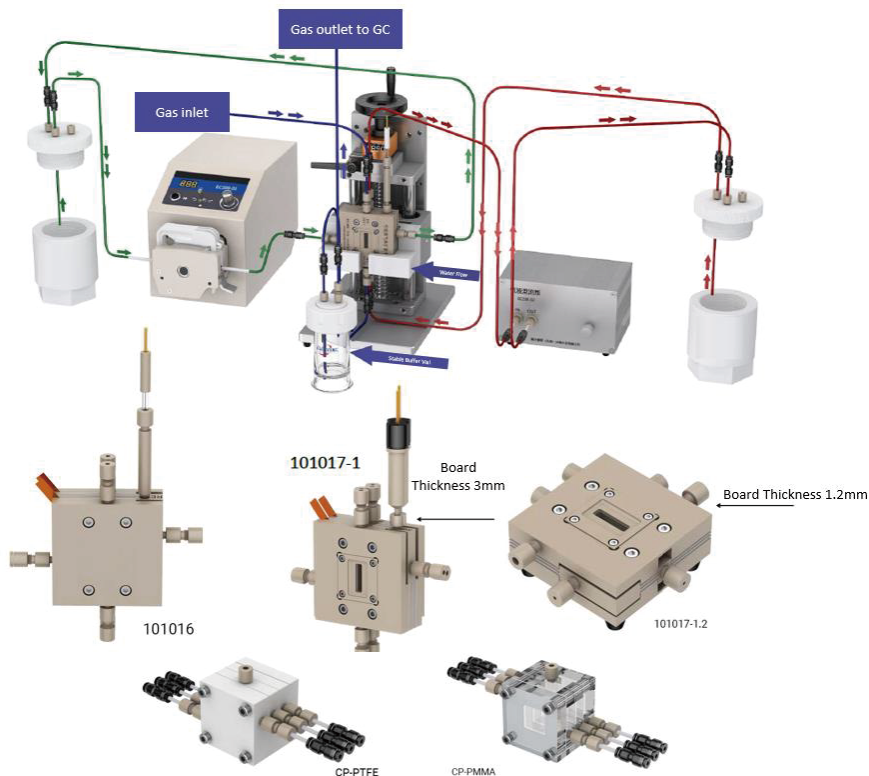
Gaoss Union manufacture and sell three-electrode, electrolytic cells, flow cells, characterization cells, electrochemical materials, etc. required for electrochemical experiments, as well as provide customized electrode and electrochemical device services.

Welcome to inquire.



Gas Diffusion Electrolytic Cell Series

Integrated Solution for Carbon Dioxide CO₂ Reduction



Specially for experiment on carbon dioxide reduction with the capability for gas-liquid separation. The apparatus is designed to handle common experimental issues with ease, eliminating interference.

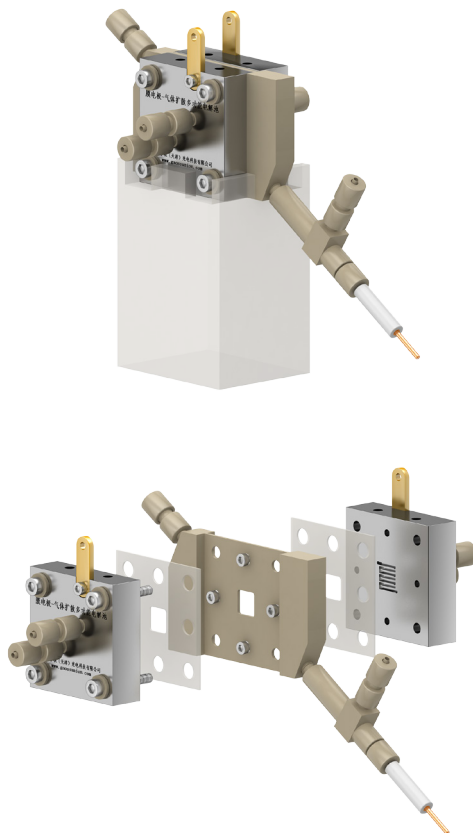
- All pipelines are made of PTFE tubing (OD 3mm).
- Equipment connections utilize standard PEEK quick connectors.
- Electrolytic cell main materials include PEEK, PTFE, and PMMA.
- CP Series with PTFE Material CP Series with PMMA Material
- Model 101017-1 features a cathode-anode spacing of 7mm, while Model 101017-1.2 offers a reduced cathode-anode spacing of 3mm. This innovative design allows for precise control and optimization of electrolytic processes, catering to diverse experimental requirements. The thoughtful configuration enhances efficiency and flexibility, making these models ideal choices for a range of applications in research and development.
- Models CP10 and CP20 have a cathode-anode spacing of 21mm.

