INSTITUTE
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LASER RADIATION ABSOLUTE DETECTORS

• Absolute detector operation principle is based on calorimetrical measurement of laser radiation energy. The absolute black body cavity model is used as laser radiation collector. A semiconductor thermobattery operates as the collector heating recorder.

• The uniform sensitivity of the absolute detector in a wide spectral range permits to use it for energy parameters measurement of, practically, all coherent radiation actual sources.

• To decrease the secondary thermal impacts influences, the compensation method, realizing by differential inclusion of two identical active area units, placed into one thermostate, is used. One of this active area units is in operation, the other is not exposed to the light-striking. A resistive heater is assembled into collector to grade the measurements by substitution method.

Appearance of laser radiation absolute detectors

• Such detectors benefit is an application of a recording thermobattery, made of specially developed semiconductor material.

• The material is optimized for operation temperature range from – 15 °C to +35°C and has better temperature stability of parameters, than such stable alloy as manganin has.

• The detector sensitivity is 2-5 times higher as compared to known detector sensitivity. Temperature stability is no less than 0,01%/K.

Specification

№	Parameter, measurement unit	Value
1.	Spectral range, mcm	0.4 ÷ 12.0
2.	Pulse duration, s	$1 \div 5 \times 10^{-9}$
3.	Minimum beam diameter, mm	3.0
4.	Input aperture, mm	20
5.	Energetic range, J	$10^{-4} \div 10.0$ (100 with neutral filter)
6.	Coefficient of absorption, no less then	0.98
7.	Coefficient of converting, mV/J	80
8.	Resistance of recording, kOhm	3.0
9.	Time of conservation of electric signal on the level of 0.99, no less then, s	0.3
10.	Time of reaching of level 0.99 for the maximum signal, no more then	100
11.	The mean error, %	2.5

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