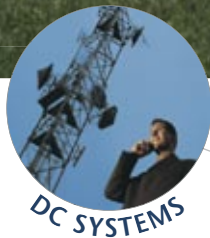
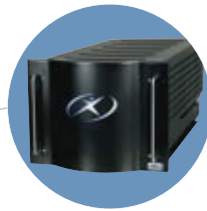


HyPM[®] XR

Fuel Cell Backup Power Systems

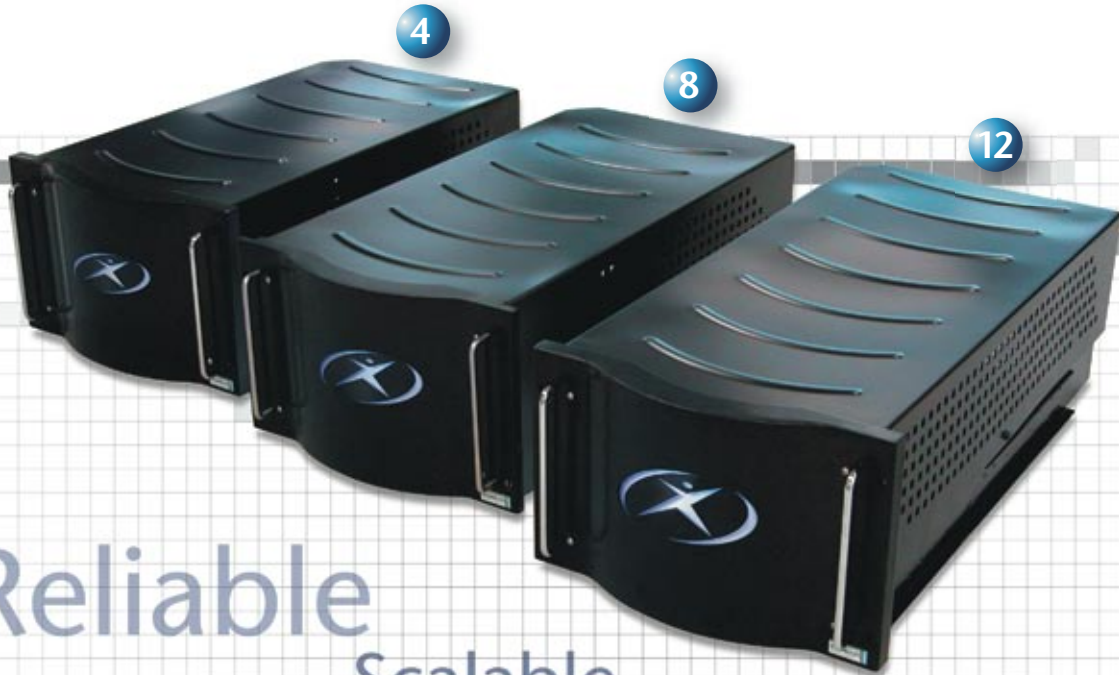


Flexible in design and versatile in application, Hydrogenics' HyPM[®] XR Fuel Cell Backup Power Modules ensure critical network continuity in today's demanding AC and DC backup power markets.

HyPM® XR Fuel Cell Backup Power Systems

Reliable...Extended Run (XR)

HyPM XR Fuel Cell Power Modules are available
in power outputs of 4, 8 and 12 kW



Reliable

Scalable

Compact

Lower
Life Cycle Costs

High Efficiency

Extended Run

Hydrogenics' portfolio of HyPM®XR Fuel Cell Backup Power Systems continues to expand in response to customer needs.

Hydrogenics partners with UPS providers and end-users in mission critical services, including data centers and telecommunications, to deliver a compelling backup power solution.

HyPM XR Fuel Cell Backup Power Systems ensure continuity in critical network operations that require reliable extended run backup power at a lower life cycle cost.

Designed on a hydrogen powered, emission free fuel cell platform, HyPM XR fuel cell modules are rack mountable, compact, and suited to a range of applications.

HyPM XR offers scalable power and voltage options to guarantee uninterrupted power supply for demanding AC and DC dependent networks - operating both indoor and outdoor.



