



BITZER SEMI-HERMETIC EXPANDER/GENERATOR

POWER+ GENERATOR

ElectraTherm's POWER+ GENERATOR produces fuel-free, emission-free power from low grade waste heat using the Organic Rankine Cycle (ORC) and proprietary technology. The company's patented BITZER semi-hermetic twin screw expander/generator combination enables the POWER+ GENERATOR to generate fuel-free and emission-free electricity from various forms of waste heat. ElectraTherm's patented ORC design represents a dramatic change from radial or axial turbine technologies, providing a more cost efficient, robust design with no shaft seal between the expander/generator combination, greatly enhancing reliability. The 4400B+ is an evolution of ElectraTherm's POWER+ and the BITZER expander offers enhanced performance across the operating range with a maximum output increased to 75kW.

4400B+ CONFIGURATIONS - UP TO 75kWe



4400B+ STAND ALONE

- // Dimensions*: 2.0 x 2.4 x 2.3 m
- // Weight: 3,290 kg / 7,245 lbs
- // Customizable balance of plant
- // Indoor or outdoor installation
- // Global Price: Estimated 3 to 5 year payback depending on project details, contact us for a current review**



4400B+ SYSTEM PACKAGE

- // Dimensions*: 12 x 2.4 x 2.9 m
- // Weight: 6,095 kg / 13,438 lbs
- // Includes: liquid loop radiator, cold water pump, integrated controls, requires minimal engineering
- // Contact ElectraTherm for current pricing**

*Renderings may not be exact representations of final POWER+ product.
**Certification fees for certain countries may apply.

HEAT TO POWER APPLICATIONS

ElectraTherm generates electricity from various heat sources, including:



Stationary Engines



Biomass/Biogas



Boilers & Process Heat



Oil & Gas, Geothermal



Flare Elimination

4400B+ PERFORMANCE PARAMETERS - UP TO 75kWe

ElectraTherm's Water Cooled Condensing System Performance

| | | | |
|------------------------------------|--------------------------------------|----------|----------------|
| HOT WATER INPUT PARAMETERS | Hot water input temp range | °F | 170 - 302 |
| | | [°C] | [77 - 150] |
| | Thermal input range | MMBTU/hr | 1.3 - 5.2 |
| | | [kWth] | [380 - 1450] |
| Flow rate range | | gpm | 50 - 238 |
| | | [l/s] | [3.0 - 15.0] |
| WATER COOLED CONDENSING PARAMETERS | Cooling water input temp range | °F | 40 - 150 |
| | | [°C] | [4 - 65] |
| | Heat rejected to cooling water range | MMBTU/hr | 1.3 - 4.7 |
| | | [kWth] | [380 - 1365] |
| Cooling water flow rate | | gpm | 95 - 285 |
| | | [l/s] | [6.0 - 18.0] |
| LIQUID LOOP RADIATOR (LLR) | LLR approach to ambient air temp | °F | 20 |
| | | [°C] | [11] |
| | Heat rejected to LLR | MMBTU/hr | 1.3 - 4.7 |
| | | [kWth] | [380 - 1365] |

| 4400B+ OPTIMIZATION ALTERNATIVES | | | | | |
|---|-------------------------|------------------------|--------------------------|----------------------------------|-----------|
| Model / Condition | INPUT VALUES | | | | OUTPUT |
| | Cold Water Temp °F [°C] | Hot Water Temp °F [°C] | Hot Water Flow GPM [L/s] | Minimum Required MMBTU/hr [kWth] | Gross kWe |
| B+ / High Temp / Low Flow | 77 [25] | 302 [150] | 65 [4] | 3.3 [950] | 75 |
| B+ / Low Temp / High Flow | 77 [25] | 270 [132] | 170 [10.7] | 3.3 [950] | 75 |
| B+ / High Temp / CHP* | 140 [60] | 302 [150] | 160 [10.0] | 5.2 [1100] | 75 |
| Cold water flow rate: 220 GPM [14 L/s]; *CHP 255 GPM [16 L/s] | | | | | |
| *CHP provides up to 185°F [85°C] condensing for beneficial uses | | | | | |

PERFORMANCE CHARACTERISTICS

| | |
|-----------------------------|--|
| Nominal Rating | Up to 75kWe* @ 380 - 500V / 3 phase / 50 & 60 Hz |
| Ambient Operation | 32°F - 120°F (0°C - 48°C)** |
| Power Factor Correction | Load and Site Dependent - from 0.9 to 1 |
| Total Harmonic Distortion | <3% |
| Emissions | Zero (Closed Binary Cycle) |
| Minimum Operating kW Output | 5 kWe |

DESIGN ATTRIBUTES

| | |
|-----------------------------|--|
| Refrigerant Plumbing | Built to ASME and CE Standards |
| Power Block | BITZER Semi-Hermetic Twin Screw Expander Generator Combination |
| Generator | Grid-Tied Induction (Brushless Construction, Asynchronous) |
| Heat Exchangers | Compact, Brazed Plate Construction |
| Design Life | 20 Years |
| Lubrication | Patented Process Lubrication |
| Grid Protective Relay (GPR) | External Additional GPR Interface Included |

SYSTEM DESCRIPTION

| | |
|---------------------------|---|
| Working Fluid | R245fa (Pentafluoropropane)*** |
| Heat Source | Hot Water 170°F - 302°F (77°C - 150°C) |
| Cooling Requirement | Water 40°F - 150°F (4°C - 65°C) |
| Minimum Temp Differential | Between Hot Water Input and Cooling Water Input = 80°F / 27°C |
| Controls | Programmable Logic Controller Based Custom Controls |
| Remote Monitoring | Machine accessible with included VPN router |
| Operation | Designed for Unattended Operation |
| Cabinet | NEMA 3R Outdoor Rated /IP 54 Compliant |
| Shipping | Ships from Flowery Branch, GA, USA |
| Dimensions & Weight | Various Configurations Available (see first page) |
| Sound Pressure | 78dBA at 1 meter. Sound Attenuated Option: <70dBA at 1 meter |

*Output depends on hot and cold resources

**Extreme environments require optional equipment

***R245fa is a non-flammable and non-ozone depleting working fluid

FEATURES INCLUDE:

- // Ease Of Installation
- // Low Maintenance, with No Drive Couplings, Shaft Seals, or Oil Changes
- // Robust, Twin Screw Expander Power Block
- // CE Certified
- // Remote Monitoring
- // Automated Control System
- // Modular and Scalable
- // Zero Emissions
- // Zero Toxic By-Products
- // Zero Fossil Fuel Requirements
- // Dual-Heat Stream Input + Radiator Option Available



BY BITZER GROUP