

Electrolyser Product Range



ITM has developed a suite of electrolyser products for a range of applications from laboratory-based analytical systems, through soldering and joining, to clean fuel provision for hydrogen-powered vehicles.

Each ITM product has been designed to be simple to use and to require a minimum of maintenance. ITM electrolysers deliver hydrogen at a pressure and quality appropriate to the application.

The electrolysers generate hydrogen at purities of up to 99.9999% and dew points of down to  $-60^{\circ}\text{C}$  in order to meet the requirements of the associated hydrogen technology, whether it be a hydrogen fuel cell, a hydrogen engine, a hydrogen compressor, a hydrogen store (steel cylinder, composite tank or metal hydride system) or gas chromatography equipment.

ITM is expert in the design of hydrogen systems and aims wherever possible to provide a product solution that is well suited to your hydrogen application. If you have a particular need for a product that is a little different to our standard technical performance (e.g. in terms of flow rate, pressure or purity) then ITM has the flexibility in many cases to provide a solution that will match your needs.

ITM is an ISO certified company. All products are developed in accordance with best practice and are presently subject to CE approval.

Hydrogen production rates fall into three ranges:



### Small

In the region of 0.5 – 2.5 kg/week  $\text{H}_2$ . This is appropriate for laboratories, the education market, fuel cell developers and for trickle charging hydrogen stores.



### Medium

A minimum of 1 kg/day  $\text{H}_2$ . Units in this range may be used on their own or in tandem for  $\text{H}_2$ ome, transport and small industrial applications.



### Large

As required for high pressure transport refuelling and other industrial applications.

## Applications

Product Range	Applications					
	Energy Storage	Backup Power	Clean Fuel	Gas Chromatography	FC Development Dental Labs / Workshops	System Intergrators & Experimentors Heating, Cutting & Joining
HBox	•	•				
HLab				•	•	
HPac	•	•			•	
HFlame					•	•
HFuel	•		•			
HCore						•

## Benefits

There are many benefits to generating hydrogen on-site and on-demand with an ITM electrolyser.

### Safety

The issues associated with the storage of pressurised gas are well recognised. Handling, shipping and storage of bottled gas often require special facilities and apparatus. On-site hydrogen generation minimises the quantity of local storage and the risks associated with handling high pressure cylinders.

### Convenience

Hydrogen is commonly stored and transported in pressurised cylinders. The hassle associated with running out is considerable and often leads to delays and expense. On-site generation eliminates this risk.

### Simplicity

Hydrogen can be generated via electrolysis anywhere where there is access to potable water and electricity.

### Cost

Why continue to pay for the rental and delivery of hydrogen when you can make it when you need, where you need it?

### Purity

Hydrogen generated by electrolysis is naturally low in impurities. ITM offers a range of polishing and dehumidification add-ons to achieve 99.9999% purity at -60°C dew point. This is appropriate for sensitive analytical equipment and fuel cell applications.

### Modularity

Generation capacity can be easily increased by running multiple modules together.

### Environment

The vast majority of hydrogen used today is derived from natural gas in large reformation plants. This process, along with the subsequent transportation of hydrogen to site emits greenhouse gasses. Electrolysis fed by a renewable input (or a green electricity tariff via the grid) enables the generation of zero-carbon hydrogen – the only truly green fuel!

## Technology

An electrolyser is a device which uses electrical energy to split water into hydrogen and oxygen gasses. An ion permeable electrolyte with catalysts on either side is where the electrochemistry takes place. With the exception of the HFlame, a HHO gas generator for heating, cutting and joining of metals, ITM's electrolyser products (HLab, HBox, HCore and HPac) are based on a solid polymer electrolyte.

For HLab and HPac the use of solid polymer electrolytes enables the oxygen side of the system to remain at atmospheric pressure, reducing complexity

and cost. HBox is a balanced pressured electrolyser and if desired HCore may be configured to deliver both high pressure oxygen and hydrogen.

## Options

ITM offers a range of generation capacities to suit a range of applications. Detailed information is contained in the individual product data sheets. A summary is given below.



Product Range (left-right): HCore, HLab 600, HLab 1000, HBox 1000, HBox 3000, HFlame, HPac

Product	Output			H <sub>2</sub> Pressure		Purity	Dew Point
	(cc/min)	(Nm <sup>3</sup> /h)	(kg/24h)*	(bar)	(psi)	(%H <sub>2</sub> )	(°C)
<b>HCore</b>	3000	0.180	up to 0.39	up to 25.0	368	99.5	35
<b>HBox 1000</b>	1000	0.060	0.13	15.0	218	99.99	-60
<b>HBox 3000</b>	3000	0.180	0.39	15.0	218	99.99	-60
<b>HBox 3000 PV</b>	3000 peak	0.180 peak	0.21 peak	15.0	218	99.99	-60
<b>HLab 600</b>	600	0.036	0.08	13.8	200	99.9999	-60
<b>HLab 1000</b>	1000	0.060	0.13	11.7	170	99.9999	-60
<b>HPac 10</b>	10,000 min	0.600 min	1.30 min	15.0	218	99.99	-60
<b>HFlame 6†</b>	5,800	0.360	n/a	2.0	29	n/a	35
<b>HFuel 15kg</b>	116,000	6.954	15.00	350	5,076	See brochure	See brochure

\* If operated continuously † HHO gas generator



ITM Power has designed hydrogen systems technology for integration into the built environment and transport to provide energy security and zero-carbon energy solutions for early adopters.



ITM Power PLC  
22 Atlas Way  
Sheffield  
S4 7QQ  
UK

T: 0114 244 5111  
W: [www.itm-power.com](http://www.itm-power.com)