Testbench EL1 - S

PEM- / AEM- / AEL Electrolysis Testbench

TECHNICAL DATA SHEET

The **GFS Testbench EL1-S** is a **professional-grade testing platform** engineered for **PEM**, **AEM**, and **AEL** electrolysis research.
Designed for **single cell fixtures and small short stacks**, it accommodates **cell areas from 1 to 25 cm²** and supports **automatic operation by scripts and data evaluation.**

The testbench is designed to run long-term performance testing scripts and generate repetable and comparable testing data for CCMs, or electrodes in water electrolysis applications.

With it´s fully iron free gas/media pathways and automatic media refilling the testbench can operate over very long periods with very little to no maintenance. With its economical pricing the testbench can give perfect access to multichannel testing in CCM and electrode development on compact space.

Key Features

- **Optimized for Long-Term Testing**
  - Manufactured using **high-quality materials** such as **titanium, PEEK**, and **Nickel** the gas/media pathways ensure corrosion resistance, repeatable data and stable long-term operation.
- **Custom Gear Pump**
  - Includes a **GFS-designed gear pump** (Titanium + PEEK) for **stable and precise media circulation**
- **Integrated Datalogging**
  - Temperature and voltage are recorded via the **GFS Datalogger**, with **up to two channels for voltage and temperature measurement.**
- **Intelligent Software Control**
  Operated through the **GFS Cellflow Software**, featuring:
  - Full device control and automation via **Python scripting**
  - **Database** for structured data storage
  - Real-time **visualization and analysis**
  - **Interface-Independent**
    Easily integrates **new, remote-controllable devices** with **no interface restrictions**.
- **Comprehensive Sensor Suite**
  Standardized with:
  - Integrated Datalogger for voltage and temperature
  - Conductivity sensors for measuring the liquid media conductivity
  - PID-controlled media and cell temperature regulation
  - Integrated media reservoirs with automatic refill
  - Integrated purging of media path
  - Optional: pressurized Operation up to 8bar, massflow meters, gas analysis
- **Flexible device integration**
  The testbench can be updated optional features at any time and is compatible with a range of different 3rd party devices.

Compatibility
The testbench is **optimized for GFS test cells**, but **compatible with third-party cell housings** via standardized connections.

GFS Fuel Cells GmbH
Auf der Trift 3
66127 Saarbrücken

info@gfs-fuelcells.de
+49 (0) 6898 91 22 985

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Specifications

General Information	for PEM / AEM / AEL - Electrolysis
Power Supply	AC 230V / 50Hz
Power Range	1W – 720W
Maximal Current	72 A
Maximal Voltage	10V
Load Regulation	±0.01 % of output **+ 5 mA / + 2 mV**
Test Object	Single Cells up to 25cm² or short stacks up to 5 cells
Operating Pressure	Atmospheric, optional up to 8 bar
Operating Temperature	Up to 90°C
Size (mm)	650 x 400 x 750 (H x W x D)
Operating System	Windows 11
Control Software	GFS “CellFlow” Software
Connectivity	LAN, USB, HDMI
Extended Devices	Potentiostat , Fluid Thermostat, …

Thermal Management	for PEM / AEM / AEL – Electrolysis
Cell Temperature	Heating cartridges, Fluid thermostat (optional)
Process Media/Electrolyte (and cell)	PID controlled media heating

Sensor Suite	for PEM / AEM / AEL - Electrolysis
Integrated	Voltage, Temperature, Conductivity, Water Level, H2 Sensor
Optional	Gas Flow measurement, gas analysis

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GFS Media Pumps	for PEM / AEM / AEL - Electrolysis
Flow Range	0.1-1 l/min or customized
Materials	PEEK, Titanium/PTFE
Controller	PID
Pump Type	Gear pump/membrane pump

GFS Cellflow Software	for PEM / AEM / AEL - Electrolysis
Interfaces	LAN, USB…
Data Storage	Database
Automatization	Python Scripting
Data Visualization	Supports multiple live data plots
Data Evaluation	Incl. advanced data analysis

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