

SEM0360

Fundamentos Termodinâmicos

AULA 6: Componentes como volumes de controle

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Aula de hoje

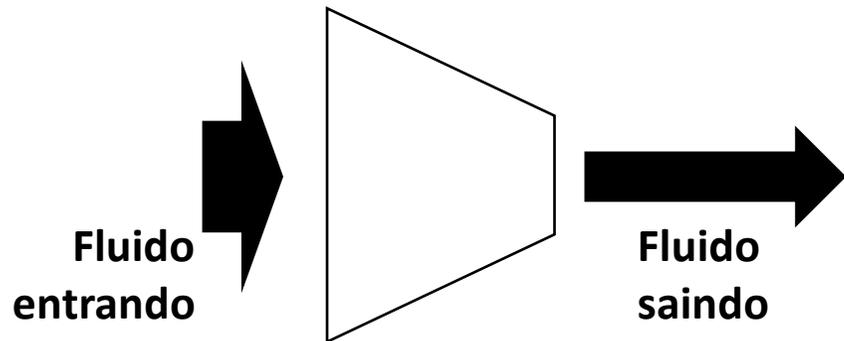
- Moran e Shapiro (8ª ed): Capítulo 4
- Çengel e Boles (7ª ed): Capítulo 5

Componentes típicos de ciclos termodinâmicos

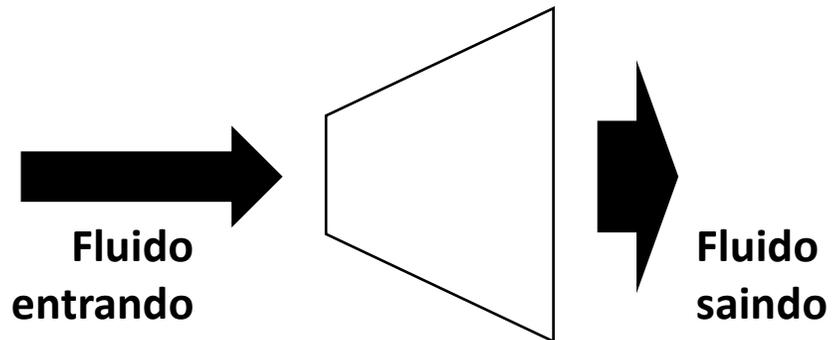
- Bocais e difusores
- Turbinas
- Bombas e compressores
- Queimadores, caldeiras e trocadores de calor
- Dispositivos de estrangulamento (válvulas de expansão, capilares)

