

SOEC R&D and EOL test benches

Stand-alone testing solutions



These high-temperature electrolyser/fuel cell test benches are designed for a range of purposes, from R&D durability testing to end-of-line (EOL) activation and characterisation of stacks after the assembly line. They support Solid Oxide (SOEC) and Protonic Ceramic (PCCEL) electrolyser technologies.

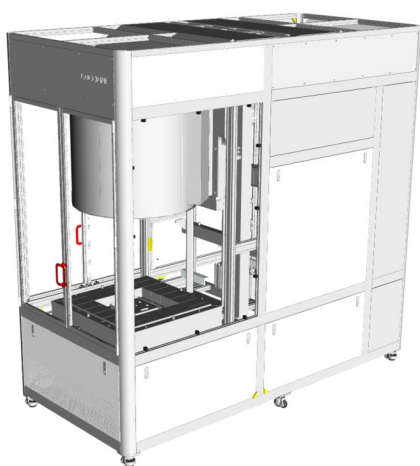
THE SYSTEM

The systems supply the gases needed for stack operation and generate steam.

A furnace heats the stack and manages its temperature, and a circulation heater is added for higher flows. The benches can run electrolysis characterisation tests, EOL testing and durability tests.



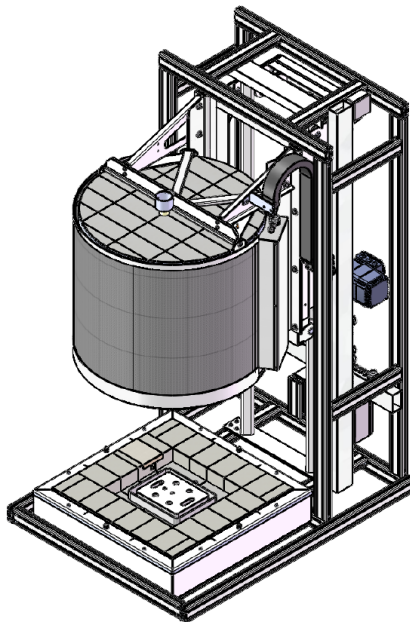
1. Stack furnace in the R&D bench



2. Test bench layout for larger stacks and EOL testing

MAIN FEATURES

- > Hydrogen circulation (cathode circuit)
- > Nitrogen circulation (cathode circuit)
- > Forming gas circulation (cathode circuit)
- > Steam generation (cathode circuit)
- > Air circulation (anode circuit)
- > Circulation heater (for high-flow stacks)
- > EIS device (1 mHz–20 kHz)
- > Power supply (sized to stack performance)
- > Heat recovery through regenerative heat exchangers, with provision for heat reuse across parallel stations
- > High-temperature-resistant layout



THE SOFTWARE

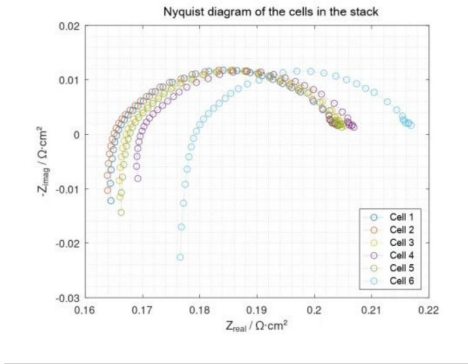
The software is built on Loccioni's Aulos platform and is divided into two subsystems: **Aulos Automation**, a desktop monitoring application that includes the HMI for controlling the hardware and running routines, and **Aulos Supervisor**, a server accessed through a web page, where users can build test plans by dragging and dropping instructions, and access the data generated by the system to compare and overlay the results of different tests. The AULOS application can:

R&D

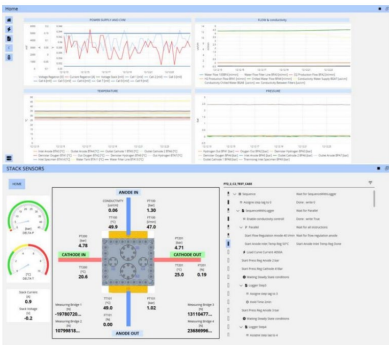
- > Perform durability tests
- > Run temperature-dependent tests
- > Monitor cell degradation
- > Run EIS tests

EOL

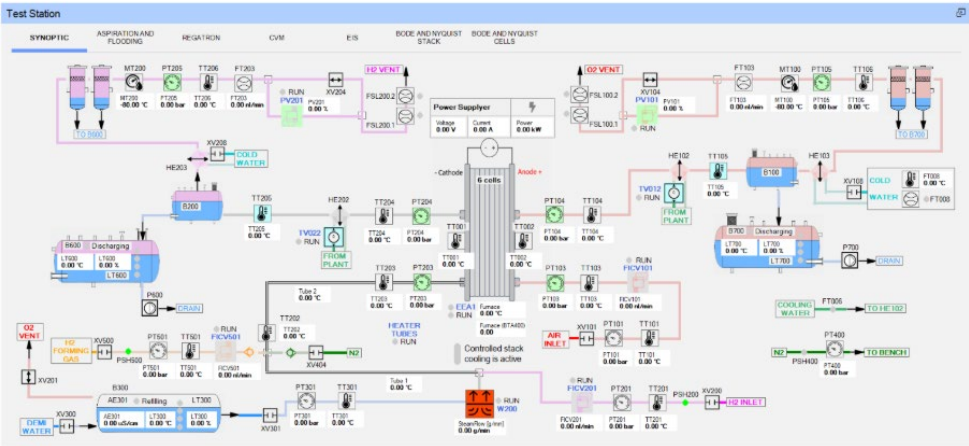
- > Run controlled-temperature processes
- > Mix gas flows by regulating several gases in parallel
- > Perform stack activation after assembly
- > Shorten process time with a self-optimising algorithm based on electrical measurements



3. EIS acquisition



4. AULOS interface for data acquisition and monitoring



5. Bench synoptic view

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