

Your Photonics Partner

Spectrometer Accessory

BAC046 Variable Path Length Gas Cell



The BAC046 Variable Path Length Gas Cell is designed for measuring the spectral absorbance of gases in the UV-Vis-NIR. The molecular density of gas is low so a long optical path is required to measure its molar concentration by spectral absorbance techniques as used with liquids. The BAC046 contains three mirrors, two windows, two 5-axis fiber ports and an adjustable optical path with path length steps of 0.8 meters for a total path length of 8 meters. With an optical path folded in a volume of 0.75 liters the BAC046 can be used to identify and characterize materials in; pharmaceutical, food science, biology, semiconductor, geology, and others.

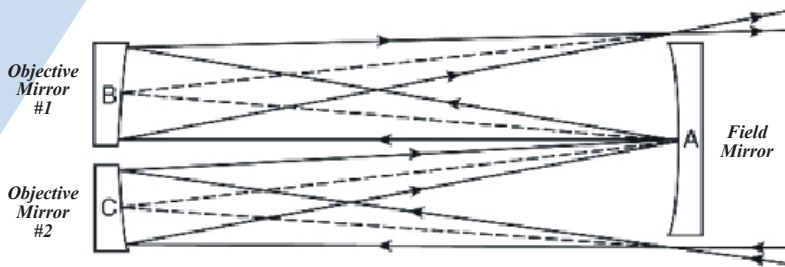
The three internal mirrors are coated with UV enhanced Aluminum, the cell body is made of Borosilicate glass. Two stainless steel valves and a tube inside the cell allow gases to flow smoothly through the cell during measurement.

There is a 3-mirror "White" cell system which reflects the optical beam within the long path cell which can achieve multiple passes in increments of 4. The below picture shows an optical beam with 4 passes. For white cell operation, the radiation from the source is focused on the entrance aperture where, the diverging beam passes to the first "Objective Mirror," which focuses an image on to the "Field Mirror." The beam is returned again diverging to the second objective mirror, which directs it either out of the cell (4 passes) or back to the field mirror for additional multiple passes.

Specifications:

Base Path	0.8 - 8.0 meters
Adjustable Optical Path	0.8 meters
Window Material	Fused silica
Mirror Coating	Protective UV Aluminum
Transfer Optics	UV Optics
Fiber Optic Connectors	SMA 905
Body Material	Borosilicate Glass
Volume	0.75 Liter
End Plate Material	Black Anodized Aluminum
Seal Material	Viton O-ring
Valve	Stainless Steel Plug Valve
Gas Connection	1/4" Hose Barbs Connector
Dimensions	Ø100mm x 406mm
Weight	2.0 kg (4.4 lbs)

Optical Design of BAC046:



The BAC046 can accommodate 4 to 40 passes where by the user performs a simple opto-mechanical adjustment. The cell's pass length is calculated by the number of passes multiplied by the length of the base path. One pass is 20 cm, the extreme optical path length ranges available are 80 cm to 8 meters. The total absorption by the mirrors, after multiple reflections, is determined as a baseline by using a dry inert gas or a specific calibration gas with a known molar concentration.

