

HyAxiom's Fuel Flexible PureCell® Model 400

PureCell® Model 400 (M400) is a unique product that can run on natural gas or a blend of natural gas & hydrogen or pure hydrogen. Operating the M400 on natural gas produces near-zero levels of NOx, SOx, CO, VOCs, and particulate matter. When operating the M400 on pure hydrogen, only clean water vapor is produced with no green house gases.

The PureCell® Model 400 can operate up to 30% hydrogen mix in natural gas without modification to the unit. This is particularly beneficial as natural gas providers begin to blend green hydrogen into natural gas pipelines. As hydrogen becomes more available to region, the PureCell® Model 400 can be easily converted from a natural gas unit to hydrogen unit onsite within a few weeks. HyAxiom has significant experience operating its PureCell® Model 400 on hydrogen and in one case, has deployed the world's largest hydrogen fuel cell installation in Seosan, South Korea (50MW, 114 units).



Daesan Industrial Complex in Seosan, South Korea (50MW, multi-story 114 unit Installation)

In addition to providing zero emissions, the PureCell® Model 400 Hydrogen System has all the features of the M400 natural gas unit including CHP for facility heating and cooling. While maintain the features and reliability of the natural gas M400, the hydrogen M400 adds 7 percentage points of higher electrical efficiency.

CHP benefits of HyAxiom's PureCell® Model 400 System

One of the key advantages of the PureCell® System is its onboard heat recovery equipment. The fuel cell power plant has heat recovery interfaces for direct heating and cooling. CHP allows the customer to reduce its need to burn natural gas to produce heat. This ability provides a significant economic savings as well as providing sizable environmental offsets when compared to burning natural gas.

The heat provided by the power plant can be used in a variety of applications, including preheating water going into boilers, domestic hot water, space heating, or absorption chillers.

Operating HyAxiom's PureCell® Model 400 System on Hydrogen

The M400 can be retrofitted to operate on pure Hydrogen. The conversion of the natural gas M400 to hydrogen M400 will take approximately four weeks. The natural gas Fuel Processing System (FPS) will be removed from the power plant and replaced with a hydrogen fuel train and exhaust equipment. Other key natural gas FPS components such as valves, catalyst beds, multiple heat exchangers are removed and replaced with hydrogen compatible valves, heat exchanges and ventilation system.

PURECELL SYSTEM BENEFITS

Energy Security

Proven PAFC fuel cell technology that is setting durability records

Energy Productivity

Increased efficiency and continuous on-site generation reduces energy costs

Energy Responsibility

Ultra-low emissions equals sustainability

PURECELL SYSTEM COMPETITIVE ADVANTAGES

Long Life

Industry leading 10-year cell stack life assures high availability and low service cost

Modular & Scalable

Solutions for multi-megawatt applications to meet growing energy demand

Experience

Most knowledgeable and experienced team in the industry

High Efficiency

Up to 90% total CHP Efficiency

Grid-Independence

Proven performance delivering power when the utility grid fails

Load Following

Capable of dispatching power to match building needs

Small Footprint

Highest power density among clean generation technologies

Flexible Siting

Indoor, outdoor, rooftop, multi-unit

RATED POWER OUTPUT: 460KW, 480VAC, 60HZ

Characteristic	Units	Operating Mode	
		Power 460kW	Eco 440kW
Electric Power Output ¹	kW/kVA	460/532	440/517
Electrical Efficiency ¹	%, LHV	43.5%	44.4%
Peak Overall Efficiency	%, LHV	90%	90%
Gas Consumption ¹	MMBtu/h, HHV (kW)	4.04 (1,185)	3.78 (1,108)
Gas Consumption ^{1,2}	SCFH (Nm ³ /h)	3,941 (106)	3,688 (98.7)
High Grade Heat Output @ up to 250°F ¹	MMBtu/h (kW)	1.30 (382)	1.16 (341)
Low Grade Heat Output @ up to 140°F ^{1,6}	MMBtu/h (kW)	1.68 (492)	1.54 (452)

FUEL

Supply..... Natural Gas
Inlet Pressure 10 to 14 in. water (25 - 35 mbar)

EMISSIONS^{3,4}

NOx 0.02 lbs/MWh (0.009 kg/MWh)
CO 0.01 lbs/MWh (0.005 kg/MWh)
VOC 0.01 lbs/MWh (0.005 kg/MWh)
SO₂..... Negligible
Particulate Matter..... Negligible
CO₂¹ (electric only) 1,006 lbs/MWh (456 kg/MWh)
(with High-Grade heat recovery) 567 lbs/MWh⁵ (257 kg/MWh)
(with full heat recovery) 496 lbs/MWh⁵ (225 kg/MWh)

OTHER

Ambient Operating Temp -20°F to 104°F (-29°C to 40°C)
Relative Humidity 0 to 95% (non-condensing)
Sound Level <65 dBA⁶ @ 33 ft. (10m)
Water Consumption None (up to 86°F (30°C) Ambient Temp.)
Water Discharge None (Normal Operating Conditions)

CODES AND STANDARDS

ANSI/CSA FC1-2014: Stationary Fuel Cell Power Systems
UL1741 SA: Inverters for Use With Distributed Energy Resources

NOTES

1. Average performance during 1st year of operation.
2. Based on natural gas higher heating value of 1025 Btu/SCF (40.4 MJ/Nm³)
3. Emissions based on 460 kW and 440 kW operation, respectively.
4. Fuel cells are exempt from air permitting in many U.S. states.
5. Includes CO₂ emissions savings due to reduced on-site boiler gas consumption.
6. With optional equipment.

HyAxiom, Inc.