Fuel Cell Backup Power

HyPM[®] XR Fuel Cell Power Modules enhance customer value with:

HIGH RELIABILITY

- Unlimited start-stop cycles with minimal maintenance
- Designed in conformance with UL, CSA, and CE
- Built-in advanced diagnostics and controls

LOWER LIFE CYCLE COSTS

- Lower total cost of ownership compared to batteries or diesel generators

EASE OF INTEGRATION

- Modular product designs support flexibility in integration and versatility in application
- Simple electrical and mechanical interfaces facilitate integration into both OEM products and end-user applications

ZERO EMISSIONS

- Enables operation in emissions restricted environments, both indoor and outdoor

DYNAMIC RESPONSE

- System transient response can be enhanced by using energy storing ultracapacitors to ensure instantaneous response on demand

SCALABLE POWER OPTIONS

- 4, 8 and 12 kW modularity
- Multiple modules operating in parallel
- Seamless module addition as load grows

COMPACT FOOTPRINT

- Industry leading gravimetric and volumetric power density, optimizing facility space utilization

HIGH EFFICIENCY

- High peak operating efficiency > 55%



HyPM® XR Fuel Cell Power Modules

Modules for Original Equipment Manufacturers and System Integrators

Hydrogenics provides HyPM XR Fuel Cell Power Modules to OEMs and System Integrators for inclusion in their backup power product offerings.

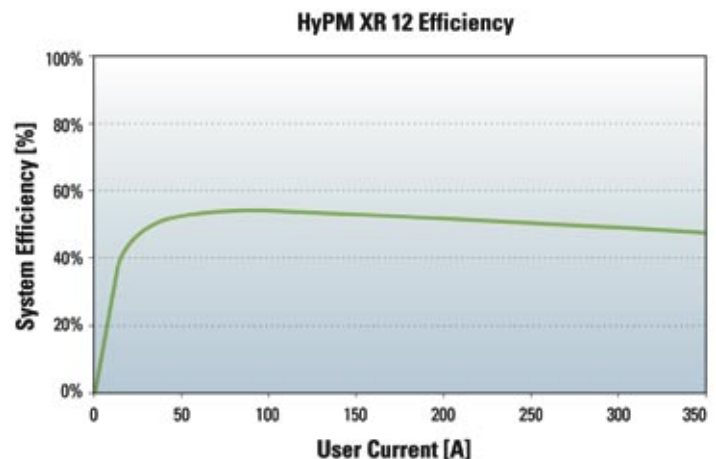
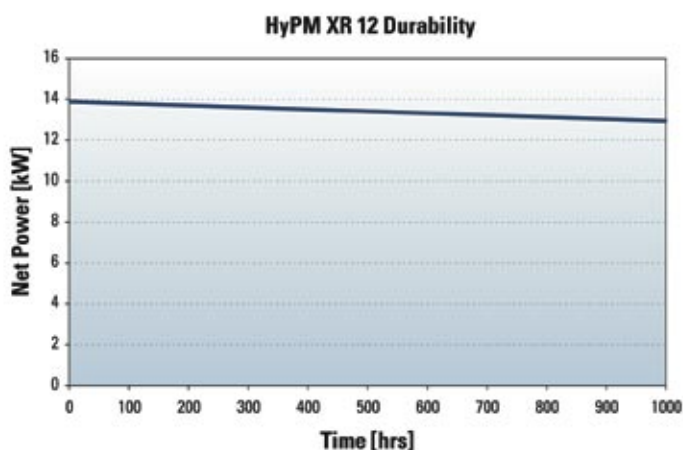
Modules have been integrated into several different systems meeting combinations of the following requirements:

- indoor and outdoor installations
- AC and DC power
- hybrid configurations with ultracapacitors or batteries

Module Specifications	HyPM® 4	HyPM® 8	HyPM® 12
Maximum Electrical Power (kW)	4.5	8.5	12.5
Voltage Range (V)	30.5 – 38	24.5 – 38	37 – 57
Maximum Operating Current (A)	150	350	350
Dimensions (LxWxH) cm	87 x 50 x 32	87 x 50 x 32	96 x 50 x 32
Dimensions (LxWxH) in	34.3 x 19.7 x 12.6	34.3 x 19.7 x 12.6	37.8 x 19.7 x 12.6
Volume (l)	139.2	139.2	153.6
Volume (gallons)	36.8	36.8	40.6
Mass (kgs)	80.5	80.5	90.0
Mass (lbs)	177.5	177.5	198.4

The following specifications are the same for all HyPM® Fuel Cell Power Modules

Peak efficiency (lower heating value) %	55
Time from Idle to Peak Power (s)	<4
Supply Pressure (kPa) (abs)	500 – 700
Supply Pressure (psia)	72.5 – 101.5
Stack Operating Pressure (kPa) (abs)	<125
Stack Operating Pressure (psia)	<18
Operating Temperature (°C)	10 – 40
Operating Temperature (°F)	50 – 104



HyPM XR Backup Power Systems

ensure critical network continuity in today's demanding AC and DC backup power markets

HyPM® XR DC Backup Power System

Hydrogenics also provides an integrated HyPM XR DC Backup Power System to meet the common needs of several customers requiring DC backup power in Outside Plant (OSP) environments.