Bocais e difusores

- Bocal



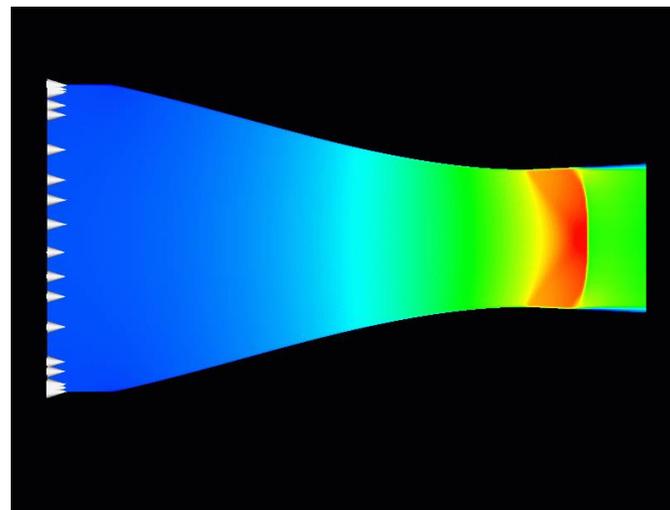
- Difusor



Fonte: Electrolux



Fonte: Amazon

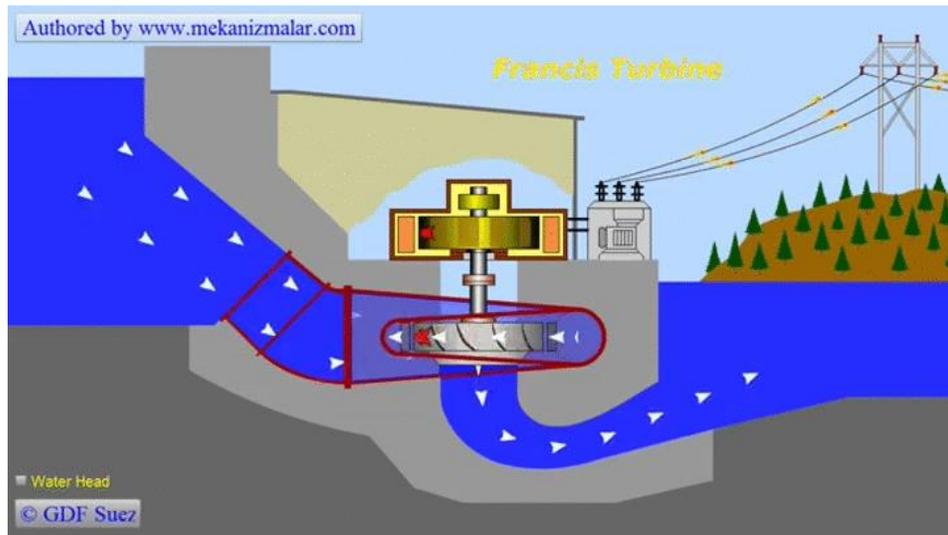


Fonte: ANSYS



Fonte: Quora

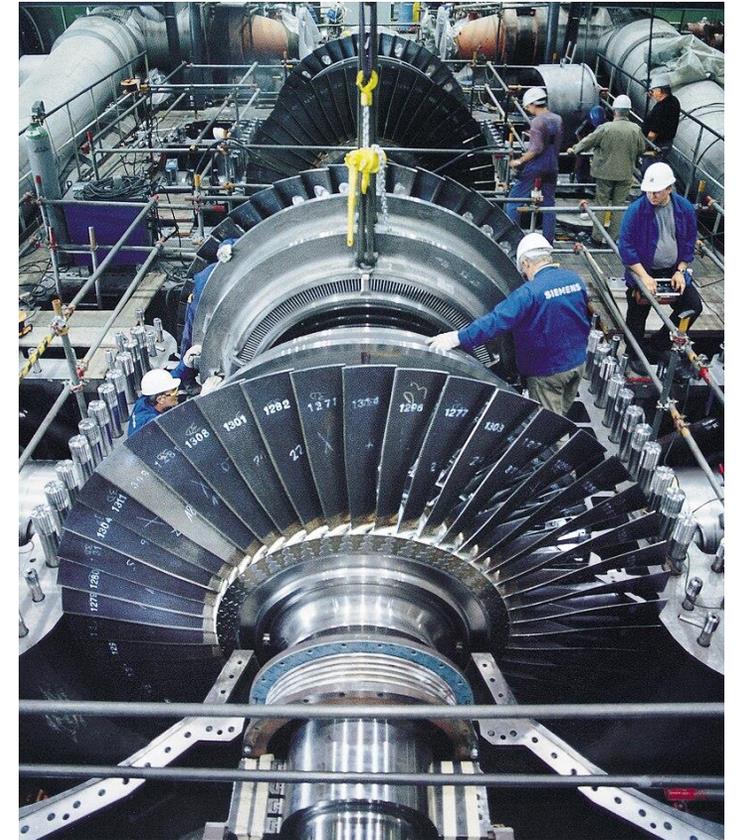