Committed to the electrochemical equipment research&development, and manufacturing

Gas Diffusion Electrolytic Cell Series

Membrane Electrode-Gas Diffusion Multi-Functional Electrolytic Cell

Model: 101018

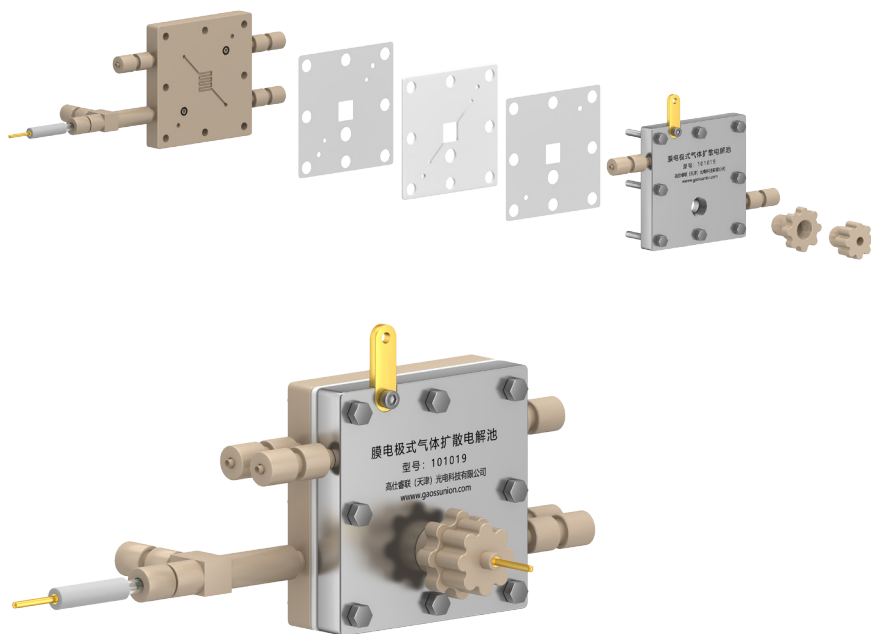


The reactor adopts a sandwich structure, which can be freely combined into a CO₂ reduction gas diffusion electrolysis cell, a solid electrolysis cell for producing pure liquid products, and a membrane electrode reactor according to the experimental requirements.

- Reaction chamber size: 10*10mm.
- Reactor material: high-purity titanium + PEEK.
- Reactor area: 1 cm²
- PEEK chamber thickness: 1.2mm.
- Standard reference: Agcl electrode.

Gas Diffusion Electrolytic Cell Series

Membrane Electrode Gas Diffusion Electrolytic Cell Model: 101019



This electrolytic cell, as a new type of gas diffusion electrolytic cell, is a new improvement on the membrane electrode electrolytic cell. The gas chamber adopts the serpentine flow path commonly used in MEA cells, which greatly increases the contact time between the reaction gas and the cathode and improves the reaction efficiency. The new flow path design of the cathode chamber reduces the spacing between the working electrode and counter electrode to 0.4mm.

- Plate material: high-purity titanium.
- Flow path type: serpentine flow path (default), support customised flow paths.
- Distance between working electrode and counter electrode: 0.4mm.
- Electrode reaction size: 10*10mm, 20*20mm, 30*30mm, etc.
- Working electrode: gas diffusion electrode (self-provided).
- Reference electrode: silver silver chloride electrode (standard).
- Counter electrode: porous material such as iridium oxide mesh (self-provided).

