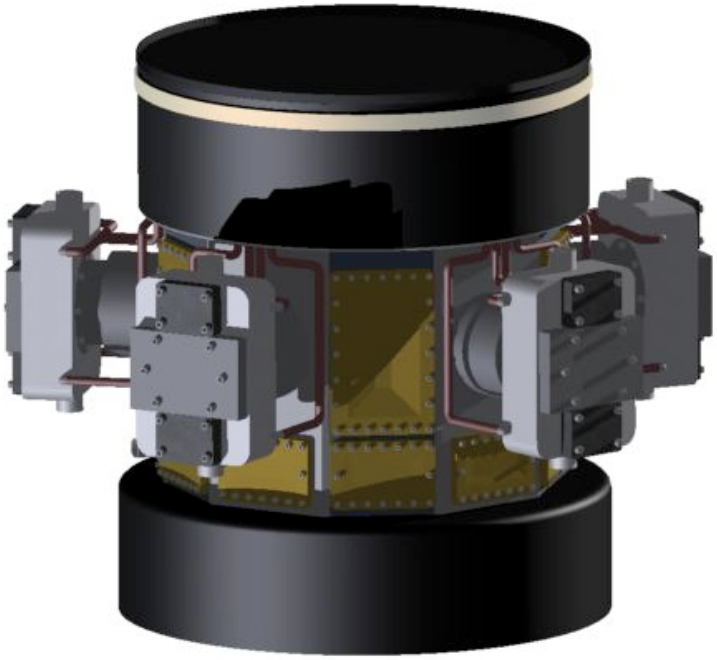
Energiprojekt i Sverige AB

Conversion of BioMass To Electricity and Heat



Radial Piston Steam Engines
500kW&1000kW

Energiprojekt i Sverige AB®
www.energiprojekt.com

Address:
Dammvägen 7
571 75 Fredriksdal
SWEDEN
info@energiprojekt.com

Principle of Operation

The most effective way to produce electricity from Bio Mass is by means of a Piston Steam Engine.

The generator is directly connected to the engine, without an intermediate gearbox.

The Steam Engine needs steam of 30 bar and 500 deg C. Steam is produced from environmentally friendly Bio Mass fuels.

Our Steam Engine

Our Steam Engine is built as a Radial Piston Engine with vertical Crank Shaft. This set up has superior advantages in terms of reducing vibrations to a minimum.

About our Steam Engine, it is also to be noted:

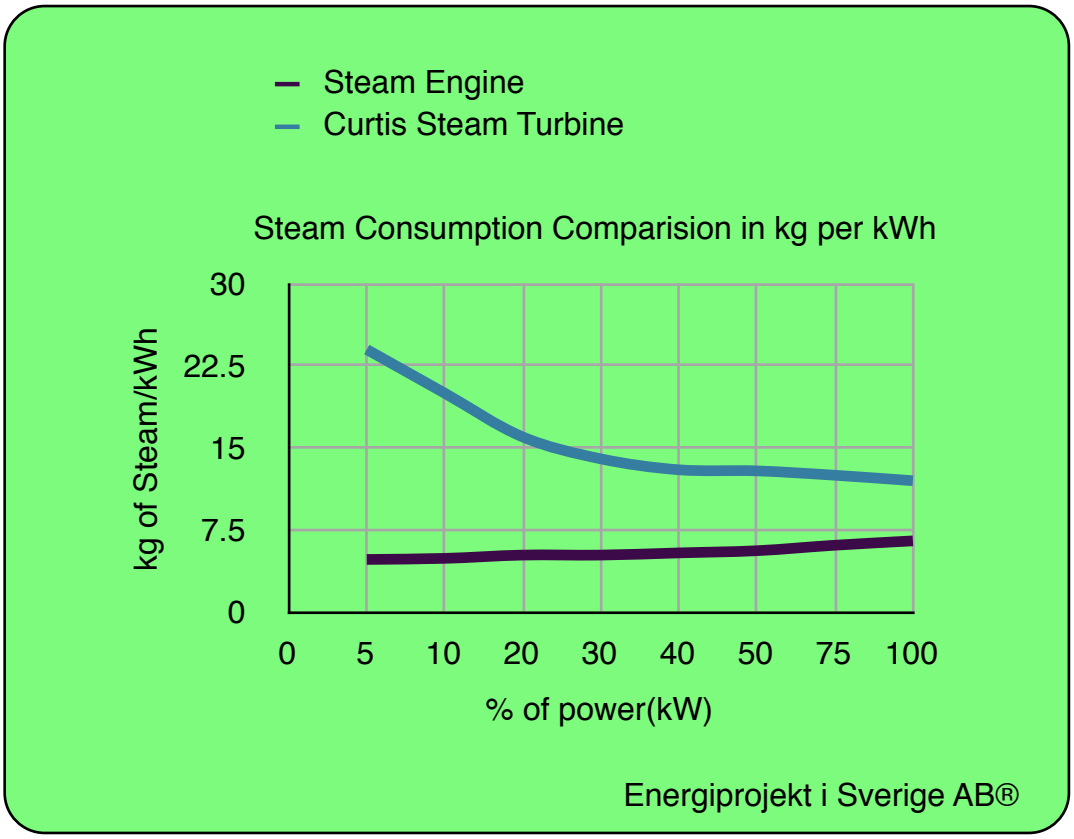
- It operates free from oil lubricants in the steam exhaust system.
- It can be used for both direct drive of any object, or electric generation.
- It has a starting/running torque considerably higher than all other heat engines/turbines.
- It has an extremely long life span
- It can continuously run with variable rpm in both directions.
- It has an almost horizontal efficiency graph.
- It can be “over loaded”, the meaning of which is that it can run up to 30% above rated output power.
- The superior torque makes the steam engine the best choice to meet sudden changes in electric load.
- Due to the superior torque the steam engine is the best choice on isolated grids.
- It can run either on isolated grids or synchronized to a national grid.
- When producing electricity, it will also produce exhaust heat in relation 1 part electricity, 3 parts of heat; about 100 deg C.

Efficiency

The efficiency of piston Steam Engines or Steam Turbines is most often expressed as the amount of steam (kg) needed to produce one(1) kWh.

In the graph below we compare our Steam Engine with a Curtis Steam Turbine.

The graph shows that the amount of steam to produce 1 kWh by means of a piston Steam Engine is significantly lower, which means superior running economy.

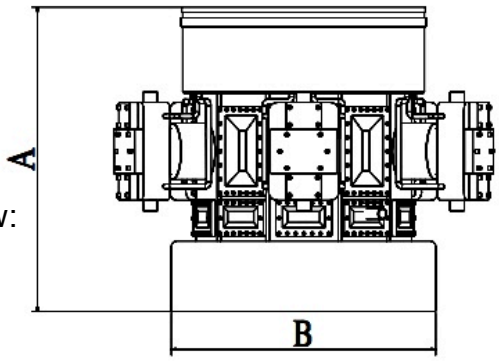


Standard Steam Engine Specification

POWER	500kW	1000kW
Steam input data (Low temperature / pressure will reduce efficiency)	30 BAR 500 degC	30 BAR 500 degC
Generator	Any Voltage 50-60Hz	Any Voltage 50-60Hz
Type	Single Expansion	Single Expansion
Number of Cylinders	5	5
Cylinder Bore	Ø 200 mm	Ø 280 mm
Steam consumption	Approximately 5-6 kg/ kWh	Approximately 5-6 kg/ kWh
RPM	1000	1000
Output steam data	Continuously Variable	Continuously Variable

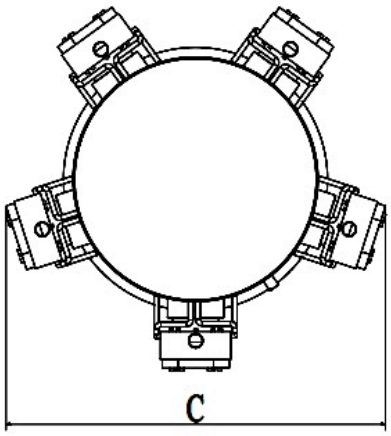
Steam Engine Dimensions:

Side view:



	500kW	1000kW
A	1730 mm	2300 mm
B	1500 mm	2000 mm
C	2155 mm	2490 mm

Top view:



Energiprojekt i Sverige AB®
www.energiprojekt.com