



Laboratory of Power Engineering Systems and Renewable Sources of Energy

Principal goals and activities

The principal goal of the laboratory is especially research in transfer of heat and mass in heat exchangers, optimisation of transfer phenomena, research of transfer and accumulation of energy. Other activities include research in increasing heat transfer efficiency, conservation of heat in storage and the issue of stratification in heat accumulators. Development of new heat exchangers and optimisation of the heat exchange faces, research and optimisation of floor heat convectors as well as development of enthalpy heat exchangers.

In terms of renewable sources of energy, the activities of the laboratory focus on solar systems, photovoltaic and thermosolar collector systems, heat pumps and research of the thermoacoustic phenomenon. The laboratory also conducts measurement of parameters of fans, blowers and compressors, measurement of heat and mass flow, research of propagation of pollutants in internal environments.

General focus of laboratory

The laboratory focuses on the research and development of heat exchangers and optimisation of the transfer process of heat and mass. Research of transfer and conservation of heat in accumulator tanks, research in renewable sources of energy – notably solar systems and heat pumps, measurement of parameters in pumps, fans, blowers and compressors, measurement of heat pumps, measurement of balance in heat machines.

Specific instruments and outcomes

- Ejector aerodynamic tunnel.
- Experimental thermoacoustic motor.
- Turbocharger and fan tunnel.
- Source of heat with an experiment stratification tank, heat pump, gas furnace and other equipment.
- Experimental set, air-conditioned track.
- Equipment for research of transfer of moisture across membranes, equipment for measurement of low breathability values.
- Instrument for analysis of rapid change of pressure (up to 16 channels, 10 kHz each), precision measurement of low pressure, precise calibration of pressure sensors.
- Compressors, cylinders and piping of compressed air with potential flow of compressed air up to 1 kg/s.
- Instruments for precise measurement of temperature (contact and non-contact), flow velocity, pressure, volume/mass flux, power, convective and radiation heat flux.