Turbinas



Fonte: The Eng. Concepts

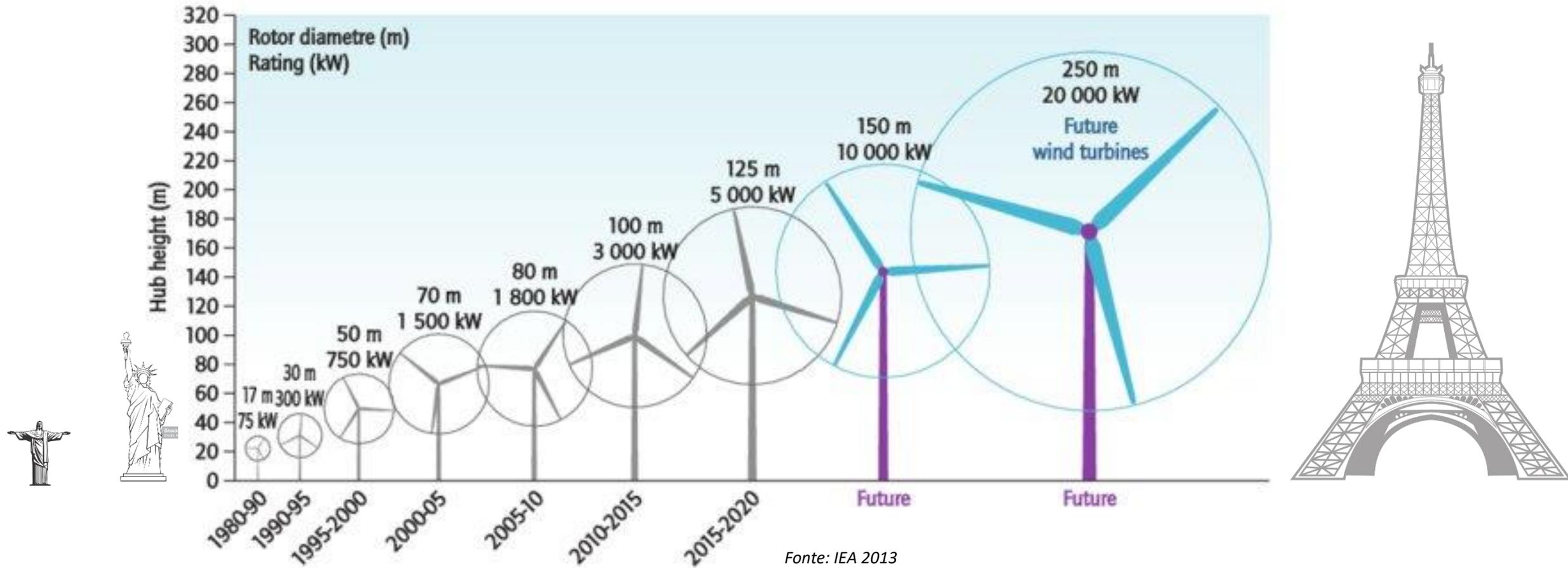


Fonte: Giphy

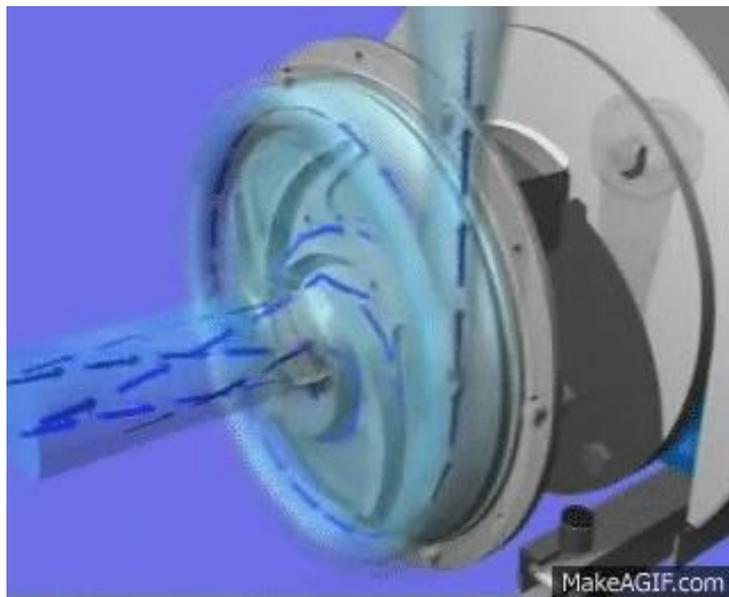


Fonte: Wikipedia

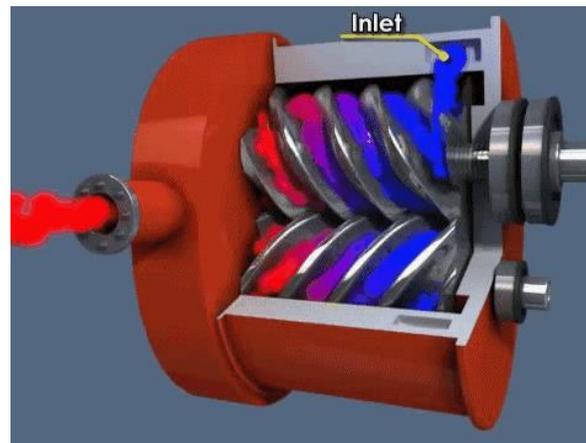
Curiosidade: evolução das turbinas eólicas