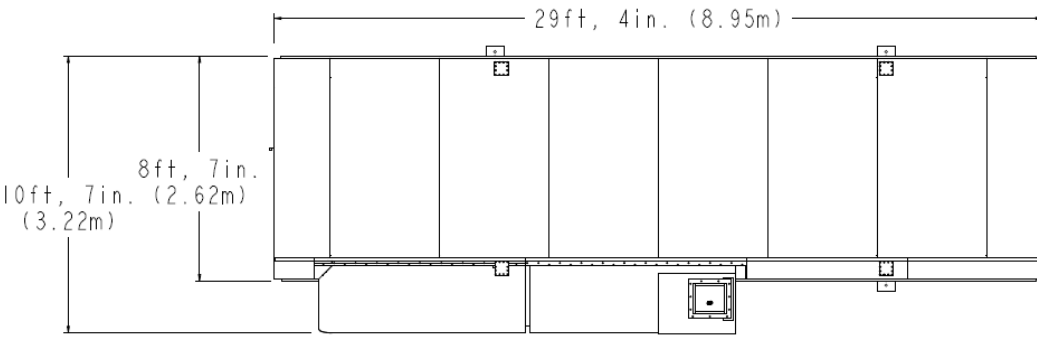
Corporate Headquarters
101 East River Drive
East Hartford, CT 06108
(860)727-2253
www.hyaxiom.com
email: fuelcells@doosan.com



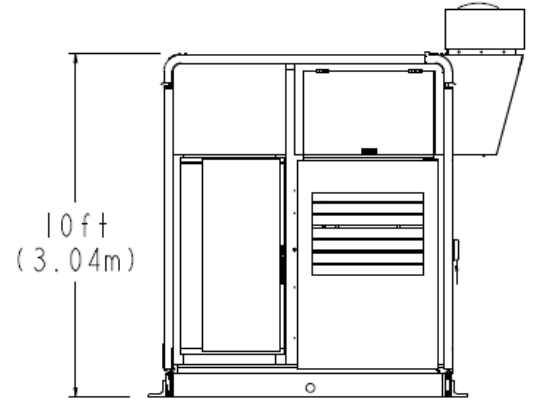
The manufacturer reserves the right to change or modify, without notice, the design or equipment specifications without incurring any obligation either with respect to equipment previously sold or in the process of construction. The manufacturer does not warrant the data on this document.

SYSTEM DIMENSIONS

Power Module

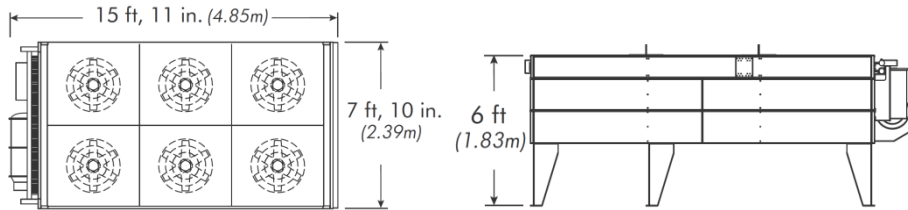


Top View



Side View

Cooling Module



Top View

Side View

PHYSICAL SPECIFICATIONS

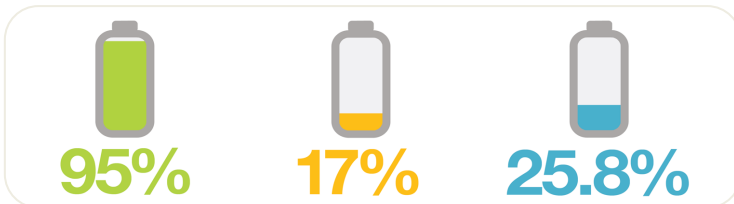
	Power Module	Cooling Module
Length	29' 4" (8.95m)	15' 11" (4.85m)
Width	8' 7" (2.62m)	7' 10" (2.39m)
Height	10' (3.02m)	6' 0" (1.83m)
Weight	57,000 lb (27,216 kg)	3,190lb (1,447 kg)

PURECELL ADVANTAGE

OFFSET 3x MORE CO₂



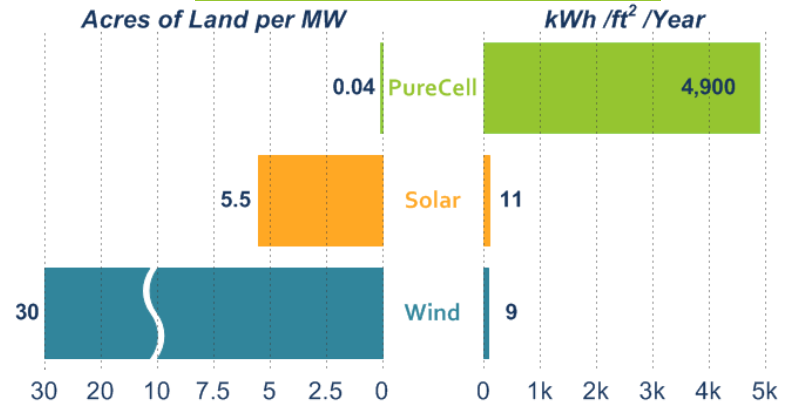
CAPACITY FACTOR



CO₂ OFFSET



USE LESS LAND



HyAxiom, Inc.
Corporate Headquarters
101 East River Drive
East Hartford, CT 06108
(860)727-2253
www.hyaxiom.com
email: fuelcells@doosan.com

The manufacturer reserves the right to change or modify, without notice, the design or equipment specifications without incurring any obligation either with respect to equipment previously sold or in the process of construction. The manufacturer does not warrant the data on this document.