

# FUEL CELL STACKS

## for RESEARCH, TRAINING and PROJECTS



Pro-RD Fuel Cell Stacks are designed by Pragma Industries for the stringent demand of fuel cell scientists and professionals.

Built for long life performance and scalability, they fit the needs for those who want to:

- do advanced research on MEAs
- investigate thermal effects in stacks
- perform professional training
- integrate fuel cell systems
- quick start a fuel cell lab

Pro-RD FCS is fully modular from one to ten cells or more. Scale down or up can be achieved in lab environment by the user with simple tools. Would you like to use your own Membrane Electrodes Assemblies, change the number of cells, adjust the stack compression, insert numerous thermal sensors or other sensors? This is all possible with Pro-RD FCS.

Pro-RD is delivered ready to use following customer's requirements.

SCALABILITY ■■■

RELIABILITY ■■■

STRENGTH ■■■



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# Pro-RD FUEL CELL STACKS

- Designed for advanced research
- Can be taken apart and rebuilt
- Scalable upon experiments



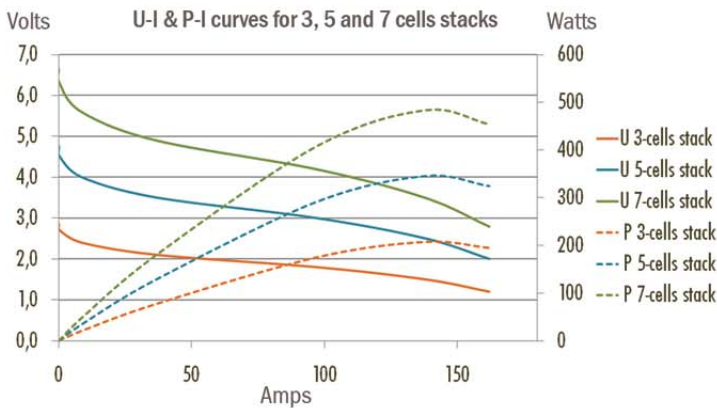
Made of thick (6mm) graphite bipolar separators, the stack can be heavily equipped with sensors to investigate MEAs behavior. Furthermore, the path of temperature regulation fluid has been designed to ensure optimal thermal homogeneity with flow passing through each graphite plate and endplates.

The stacks are delivered ready-to-use with our standard MEAs, gaskets, number of cells selected, gas connectors chosen by user. A complete documentation is included in the package, explaining operation best-practices and dismantling and building procedures

Additionally to our standard stacks, Pragma Industries can design and build stacks tailored to your needs, from 10cm<sup>2</sup> to 150cm<sup>2</sup> of active area.

## Key features

- Stack can be taken apart and rebuilt to change MEAs or insert sensors
- Bipolar plates have built-in gaskets
- Stack power can easily be scaled by adding/removing cells
- Optimal thermal management with cooling fluid circulation in each plate
- Stack is delivered with complete instruction guide



Performance chart obtained under the following conditions:

- Stack temperature: 70°C
- Anode hydrogen flow stoichiometry: 1.5
- Cathode air flow stoichiometry: 3
- Pressure anode and cathode: 1 barg
- Relative humidity at anode: 100%
- Relative humidity at cathode: 55%



Model	FC103	FC105	FC107
Number of cells	3	5	7
Active area	100cm <sup>2</sup>	100cm <sup>2</sup>	100cm <sup>2</sup>
Voltage	2.85 - 1.2V	4.75 - 2V	6.65 - 2.8V
Max current	162A	162A	162A
Max power	200W	340W	470W
Max operating pressure	2 barg	2 barg	2 barg
Max operating temperature	80°C	80°C	80°C
Flowfield type	7-fold serpentine		
Gases/fluid connections	Swagelok compression fittings		

Check out the video of Pro-RD Stack taken apart and rebuilt on our website.



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