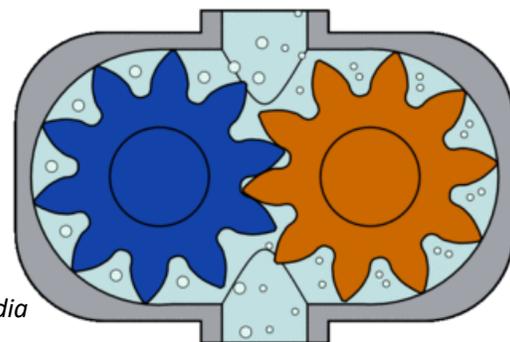
Bombas e compressores



Fonte: FlowKooler



Fonte: Giphe



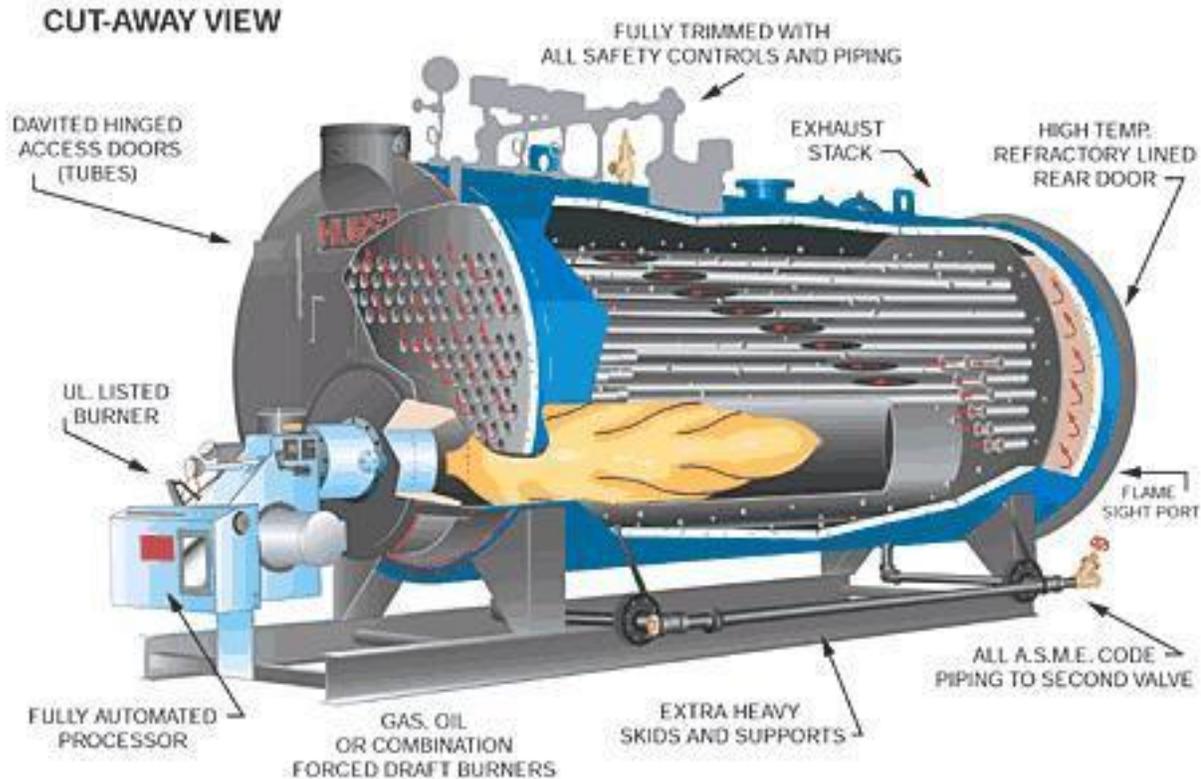
Fonte: Wikipedia

Fonte: Gas Turbine Engineering Handbook (4th Edition)

