ESF II project of the University of West Bohemia in Pilsen

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Examples to practice - 2

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Examples for practicing the reading of water or steam parameters

Example 1

The water vapor has a pressure of 1.6 MPa and a temperature of 500 ° C. Determine if the steam is saturated or overheated and justify. Next, determine the enthalpy and specific volume of steam.

Example 2

Determine the enthalpy of steam with a pressure of 0.9 MPa and a dryness of 0.85. Is the steam saturated or wet?

Example 3

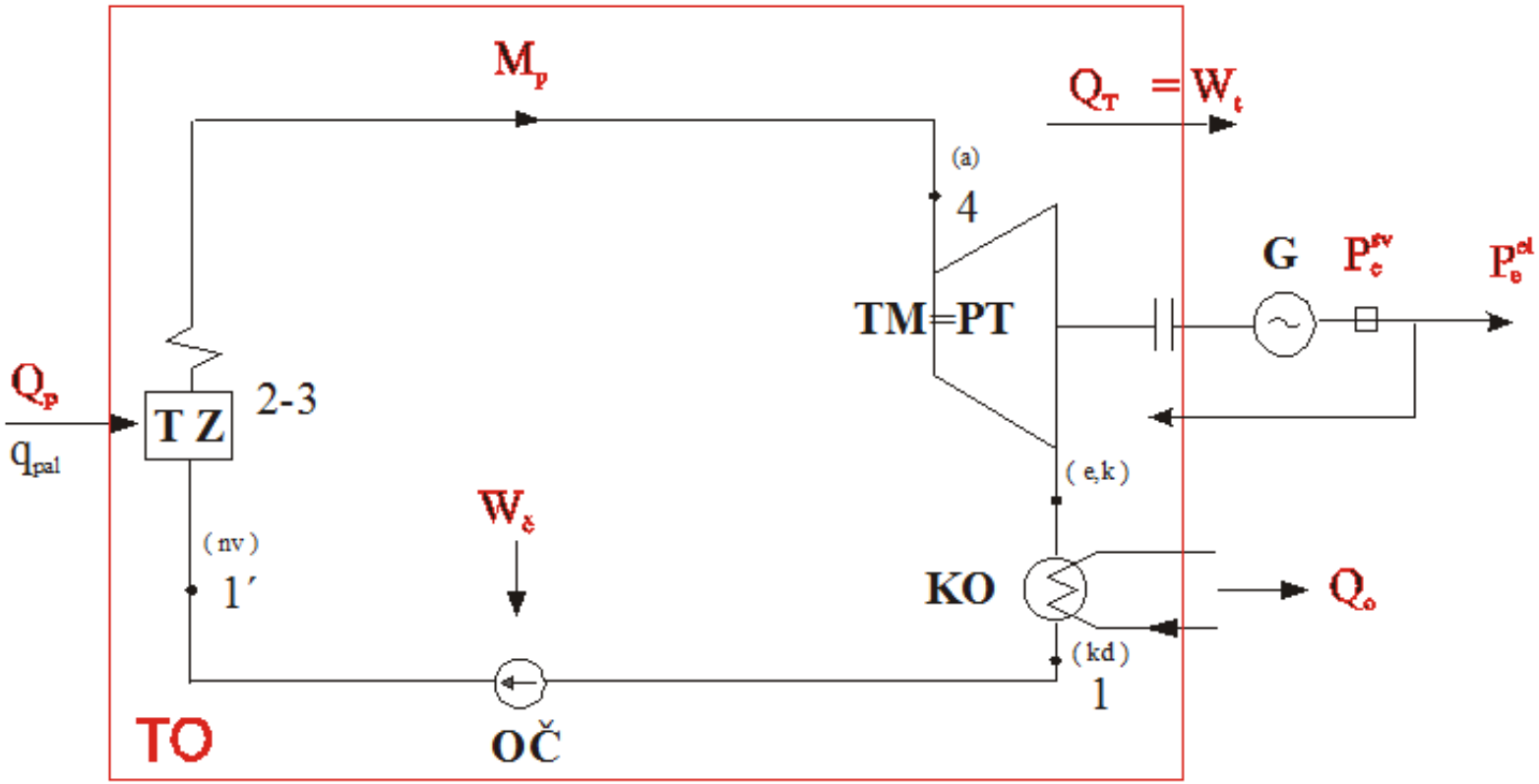
Superheated steam at a pressure of 3 MPa and a temperature of 350 ° C adiabatically expands to a pressure of 0.2 MPa. Determine the enthalpy and volume of the emission vapor and the volume, dryness and temperature of the vapor after expansion (i.e. emission steam).

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Example 4

The condensing turbine works with input parameters of admission steam 10 MPa and 500 ° C. The condenser pressure is 0.004 MPa and the temperature 29 ° C. The dryness of the steam after actual expansion is x = 0.85. Calculate the thermal efficiency of the ideal RC cycle and the thermodynamic efficiency of the turbine.



Example 5

Determine the thermal efficiency of an ideal RC cycle with changes in inlet pressure. The input steam input parameters are 3 MPa, 7 MPa and 11 MPa at the same initial steam temperature of 500 ° C and condensate pressure of 0.004 MPa.

Example 6

At the outlet of a turbine with a 25 MW generator, the dryness of steam is x = 0.87. Calculate the heat demand for the turboset if the emission steam parameters are 8 MPa and 470 ° C. The mechanical efficiency is 0.9975 and the generator efficiency is 0.972.

Example 7

Calculate the ideal thermal efficiency of a 12.5 MW turboset if the emission steam parameters at the turbine inlet are 3,260 kJ / kg and 5.5 MPa. The steam dryness at the outlet is x = 0.85.

Used and recommended literature

- Dvorsky, Emil; Hejtmankova, Pavla; Kocmich, Martin. Elektrarny : zaklady vyroby elektricke energie : priklady. 1. vyd. Pilsen : UWB, 1994. ISBN 80-7082-133-7.
- Dvorsky, Emil; Hejtmankova, Pavla. Elektrarny : zvysovani ucinnosti premen energie v tepelnych elektrarnach : priklady. 1. vyd. Pilsen : UWB, 1999. ISBN 80-7082-523-5.

- …… and other literature listed in the course syllabus on the website Portal of the UWB in Pilsen

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