

TOSHIBA

ENVIRONMENTALLY FRIENDLY COGENERATION PACKAGE

200kW FUEL CELL POWER PLANT

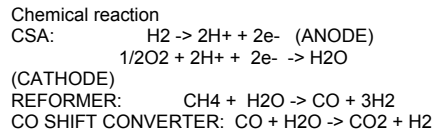
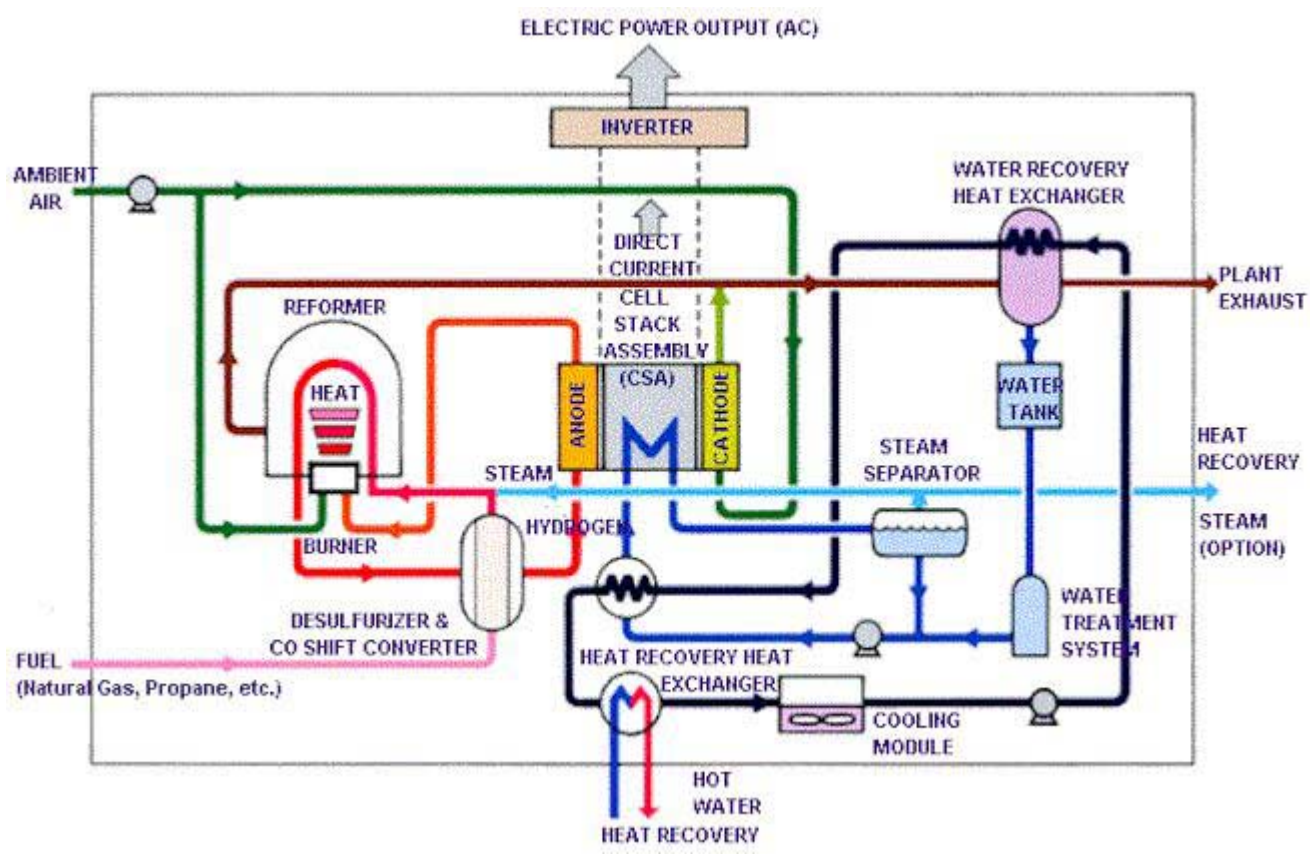


In partnership with International Fuel Cells Corporation and ONSI Corporation in the U.S., TOSHIBA has developed the commercial 200kW PC25TMC fuel cell power plant.

