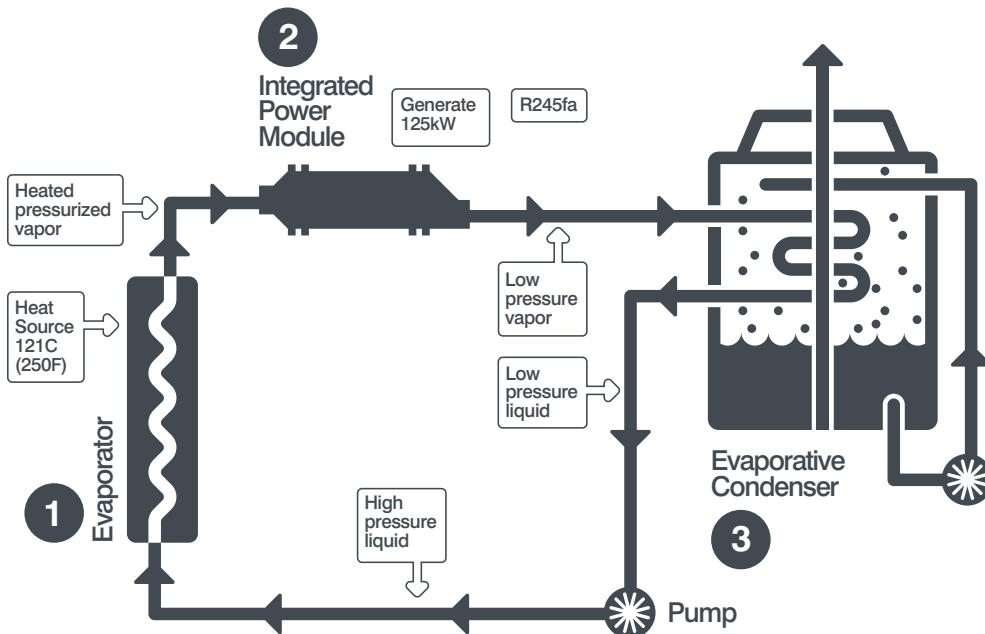


Clean Cycle™ 125kW. Waste Heat to Electricity Generator.



Clean
Cycle™

Stop wasting heat.

The Clean Cycle waste heat-to-electricity generation system 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 technology to recapture lost energy and turn it into money.

The Clean Cycle captures heat from a wide range of systems including, engines, boilers, industrial heat stacks and solar thermal installations.

Typical payback periods for applications like these range from 18 – 36 months.

Optimized Rankine Technology™

The Clean Cycle 125 integrates proven technologies into a unique, super-efficient system design. Key innovations include:

The M-Series™ integrated power module

High-speed turbine expander (26,500 rpm) plus high-efficiency alternator in one sealed unit. One moving part. No external seals. No gearbox.

Magnetic bearings

Super-efficient magnetic bearings with self-centering. No metal-on-metal. No oil systems.

Calnetix Power Conditioning

Sophisticated power electronics to turn the high-frequency output into utility-grade power. Power factor is 1, so no expensive capacitors.

Safe Working Fluid

A safe HCFC with negative environmental impact.

Clean Cycle™ configurations

The Clean Cycle™ S Series

Calnetix Power Solutions Power Module (called the M Series) provided on a frame for integration by our distribution and integration partners.

The Clean Cycle™ P Series

A pre-packaged system for immediate installation; pre-configured with the right condenser and evaporator for each application.

The benefits

Clean energy with no fuel needed

Zero emissions and eco-safe

Proven ORC technologies

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

 **CALNETIX
POWER
SOLUTIONS**

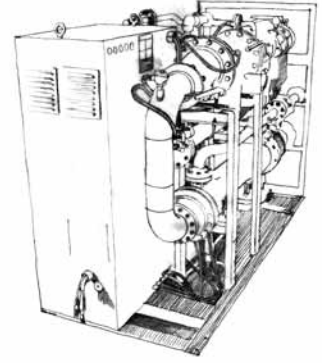
Clean Cycle™ Performance

Component Design

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

System

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



Pressurized Hot Water to Power

Electrical Output Gross	125kWe		
Waste Heat Conditions	Inlet Temp	250°F	121°C
	Outlet Temp	243°F	117°C
	Input Energy	3,043,000 BTU/hr	892 kW
	Flow rate	423 GPM	96 m³/hr
Waste Heat Conditions	Temp	70°F	21°C
	Condensing Load	2,616,000 BTU/hr	767 kW

Saturated steam

Electrical Output Gross 125kWe

Temperature	Pressure	Flow
258°F	34.3 psia	3,405 lbm/hr
126°C	236.5 kPa	1,544 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

Electrical Output Gross 125kWe

Inlet Temp		Flow Rate	
°F	°C	lbm/hr	kg/hr
400	204.4	102,496	46,491
500	260.0	56,942	25,829
600	315.6	39,421	17,881
700	371.1	30,146	13,674
800	426.7	24,404	11,069
900	482.2	20,499	9,298

1. Waste heat conditions – Exhaust gas temperature reduced to 275° F (135° C) with condensing temperature of 70° F (21.1° C)
2. Assumed exhaust gas Cp = 0.25 Btu/lbm - °F (1.05 kJ/kg - °C)
3. Heat exchanger 95% efficient

About Calnetix Power Solutions.

Calnetix Power Solutions is a world leader in waste-heat-to-electricity generation in small-scale applications. Led by an experienced and dynamic management team, the company developed the innovative M-Series power module that is at the heart of the Clean Cycle.

Clean Cycle™

Talk to us.

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