

# Rank.<sup>®</sup> MICRO

## Product description

The Rank<sup>®</sup> MICRO machine generates clean electricity up to 2,5 kWe, taking advantage of heat sources below 120 °C.

Besides excellent electrical performance, the condenser heat produced at temperatures up to 50 °C can also be used. This heat is available for several applications with thermal needs below 50 kWt.



## A Rank<sup>®</sup> machine for every need

Whatever your need is, we have a Rank<sup>®</sup> machine that can be adapted to it through various products that cover a wide range of thermal and power applications.

For very low power applications or demonstration/didactic installations, Rank<sup>®</sup> MICRO allows electric generation from heat sources at 90°C.



## What is Rank<sup>®</sup>?

The Rank<sup>®</sup> equipment allows electrical energy and useful heat production using a low-temperature heat source, with economic and environmental benefits.



# Rank<sup>®</sup> MICRO

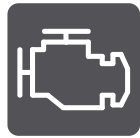
## Applications

Among the main applications of the Rank<sup>®</sup> ORC machines, we highlight the waste heat recovery and the use of renewable heat sources, with a special interest in cogeneration and trigeneration systems.

### Heat sources



Industrial Waste Heat



Engines



Biomass



Solar CHP



Waste



Geothermal

### Heat sinks



Cold Production



Heating

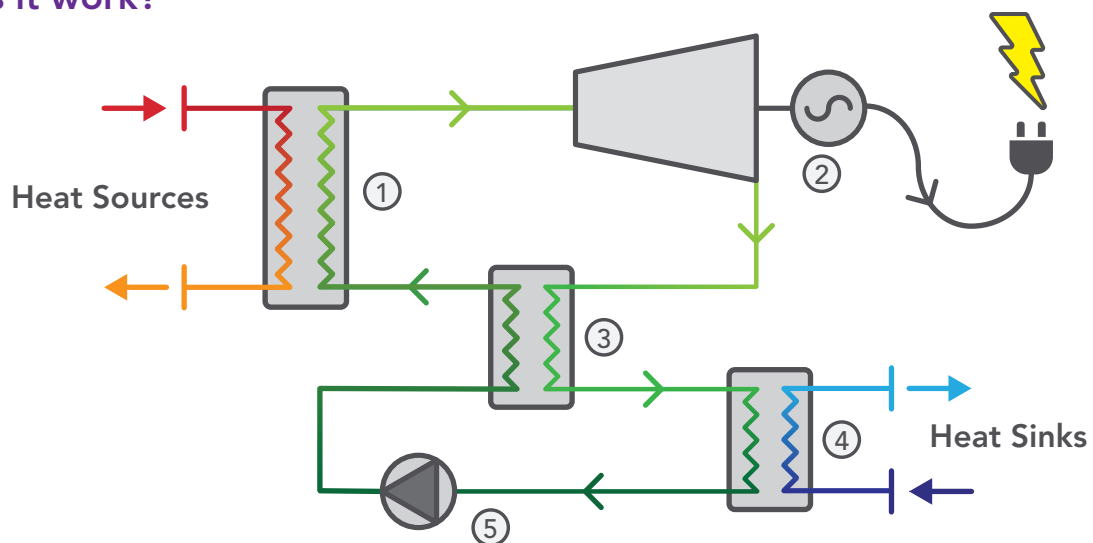


Industrial Processes



Drying

## How does it work?



- ① Evaporator** A heat exchanger provides heat to the high-pressure working fluid and passes from subcooled liquid to superheated vapor (in the form of water or thermal oil).
- ② Turbine** The expansion of the superheated vapor is used to generate clean electricity.
- ③ Regenerator** The expanded working fluid is used to preheat the high-pressure liquid at the inlet of the evaporator to increase the efficiency of the system.
- ④ Condenser** It produces useful heat (in the form of water) from the condensation of the working fluid at low pressure.
- ⑤ Pump** The pressure of the working fluid is increased, and the ORC cycle is completed.

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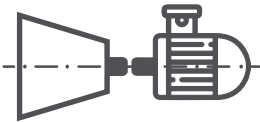
## Rank® Technology

The Rank® equipment is composed of high quality, robust and efficient components, which offer our customers the following advantages and benefits.