Gas Diffusion Electrolytic Cell Series

CO₂ reduction complete solution BOM

Product Name	Specifications	Remark
Gas diffusion electrolytic cell	101016	No observation window
Observable gas diffusion electrolytic cell	101017	Equipped with observation window, the distance between the anode and cathode < 7mm
Observable gas diffusion electrolytic cell	101017-1.2	Equipped with observation window, the distance between the anode and cathode < 3mm
Membrane Electrode-Gas Diffusion Multi-Functional Electrolytic Cell	101018	
Membrane Electrode Gas Diffusion Electrolytic Cell	101019	
H-type exchange membrane electrolytic cell	CP10	Channel 10*10
H-type exchange membrane electrolytic cell	CP20	Channel 20*20
Choose ONE of the above cells		
Water management system	101015	
Leakless Ag/AgCl electrode	PK-1038	
Hg/HgO electrode	Hg-1038	
Pt sheet electrode	15*35*0.2	
Peristaltic pump	EC200-01	
Anion exchange membrane	Fuma-FAA-3-50	
Cation exchange membrane	N115 100*100	
Hydrophobic carbon paper	100*100	A box of 10 sheets
Salt bridge	CP-1038	
Copper tape	5mm*50m	
PTFE electrolyte reservoirs	YL-1	
PTFE tube	3mm*5m	
Buffer vial	30ml	
Mixed flow pump for gas and liquid	EC200-02	Internal shear force
Mass Flow Meter	ACCU	

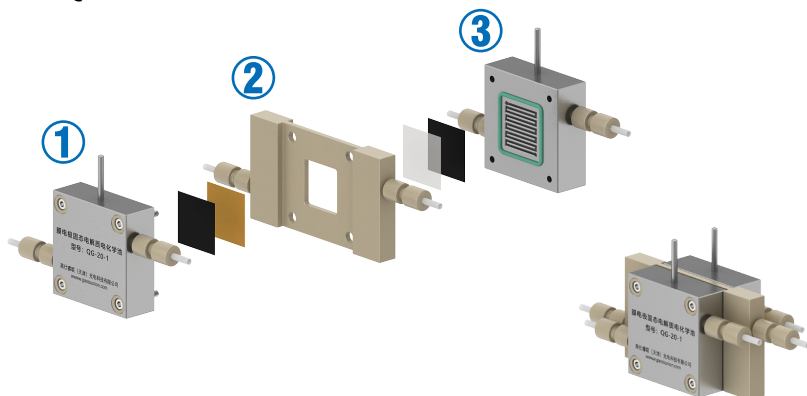
All sizes are standard sizes and various volumes can be custom-made according to requirements.

Committed to the electrochemical equipment research&development, and manufacturing

Gas Diffusion Electrolytic Cell Series

Solid-State Electrolyte Electrochemical Cell (Two-Electrode System)

Model: QG-20-1



The solid-state electrolyte cell adopts a sandwich structure, establishing a gas-solid interface. It utilizes a solid electrolyte in place of liquid electrolyte, eliminating the introduction of anions/cations and directly achieving the preparation of high-purity liquid product solutions.

Features:

- Bipolar Plates with Serpentine Gas Flow Channels: Electrode bodies 1 and 3 serve as bipolar plates with inner serpentine gas flow channels, effectively enhancing the concentration of gaseous reactants on the catalyst surface to achieve high current density.

- Between electrode bodies 1 and 2, a double-layer structure comprising an anion membrane (dioxide material) and a gas diffusion layer (loaded with anode catalyst) is employed to realize the gas-solid interface and anion transport (Note: hot pressing is required for sufficient contact).

