

micro-10

by Mitis

The world's first
flameless combustion,
oil-free microturbine.



Truly Multi Fuel

Compatible with various hydrocarbon gaseous, liquid and mixtures fuels, hydrogen ready



Ultra Low Emissions

Low NOx (< 1 ppm), low CO (< 5 ppm) thanks to flameless combustion. Oxygen rich exhaust



Combined Heat & Power

Maximum fuel conversion efficiency with combined heat and power, and cooling.



Cloud monitoring

Remote monitoring and AI based predictive maintenance



Silent Operation

55 DB at 1 meter



Low Maintenance

Oil-free operation thanks to aerodynamic air foil bearings



High Reliability

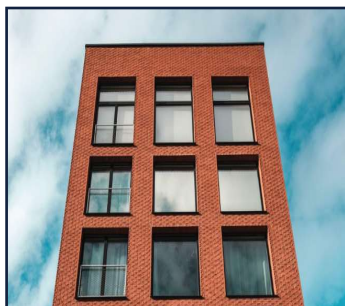
Less moving parts, single direction rotating rotor.



Long-Life

Designed for a minimum of 80 000 hours of operation

Typical Applications



CHP for Buildings

Providing both electricity and heat is ideal for large scale residential buildings, recreational facilities, wellness centers, hotels, hospitals, etc.



Biofuels

Convert both biogas from anaerobic digesters or gasification and liquid biofuels (pyrolysis, etc), ideal for farms, landfills, agrofood, etc



Flare Gas

Produce both electricity and heat for local infrastructure from flare or complex gas mixtures. Ideal for remote operating oil fields, decommissioned oil wells, and industry off-gas.

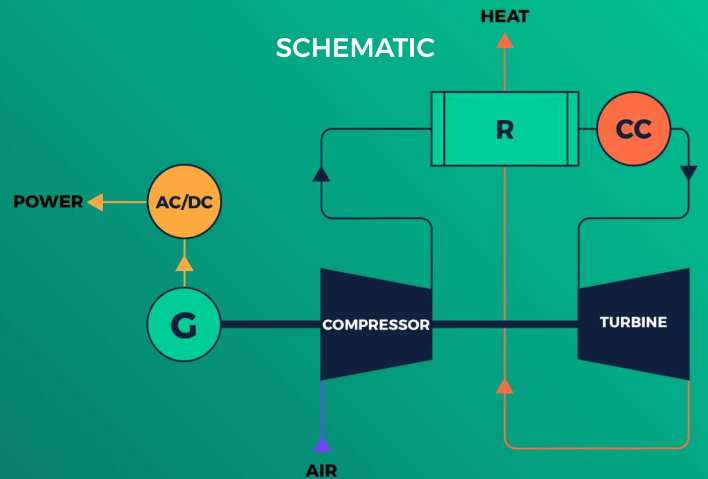
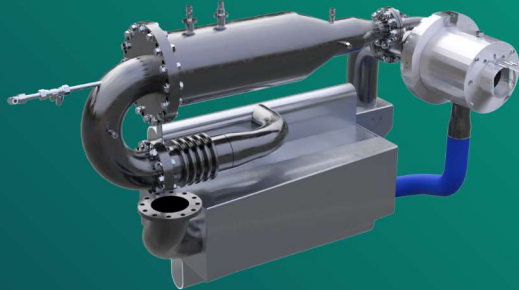


Microgrids

An ultra reliable, multi-fuel off-grid primary or back-up power generator ideal for use in combination with solar panels and battery storage systems, providing both AC and DC.

Our Microturbine

As experts in high-speed turbomachinery this turbine has been meticulously developed for maximum impact.



Flameless Combustor

Our patented flameless combustion method minimizes emissions, while also enabling the ability to burn almost any fuel, liquid or gas.



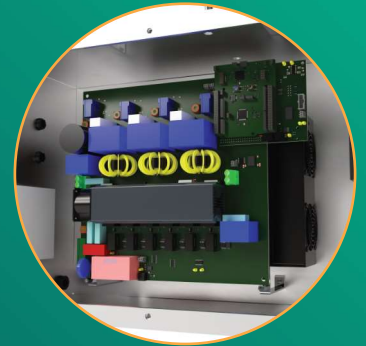
Turbogenerator

Our multi-patented compact turbo generator with ultra high efficiency components and air bearings allowing our system to be oil-free.



