670 ELECTROLYSIS WORKSTATION

670 Electrolysis Workstation

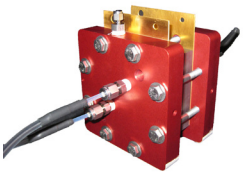
The 670 Electrolysis Workstation is a turn-key, customizable platform that can accommodate both liquid and gas on one or both of the electrodes. It boasts a multi-range, high current (±20 Amp) potentiostat for high accuracy over a broad range of reaction rates and cell sizes. Included in the system is the powerful, user friendly FlowCell® software for system operation and experimentation. Perfect for investigating a wide range of Electrolysis processes.

The 670 was designed and built to be chemistry agnostic. It works with a broad of a range of chemistries as possible: Acids, bases, water-based solutions or organic-based solutions, and a wide range of gases.

Broad Range of Application Areas

General Purpose Electrolysis and CO_2 Reduction

OPTIONS



Cell Fixture

Pt-Ti Flow Field

Back Pressure

892 Data Expansion Unit

FEATURES

- 670 Controller with 20A/5V Potentionstat plus Impedance Analyzer for EIS & HFR
- Flow Bench with heated reservoirs, pumps, purge, and taps for product sampling
- Mass Flow Control of Dry or Humidified Gases

Processes Power-to-Fuels

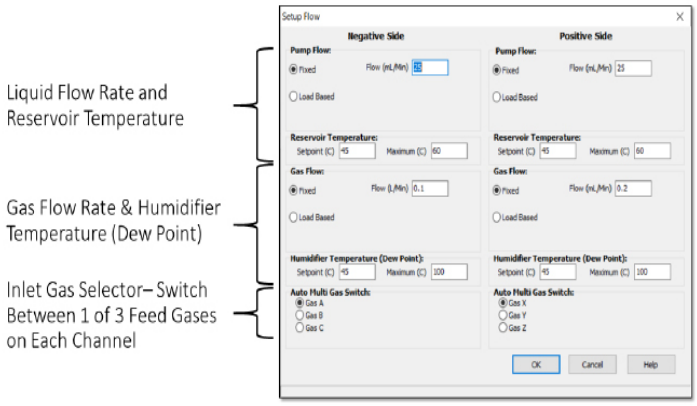
- CO_2 reduction
- Low temperature CO / Syngas Production
- Organic Electrosynthesis
- Electrochemical Ammonia Synthesis
- Electrochemistry-based Chemical Manufacturing

Accommodations for Liquid & Gas

- Inert carrier gas (e.g., N_2) or a reactant (e.g., CO_2)
- Integrated Gas Selector for automatic switching between up to three (3) gases on both channels (e.g., CO_2 and N_2)
- Two (2) Precision Peristaltic Pumps for liquid feed control
- Each channel is independently controlled
- Provisions for in-line sensors for product monitoring, ion selective probes and/or pH, using the 892 for data integration and control / alarm conditions

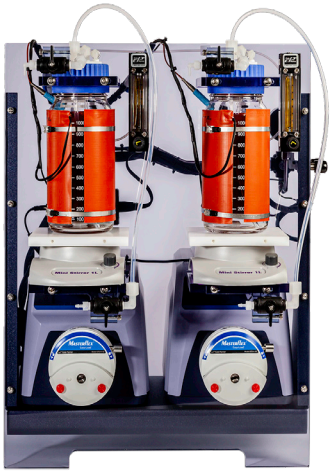
Advanced Diagnostics

- Voltage & Current Control Modes - Constant, Scanning, Step-Stair
- Electrochemical Impedance Spectroscopy (EIS) plus internal resistance by High Frequency Resistance (HFR) with Integrated 881 FRA
- Whole cell, half-cell and IR-Free Voltage