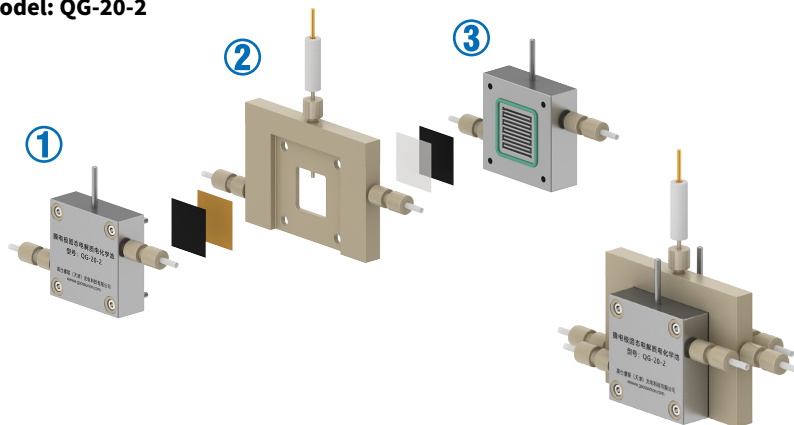
Similarly, between electrode bodies 2 and 3, a double-layer structure with a cation membrane (Nafion115) and a gas diffusion layer (loaded with cathode catalyst) is used to achieve the gas-solid interface and cation transport (Note: hot pressing is required for sufficient contact).

- Electrode body 2 is the core component of the solid-state electrolyte cell, featuring a built-in 3mm thick square (4cm²) hollow layer. This layer can be filled with molded solid electrolyte to replace the liquid electrolyte, enabling the direct preparation of liquid fuels. The solid electrolyte primarily consists of highly conductive polymer or porous ceramics. The use of pure water aims to carry away the liquid product, promoting the shift of the reaction equilibrium to the right and obtaining impurity-free product aqueous solutions. Substances generated in electrode body 1 and electrode body 3 pass through their respective membranes and react in intermediate

Gas Diffusion Electrolytic Cell Series

Solid-State Electrolyte Electrochemical Cell (Three-Electrode System)

Model: QG-20-2



The QG-20-1 has been enhanced with the addition of a reference electrode. The reference electrode chamber has a board thickness of 3mm. The overall design of the solid-state electrolyte cell incorporates a sandwich structure, establishing a gas-solid interface. It utilizes a solid electrolyte in place of liquid electrolyte, preventing the introduction of anions/cations and facilitating the direct production of high-purity liquid solutions.

Features:

- Bipolar Plates with Serpentine Gas Flow Channels: Electrode bodies 1 and 3 serve as bipolar plates with inner serpentine gas flow channels, effectively enhancing the concentration of gaseous reactants on the catalyst surface to achieve high current density.

- Between electrode bodies 1 and 2, a double-layer structure comprising an anion membrane (dioxide material) and a gas diffusion layer (loaded with anode catalyst) is employed to realize the gas-solid interface and anion transport (Note: hot pressing is required for sufficient contact).

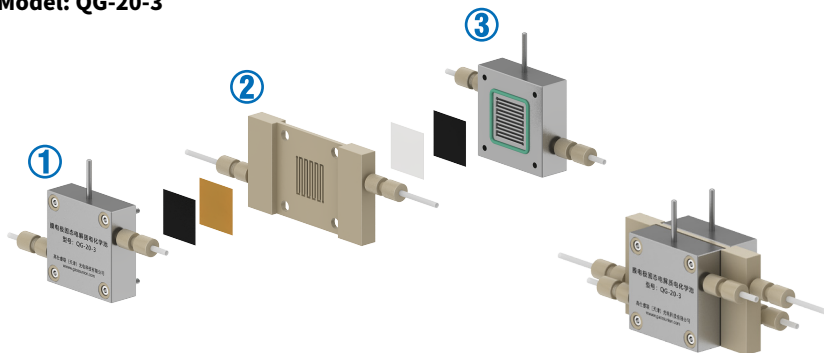
Similarly, between electrode bodies 2 and 3, a double-layer structure with a cation membrane (Nafion115) and a gas diffusion layer (loaded with cathode catalyst) is used to achieve the gas-solid interface and cation transport (Note: hot pressing is required for sufficient contact).