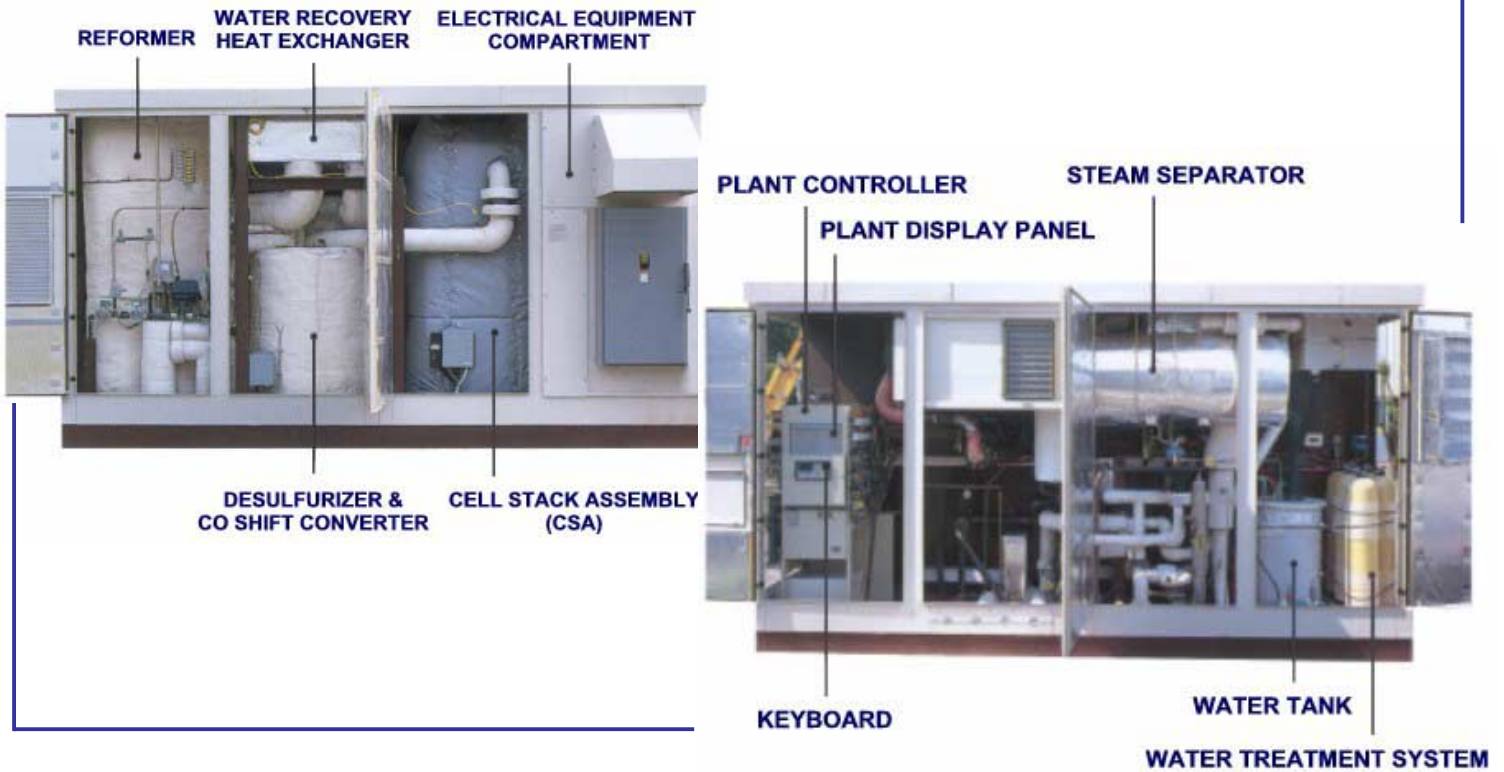
**PC25™C: Highly Reliable,
Cost Effective and
Environmentally Friendly
200kW Fuel Cell Power Plant**

- 1** Electrical Efficiency: 40%
Equal to Large Scale Thermal Power Plant
- 2** Overall Efficiency with Heat Recovery: greater than 80%
- 3** Clean Exhaust through Electrochemical Conversion
NOx less than 5ppm
- 4** Negligible Noise and Vibration through Static Conversion Processes

