DAP double blackbody

Precision double area blackbodies

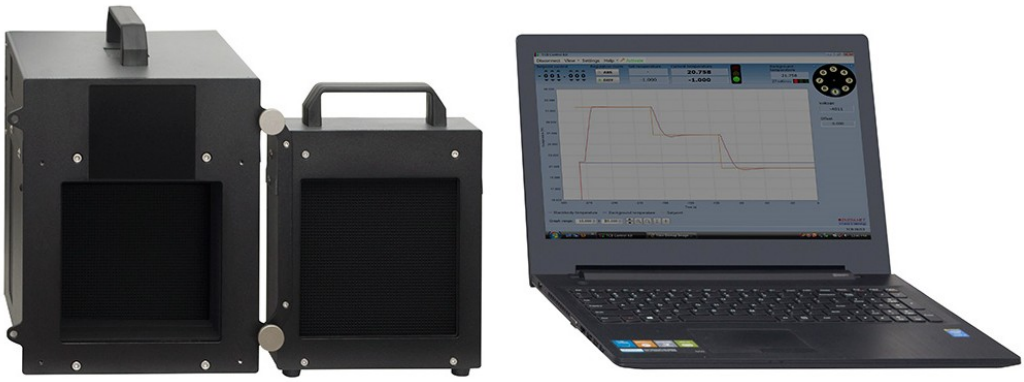

Fig.1. Photo of DAP-6D blackbody

BASIC INFORMATION:

All thermal imagers must be factory-calibrated to generate non-uniformity compensation (NUC) coefficients which are applied automatically by the camera in real time to maintain good image quality. NUC coefficients are typically calculated on basis of images of an large area blackbody that fill FOV of tested imager at two temperatures: 1) high temperature in range from about 60ºC to about 120ºC depending on model of thermal imager, 2)laboratory ambient temperature (sometimes slightly increased to be approximately equal to the image sensor temperature).

The operation of two point NUC must be done quickly because settings of thermal imagers vary with time. Speed of temperature regulation of typical thermoelectrically controlled blackbodies is too low. Therefore two blackbodies are typically used during non-uniformity calibration. The tested thermal imager first looks on high temperature blackbody and within seconds is moved to look on the low temperature blackbody.

Inframet offers DAP blackbodies as near perfect cost effective solution for non uniformity calibration of thermal imagers. DAP blackbody is an equivalent to two typical blackbodies but is offered at cost only slightly higher than typical TCB blackbody. At the same time ultra high accuracy of differential temperature between two emitters of DAP blackbody is achieved.

From design point of view DAP blackbody is practically typical thermolectrically controlled TCB blackbody having emitter of electronically regulated and stabilized temperature connected to PB passive blackbody of non-stabilized electronically temperature. Temperature difference between emitter of TCB blackbody and emitter of PB blackbody is regulated and stabilized with ultra high precision. In detail only temperature of the emitter TCB blackbody is actively regulated and stabilized. Temperature of emitter of PB blackbody is not stabilized electronically. However because of its good thermal insulation and high thermal inertia temperature of the emitter of PB blackbody changes with very slow speed and can be considered as constant in temporal intervals not longer than several minutes. Next, software offers possibility to correct possible temporal variations of PB passive blackbody.

It should be noted that DAP blackbodies are not optimal for use in temperature chambers when non uniformity calibration is to be done at several ambient temperatures and speed of change of ambient temperature is high. In the latter scenario a set of two typical active TCB blackbodies is recommended.

VERSIONS

DAP blackbodies can be delivered in form of a series of versions. Size of blackbody emitter is the main criterion. Emitter size is indicated by blackbody code: DAP- XD where X is approximate size of square of the emitter in inches.

Additional option in form of slight regulation of passive PB blackbody is possible (additional letter H in code). This letter indicates that temperature of the passive blackbody can slightly increased to be approximately equal to temperature of the imaging sensor of the tested imager.

Detail parameters of TCB blackbody used as the main part of the DAP blackbody are the same as in http://www.inframet.com/Data%20sheets/TCB.pdf

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