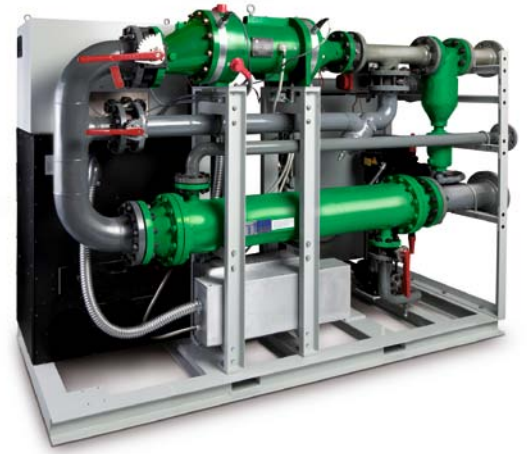


# Heat Recovery Solutions

## Clean Cycle™ 125 kW



### Stop wasting heat.

The Clean Cycle™ system from GE's Heat Recovery Solutions division captures wasted heat and turns it into electricity that you can use or sell back to the grid.

For the first time, small-scale installations can benefit from proven Organic Rankine Cycle to recapture lost energy and turn it into money. The Clean Cycle™ from GE's Heat Recovery Solutions division captures heat from a wide range of systems including various engine types and biomass boilers. Typical payback periods for applications like these range from 18 to 36 months.

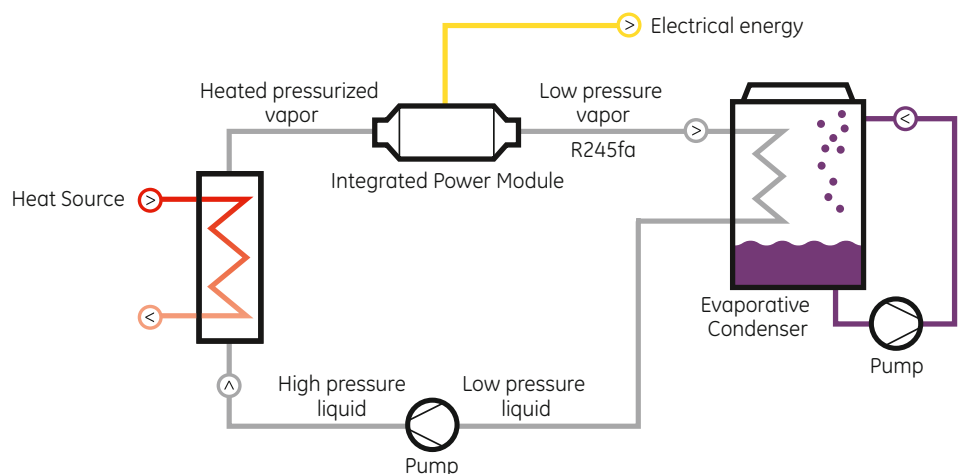
### Optimized Rankine Technology

The Clean Cycle™ 125 kW integrates proven technologies into a highly efficient system design. Key innovations include:

- Integrated power module, a high-speed turbine expander (26,500 rpm) plus high-efficiency alternator in one sealed unit. Only one moving part. No external seals. No gearbox.
- Super-efficient magnetic bearings with self-centering. No metal-on-metal. No oil systems.
- Sophisticated power electronics to turn the high-frequency output into utility-grade power. Power factor is 1, so no expensive capacitors.

### The benefits

- Cleaner energy with no fuel needed
- No additional emissions
- High-speed, high-efficiency power module
- Simple synchronization with utility
- Small-footprint packaged unit: ready to integrate
- High reliability, very low maintenance and ownership costs
- Modular and scalable design
- Fast payback



a product of  
**ecomagination**



GE imagination at work

## Component Design

Alternator	High speed, permanent magnet
Turbine	Single stage radial expander turbine
Bearings	Magnetic frictionless
Design Standards	Yes
Piping	ASME B31.1
Heat Exchangers	ASME VIII/PED
Electrical Enclosures	NEMA1/IP23

## Clean Cycle™ 125 Performance Parameters

Electrical Output Gross 125 kW

### Waste Heat Conditions

Evaporation Temp	250°F	121°C
Input Energy	3,340,000 BTU/hr	980 kW

### Condensing in ISO Ambient: 59°F (15°C) 60% RH

Temp	70°F	21°C
Condensing Load	2,800,000 BTU/hr	821 kW

## Pressurized Hot Water to Power

Electrical Output Gross 125 kW

### Waste Heat Conditions

Inlet Temp	290°F	143°C
Outlet Temp	260°F	127°C
Flow Rate	119,555 lbm/hr	54,343 kg/hr

Condensing temperature of 70°F (21°C) and heat exchanger 95% efficient.

The technological strength of GE's Heat Recovery Solutions division lies in the generation of power from waste heat within the low power range. The innovative Clean Cycle™ 125 kW generator that produces emission-free power from waste heat emitted by various engine types and biomass boilers was developed under the guidance of an experienced and dynamic management team.

## System

Refrigerant	R245fa (Non-ozone depleting)
Controls	PLC based
Remote Monitoring	Web based gateway
Operation	Designed for local and remote control
Packaged Solutions	Available

## Saturated Steam to Power

Electrical Output Gross 125 kW

Temperature	255°F	124°C
Pressure	32 psia	220.6 kPa
Flow	3,692 lbm/hr	1,678 kg/hr

1. Waste heat operating conditions: no superheat in steam included.  
Condensing temperature of 70°F (21°C) and heat exchanger 95% efficient.

## Hot Gases to Power

Electrical Output Gross 125 kW

Inlet Temp		Flow Rate	
°F	°C	lbm/hr	kg/hr
400	204	150,000	68,182
500	260	75,000	34,091
600	316	49,500	22,500
700	371	36,900	16,773
800	427	29,250	13,295
900	482	24,250	11,023

1. Waste heat conditions – Exhaust gas temperature reduced to 300°F (149°C) with condensing temperature of 70°F (21°C)  
2. Assumed exhaust gas Cp = 0.25 Btu/lbm - °F (1.05 kJ/kg - °C)  
3. Heat exchanger 95% efficient



GE imagination at work

## Talk to us.

### Heat Recovery Solutions

2901 S.E. Monroe Street  
Stuart, Florida 34997, USA  
T: +1-772-219-9449

United Kingdom  
T: +44 1666 822 482

### Jenbacher gas engines

Achenseestrasse 1-3  
6200 Jenbach, Austria  
T: +43 5244 600-0

info.heatrecovery@ge.com  
www.geheatrecovery.com