

Common Questions and Answers:

Q1: What is the required accuracy for an assembly?

A1: Please refer to the mechanical layout drawings. They show the distance between two elements (lenses) with the tolerance. When designing the mechanical barrel, one should perform an overall tolerances range allowance, and split this between the production accuracy of the mechanical barrel and the assembly accuracy of the elements in the barrel.

Q2: What is needed to achieve good focusing?

A2: The design of the mechanical barrel should include accurate longitudinal (along the optical axis) movement of the entire lens kit. The range of this movement is specified in the mechanical drawing. The sensitivity of such movement should be of the order of +/- 0.015mm. A common practice to provide such movement is to use an accurate thread to connect the two main parts of the mechanical barrel. The first part is attached to the camera while the second part is threaded into the first part, thus enabling the user to control the focus.

Q3: What does 'aperture stop' mean?

A3: "Aperture Stop" is an important optical surface. Its diameter defines the amount of energy that passes thru the lenses to the detector. Its position is also critical for preserving the high performance of the kit. The mechanical designer must maintain its position and diameter while designing the barrel. The thickness of the aperture stop shall not exceed 1.0 mm.

Q4: What is "1.0 mm Ge cover glass"?

A4: Every thermal detector has a cover window for protection. Most are made from Germanium with a thickness of 1.0 mm.

Q5: What if my cover window has a thickness other than 1.0 mm?

A5: The working BFL (Back Focal Length) depends on the thickness of the cover window. It is also possible to still use the lens kit with other cover windows, taking into account that the BFL can slightly change. This change would be equal to $(t-1)/4$, where "t" is the actual window thickness, "1" is the thickness used for the design, and "4" is the refractive index of Germanium.

Q6: How does temperature affect the lens kit performance?

A6: All lenses are made from the thermal transparent material called Germanium. The refractive index of Ge depends on the operating temperature. The working BFL provided is calculated for 20 deg C. If the temperature deviates from this nominal value, one may need to re-focus the lens to retain a best focus. The movement shift shown in the mechanical drawings takes into account the operating temperature range plus the operating working distances.