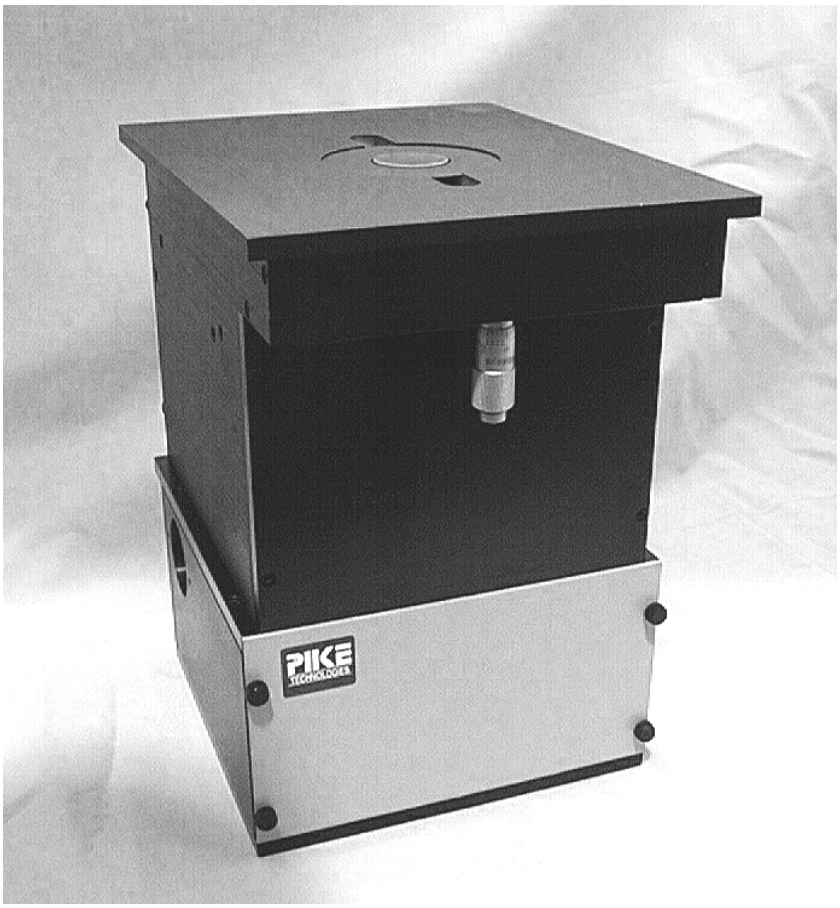
Installation and User Guide

PIKE TECHNOLOGIES



Upward Looking Diffuse Reflection Accessory

Address Comments to:

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Part Number **350-044001**
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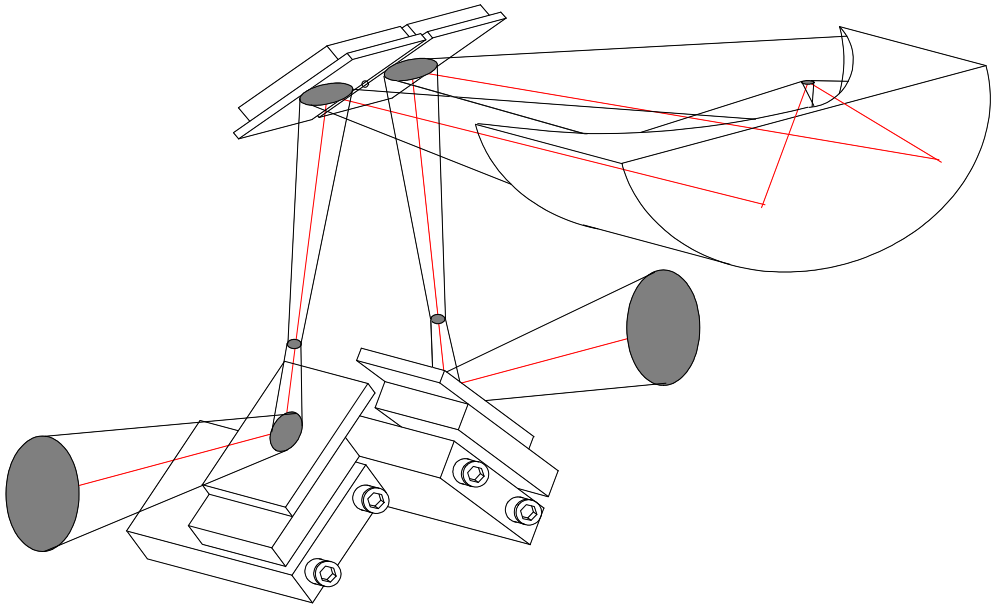
INTRODUCTION

