

Biomass *CHP Units with Split*



CHP Units for Cogeneration from Biomass



Cogeneration plants with Organic Rankine Cycle (ORC) products produce both heat and electrical power from biomass efficiently and in a user-friendly manner. The generated power ranges between 250 kW and 3 MW.

ORC split systems allow maximization of electric power production for a given biomass consumption due to a more efficient exploitation of thermal power from the boiler, while nonsplit systems maximize electrical efficiency. ORC units can be fed by thermal oil, saturated vapor, or superheated water.



(Layout Turboden 10)

Applications

- District heating networks
- Timber drying in sawmills
- Sawdust drying in wood pellet factories
- Air preheating in MDF factories
- Greenhouses, swimming pools, hot springs
- Refrigeration

Fuels

- Wood biomass: sawdust, woodchips, bark, treated wood
- Other biomass: dried sewage sludge, straw, green cuttings, rice husks, etc.
- Waste material

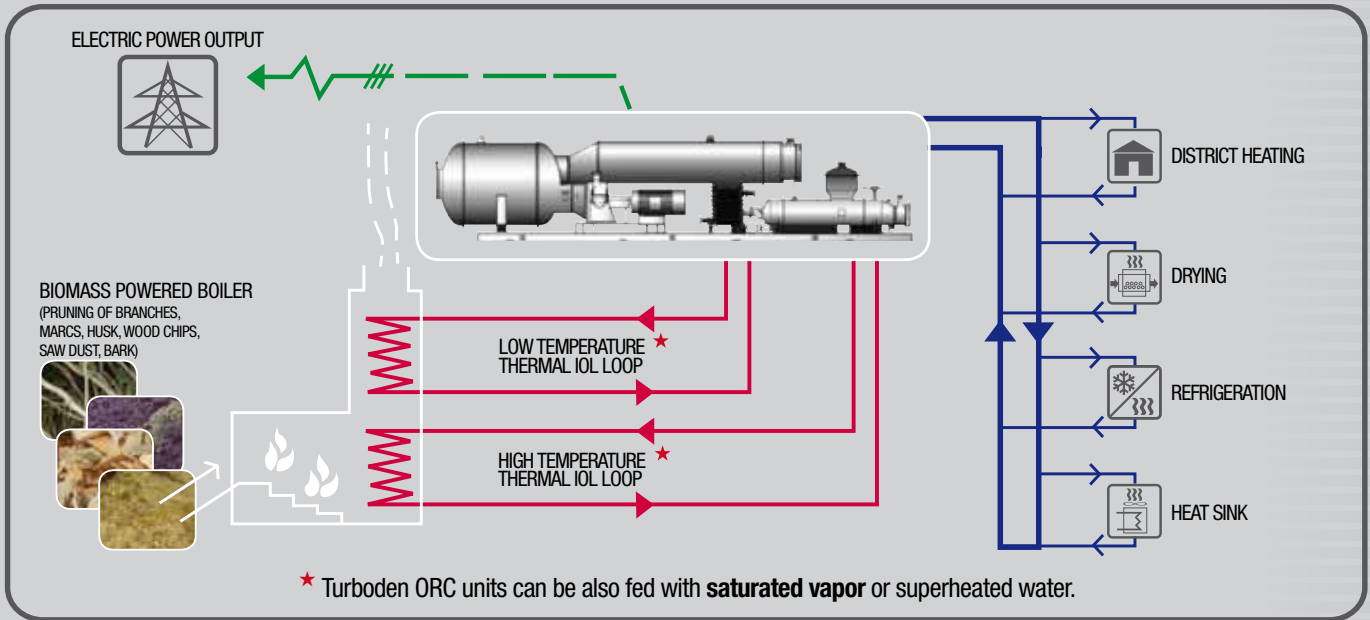
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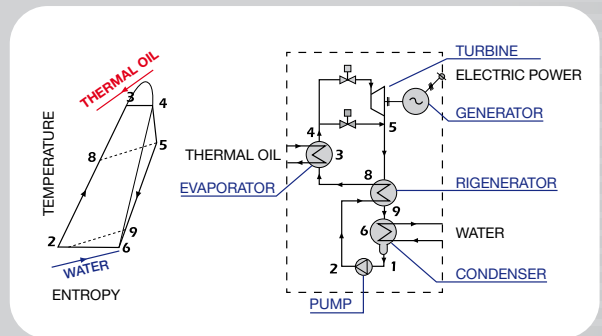
Example of CHP Plant in Biomass Applications (Split Type)



Thermodynamic Principle: The ORC Cycle

The turbogenerator uses the high-temperature thermal oil to preheat and vaporize a suitable organic working fluid in the evaporator (8>3>4). The organic fluid vapor powers the turbine (4>5) that is directly coupled to the electric generator through an elastic coupling. The exhaust vapor flows through the regenerator (5>9),

where it heats the organic liquid (2>8). The vapor is then condensed in the condenser (cooled by the water flow) (9>6>1). The organic fluid liquid is finally pumped (1>2) to the regenerator and then to the evaporator, thus completing the sequence of operations in the closed-loop circuit.



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