- Electrode body 2 is the core component of the solid-state electrolyte cell, featuring a built-in 3mm thick square (4cm²) hollow layer. This layer can be filled with molded solid electrolyte to replace the liquid electrolyte, enabling the direct preparation of liquid fuels. The solid electrolyte primarily consists of highly conductive polymer or porous ceramics. The use of pure water aims to carry away the liquid product, promoting the shift of the reaction equilibrium to the right and obtaining impurity-free product aqueous solutions. Substances generated in electrode body 1 and electrode body 3 pass through their respective membranes and react in intermediate

Gas Diffusion Electrolytic Cell Series

Solid-state electrolyte electrochemical cell (serpentine channel system)

Model: QG-20-3



The QG-20-1 has been enhanced with the addition of a reference electrode. The reference electrode chamber has a board thickness of 3mm. The overall design of the solid-state electrolyte cell incorporates a sandwich structure, establishing a gas-solid interface. It utilizes a solid electrolyte in place of liquid electrolyte, preventing the introduction of anions/cations and facilitating the direct production of high-purity liquid solutions.

Features:

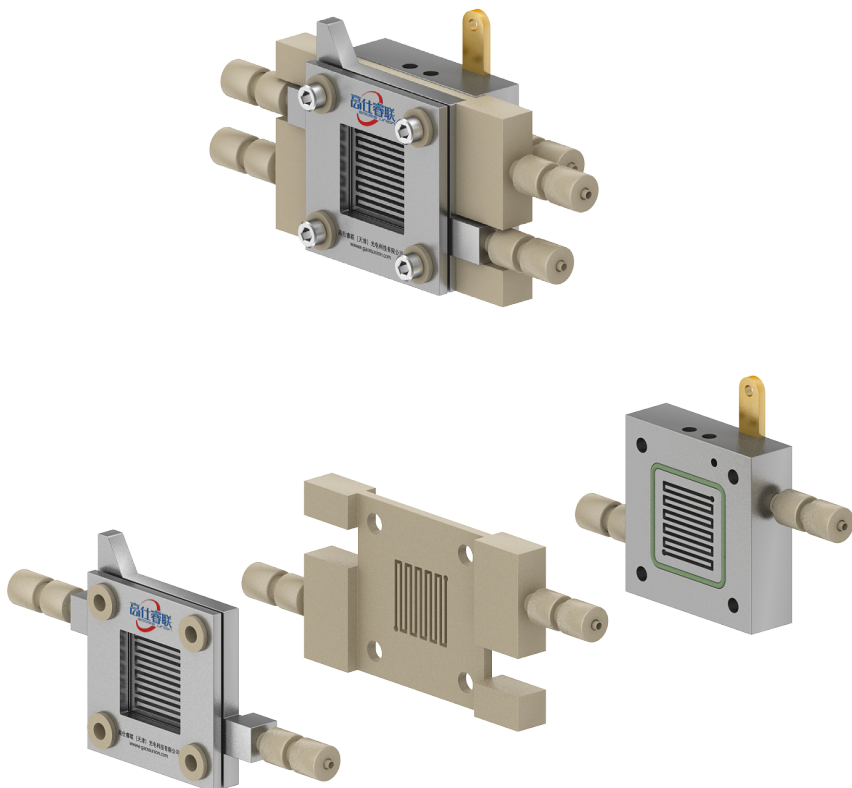
- Bipolar Plates with Serpentine Gas Flow Channels: Electrode bodies 1 and 3 serve as bipolar plates with inner serpentine gas flow channels, effectively enhancing the concentration of gaseous reactants on the catalyst surface to achieve high current density.
- Between electrode bodies 1 and 2, a double-layer structure comprising an anion membrane (dioxide material) and a gas diffusion layer (loaded with anode catalyst) is employed to realize the gas-solid interface and anion transport (Note: hot pressing is required for sufficient contact).

Similarly, between electrode bodies 2 and 3, a double-layer structure with a cation membrane (Nafion115) and a gas diffusion layer (loaded with cathode catalyst) is used to achieve the gas-solid interface and cation transport (Note: hot pressing is required for sufficient contact).