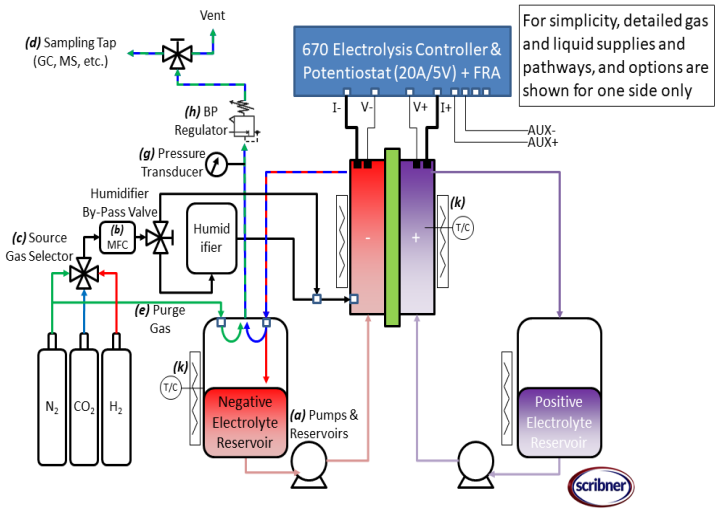
Flow Bench

- Separation of gas and liquid
- Blanket of inert purge gas for liquid reservoirs
- Independent control of temperature & flow rate on each liquid channel
- Taps for product sampling
- Single pass or recirculating modes
- Wetted materials selected for chemical compatibility across a broad range of environments – acids, bases, oxidizing/reducing, aqueous and non-aqueous (organic) solvents
- Optional pressurized operation to 1.5 bar_g



Description of Image to right:

The 670 Flow Bench supports (a) two liquids with pumps (variable flow rate; CW and CCW operation), (b) two gases with MFCs (dry or humidified), (c) Source Gas Selector (up to 3 different gases for each side), (d) tap-offs for gas sampling, (e) Inert gas purge of reservoir headspace and cell, (f) check-valves to prevent back-flow (not shown), (g) additional monitoring (pressure, in-line sensors, product gas flow rate, etc.), (h) elevated pressure operation to 2.5 bar_{abs} (1.5 bar_g), (i) recirculating or single-pass operating modes, (j) wetted materials are compatible with very broad range of environments (all non-metallic, borosilicate glass, PFA, Teflon, Viton, PVDF), (k) temperature-controlled reservoir/liquid and cell.



600 Electrolyzer Test Station

A bench-top fully-integrated instrument for R&D testing

The 600 Electrolyzer Test Station (ETS) is ideal for labs requiring detailed control, diagnostics and analysis of electrolyzer cells.

The 600 features

- 4 current range Potentiostat
- ±0.07 / 0.7 / 7 / 20 A, ±5 V, 100 W
- Programmable Power Supply for operation up to 100 A, 5 V, 500 W
- Automated switching between Potentiostat and Power Supply mode
- Mass flow meters for real-time O_2 and H_2 product flow rate monitoring
- EIS and HFR in Potentiostat mode
- EIS data compatible with *ZView*®, the world's leading impedance analysis & equivalent circuit modelling software
- Whole cell voltage plus two high-impedance reference electrode inputs for half-cell data
- *FlowCell-ETS*® application software for complete system control, experiment sequencing, graphing and data acquisition
- Integrated back pressure to 2 bar_g
- N_2 purge on Cathode with Supplemental N_2 on Anode
- Anode feed water recycling or once-thru operating mode
- In-line high-temperature Ion Exchange cartridge to maintain Anode feed water purity in recycle mode
- Integrated 892e Data Expansion Module for additional 8 temperature + 8 analog inputs, e.g., pressure transducers
- Safety features: E-Stop, Over Voltage/Current, Over Temperature, Product Gas Cross-Contamination

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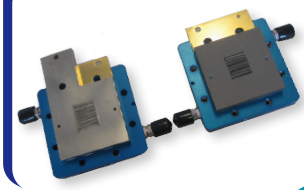
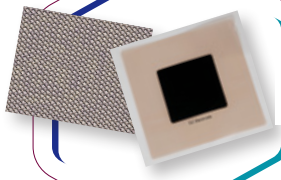
OPTIONS

Gas Sensors



Electrolyzer Cell Fixture with Pt-Ti Flow Field



Pt-Ti Mesh and MEA

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SPECIFICATIONS: 600 Electrolyzer Test System

Cell Connections:

Cell Connection	4-terminal (I+, I-, V+, V-) & differential Aux (REF)
Cell Potentiostat:	
Full Scale Current Ranges	±20 / 7 / 0.7 / 0.07 A
Current Resolution	0.007% of range
Current Limit of Error	±1.0% of range
Set and Read Voltage vs . WE	> ±5.000 V
Cell Voltage Sense Lead	Differential w/ driven shields
Voltage Measurement Resolution	152 µV
Sense Lead Input Resistance	1.0 GΩ
Modes of Operation	Constant, Scan, Step-Stair; V and I
Cell Power Supply:	
Maximum Current	100 A
Voltage Range	0 - 5.000 V
Power	Up to 500 W
Impedance Measurement (Potentiostat Mode):	
Frequency Range:	1 mHz to 10 kHz
Measurement Types	Sweep EIS and single-frequency HFR real-time measurement, Whole Cell and Aux

Cell and Electrolyte Handling:

Flow Path	All 316 SS
Feed Water Reservoir	1 L, 316 SS, auto-water fill, conductivity probe
Feed Water Supply Pump	50 – 400 mL/min, software controlled
Feed Water Temperature Range	Ambient to 95 °C
Ion exchanger / Deionizer	In-line water recycling loop
Back Pressure	Dual, 0-2 bar_g (0-30 PSIG), Manual
Cell Temperature Range	Ambient to 120 °C
Purge Gas	PC-controlled MFC on Negative; Manual on Positive
Water/Gas Separator/Dehu-midifiers	2 (Negative, Positive), condensers & collection tanks
Product Mass Flow Meters	2 (1 SLM H_2, 0.5 SLM O_2)
Additional Data Acquisition (892e):	
Data Acquisition (892e):	8 Temperature + 8 Analog (e.g., 0-5 V, 4-20 mA)
Options:	
In-Line Gas Sensors	H_2 Transmitter for monitoring of H_2 in Product O_2 O_2 Transmitter for monitoring of O_2 in Product H_2
Physical and Environment:	
Operating Temperature	5-35 oC
Power Source	100-120 or 220-240 VAC, 50/60 Hz
Size (excluding tubing connections)	53 cm x 53 cm x 90 cm (21 in. x 21 in. x 35.5 in.)
Weight	64 kg (140 lb.)

620 2ND GENERATION

Fully-Integrated, Bench Top, Instrument for Proton Exchange Membrane (PEM) & Anion Exchange Membrane (AEM) Water & Liquid Alkaline Electrolysis

Alkaline Flow Path Upgrade:
96% Reduction in Ferrous Materials

FEATURES

ADVANCED DIAGNOSTICS

Electrochemical Impedance Spectroscopy (EIS) & High-Frequency Resistance (HFR) Over Full 100 A Current Range

Automated Switching Between Potentiostat & Power Supply For High Resolution Measurement Over Full Current Range

Expanded Data Collection & External Sensor Integration

Half Cell Measurements

UNATTENDED OPERATION

Conductivity Monitoring, Smart Feedstock Management With Automatic Filling, Mixing & Balancing, Self Draining Condensation Tanks, & Electronically Controlled Purge Gas

Firmware Level, Robust, Safety Monitoring & Alarms

INTUITIVE CONTROLS

FlowCell® FlowCell-ETS® Fully Integrated Software For Control, Experimental Sequencing & Graphing

ZView® ZView® World's Leading Impedance Analysis & Equivalent Circuit Modeling

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SPECIFICATIONS

ELECTRICAL

Power Supply Max Current:
100 A

Voltage Range:
0 – 5.000 V DC

Maximum Power:
500W

Potentiostat Current Ranges:
±20 / 7 / 0.7 / 0.07 A

Current Resolution:
0.007% of range

Current Limit of Error:
±1.0% of range

Set & Read Voltage:
>±5.000 V

Cell Voltage Sense Lead:
Differential

Voltage Measurement Resolution:
152 µV

Sense Lead Input Resistance:
1.0 GΩ

Modes of Operation:
Constant, Scan, Step-Stair; V and I

Impedance Frequency Range:
1 mHz to 10 kHz – Power Supply
1 mHz to 40 kHz – Potentiostat

Impedance Measurement Types:
Sweep EIS and Single-Freq HFR Real-Time Measurement, Whole Cell and Aux / Half / Reference

