

# Rank.<sup>®</sup> HT3

## Product description

When it is possible to use heat sources at temperatures above 150 °C, the Rank<sup>®</sup> HT3 machine is the most efficient option, with an electric generation up to 140 kWe.

The heat recovered from the condenser, in the form of water up to 50 °C, can be used for a wide range of applications with thermal power below 500 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 a variety of products that cover a wide range of thermal and power applications.

LT1	MT1	HT1	HTC1	
LT2	MT2	HT2	HTC2	
LT3	MT3	HT3	HTC3	
90°C	120°C	150°C	180°C	210°C

## What is Rank<sup>®</sup>?

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



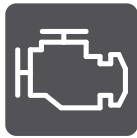
## Applications

Among the main applications of the Rank® ORC machines, we highlight the waste heat recovery and the utilisation 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

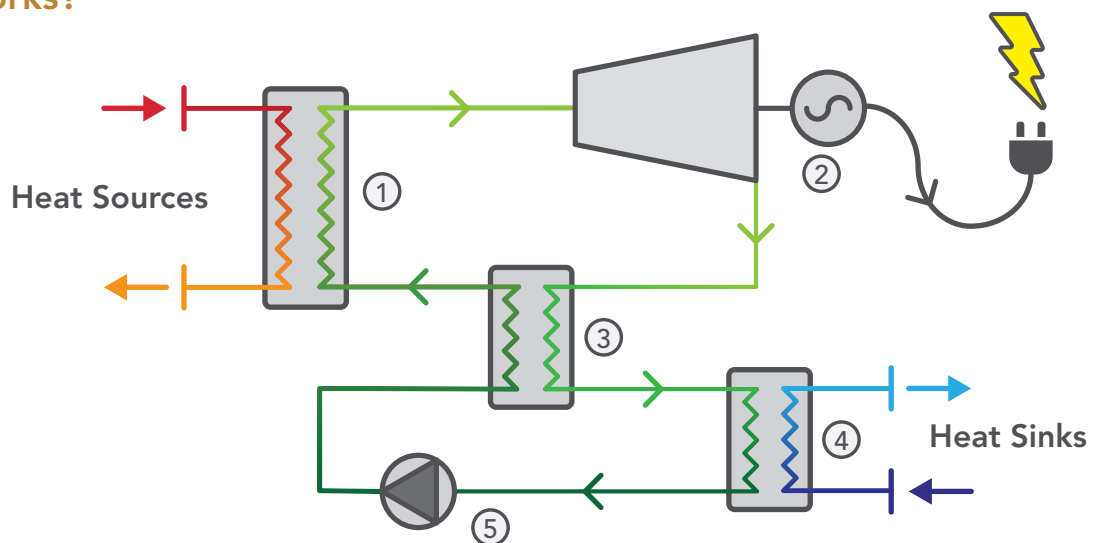


Industrial Processes



Drying

## How it works?



- ① **Evaporator** A heat exchanger that 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** To increase the efficiency of the system, the expanded working fluid is used to preheat the high-pressure liquid at the inlet of the evaporator.
- 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.

# Rank® HT3

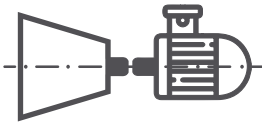
## Rank® Technology

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



### Rank® low rpm turbine

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



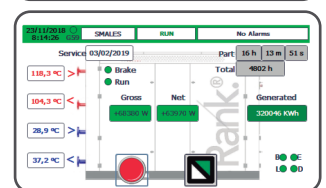
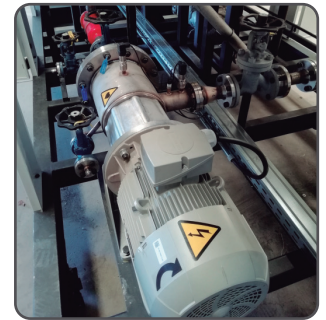
### Security

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.



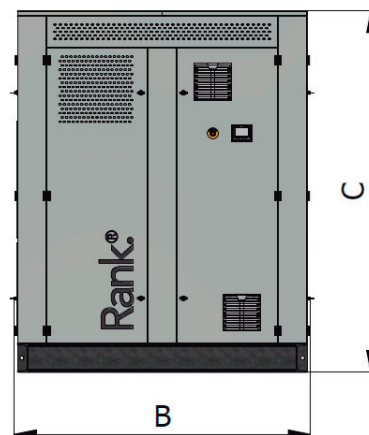
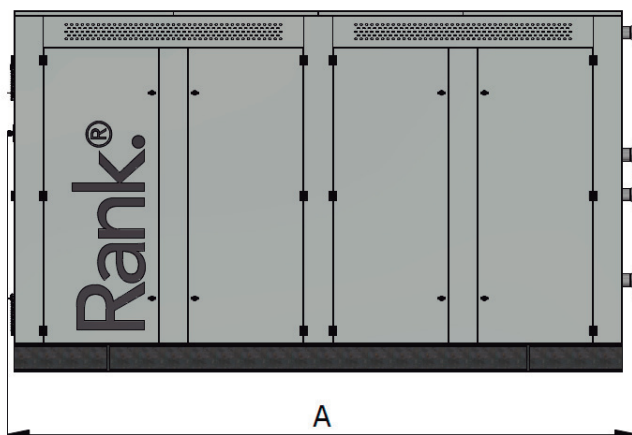
## Safety Regulations and Standards

- 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

## Technical Data

 <p>Heat source</p>	Heat transfer fluid	Thermal Oil	-
	Inlet temperature	150-180	°C
	Outlet temperature	110-140	°C
	Volumetric flow rate	56	m <sup>3</sup> /h
	Thermal power	850-1.350	kWt
	Connections diameter	DN100 PN16	-
	Pressure drop	100	kPa
	Heat transfer fluid inner volume	100	L
	 <p>Useful heat</p>	Heat transfer fluid	Water
Inlet temperature		20-40	°C
Outlet temperature		30-50	°C
Volumetric flow rate		77	m <sup>3</sup> /h
Thermal power		600-950	kWt
Connections diameter		DN150 PN16	-
Pressure drop		125	kPa
 <p>Electricity</p>	Heat transfer fluid inner volume	100	L
	Gross power	90-140	kWe
	Net power	80-120	kWe
	Voltage	3 x 400	V
	Frequency	50	Hz
	Intensity	220	A
	Data Connection	RJ45	-

## Dimensions



A = 5.500 mm  
 B = 2.250 mm  
 C = 2.500 mm  
 Weight 8.000 Kg