The PIKE Technologies Upward Looking Diffuse Reflection Accessory is available for most FT-IR Spectrometers. The design employs a high efficiency fixed ellipsoidal reflector to collect the maximum amount of diffusely reflected energy from the sample. The optics are gold coated to provide the maximum signal possible for both mid and near IR applications.

The sample position is on the top surface of the accessory. The sample position is covered by an optional window, on which a sample may be placed. This window, for the near infrared analysis of powders, is made from Saphire. An optional vial holder is available for the analysis of samples in glass vials.

OPTICAL DESCRIPTION

The optical system of the Upward Looking Diffuse Reflection Accessory is symmetrical with identical mirrors being used for the optical path from the spectrometer interferometer to the sample and the sample to the spectrometer detector. Two flat mirrors and a ellipsoidal mirror are used in each path. A drawing of the optical path is shown below.

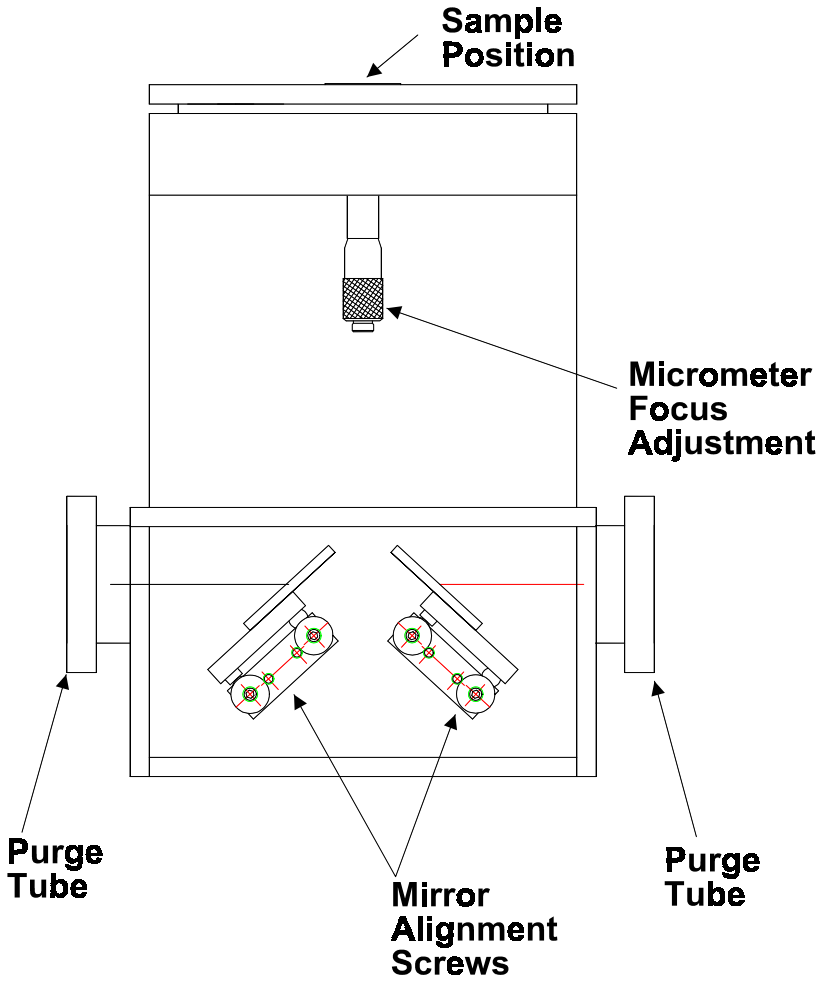


The two lower mirrors are adjustable and are used for aligning the optical system at installation. The upper flat mirrors and ellipsoid mirror are fixed in position. The ellipsoid is a large solid angle monolithic mirror which condenses the beam onto the sample with a power of 3 times. If the beam in your spectrometer sample compartment with no accessory in place is 9mm in diameter, the size of the focussed spot at the sample in the Upward Looking Diffuse Reflection Accessory is 3mm.

Note that the size of the beam in the spectrometer is dependent on manufacturer. Refer to your spectrometer user guide for the correct size.

INSTALLATION AND ALIGNMENT OF THE ACCESSORY

Inspect the drawing below and locate the indicated items on your accessory.



Accessory Front View

To install the accessory in your sample compartment perform the following.

PREPARE THE SPECTROMETER

- Remove any sample holder present in the sample compartment.

- Scan a background with your FTIR software and save either in memory or on disk, depending on the software you are using. This single beam spectrum can be used to verify the performance of the system.

PREPARE THE ACCESSORY

- Place the accessory into the sample compartment. Using the 3/32" wrench provided, loosen the screws on the two purge seal tubes located on the sides of the accessory. Push the tubes toward the side walls of the spectrometer. This will seal the accessory and ease future placement of the accessory in the sample compartment.