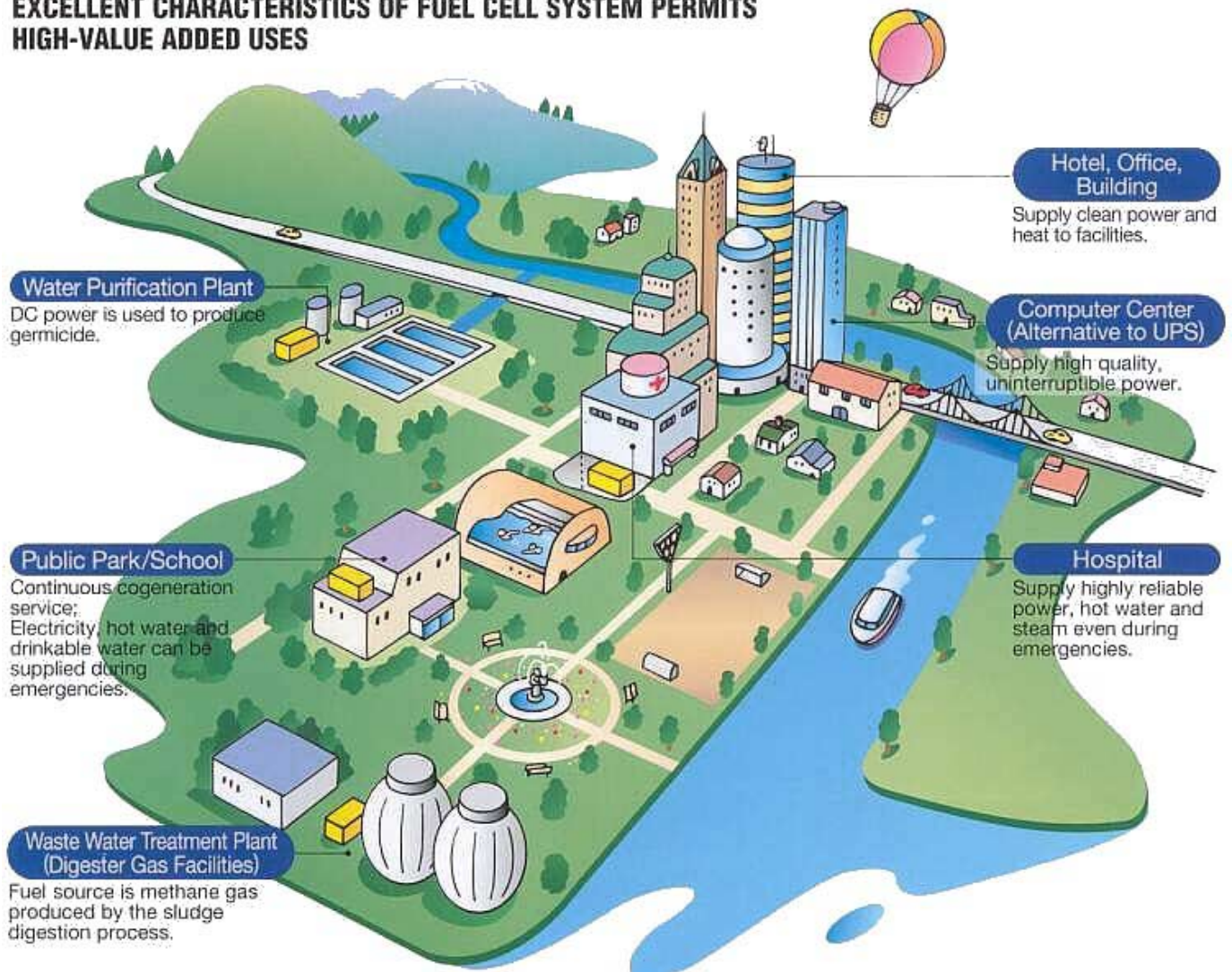
PC25TMC SYSTEM SCHEMATIC



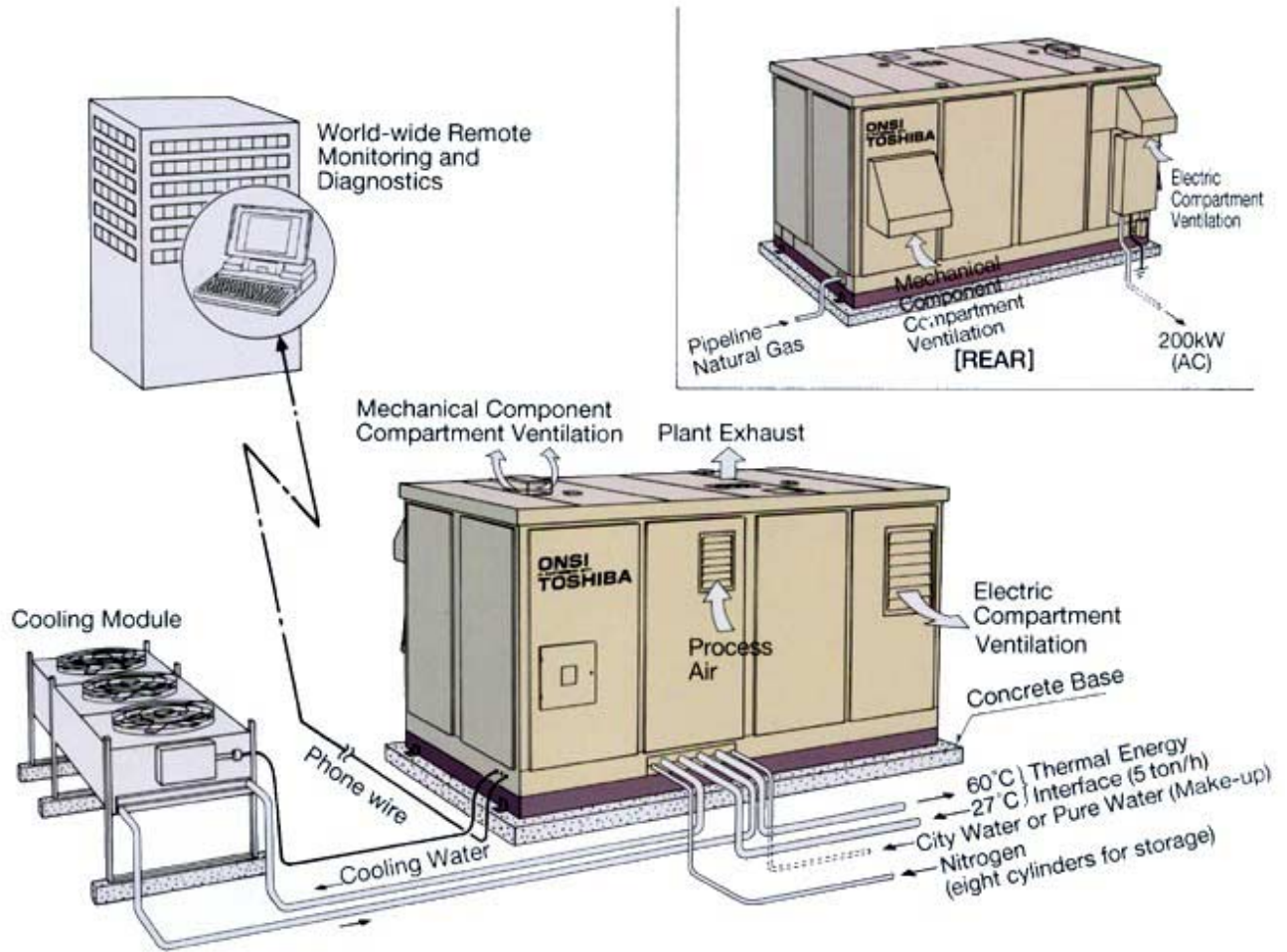
PC25™C ARRANGEMENT



EXCELLENT CHARACTERISTICS OF FUEL CELL SYSTEM PERMITS HIGH-VALUE ADDED USES



PC25™C Characteristics and Installation



(Note) In the case of indoor installation, exhaust ducts are to be attached at openings for plant exhaust and mechanical component compartment ventilation exhaust.

■ Standard Characteristics (Option available for *marked items)

Rated Power output	200kW(AC NET)
Output Voltage/Frequency	400V(50Hz),480V(60Hz)
Electrical Efficiency	40%(LHV,AC NET)
Thermal Energy Efficiency/Temperature	41%(LHV)/60Deg C hot water
Fuel/Consumption	Natural Gas/43Nm3/h
Emission	NOx: less than 5ppm Sox: negligible
Noise	About 60dB(A) at 10 meters from the package
Drain Water	Quality: pure water Quantity: around zero
Utility Supply	Water supply Quality: city water or pure water Quantity: around zero
	Nitrogen supply Four (4) cylinders containing 7 Nm3 for one start-up and shutdown cycle
