

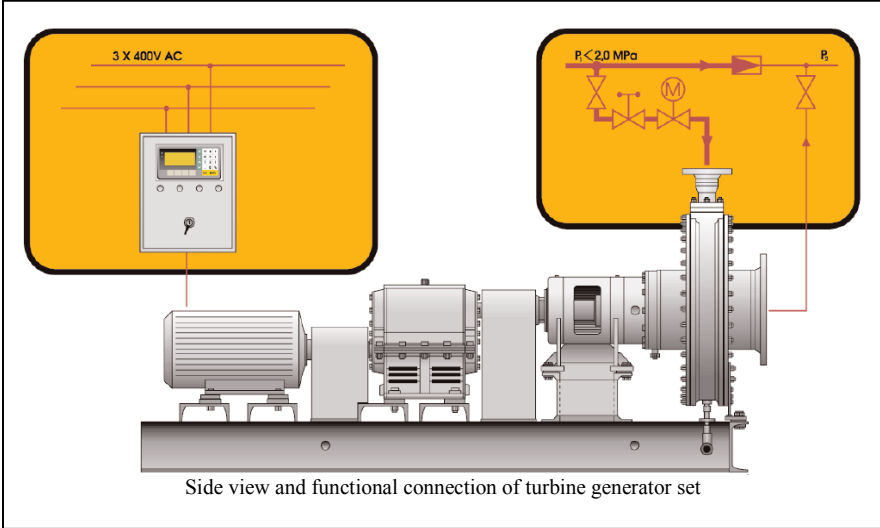


BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS
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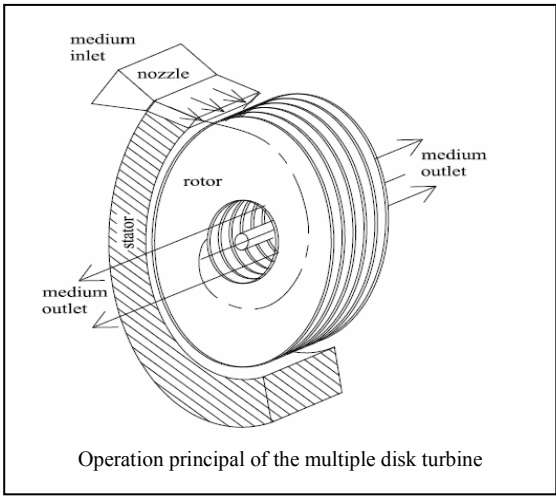
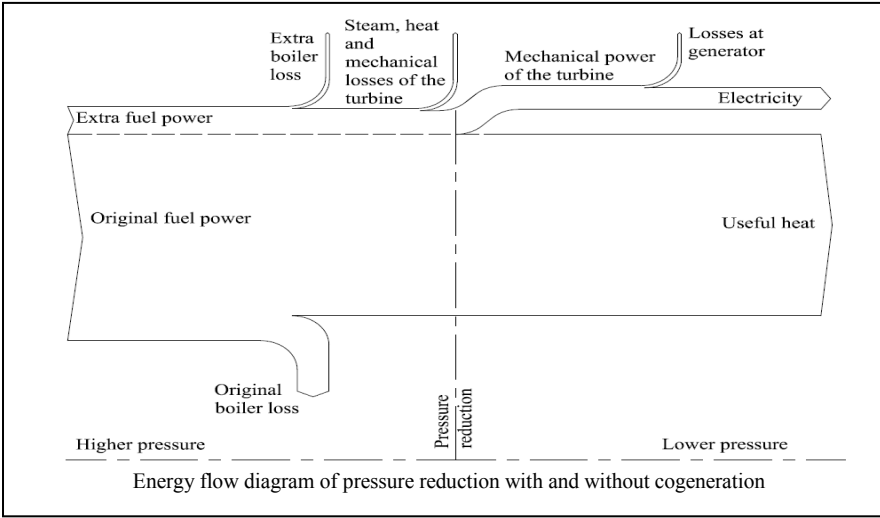


ecee Summer Study
1-6 June 2009
Côte d'Azur, France

COGENERATION IN INDUSTRIAL STEAM SYSTEMS WITH MULTIPLE-DISK TURBINES
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Significant expansion of utilisation of co-generation may be achieved with implication of small- and medium scale heat supply systems. Multiple-disk turbine may be the expansion equipment which is suitable for realisation of co-generation in small- and medium scale steam supply systems. Since the plain construction it can be produced at reasonable price, so co-generation can be economical even at low power rate. The turbine can be installed instead of throttling valves into existing steam generation systems without significant modification. In this way scope of co-generation method may be expanded significantly, which helps energy saving and reduction of CO₂ emission.



Based on these principals turbine generator sets has been developed with nominal capacity range 25-300 kW. The simple construction of the rotor ensures that the turbine is tolerant to pollution, and has relatively low manufacturing costs. The efficiency of the turbine is not too high, it is about 30-40% at nominal load (depending on the parameters of the working medium). To limit efficiency is advantageous from the point of steam humidity. When inlet steam is saturated, outlet steam will contain only a small amount of humidity. The turbine contains a nozzle which accelerates the working medium and leads it to the rotor in the appropriate direction. The turbine construction ensures that nozzles can be replaced with another one, varying its cross section, or variable nozzle may be applied. This ensures a flexible adjustment to different pressure and mass flow rate demands. Nominal mass flow rate can be adjusted to actual demand (in a certain range). A further advantage of application of this system compared to other type of expansion equipment facilities is that it does not need further purification of boiler feed-water. Normal feed-water quality, which is adequate for e.g. shell type boiler is adequate for this system.