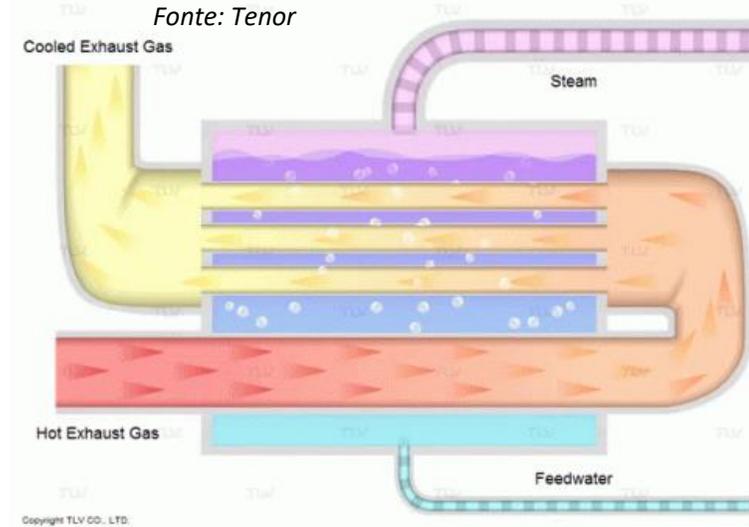


Caldeiras e câmaras de combustão

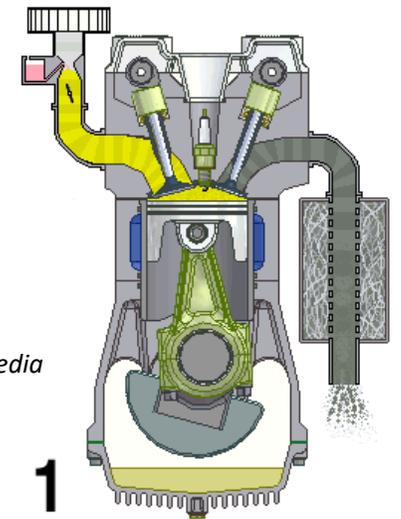
Fonte: Feedwater.co.uk



Fonte: Tenor

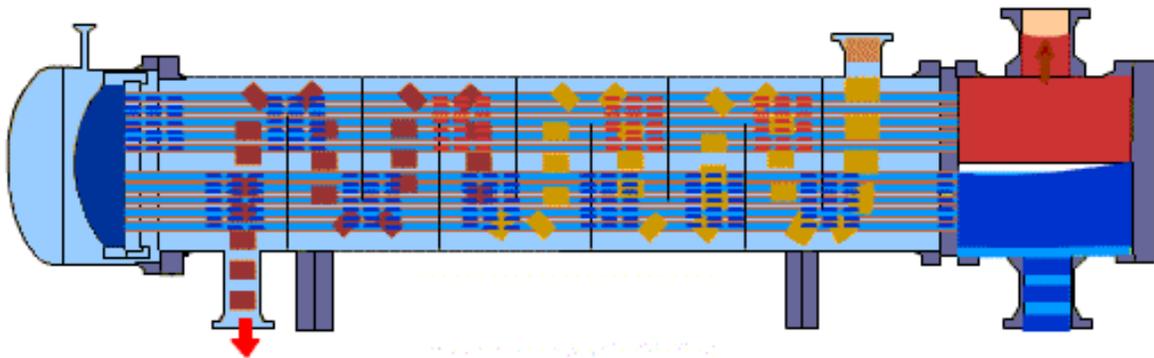


Fonte: Wikimedia

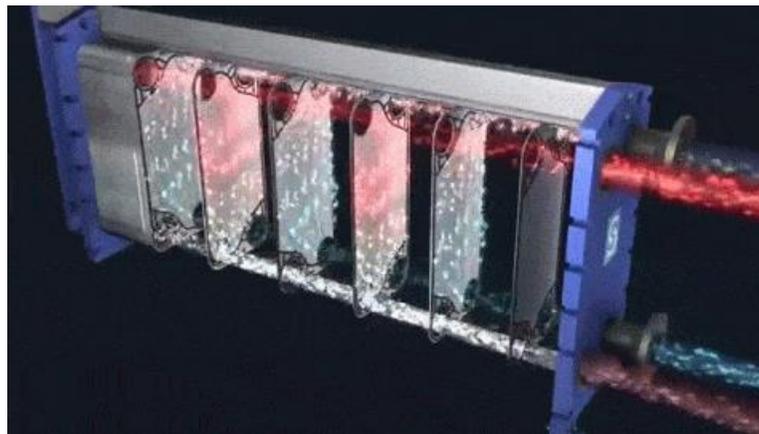


Trocadores de calor e misturadores

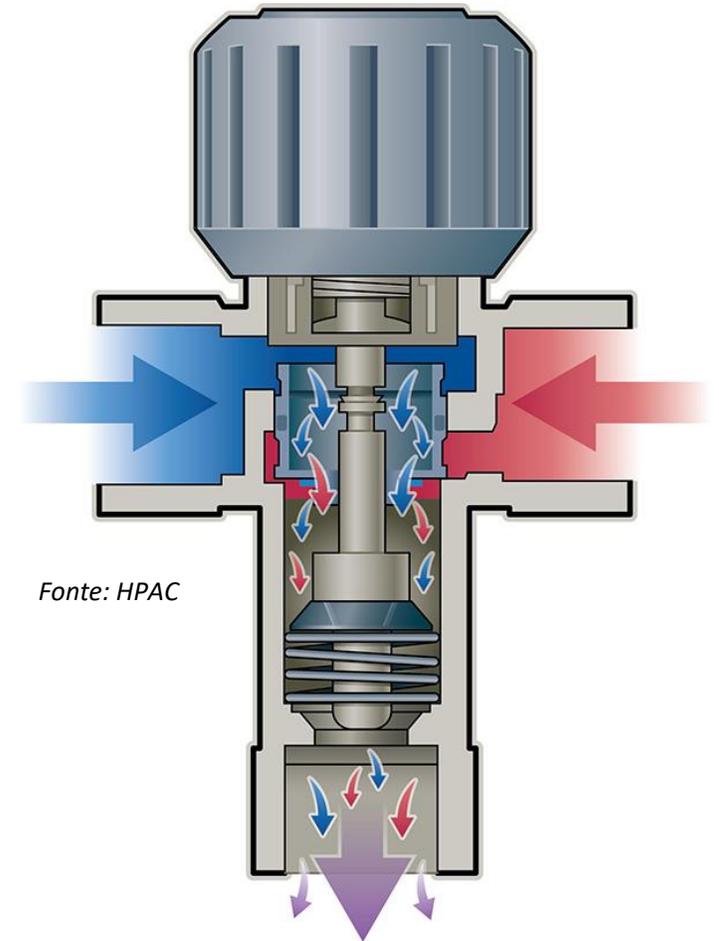
- Caldeiras são trocadores de calor!