- Electrode body 2 is the core component of the solid-state electrolyte cell, featuring a built-in 3mm thick square (4cm²) hollow layer. This layer can be filled with molded solid electrolyte to replace the liquid electrolyte, enabling the direct preparation of liquid fuels. The solid electrolyte primarily consists of highly conductive polymer or porous ceramics. The use of pure water aims to carry away the liquid product, promoting the shift of the reaction equilibrium to the right and obtaining impurity-free product aqueous solutions. Substances generated in electrode body 1 and electrode body 3 pass through their respective membranes and react in intermediate membranes and react in intermediate electrode body 2, producing products carried away by flowing pure water.

Gas Diffusion Electrolytic Cell Series

Solid-state electrolyte electrochemical cell (visualisation) Model: QG-20-4



The QG-20-3 has been upgraded with the addition of a visual high transmittance quartz window in the cathode chamber, which can be used for optical observation of the working electrodes in the cathode chamber or for additional illumination.

Model	Specifications	Remark
QG-20-1	20*20mm	includes reference electrode
QG-20-2	20*20mm	
QG-20-3	20*20mm	
QG-20-4	20*20mm	

All sizes listed are common sizes, can be customized according to requirements.

Gas Diffusion Electrolytic Cell Series

Membrane electrode - Gas diffusion dual-function electrolytic cell

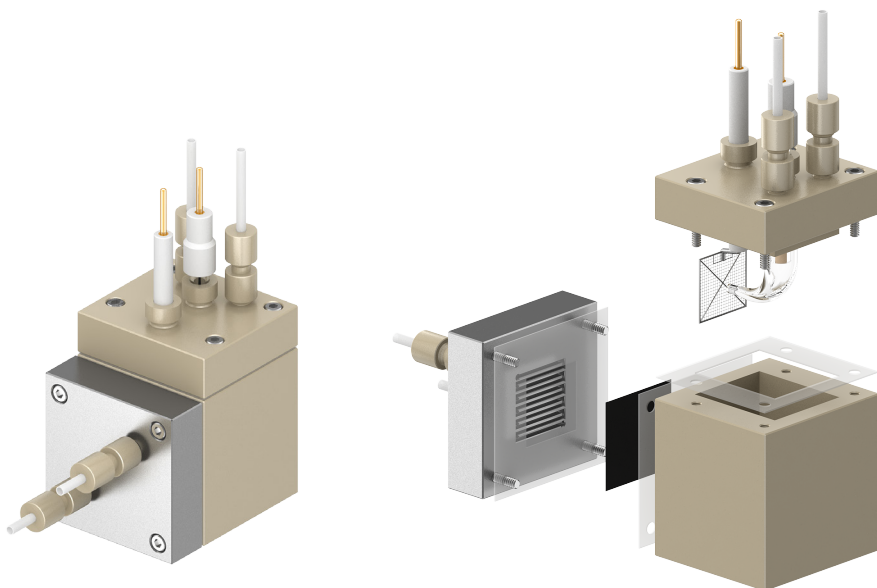
Model: MTR-4-1

Features

This electrolytic cell is specifically designed for electrochemical testing in a flowing phase, providing versatility in various experimental setups. It features a chamber-type compartment on one side and a serpentine channel on the other. The serpentine channel, commonly used for gas pathways, facilitates reactions between gases and the chamber through a gas diffusion layer.

- The dimensions of the serpentine channel are 20*20mm, ensuring efficient gas flow and reaction within the chamber.
- The electrodes shown in the illustration are for display purposes only. The platinum mesh electrodes and reference electrodes are required to be purchased separately.

Experience the MTR-4-1, where innovation meets functionality for precise electrochemical testing in a dynamic, flowing environment. Please note that platinum mesh electrodes and reference electrodes are available for separate purchase. Elevate your experiments with this cutting-edge dual-function electrolytic cell.



Gas Diffusion Electrolytic Cell Series

Membrane electrode - Gas diffusion dual-function electrolytic cell

Model: MTR-4-2

Elevating the capabilities of its predecessor, the MTR-4-2 introduces an independent chamber for a reference electrode, providing enhanced functionality for precise electrochemical testing in a flowing phase.