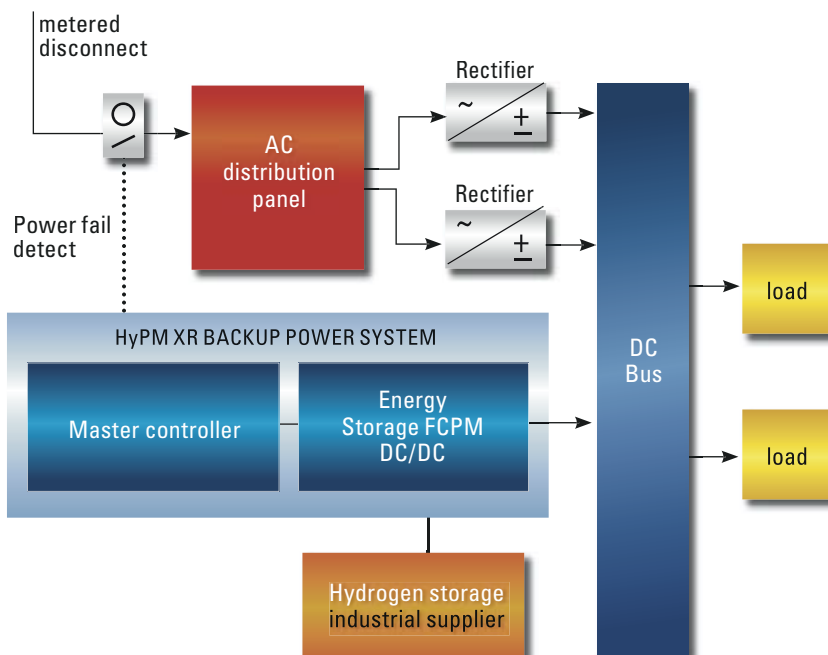
Hydrogenics HyPM XR DC Backup Power System includes a fuel cell power module, additional energy storage, thermal management, a master controller, and remote monitoring.

Hydrogenics offers a fully configured turnkey solution with the following characteristics and options:

PERFORMANCE	8 kW scalable to 16 kW (two units per cabinet) Available in -48 Vdc and +24 Vdc power conditioning Operating current 300 A @ -48 Vdc
OPERATIONS	Ambient temperature range: -40 to 46°C Relative humidity: 0 – 90% (non-condensing)
PHYSICAL DIMENSIONS*	160 – 191 H x 111 W x 107 D cm 63 – 75 H x 44 W x 42 D in
FUEL SYSTEM	Gaseous hydrogen dry 99.95% CO < 0.2 ppm Sulfur < 4 ppb
HYDROGEN STORAGE	Additional metal enclosure
EMISSIONS	Water collected @ 27°C ≥ 108 ml/min Noise 65 dBA @ 1.5 m
SAFETY	Compliance: design in accordance with UL/CSA, CE, NEBS and GR-487 Hydrogen sensor
COMMUNICATION	Remote monitoring: Ethernet

* excludes fuel storage

HyPM XR DC Backup Power System Architecture:



HyPM XR DC Backup Power System with fuel storage

HYDROGENICS: the company and its products

Hydrogenics Corporation is a recognized world leader in the development and manufacturing of hydrogen and fuel cell products for a full range of energy and industrial applications.

While HyPM® Fuel Cell Power Modules are the focus of **Hydrogenics Power Systems**, Hydrogenics' other business units are serving growing markets in hydrogen generation and fuel cell testing.

Hydrogenics OnSite Generation offers a full line of HySTAT™ hydrogen stations and turnkey hydrogen generation solutions for a wide range of hydrogen applications including industrial processes, vehicle refueling and distributed power. Hydrogenics' world-wide leadership in scalable electrolysis-based products and integrated reformer-based systems positions the company to offer a full array of hydrogen generation and refueling options. From a selection of versatile modular components,

Hydrogenics can propose the optimum HySTAT™ hydrogen station configuration that precisely meets a customer's specific operational criteria for hydrogen generation, storage, and dispensing.

Hydrogenics Test Systems offers a comprehensive product portfolio of FCATS® fuel cell test stations, diagnostics products and contract testing services which have evolved as the industry standard for fuel cell research and development efforts around the world. The expertise and capabilities that Hydrogenics Test Systems brings to their products and services allows customers to focus on developing their fuel cell stacks and components as well as other core areas of their businesses.

With its complete suite of hydrogen products and service solutions, Hydrogenics is committed to changing power and powering change.



All specifications and illustrations contained in this brochure are based on the latest product information available at the time of printing. Hydrogenics Corporation reserves the right to make changes at any time without notice, in materials, equipment, specifications and models. Printed in Canada 08.2006 ©/TM : Owned by Hydrogenics Corporation.

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