

# Thermal fluid energy machines

## Classification of thermal fluid machinery

The characteristic feature used to differentiate between thermal and hydraulic fluid energy machines is the change in density.

- **thermal fluid energy machines:** variable density of the fluid
- **hydraulic fluid energy machines:** constant density

### Thermal fluid energy machines: variable density of the fluid



#### Driven machines

Energy is added to the fluid



#### Turbomachines

Transfer of energy between the fluid and the machine by means of flow forces

- fan
- ventilator
- radial compressor



#### Positive displacement machines

Transfer of energy between the fluid and the machine by means of a variable volume, generated by a displacement device

- piston compressor
- screw compressor
- vane compressor



#### Driving machines

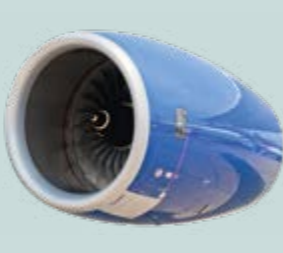
Energy is removed from the fluid



#### Turbomachines

Transfer of energy between the fluid and the machine by means of flow forces

- wind turbine
- steam turbine
- gas turbine
- jet engine



#### Positive displacement machines

Transfer of energy between the fluid and the machine by means of a variable volume, generated by a displacement device

- internal combustion engine
- steam engine
- Stirling engine
- gas expansion engine



The table below shows an extract from a typical curriculum of a technical university. The syllabus for the lecture on **thermal fluid energy machines** looks similar to this. Depending on focus,

the syllabus can be modified in line with the classification of the fluid machinery. The GUNT devices cover most of these topics.

Thermal driving machines	GUNT products
<b>Thermal engines</b>	
<b>Steam turbines</b>	ET 805, ET 830, ET 833, ET 851
Action turbine	ET 851, HM 270 (catalogue 4a)
Reaction turbine	HM 272 (catalogue 4a)
Steam power plant	ET 805, ET 810, ET 813, ET 830, ET 833, ET 850/851
<b>Gas turbines</b>	ET 792 – ET 796
Setup with compressor/combustion chamber	ET 792
Gas turbine power plant	ET 792, ET 794
Turbine as expansion machine	ET 792 – ET 796
<b>Internal combustion engines</b>	series CT 159, series CT 100, series CT 300, series CT 400
Petrol engine (four stroke)	CT 100.20, CT 150, CT 300.04
Diesel engine (four stroke)	CT 100.22, CT 100.23, CT 151, CT 300.05, CT 400.02
Two-stroke principle	CT 100.21, CT 153
Thermal driven machines	GUNT products
<b>Compressors</b>	
Piston compressor	ET 432, ET 500, ET 508, ET 513, HM 299 (catalogue 4a)
Rotary compressor	HM 299 (catalogue 4a)
Radial compressor	HM 292 (catalogue 4a)