DOCUMENT

Pegasus-R-970

Isotech

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Introduction to
Blackbody Sources

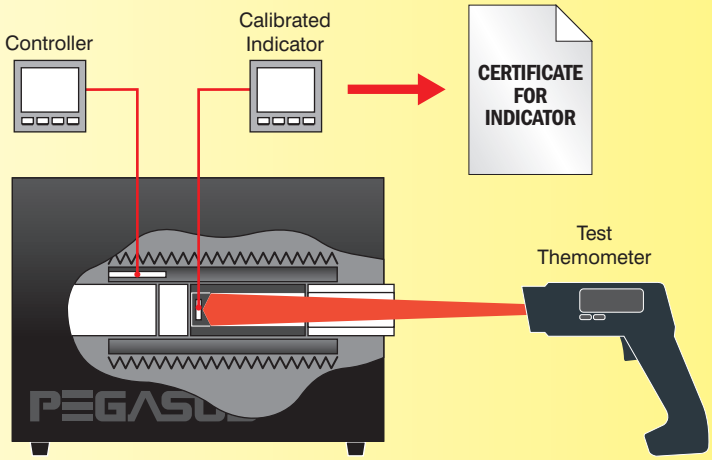
This section contains dedicated blackbody sources for low uncertainty calibration of infrared thermometers. A range of portable primary blackbody sources combine high emissivity with excellent temperature uniformity. The cylindrical cavity design minimises the effects of air movement and ambient changes.

Many of the sources can be used with high purity ITS-90 Fixed Point cells where the thermometer is calibrated against the freezing temperature of a pure metal.

How To Calibrate Infrared Thermometers

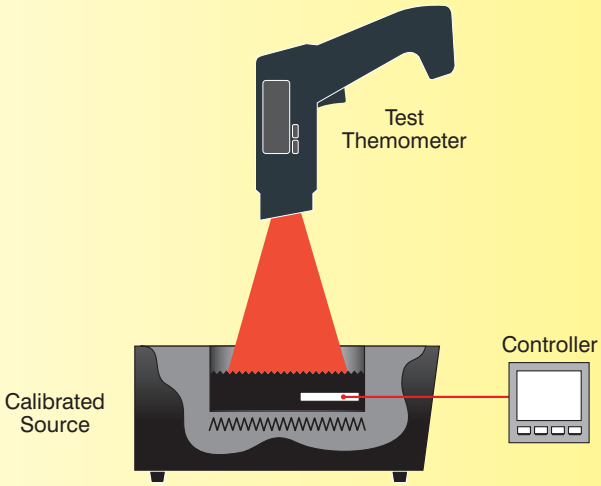
1 With a Primary Standard Source

The temperature source has an emissivity approaching unity and sufficient uniformity so that the test thermometer can be compared to a traceable contact thermometer.



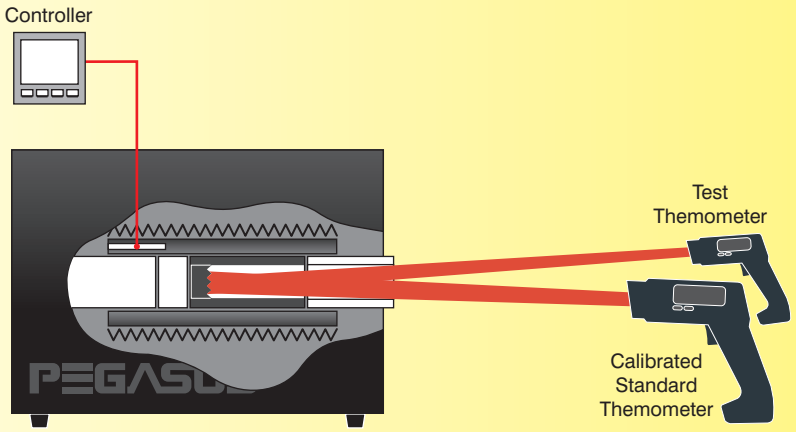
2 Calibration using a secondary standard source

With this method the blackbody is calibrated with a standard thermometer and the test thermometer is compared to the source.



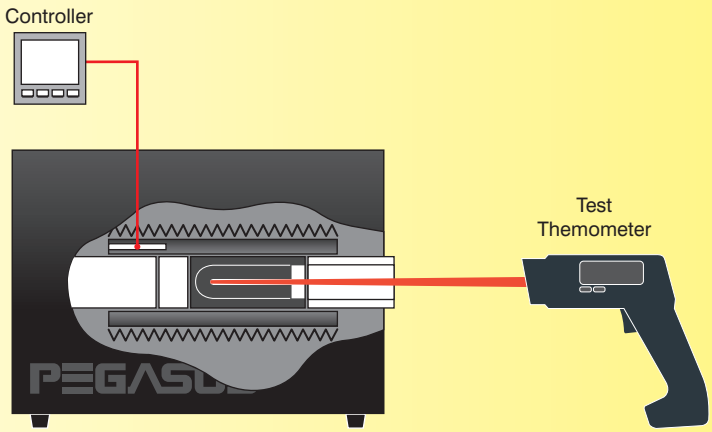
3 Calibration using a transfer standard source

With this method the test thermometer is compared to a standard radiation thermometer.



