



Handling Precautions Vigo Detectors

General Precautions

1) Storage

Always store the infrared detector in dark places at room temperature and humidity. Avoid leaving the detector in locations where it would be exposed to sunlight or strong UV or visible light as this may result in degradation of the detector characteristics.

2) Handling

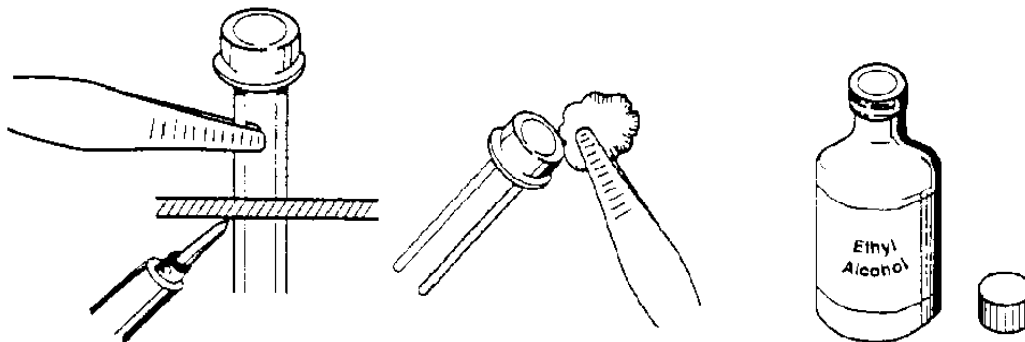
Avoid touching the detector with bare hands as much as possible. We recommend wearing rubber fingercots or gloves. Some detectors employ such soft materials as ZnS for their windows. When using tweezers or other hard tools, pay attention so as not to allow the tip or any sharp objects to touch the window surface. If the window is scratched or damaged, accurate measurement cannot be expected. In addition, when mounting the detector in place, avoid applying mechanical stress on the package and fixing it with the package decentered, because these unwanted conditions may result in leakage or damage of the package.

3) Lead Forming

Avoid bending the leads at the lead/header interface to prevent destruction of delicate glass seals. When forming leads, observe the following recommended mechanical stress limits: For metal package devices, a 0.5 kg pull for 5 seconds maximum, two 90 degree bends and three twists of the device leads at 6 mm minimum away from the package base.

4) Soldering

Since detectors are subject to damage by excessive heat particular care should be taken when soldering. (Some form of heat sink such as a pair of tweezers should be provided.)



Lightly wipe dirt off the window using ethyl alcohol.

5) Cleaning of Window

Be careful to keep the window clean as much as possible. If the window needs to be cleaned, use ethyl alcohol and wipe off the window gently. Avoid using any other organic solvents than ethyl alcohol.



Precautions for Handling TE-cooled Detectors

Thermoelectrically-cooled detectors can be kept cooled at a constant temperature during operation. The built-in thermoelectric cooler requires a supply current much higher than the maximum allowable current used for the thermistor and detector element incorporated in the same package. If the supply current for the thermoelectric cooler is applied to the thermistor or detector element even momentarily, the thermistor and detector element may be damaged. Sufficient care must be taken when dealing with supply currents.

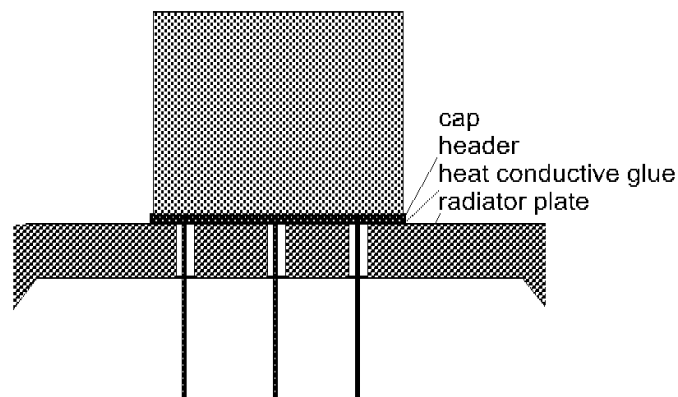
1) Handling

The Peltier element incorporated in thermoelectrically-cooled detectors is susceptible to excessive shocks, drop impacts, and vibrations. Use sufficient care in handling this type of detector.

2) Heat Sink

When operating a TE-cooled detector, always use a heat sink. If the detector is operated without using a heat sink, the detector element temperature will rise due to poor heat dissipation. If heat dissipation is inadequate, the detector element may deteriorate due to high temperature, eventually leading to permanent damage.

Always use a heat sink having the specified thermal resistance ($2^{\circ}\text{C}/\text{W}$ or less for three-stage TE-cooled MCT; $3^{\circ}\text{C}/\text{W}$ or less for two-stage TE-cooled MCT detectors). The detector's metal package should be securely attached to the heat sink. Although the heat capacity required of the heat sink depends on the current consumption of the Peltier element, we recommend using a heat sink with a heat capacity of $2\text{ W}/^{\circ}\text{C}$ or better. The heat sink must be capable of dissipating the heat generated by a thermoelectric cooler increasing the header temperature less than a few kelvins. In practice, the radiator plate under the detector header should be at least 2mm thick.



RECOMMENDED MOUNTING

The detector must be firmly mounted on the heat sink. This can be done by the use of a thin layer of heat conductive epoxy. Alternately, apply silicone grease between the heat sink and the detector's metal package. This improves the coupling efficiency of the heat sink and package, thus reducing the thermal resistance between them.

When the detector is installed on the heat sink, be sure not to apply any excessive stress to the package. This may cause cracks or leakage in the package. Do not attach the heat sink to the cap; this may cause dehermetization of the detector.



3) Peltier Cooler Element

Be careful not to misconnect the plus and minus leads of the thermoelectric cooler. If the Peltier cooler element is operated with reverse polarity, the temperature inside the detector package increases and invites degradation or damage to the detector element.

In addition, if the Peltier element is operated with a current exceeding its maximum allowable supply current, it will heat up due to the Joule heat, thereby degrading the cooling effect. In temperature control, the thermoelectric cooler capacity must be taken into consideration in order to set an optimum supply current. Never apply a current higher than the maximum (I_{max}) rating for the thermoelectric cooler. An excessively high current (higher than I_{max}) will result in significant damage to the cooler. It is recommended that the thermoelectric cooler be supplied with a current (I_{opt}) specified for each supplied detector. For stable operation over long periods of time, it is recommended that the Peltier element be operated at the maximum allowable supply current x 0.7 or below.

4) Thermistor

Always operate the built-in thermistor within the rated conditions. The maximum power dissipation of the built-in thermistor is 0.2 mW. However, it should preferably be operated at less than 0.03 mW.

Operational Notes

- Check polarity of the cooler supply. Reverse polarity will destroy the device!
- Avoid overbiasing of the detector.
- Avoid excessive power to cooler.
- Do not expose the detector to temperatures exceeding 65°C.
- Do not apply cooler power without heat sinking.
- Prevent excessive (>10%) ripple in the cooler power supply.