Fonte: HX Manufactures in India



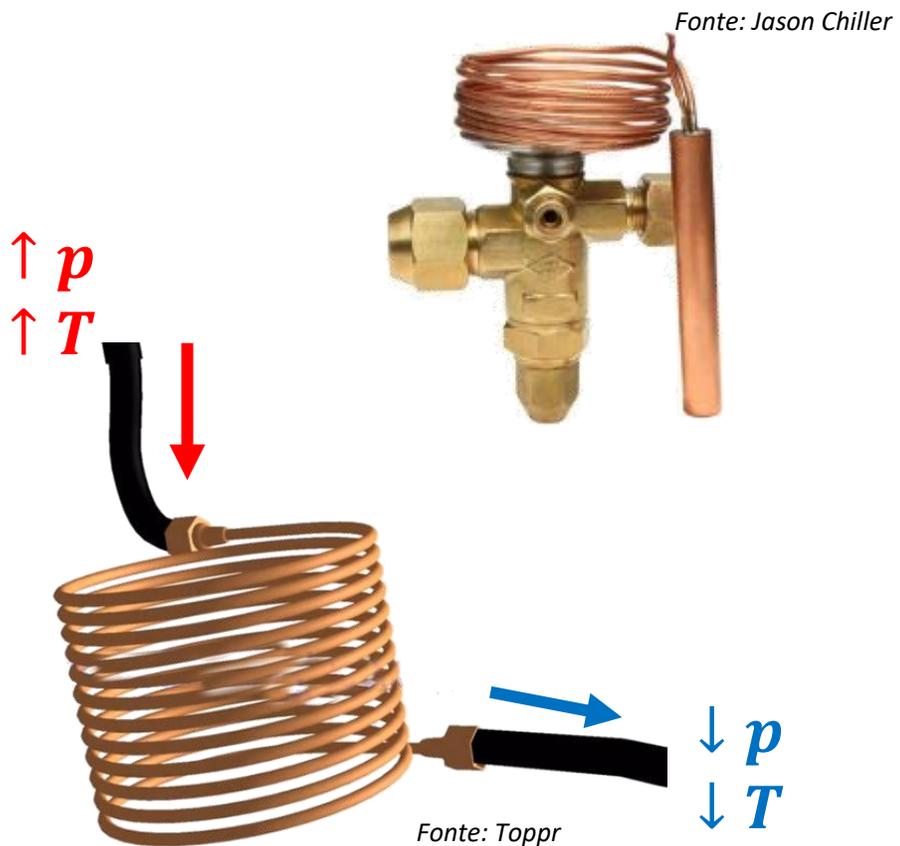
Fonte: Gifs.com



Fonte: HPAC

Dispositivos de estrangulamento

- Isentalpico



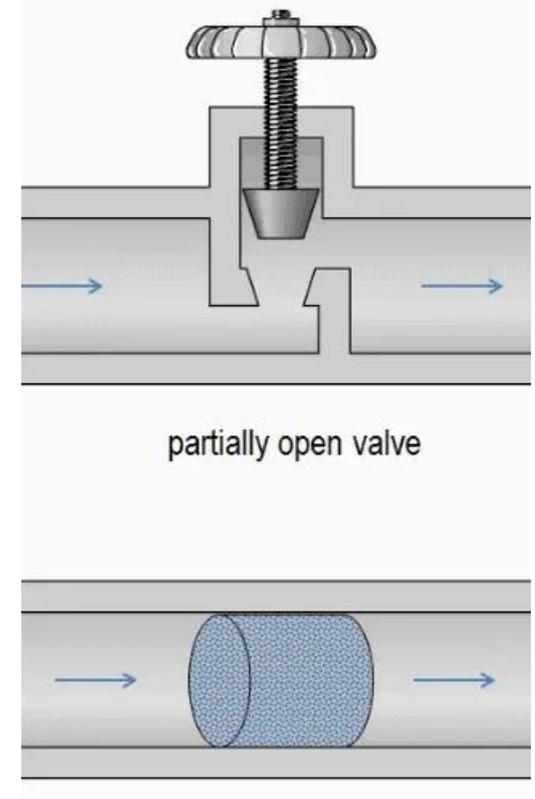
