

## THERMAL SOLAR COLLECTOR STUDY



---

### Experimental capabilities

---

- Identification of the components of a solar heating circuit
- Starting and commissioning of a solar heating installation
- Measurement of the parameters (temperature, flow, pressure..)
- Calculation of the thermal exchange and efficiency of the collector.
- Influence of the angle of the collector and the distance between the heating source and the panel

## Operating principle

ERS 050 is a pedagogical system used to study a solar collector

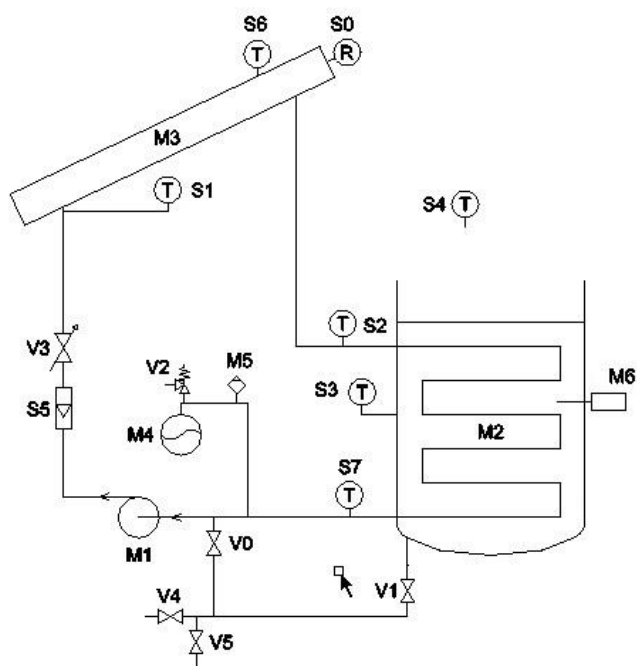
This system has been designed to study the power transmitted to a solar collector by a solar simulator (infra red light). The water circuit is designed like the standard circuit that could be found in a home. It includes the solar collector, a pump, a water tank and an electrical heater (used when there is no sun). The angle of the solar collector and the distance between the IR light and the collector can be adjusted to show the difference.

All the parameters could be measured to determine the efficiency of the system and the thermal exchange on the collector.

The robust design of this device makes it suitable for use in schools.

The equipment is set up on an Anodized aluminium frame on casters wheels. This gives it great strength and a flexibility of integration into your premises. The manufacture of this equipment complies with the European standard for machinery manufacturing.

## Illustrations



## Technical details

The system includes the following components:

- S0. Radiation sensor
- S1. Temperature sensor – inlet of the collector
- S2. Temperature sensor – outlet of the collector
- S3. Temperature sensor – water Tank
- S4. Temperature sensor – outside air
- S5. Water flowmeter – 8-80L/h
- S6. Temperature sensor – Collector
- S7. Temperature sensor – water tank outlet
- V0. Water filling valve
- V1. Tank filling valve
- V2. Safety valve
- V3. Flow adjustment valve
- V4. Filling valve
- V5. Draining valve
- M1. Water pump – 3.5bars – 500L/h
- M2. Water tank made of stainless steel with exchanger 35L
- M3. Solar collector – area : 0.1m<sup>2</sup>
- M4. Expansion tank
- M5. Automatic air drainer
- M6. Low level detector

All these components are set up on a frame made of aluminium profile. The structure is equipped with 4 casters wheels with brakes.

The unit also includes an electrical cabinet with all the standard electrical components (main switch, circuit breakers, switches, lights..) and the indicator for all the sensors (temperature, radiation..).

## Services required

- Electrical supply : 230 Vac – 50 Hz – 20 A
- Electrical network : 2phase(s) + Neutral + Earth.
- Water supply : filling
- Dimensions: (LxWxH mm): 1385 x 615 x 1695
- weight (Kg): 100

Note : if the equipment installation is operated by our staff, all supplies and exhaust connections required must stand at less than 2m from the machine

## Documentation

- User's manual
- Technical documentation of the components
- Lab exercises
- Certificate of conformity CE

## Options

- Data acquisition system

- Ref : ERS051