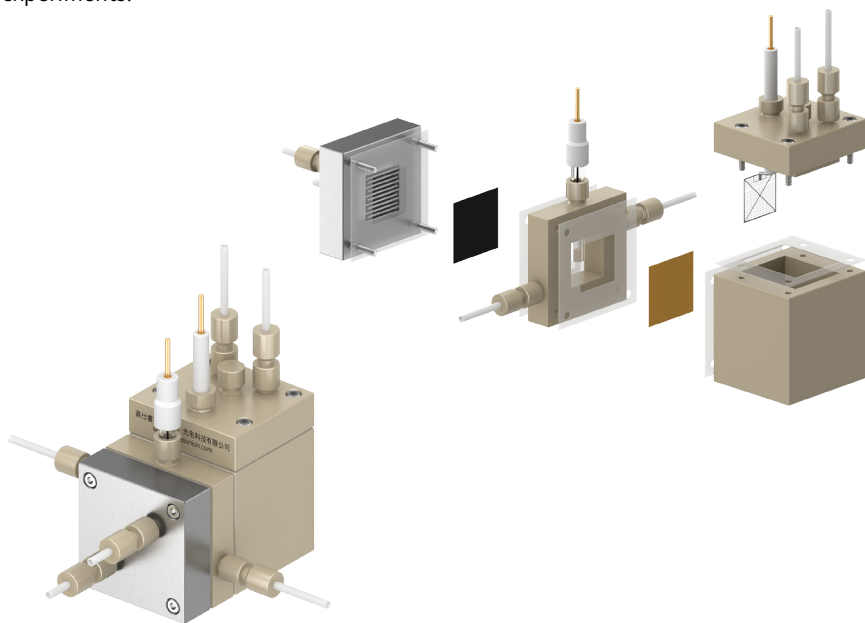
Features

Enhanced Functionality: In comparison to the MTR-4-1 model, the MTR-4-2 incorporates a separate chamber for a reference electrode, offering expanded capabilities for electrochemical experiments.

Versatile Application: Tailored for electrochemical testing in a flowing phase, this electrolytic cell delivers adaptability for a variety of experimental setups.

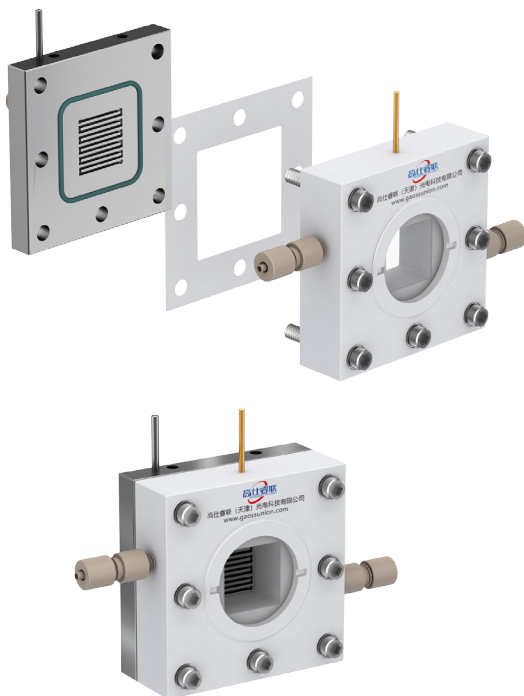
Dual-Chamber Design: Featuring a chamber-type compartment and a serpentine channel, the dual-chamber design optimizes the electrolytic cell's functionality. The serpentine channel, widely employed for gas pathways, facilitates reactions between gases and the chamber through a gas diffusion layer.

Experience the next level of electrochemical testing with the MTR-4-2, where added functionalities meet versatility in a flowing phase. Please note that platinum mesh electrodes and reference electrodes can be acquired separately to complement your experiments.