Fonte: Thermal Engineering

Fonte: Top Way Auto

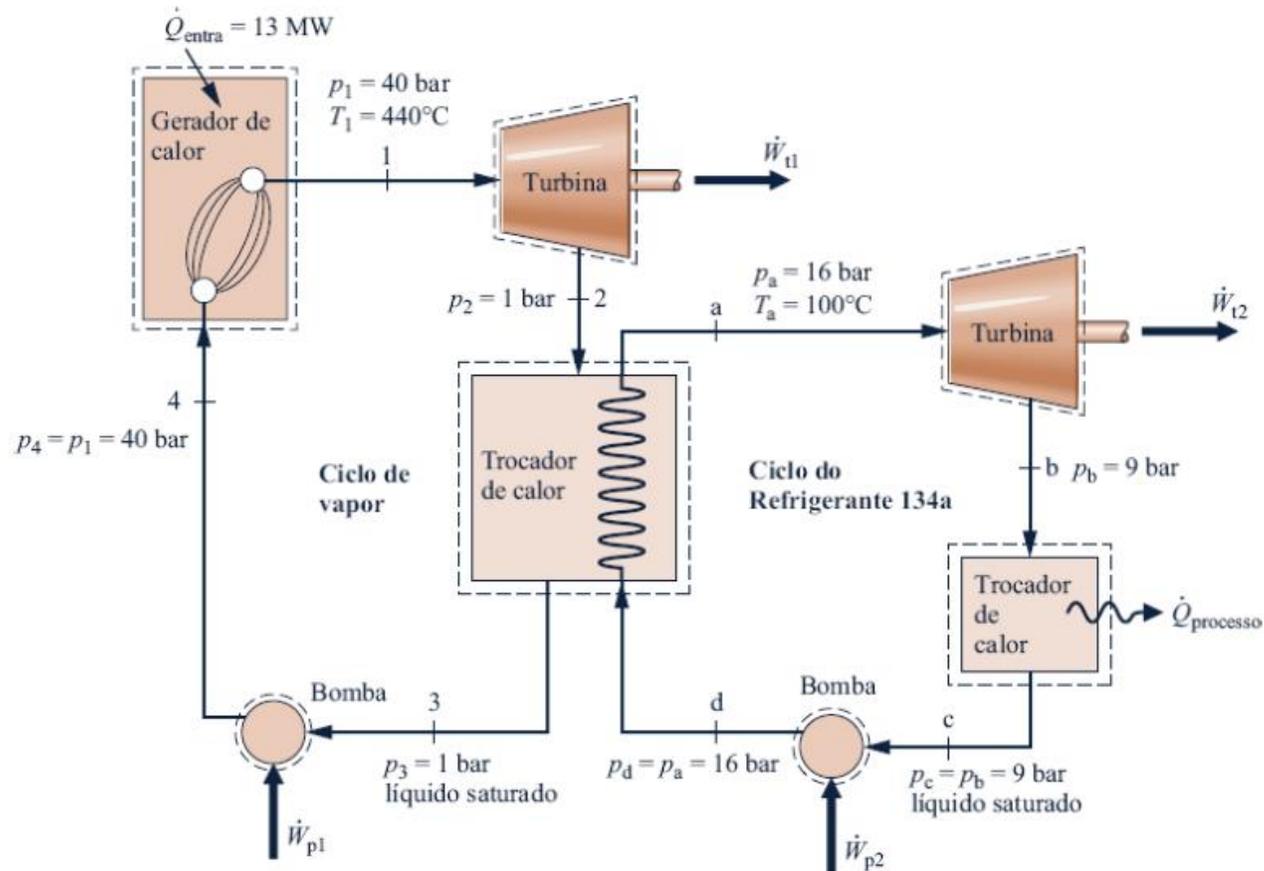


Throttling process

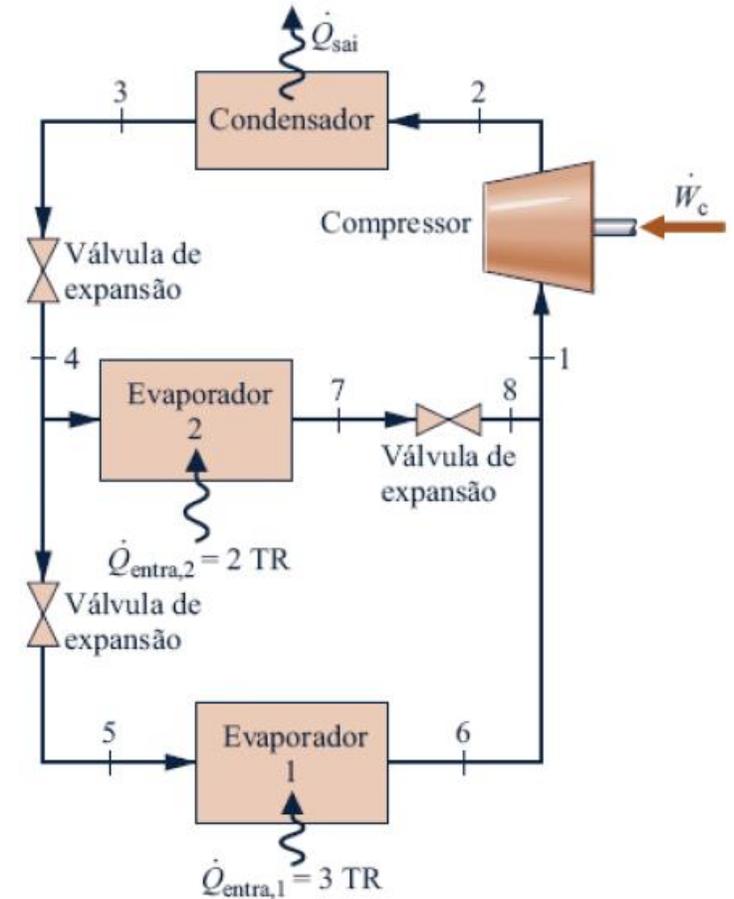
$$p_{in} > p_{out}$$
$$h_{in} = h_{out}$$