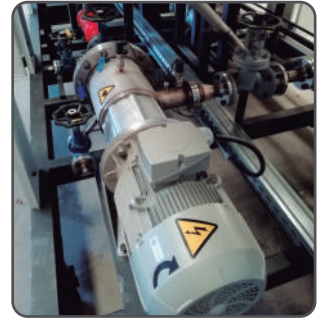
### Rank® low-rpm turbine

Operation at low revolutions reduces the noise level, lengthens the service life, and improves reliability.



### Rank® direct drive

Direct drive avoids the use of gears or pulleys, minimising the maintenance and increasing electrical efficiency.



### Zero leaks

Our hermetic components eliminate the leakage of the working fluid, reducing maintenance costs and downtime and being more environmentally friendly.



### Magnetic transmission

Magnetic transmission to ensure tightness and to reduce the possibility of leakage.



### Rank® easy-connect

Electronics-free connection to the electricity grid at the required electrical quality conditions.



### Flexible operation

Modular machines that can operate under a wide range of temperature and flow inlet and outlet conditions.



### Digitalisation through the Rank® control system

Our machines operate without the need for the human interface through an automatic, efficient managing system.



### Safety

It complies with all safety regulations and minimises the risk of accidents.



### Rank® service







Real-time remote monitoring and predictive control of the machines and automatically generated reports.

## Safety Regulations and Standards

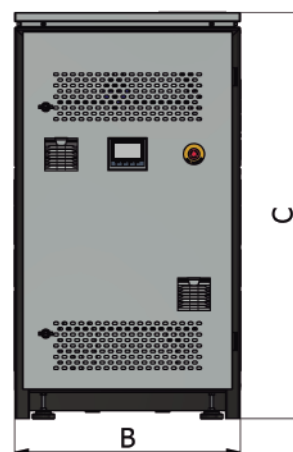
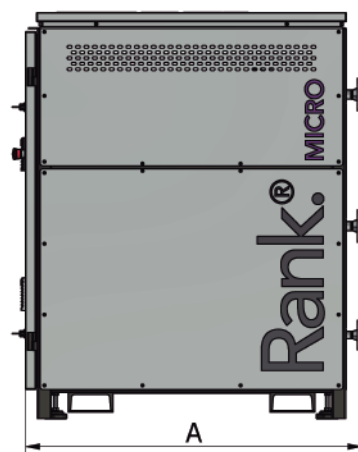
- Low voltage Directive
- Machinery Directive
- Electromagnetic Compatibility Directive
- Pressurized Equipment Directive
- ENA ER G59/3
- ASME B31.1 – Power Piping Code, Mechanical
- ASME B31.3 – Process Piping Code
- ASME Boiler and Pressure Vessel Code Section VIII
- UL 508A- Control Panel Wiring
- EN/ISO 3744:2010

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## Technical Data

		Heat source	Heat transfer fluid	Water	-
			Inlet temperature	90-120	°C
			Outlet temperature	80-110	°C
			Volumetric flow rate	3	m <sup>3</sup> /h
			Thermal power	20-45	kWt
			Connections diameter	DN25 PN16	-
			Pressure drop	50	kPa
Heat transfer fluid inner volume	3	L			
		Useful heat	Heat transfer fluid	Water	-
			Inlet temperature	20-40	°C
			Outlet temperature	30-50	°C
			Volumetric flow rate	2	m <sup>3</sup> /h
			Thermal power	15-40	kWt
			Connections diameter	DN25 PN16	-
			Pressure drop	100	kPa
Heat transfer fluid inner volume	4	L			
		Electricity	Gross power	1.5-3	kWe
			Net power	1-2.5	kWe
			Voltage	3 x 400	V
			Frequency	50/60	Hz
			Intensity	5	A
		Data Connection	RJ45	-	

## Dimensions



A = 1 200 mm  
 B = 800 mm  
 C = 1 500 mm  
 Weight 750 kg

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Although our staff has made every effort possible to ensure accurate data and close to the final solution, these should be considered indicative and not binding.