CELL & ELECTROLYTE HANDLING

Flow Path:
All 316SS

Liquid Feed Tanks:
2x 2L, Auto-Fill, Auto-Mix

Liquid Feed Concentration:
In situ KOH Conductivity

Liquid Feed Flow:
50 – 700 mL/min

Liquid Feed Temp:
Ambient – 95 °C

Liquid Filtration:
In-line De-Ionized Recycling Loop

Back Pressure:
Dual, 0 – 2 bar_g (0 – 30 psig), Manual

Purge Gas:
2x 0.5 SLPM N_2 MFC

Water / Gas Separation:
2x Auto-Draining Condensers

Product Mass Flow Measurement:
1 SLPM H_2 & 0.5 SLPM O_2

Additional Data Acquisition:
6 Temp & 6 Analog (0 – 5 V, 4 – 20 mA)

Cell Temperature:
Ambient – 125 °C

Cell Connection:
4-Terminal (I+, I-, V+, V-) & Differential Aux (REF)

PHYSICAL

Operating Temperature:
5 – 35 °C

Power Source:
100 – 120 or 220 – 240 VAC 50/60 Hz

Size (Excluding Connections):
53 x 53 x 100 cm (21 x 21 x 39.5 in)

Weight (Empty):
~65 kg (140 lbs)

SAFETY

Robust:
Embedded Firmware Level Decisions

Fail Safe Design:
N_2 Purge On Alarm Condition

Continuous Monitoring:
E-Stop, Voltage, Current, Temperate, Gas Contamination & External Signals

External Alarm:
Integrate Full Building E-Stop

Software Alarm:
User Configurable Limits

Certification:

INTERNAL OPTIONS

TEFLON™ COATED FEED TANK

Adds extra corrosion resistance to the feed stock tanks by coating 316SS in durable Teflon™.

Reduce Iron Contamination of feedstock while holding KOH solutions for long periods of time at elevated temperatures.

SWAGELOCK® SC-11

Adds **Cleaned for Oxygen Service** tubing and fittings on the oxygen side of the product flow path.

Ensure **No Organic Contaminates** which can act as fuels in oxygen rich environments.

ALKALINE FLOW PATH

Reduce 96% of Ferrous Surface Area in the flow path of electrolyte from feed stock tank to cell fixture and back into feed stock tank.

Replaces 316SS with Inconel and PTFE Tubing and Fittings for superior corrosion resistance and limited Iron leaching

ACCESSORIES

SAFETY SENSORS
H_2 in O_2 & O_2 in H_2

Continuous Monitoring of Hydrogen gas in the Oxygen gas stream. Programable detection levels of product as they approach an unsafe ratio.

Alarm Condition places machine into safe configuration and purges with Nitrogen automatically.

GOW Sensor technology leveraging thermal conductivity to make direct comparison to ambient versus feed gas.

DI WATER SENSOR
External Inline Smart Probe

In-Line DI Water Conductivity monitoring via smart probe connected to 892 data acquisition module.

Easily Convert Between PEM & AEM setups with the same machine. No modifications needed to the test system, simply connect probe inline with cell fixture

Ultra-Low Conductivity sensor specifically developed for the measurement of pure water, ultra-pure water, and DI water.

AUTOMATIC ELECTROLYSIS PRESSURE REGULATOR

30 Bar Differential Pressure experiments with automatic back pressure control, automatic draining, and automatic purge control.

Two Phase Flow separation for highly stable control of back pressure, returns product to test system at ambient pressure.

Seamless Integration with Scribner's High-Pressure Cell Fixture, 600, 620 or other test systems, standalone software with robust safety monitoring.

CELL FIXTURES

PROTON EXCHANGE MEMBRANE

PEM Electrolyzer Cell Fixture superior performance for water electrolysis, with convenient porting, electrical heating, customizable materials and flow fields.

ANION EXCHANGE MEMBRANE

AEM Electrolyzer Cell Fixture offers customizable materials for chemical resistance and usability. Fluid is routed directly into flow field through end plate.

HIGH-PRESSURE ELECTROLYSIS

50 Bar Capable. Available in Aluminum Stainless Steel, and Nickel 200 End-Plates, as well as a wide range of Flow Field materials and patterns.