Gas Diffusion Electrolytic Cell Series

Gas diffusion photoelectrochemical cell Model: MTR-QW



Key Features:

Photocatalytic Gas Diffusion Electrode: This electrolytic cell achieves remarkable results by harnessing the potential of gas diffusion electrodes in the realm of photocatalysis. The inclusion of materials like carbon cloth, carbon paper, or porous structures such as foam metal electrodes and RVC ensures optimal performance.

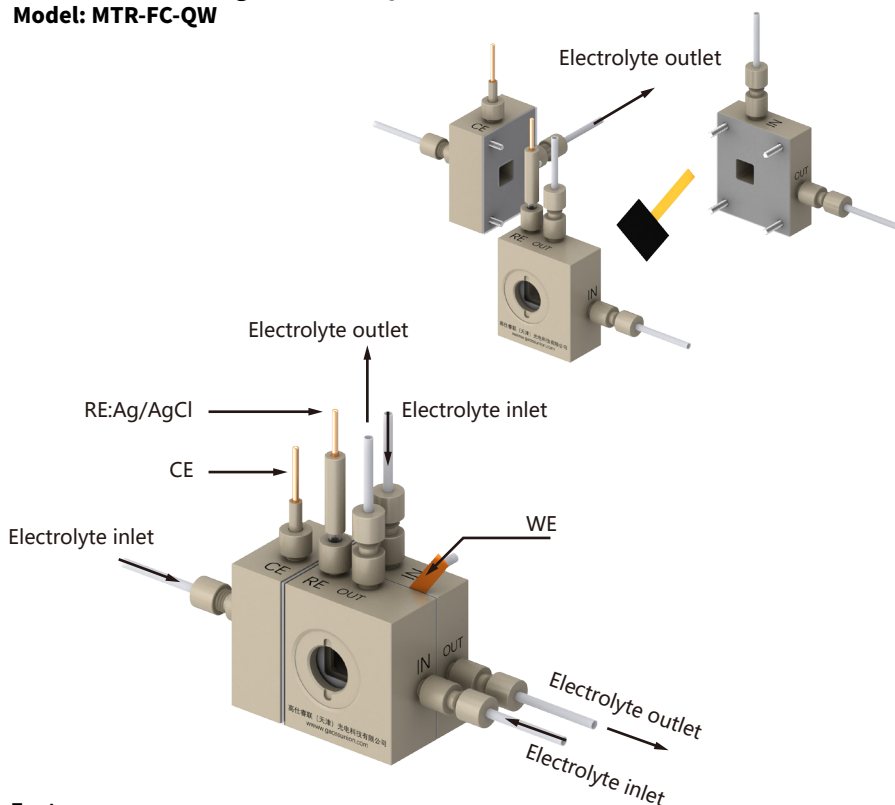
Cathode Configuration: The cathode of this electrolytic cell is designed to accommodate gas diffusion electrodes such as carbon cloth or carbon paper. Alternatively, porous materials like foam metal electrodes or RVC can also be employed. The cathode is equipped with a platinum wire reference electrode, provided as a standard configuration.

Serpentine Flow Path for Cathode Inlet: Enhancing the interaction between reaction gases and catalysts, the cathode inlet utilizes a serpentine flow path. This design promotes thorough and efficient reactions. For applications requiring humidified gases, we recommend pairing this electrolytic cell with the specially crafted gas humidifier.

Gas Diffusion Electrolytic Cell Series

Gas diffusion exchange membrane photoelectrochemical flow cell

Model: MTR-FC-QW



Features:

This electrolytic cell addresses the issue of catalyst shading from incident light in the previous Flow cell gas-diffusion electrolytic cell. Primarily designed for testing flow systems such as photoelectrochemical CO₂ reduction (CO₂RR) and nitrogen reduction (NRR).

Electrode Specification:

Reference Electrode: Silver Chloride Electrode (Standard)

Counter Electrode: Graphite Rod Electrode (Standard)

Working Electrode: Gas Diffusion Electrode (Self-supplied)

This innovative solution is tailored for applications demanding precise and reliable results in light of its improved design over conventional flow cell gas-diffusion electrolytic cells.