- Fix down the accessory. Some configurations of accessory include their own instrument sample compartment mounting plate, and this plate may be fixed in place without requiring access to the inside of the accessory.

- If your accessory does not contain an instrument sample compartment baseplate, remove the lower front cover of the accessory. This cover is held in place by four thumbscrews. Inside the accessory are two mirror mounts and a base fixing position. Tighten the screw in place.

ALIGN THE ACCESSORY

- Place the gold coated alignment mirror onto the top surface of the accessory with the mirror surface facing down.

- Remove the four thumbscrews holding the lower front cover in place and remove the cover. Behind this cover, there are two adjustable mirrors which are used for alignment.

- Set up the FTIR software to alignment or monitor mode and note the size of the interferogram. Turn the focus adjust micrometer to raise and lower the sample stage to achieve maximum throughput. The gap between the sample platen and body of the accessory should be about ¼".

- Adjust the output adjustable mirror. This is the mirror that is the closest to the instrument detector. Turn both screws on this mirror mount to maximize throughput.

- Adjust the focus micrometer to maximize throughput.

- Adjust the input adjustable mirror. This is the mirror that is the closest to the instrument interferometer. Turn both screws on this mirror mount to maximize throughput.

- Adjust the focus micrometer to maximize throughput.

- Repeat the last four steps until there is no further increase in signal. Typically, you should achieve a signal throughput which is at least forty percent of the signal that was present before the accessory was placed into the sample compartment.

Replace the lower front cover and fix in place with the four thumb screws.

PACKING LIST

Included with your accessory are the following parts.

- Main accessory
- Sample window if ordered. This is mounted into the top of the main accessory
- Gold alignment mirror
- Wrench set
- 4ft length of purge tubing

PRECAUTIONS

MIRRORS

In order to provide the maximum transmission in the infrared and near infrared, with the minimum spectral interference, the mirrors used in this device are uncoated (bare) gold on a glass substrate. Since the coatings are soft, care must be taken to avoid damage. Normally, these mirrors will not need cleaning, since they are contained within the housing of the accessory. If they do need cleaning, use a clean dry supply of air to blow off any dust. Under no circumstances must the mirrors be rubbed with paper products such as "Kleenex" since this will produce scratching of the mirror coating.