AUTOMATIC ELECTROLYSIS PRESSURE REGULATOR

Intuitive, automatic regulation for precise, consistent control, no manual operations

Empowering differential pressure experiments up to 30 bar

FEATURES

HIGH PRESSURE ELECTROLYSIS

Automatic Differential Pressure Control Up To 30 Bar PEM Electrolysis

Smooth Handling Of Two-Phase Flow For Stable Pressure Control

Gas / Liquid Separation With Automatic Drain

Designed In Partnership With NREL(1) & CE Certified

UNIVERSAL IMPLEMENTATION

Standalone Product For Use With Scribner or Other Electrolysis Systems

Dedicated Software For Control And Data Logging

Additional Logic Control For User Expandability

UNATTENDED OPERATION

Fully Automatic Control For Long-Term Testing

Failsafe & Purge Upon Alarm With Automatic Safety Monitoring

SPECIFICATIONS

OVERVIEW

Operation	Single Channel with Gas/Liquid Separation
Range	0-30 bar (0-3000 kPa)
Setpoint Accuracy	±1.5% F.S.
Readback Accuracy	±1.5% F.S.
Gas Flow Rate	Validated up to 5 SLPM
Liquid Drain	Automatic
Inlet Gas Dew Point	Up to 90° C
Fluid Temp	Up to 90° C
Pilot Gas Supply	Clean N2, 31-38 bar (3100-3800 kPa), consumption up to 0.055 SL/bar
Condensate Collection Tank: Safety	All stainless steel, auto-draining; ~0.6L Automatic purge on alarm condition

USER CONTROLS AND CONNECTIONS

Front	Drain rate control knob
Top	Serial interface, event port, and E-stop button
Rear	AC power in and power switch

PHYSICAL AND ENVIRONMENT

Operating Temperature	5-35° C
Power Source	100-120 VAC, 50/60 Hz, 0.5 A minimum 220-240 VAC, 50/60 Hz, 0.25 A minimum
Size (excluding tubing connections)	33 cm x 33 cm x 64 cm (13 in. x 13 in. x 25 in.)
Weight (estimated)	17 kg (38 lb.)
Altitude	Up to 2,000 m
Relative Humidity	Below 80%
Pollution Degree	2 – Equipment is intended for environments with no conductive pollution (expect for occasional condensation)

Note: All pressures in gauge unless otherwise noted.

(1) The National Renewable Energy Laboratory, 15013 Denver West Parkway, Golden, CO 80401, is a national laboratory of the U.S. Department of Energy managed by the Alliance for Sustainable Energy, LLC for the U.S. Department of Energy under Contract Number DE-AC36-08GO28308.

PRODUCT CONFIGURATION

LET'S CONFIGURE YOUR TEST SYTEM

If It Isn't On The Page, Let's Talk Customization

6	2	0	X	-		T	

POWER SUPPLY	
Code	**Description**
X	500W, 100A, 5V, EIS

THERMOCOUPLE CODE	
Code	**Cell Thermocouple Type**
T	Type T

INTERNAL OPTION CODE				
Code	**Alkaline Feed Stock Conductivity Sensor**	**Teflon™ Tank Coating**	**Enhanced Corrosion Resistant Flow Path**	**SC-11 Cleaned Oxygen Product Flow Path**
0	N	N	N	N
1	Y	N	N	N
2	Y	Y	N	N
3	Y	Y	Y	N
4	Y	Y	Y	Y
#	Custom Configuration, Please Contact Scribner With Your Requirements			

PLUG (VOLTAGE) CODE	
Code	**Plug Type**
C	Chinese Plug (230V)
E	European Plug (230V)
N	North American Plug (120V)
U	UK Plug (230V)

EMPOWERING ELECTROCHEMISTRY

ABOUT US

We're the power behind the pioneers—advancing electrochemical research with precision instruments, deep expertise, and unwavering support.

More than a supplier, we're a trusted partner in innovation, removing technical barriers so scientists can focus on breakthroughs that shape the future.

From lab bench to global impact, Scribner makes complex research possible, precise, and scalable.

OUR EXPERTISE

Electrochemistry isn't just what we do—it's who we are. With decades of experience and industry-defining innovation, we deliver cutting-edge electrochemical instrumentation and expert insight that empower scientists to push boundaries.

Whether you're optimizing performance at the molecular level or scaling up for global impact, we provide the precision tools and partnership to turn possibility into progress.

Our product catalog includes:
-Fuel Cell Test Systems
-Electrolyzer Test Systems
-Membrane Conductivity Test Systems
-Redox Flow Cell Test Systems
-Battery Test Systems

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