INSTITUTE
OF THERMOELECTRICITY
• UKRAINE •

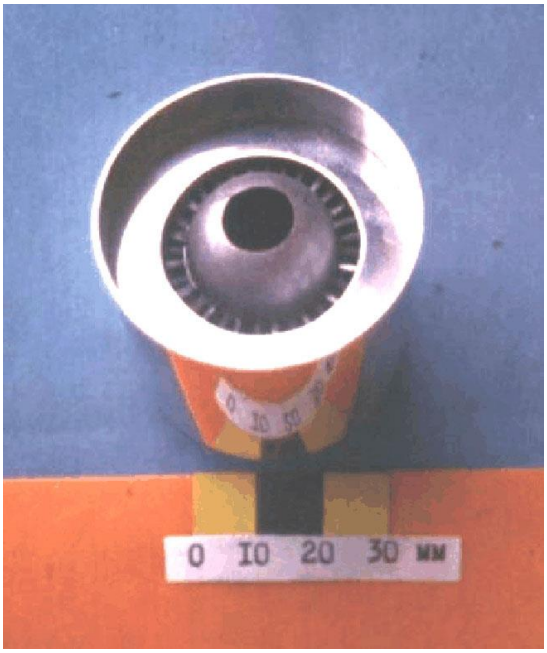
THERMOELECTRIC PYRHELIOMETER

• The pyrheliometer is intended for the absolute measurement of direct solar radiation with the highest precision.

• The pyrheliometer can be used for the measurement of solar constant both under terrestrial and space flight conditions (as part of meteorological satellites, space stations).

• The pyrheliometer can be used as a meteorological means to provide precise measurement of short-wave and long-wave solar spectrum parts, scattered solar radiation, etc.

Appearance of thermoelectric pyrheliometer



• The highest measurement precision is attained due to:

- provision of the isothermal mode of cavity calorimetric receiving element and a system of aperture diaphragms by means of special thermoelectric heating/cooling systems;
- utilization of high-precision multi-element differential thermopiles made of optimized semiconductor thermoelectric material. The thermopile provides constant conversion coefficient over the temperature range of -40ºC ÷ +40ºC;
- utilization of absolutely black body as a receiving collector of cavity model, with a special-shaped mirror reflector mounted inside the cavity at the point of initial incidence of solar radiation beam;
- provision during calibration of the equivalency of replacement of solar radiation thermal effect with the electric calibrator thermal effect;

- utilization of stable blackening coatings on the internal surface of receiving cavity with their reflection factor characterized by predominantly mirror component;
- utilization in the creation of pyrheliometer of design principles successfully tested in the development of microcalorimeters with the resolution of 10^{-8}W.

Parameters of pyrheliometer

1. Basic error of measurement over the range of 80-2500 W/m^2, %	$\pm$ 0,1
2. Reproducibility of measurement results at the level of solar constant, %	$\pm$ 0,04
3. Time constant, s	1
4. Time of reading the indications up to 0,05 % of the amplitude value, s	- 10
5. Dimensions of extermal case pyrheliometer (without places of fastening):	
diameter, mm	120
heights (without aperture pipe), mm	110
heights (with aperture pipe), mm	300
6. Total weight, kg	2,8

Orders and additional information: General Post Office, Box 86, 58002, Ukraine; e-mail: ite@inst.cv.ua; fax: (380-3722)-41917; tel: (380-3722)-41917; http//ite.cv.ukrtel.net.