Recuperator

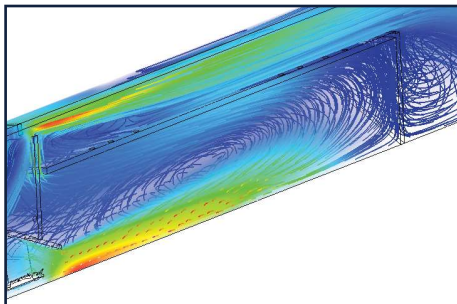
Our patented micro-channel recuperator design maintains high efficiency at high temperatures, with minimal pressure loss.



Power Electronics

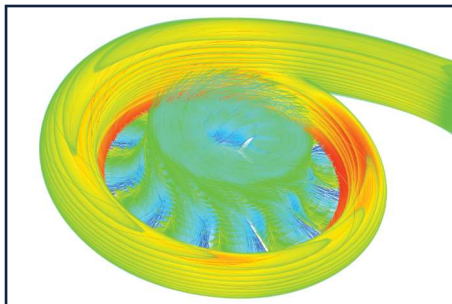
Our high efficiency, high frequency SiC Rectifier delivers maximum electrical efficiency and also provides adaptive output voltage.

Engineered with Advanced Simulation



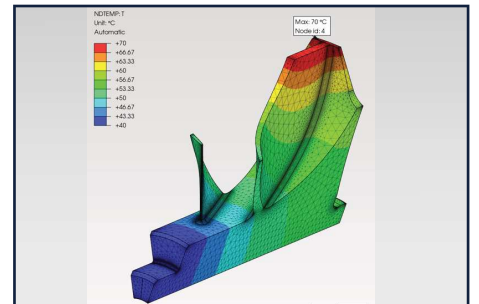
Combustion Modelling

The flameless combustor geometry is modelled by advanced Computational Fluid Dynamics simulation to minimize NOx and CO emissions and optimize efficiency.



Aerodynamics

Compressor and turbine aerodynamics are numerically optimized to give the highest electric efficiency.