4 Using ITS-90 Fixed Point Cells

The test thermometer is calibrated, not against a source or other thermometer, but against a fixed temperature from an ITS-90 Fixed Point Cell. For example by melting a quantity of pure Gallium to obtain a fixed temperature of 29.7646°C



■ *Blackbody*

A blackbody has been defined as either a source with zero reflectivity or a source emitting the maximum possible radiation (at all wave lengths) for its temperature.

■ *Emissivity*

Emissivity is the ratio of the radiation emitted by a surface to that emitted by a black body at the same temperature.

Isotech has a range of sources having a high emissivity combined with thermal uniformity for use as Primary Standard Sources for low uncertainty calibration wavelength independent calibration.

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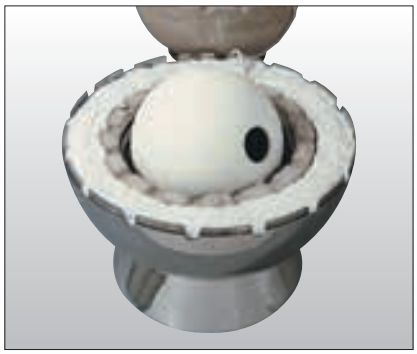
Types of **Equipment**

Primary Black Body Sources

■ **Hyperion R, Gemini R, Medusa R, Oberon R.**
Black body sources covering the range from -10°C to 1100°C.
Can also be used with fixed point cells.
Aperture sizes ranging from 20 to 65mm.

■ **Cyclops**
Temperature range from 100°C to 1300°C.



Special Applications

Model 989 / 991
Blackbodies for Thermal Image Systems and Tympanic Thermometers

Cover human body temperatures

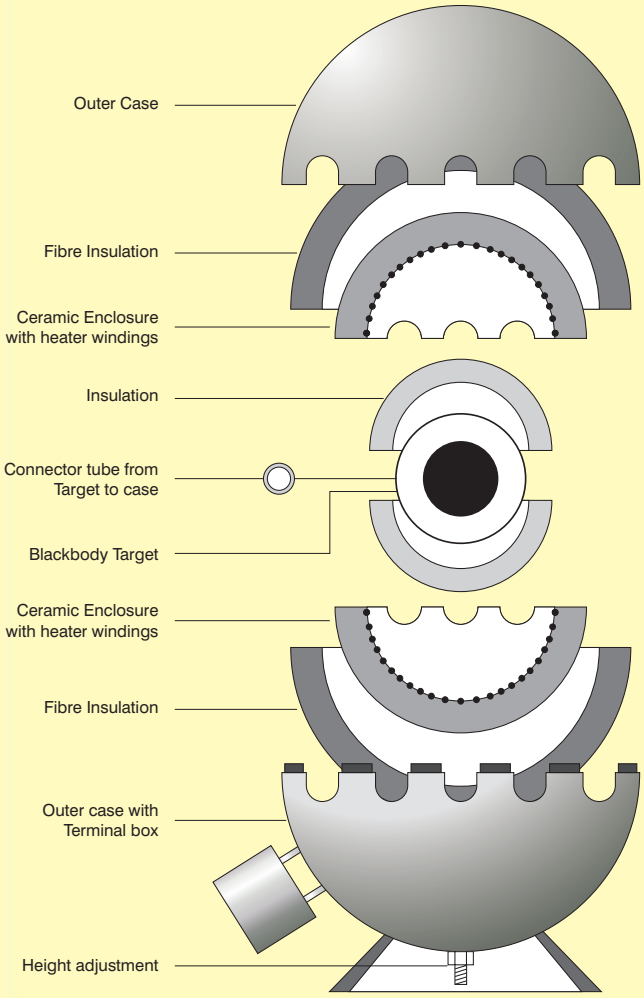
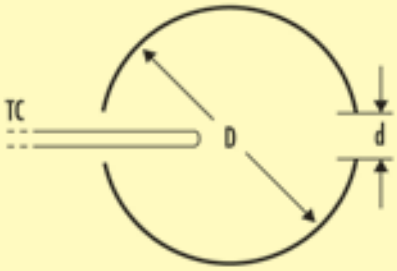
Model 975 Secondary Source Emissivity 0.95

Model 550-02 Low Cost 50 - 350°C

Calibration of Simple Low Cost Infrared Thermometers.

Many of Isotech's calibrators for PRTs and Thermocouples can also be used for testing simple Infrared devices, see Isocal-6 or Dry Block sections.

Cyclops
Blackbody Source



Effective emissivity of cavity in relation to temperature indicated by the thermocouple (TC)