

## Solar thermal test facility



The solar thermal test facility is used for student training as well as research and development. Up to 6 collectors can be installed on the roof of the machine laboratory at the IEFE. The collectors are south facing with adjustable tilt angle. Each collector has separate supply lines, which allows independent operation of the collectors.

The installation consists of the following components:

- **Collector system**
- **Solar storage system**
- **Cooling system**



The entire configuration of the installation including the measurement points is shown in the **P&ID (Piping and Instrumentation Diagram)**. The cooling circuit of the solar thermal facility also serves the ORC, which is also included in the P&ID. The measurement data is collected, recorded and visualized using a National Instruments data acquisition device with LabView visualization.

The system can be operated in the following two modes:

### 1. **Temperature controlled mode** (solar circuit 1)

- Definition of collector characteristics under real operating conditions
- Operation of the solar collectors with a constant inlet temperature, which is controlled using a heating element and a bypass valve

### 2. **Storage mode** (solar circuit 2)

- Operation under real condition of the collector system with a solar storage system
- Automatic operation with a solar regulator (SOLTOP SR4)
- Simulation of space heating and of domestic hot water by connection to the cooling circuit
- Measurement instrumentation allows separate energy balancing of all circuits