

ELECTRA  **THERM®**



GREEN MACHINE

Distributed Power Generation from Waste Heat

THE GREEN MACHINE



The Green Machine ORC

ElectraTherm offers a full range of ORCs, including 35kW, 65kW and 110kW solutions available as a stand alone or in series. ElectraTherm's award-winning Green Machine utilizes low grade heat sources to make electricity with:

- No fuel requirement
- 20-year design life
- Minimal footprint
- Low maintenance
- Zero emissions
- Attractive payback

Standard Features and Specifications

- Fully automated controls with remote monitoring and operating capabilities
- Induction generator with power factor correction for easy grid connection
- Simple maintenance, with no gearbox or oil changes
- NEMA 3R / IP 54 compliant enclosure for outdoor use
- Sound attenuated option: <72db at 1 meter
- CE certified
- Compact, brazed plate heat exchangers
- Robust, Twin Screw Expander power block
- Patented in-process lubrication

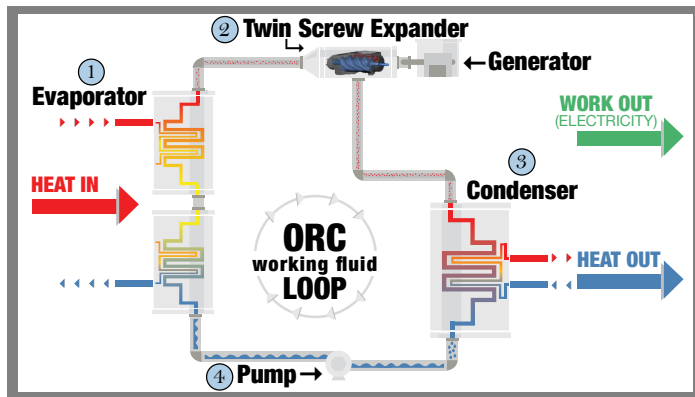
THE GREEN MACHINE

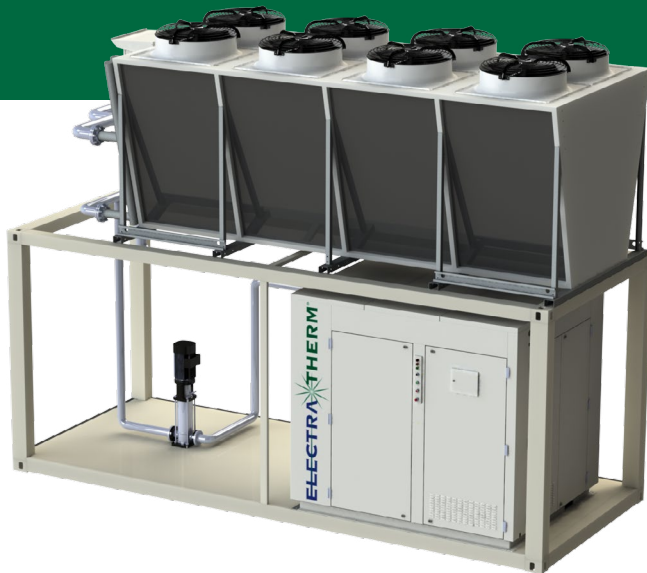
How It Works

ElectraTherm's waste heat-to-power system uses a closed loop Organic Rankine Cycle (ORC).

Steps in the Process

- 1) Working fluid is pumped to higher pressure and transferred to the evaporator.
- 2) Heat captured by the evaporator boils the working fluid into pressurized vapor.
- 3) The vapor flows through the twin screw expander, spinning an electric generator to produce power.
- 4) The vapor is cooled and condensed back into a liquid in the condenser to repeat the cycle.





THE GREEN MACHINE

4200-FS

Low Cost Packaged Solution
Up to 35kWe

- Dimensions: 6.1 x 2.4 x 2.6 m, Weight: 9,500 kg
- Packaged ORC at 35kWe
- Turnkey, inc. liquid loop radiator, working fluid, start up & commissioning, and hot water bypass (if required)
- Various configurations available



4400

THE GREEN MACHINE

4400

ElectraTherm's Standard ORC Model

Up to 65kW_e

- Dimensions: 2.4 x 2 x 2.3 m, Weight: 3,600 kg
- Customizable balance of plant
- Indoor or outdoor installation
- Water or air condensing
- Various configurations available



6500

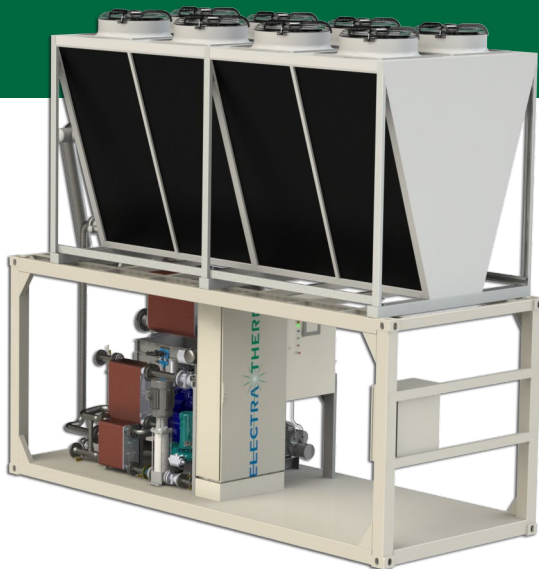
THE GREEN MACHINE

6500

High Output Model
Up to 110kW

- Dimensions: 3 x 2.4 x 2.6 m, Weight: 7,490 kg
- Multiple condensing options
- Easy to install
- No concrete foundation required
- Dry cooler mounting integrated
- Various configurations available

6500-FS



THE GREEN MACHINE

6500-FS

High Output Package Solution

Up to nokWe

- Dimensions: 6.1 x 2.4 x 2.6 m, Weight: 12,247 kg
- Turnkey inc. liquid loop radiator, all piping/pumps, no concrete foundation required, minimal engineering
- Various configurations available

Performance Table

Green Machine			4200 <35kWe	4400 <65kWe	6500 <110kWe
Hot Water Input Parameters	Hot water input temp range	°F	170 - 240	170 - 240	170 - 252
		[°C]	[77 - 116]	[77 - 116]	[77 - 122]
	Thermal input range	MMBTU/hr	1.02 - 2.22	1.02 - 2.9	1.2 - 5.4
		[kWth]	[300 - 650]	[300 - 860]	[330 - 1600]
	Flow rate range	gpm	50 - 200	50 - 200	100 - 350
		[l/s]	[3.2 - 12.6]	[3.2 - 12.6]	[6.4 - 22.1]
Water Cooled Condensing Parameters	Cooling water input temp range	°F	40 - 150	40 - 150	40 - 150
		[°C]	[4 - 65]	[4 - 65]	[4 - 65]
	Heat rejected to cooling water range	MMBTU/hr	0.9 - 2.0	0.9 - 2.7	1.1 - 5.1
		[kWth]	[270 - 600]	[270 - 795]	[320 - 1500]
	Cooling water flow rate	gpm	<220	<220	<350
		[l/s]	[<13.9]	[<13.9]	[<22.1]
LLR / Dry Cooler	Ambient air temp	°F	<100	<100	<100
		[°C]	[<38]	[<38]	[<38]
	Heat rejected to condenser	MMBTU/hr	0.9 - 2.0	0.9 - 2.7	1.1 - 5.1
		[kWth]	[270 - 600]	[270 - 795]	[320 - 1500]

