

C500 HE System Natural Gas



The C500 HE is a fully-integrated power solution that combines microturbines with an Organic Rankine Cycle (ORC) waste heat to electricity generator to increase power and efficiency. The system uses six C65 microturbines, directing their clean microturbine exhaust through an ORC to provide a total of 500kW net output with 37% electrical efficiency. The microturbines and ORC share common design features that deliver high reliability, reduce maintenance, and simplify installation. Both the microturbines and the ORC utilize:

- Efficient high-speed permanent magnet generators
- Oil-free, low-maintenance bearings (air bearings in the microturbines, magnetic bearings in the ORC)
- Digital power electronics providing variable-speed generator operation and integral utility protective relay functions.

The Capstone microturbines have ultra-clean exhaust emissions and the ORC uses a non-ozone-depleting refrigerant, making the C500 an environmentally responsible solution for a variety of power generation applications that require high net fuel efficiency.

Features and Benefits

- 500kW net output
- 37% electrical efficiency
- Digital power electronics – provides variable-speed generator operation and integral utility protective relay functions
- PLC based controls
- Ultra-low emissions
- One moving part per system – minimal maintenance and downtime
- Oil-free, low-maintenance bearings
- Integrated utility synchronization and protection⁽¹⁾
- Fully-integrated system
- Remote monitoring and diagnostic capabilities

Reliable power when and where you need it. Clean and simple.

Electrical Performance⁽²⁾

Electrical Power Output	500kW
Voltage	400–480 VAC
Electrical Service	3-Phase, 4 wire
Frequency	50/60 Hz
Electrical Efficiency LHV	37%

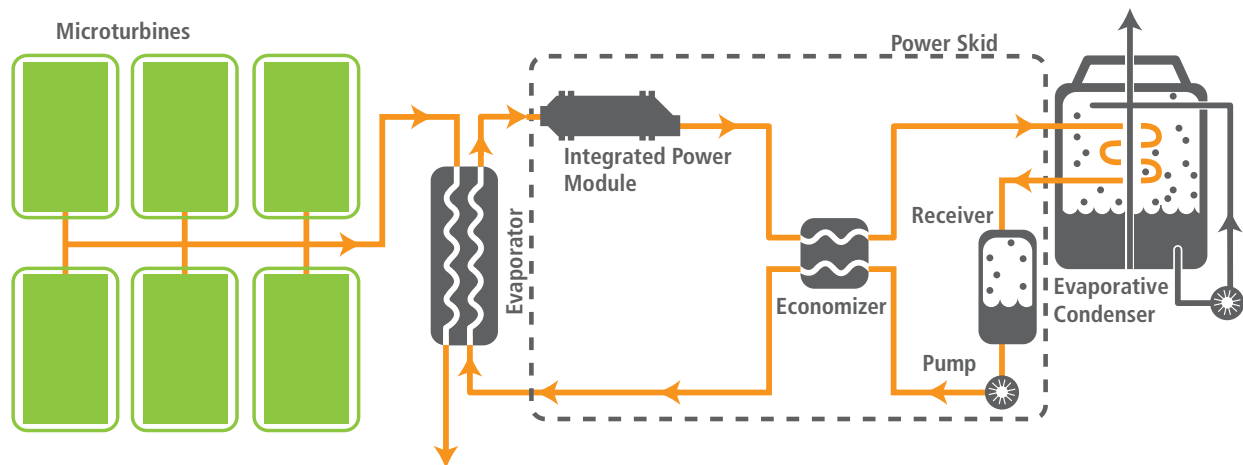
Fuel/Engine Characteristics⁽²⁾

Natural Gas HHV	30.7–47.5 MJ/m ³ (825–1,275 BTU/scf)
Inlet Pressure ⁽³⁾	517–552 kPa gauge (75–80 psig)
Fuel Flow HHV	5,330 MJ/hr (5,052,000 BTU/hr)
Net Heat Rate LHV	9.7 MJ/kWh (9,180 BTU/kWh)

Exhaust Characteristics⁽²⁾⁽⁴⁾

NO _x Emissions at 15% O ₂	9 ppmvd (19 mg/m ³)
NO _x / Electrical Output	0.12 g/bhp-hr (0.36 lb/MWhe)

Cycle Overview



Certifications

- Microturbines are certified to UL 2200 and UL 1741 for natural gas operation (UL files AU2687, E209370)
- Microturbines comply with IEEE 1547 and meet statewide utility interconnection requirements for California Rule 21 and the New York State Public Service Commission

(1) Some utilities may require additional equipment for grid interconnectivity
 (2) Nominal full power performance at ISO conditions: 59°F, 14.696 psia, 60% RH
 (3) Inlet pressure for standard natural gas at 39.4 MJ/Nm³ (1,000 BTU/scf) (HHV)
 (4) Exhaust emissions for standard natural gas at 39.4 MJ/Nm³ (1,000 BTU/scf) (HHV)
 Specifications are not warranted and are subject to change without notice.

