

Products

Properties	Commercial			
	Residential*	System 1*	System 2**	Transportation*
Basics				
Available Powerplant Type	2003 Stationary	2003 Stationary	Immediately Stationary	2002 Mobile
Power level, kW @ Electrical Efficiency***	5.0 @ 26%	150 @ 25%	200 @ 40%	50 @ 34%
Type of Fuel	Natural Gas/Petroleum Gas	Natural Gas/Petroleum Gas	Natural Gas/Petroleum Gas/ADG	California Reformulated Gasoline Phase II
Fuel nickname	Methane/Propane	Methane/Propane	Methane/Propane/ADG	Gasoline
Grid-Connect Required	No	Yes	No	No
Overall H ₂ Production Efficiency***	80%	81%	109%	80%
Input				
Inlet Fuel Flowrate, kg/hr.	1.9	43	39	24
Fuel inlet pressure***	Typical Pipeline/Tank Pressure	Typical Pipeline/Tank Pressure	Typical Pipeline/Tank Pressure	Typical Fuel Pump Outlet Pressure
Fuel Inlet temperature, °C	-20 - 40	-20 - 40	-20 - 40	-20 - 40
Air inlet pressure, kPa (absolute)	Ambient	Ambient	Ambient	Variable
Air inlet temperature, °C	Ambient	Ambient	Ambient	Ambient
Output				
Hydrogen Output, l/min.	~ 0.78	~ 2833	2991	~ 1,000
Mole Hydrogen/Mole Fuel	3.1	2.9	3.6	~14.3
Maximum total sulfur, mg/kg	< 5	< 5	< 5	N/A
Maximum carbon monoxide, mg/kg	< 10	< 10	< 10,000	< 50
Emissions quality	CSCAQDS	CSCAQDS	CSCAQDS	SULEV
Operation				
Running Time, hrs.	40,000	40,000	40,000	5,000
Start-Stop Cycles	200	200	200	5,000 - 10,000
MTBF, hrs.	> 8,000	> 8,000	> 8,000	N/A
Temperature Range, °C	-30 - 40	-30 - 40	-30 - 40	-30 - 40
Control				
Data Acquisition/Control Port	Yes	Yes	Yes	N/A
Technology				
Desulfurization	Hydrodesulfurization	Hydrodesulfurization	Hydrodesulfurization	N/A
Reformer	Catalytic Partial Oxidation	Catalytic Partial Oxidation	Catalytic Steam Reforming	Catalytic Partial Oxidation
CO Cleanup	Water Gas Shift, Preferential Oxidation	Water Gas Shift, Preferential Oxidation	Water Gas Shift	Water Gas Shift, Preferential Oxidation
Physical				
Volume, l	~ 64	~ 4573	~ 6,880	~ 70
Width, m	~ 0.5	~ 1.5	~ 1.4	N/A
Height, m	~ 0.75	~ 2.0	~ 1.8	N/A
Depth, m	~ 0.5	~ 1.5	~ 2.7	N/A
Weight, kg	~ 65	TBD	~ 4990	~ 70
Safety				
Emergency Shutdown Available	Yes	Yes	Yes	Yes
ANSI Z21.83 Compliance	Yes	Yes	Yes	Yes

Notes:

* Estimated

** System tightly integrated with an existing Fuel Cell System

*** Item unique to customer application and integration