

# ET 813 + ET 813.01 + HM 365 Steam power plant with two-cylinder steam engine

The experimental plant, consisting of a two-cylinder steam engine ET 813, the electrical steam generator ET 813.01 and the universal drive and brake unit HM 365, illustrates the typical

cyclic process of a steam power plant. The clear layout and comprehensive instrumentation allow you to observe and understand all functions.

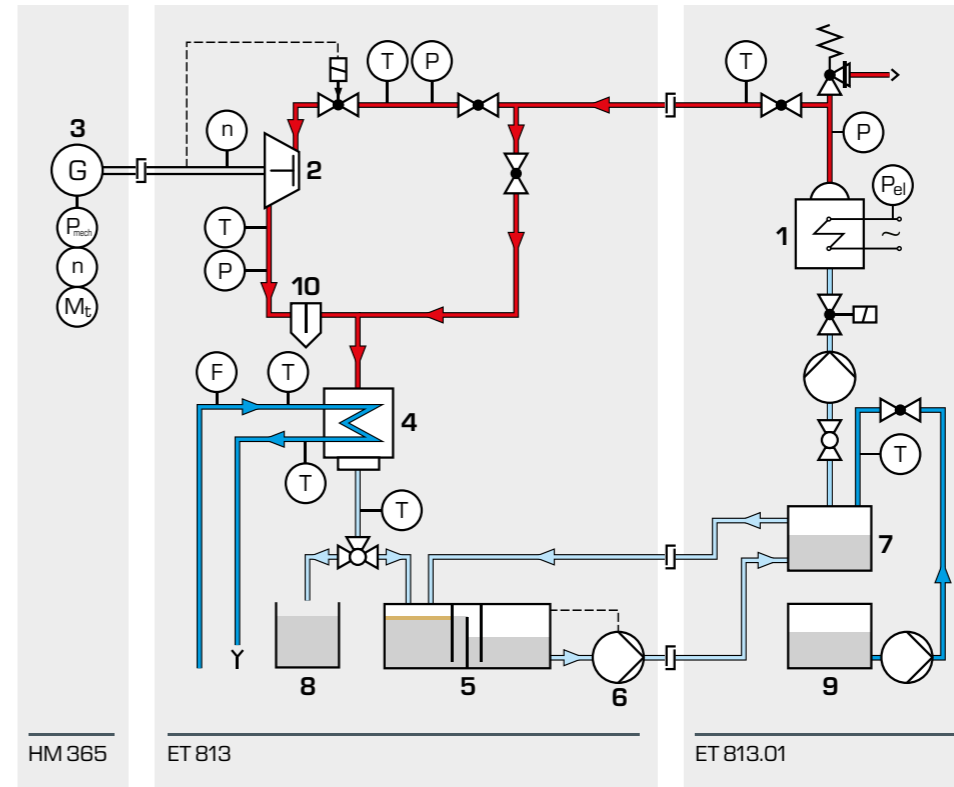
- part of the GUNT-FEMLine
- operating principle of a piston steam engine
- cyclic process of a steam power plant
- power measurement
- energy balances
- determination of efficiency
- electrical steam generator: quick start-up, fully automatic, reliable, no exhaust gases, no fuel necessary
- no special authorisation needed (in EC countries)



HM 365 Universal drive and brake unit

ET 813 Two-cylinder steam engine

ET 813.01 Electrical steam generator



Steam is generated in the electric steam generator 1 and fed to turbine 2 via pipes. The turbine is loaded via the brake unit 3. The exhaust steam from the steam engine then enters the water-cooled condenser 4. The condensate is carried to the cascade tank 5, where lubricating oil is separated from the steam engine. From here, pump 6 pumps the condensate into the feedwater tank 7 and the circuit is closed.

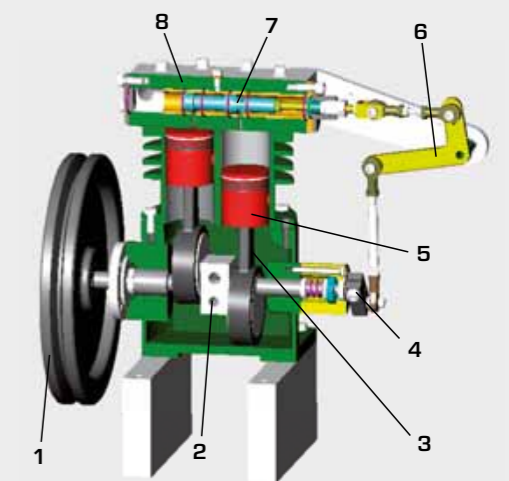
- 1 steam generator, 2 turbine,
- 3 brake unit, 4 condenser,
- 5 cascade tank, 6 pump,
- 7 feedwater tank,
- 8 condensate measuring tank,
- 9 fresh water tank,
- 10 oil separator;
- steam,
- cold water / fresh water,
- feedwater

A single action two-cylinder steam engine with enclosed crank drive is the core element. Because of its enclosed design this kind of steam engine is called a steam motor.

A piston slide valve inside the cylinder cover controls the flow of steam. The crankshaft moves the piston slide valve via a small crank and a bell crank lever.

### Steam engine

- 1 flywheel, 2 crankshaft, 3 connecting rod,
- 4 drive crank to operate the slide valve, 5 piston with piston rings,
- 6 bell crank lever, 7 piston slide valve, 8 cylinder cover



### Software for data acquisition

The software enables display of measured values on a PC. Recording and saving of data history is possible.

With the help of spreadsheet programmes (e.g. MS Excel) saved data can be evaluated. The measured values are directly transmitted to the PC via USB.