Dimensions/weight	Power Module 5.5m x 3.0m x 3.0m, 18.2tons
	Cooling Module 4.1m x 1.3m x 1.2m, 0.7tons
Installation	Outdoor or Indoor
Operation/Electrical interface	Automatic, Unattended Operation/Grid-Connected*

■ Options

Heat Recovery	High Temp. water(90-120°C)+Hot water(60°C) Steam(170°C, 7atg)+Hot water(60°C)
Fuel	Propane(LPG) Anaerobic Digester Gas
Electrical Interface	Dual Grid-Independent/Grid Connected Direct Current Supply
Monitoring	Remote Performance Monitoring and Diagnostics

■ Maintenance

	Frequency	Item	Duration
aintenance During Operation	Each 3000 operating hours	· Clean filters · Replace WTS resin	1 day
Annual Maintenance	Annually	· Service pumps · Inspect/clean heat exchangers and tank	about 4 days
Overhaul	Every 5 years	· Replace CSA · Replace catalysts	about 2 weeks

TOSHIBA

TOSHIBA CORPORATION
INTERNATIONAL OPERATIONS-ENERGY SYSTEM GROUP

1-1 Shibaura 1-chome, Minato-ku, Tokyo 105-8001, Japan
PHONE: (03)3457-3622 FACSIMILE: (03)5444-9199
URL: www.toshiba.co.jp/product/fc/fce/index.htm

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