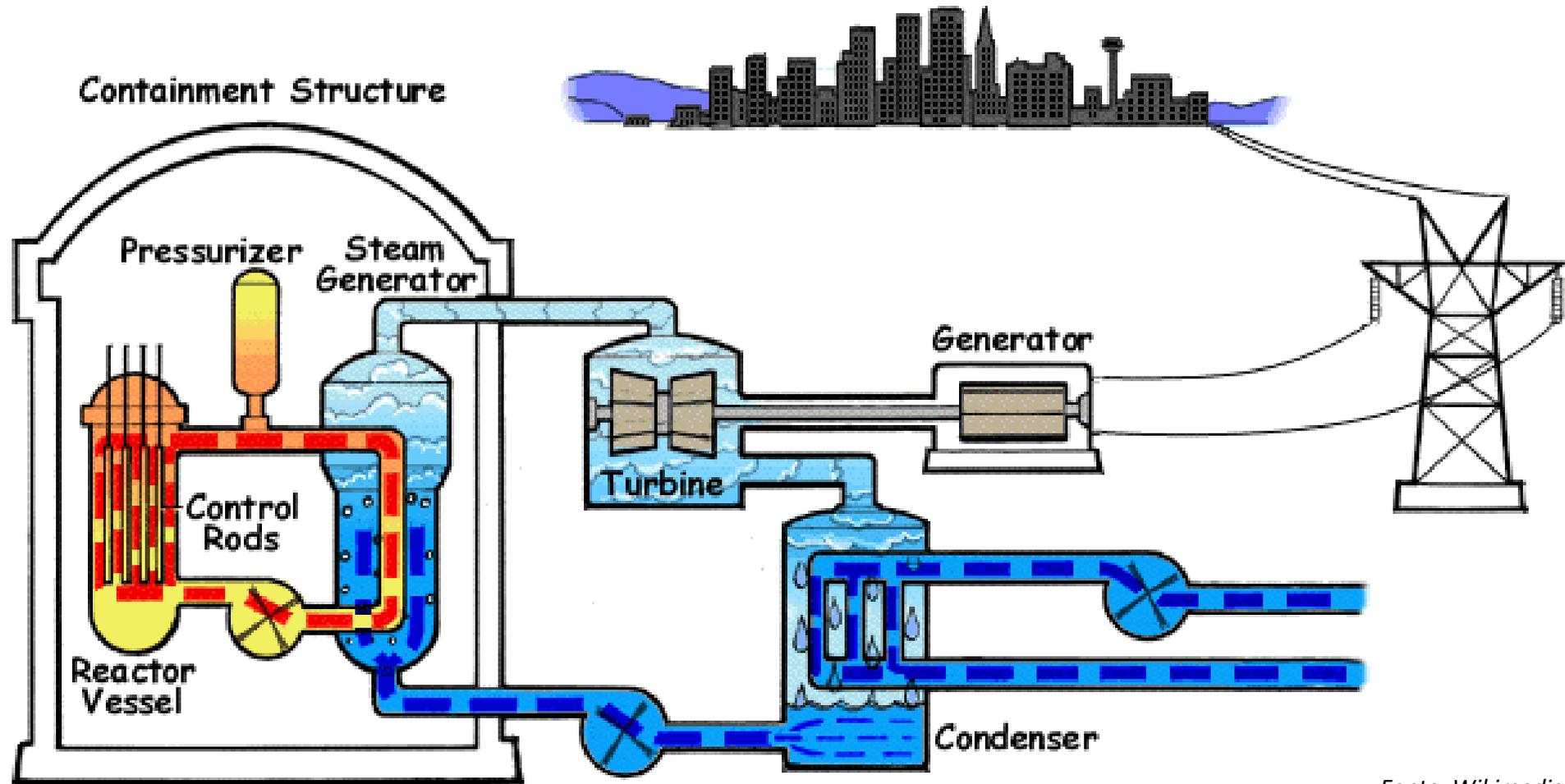
Integração de sistemas: ciclos termodinâmicos



Fonte: Shapiro



Planta nuclear



Fonte: Wikimedia

Curiosidade: turbina de avião