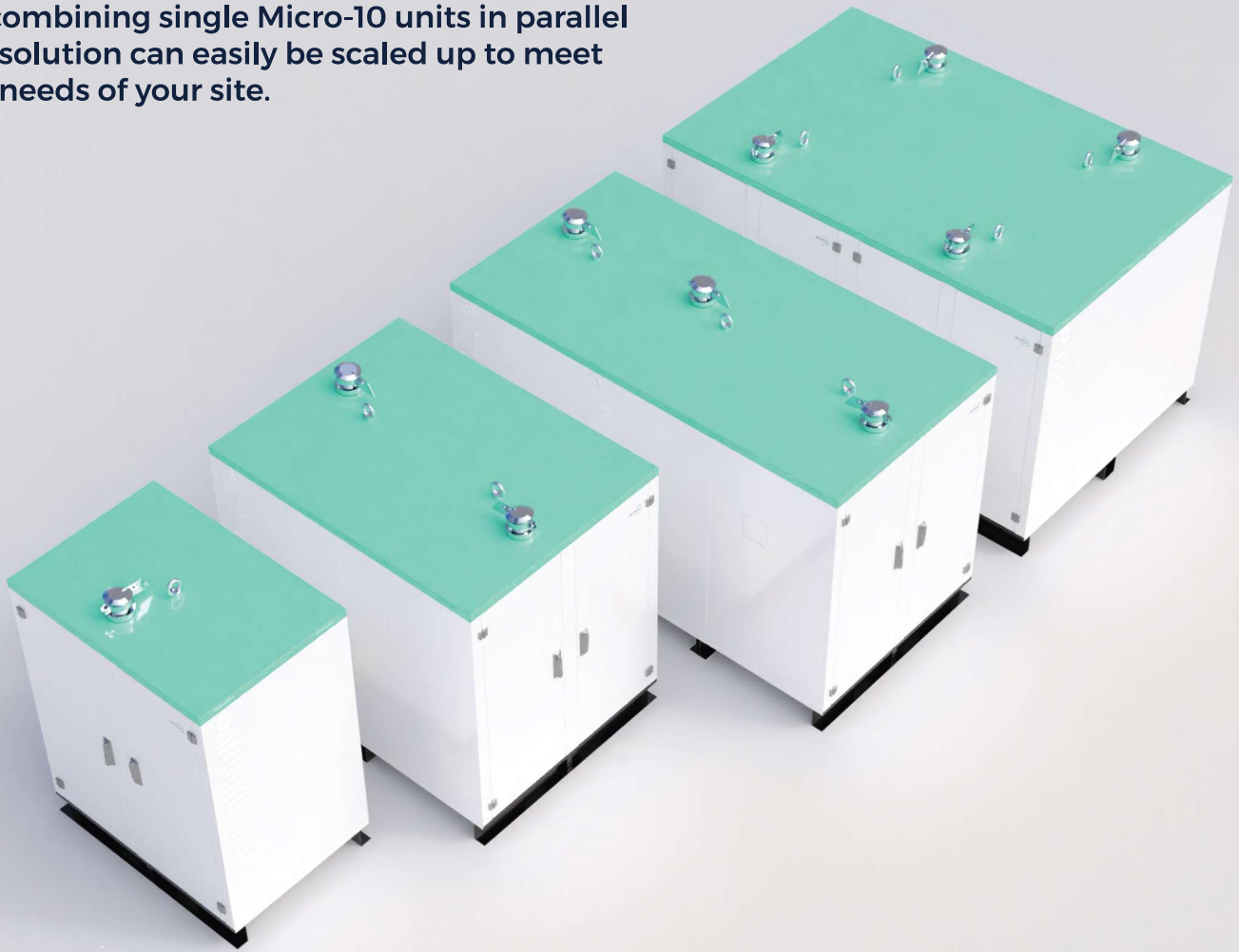


Structural Integrity

Detailed Finite Element analysis of each component allows to evaluate mechanical stresses accurately to increase the life of the system.

Ready to Scale

By combining single Micro-10 units in parallel our solution can easily be scaled up to meet the needs of your site.



Internal Views



Specifications

Core System

Engine	Variable high speed gas turbine (up to 100,000 RPM)
Operation	Continuous
Lubrification	N/A, air foil bearings
Cooling	Only internal water cooling for the electric stator
Service	12,000 hours
Communication	dry contacts / ethernet / usb / (option : other communication)
General Compliance	ISO 8528 (G2)

Electrical Output:

Rated power	[kW]	10
Active power	[kVA]	10
Output Voltage On-Grid	[V]	Automatic
Output Voltage Off-Grid	[V]	400, 480 (3P + N (selectable))
Single Phase	[V]	option: 220-277, 7.2kW power
Waveform		Sinewave
Frequency On-Grid		Automatic
Frequency Off-Grid	[Hz]	50 or 60
Starting mode		battery (for off-grid)
Internal Battery Voltage	[V]	48
Internal Battery Capacity	[Ah]	50

Fuel and Emissions

Fuel types	Natural gas, LPG, biogas, low LHV gas, liquid fuels.	
Fuel flow (l)	[nm ³ /h]	4.3
NOx at 15% O2	[ppmvd]	< 10
CO at 15%O2	[ppmvd]	< 20
Exhaust mass flow	[g/s]	141

Operating Conditions:

Sound Pressure Level (at 1 m)	[dB]	55
Ambient temperature	[°C]	-20 to +35
Operating Altitude	[m]	0 - 2000
Relative humidity	[%]	0 - 100
Canopy protection rating		IP24 (standard)
Soundproof Canopy		tropicalized C5 200micro (or equivalent) or stainless steel (optional)
Fire protection	[min]	30

Dimensions & Weight

Width	[cm]	80
Length	[cm]	120
Height	[cm]	160
Weight	[kg]	400

Water Inlet Temperature Graphs

