

## Long-Path Gas Cells – For Measurement of Low Concentration Vapor Components



Long-Path Gas Cells

### FEATURES OF THE LONG-PATH GAS CELLS

- Long-Path gas cells for measurements of vapor species to ppb levels
- Fixed and variable pathlength versions
- Heated versions available up to 200 °C
- Standard fully purgeable optics
- Fits most FTIR spectrometers

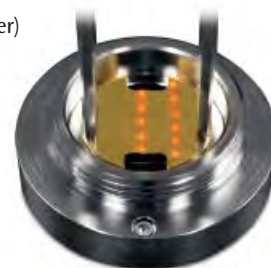
PIKE Technologies offers several Long-Path Gas Cells for analysis of trace components in gas samples – typical concentrations may range from the ppm to ppb levels. The Long-Path Cells feature a folded path design providing an extended pathlength within a compact dimension. The FTIR beam enters the cell through an IR transparent window and reflects a number of times between the accessory mirrors before exiting to the detector. The number of reflections is determined by the optical configuration of the cell and may be selected as a permanently aligned version or a user-adjustable version (variable-path). Typical applications of the long-path gas cells include air pollution studies, gas purity determinations, monitoring of industrial processes, exhaust gas analysis and many others.

All Long-Path Gas Cells are manufactured by PIKE Technologies. The fixed and variable long-path gas cell assemblies have either a nickel-coated aluminum cell, stainless steel, or a heavy-wall borosilicate glass cell. Gas cells may be operated under vacuum or pressure. The top of the cell is enclosed by the valve/gauge assembly with stainless steel ¼" Swagelok valves. Tube compression fittings are available upon request.

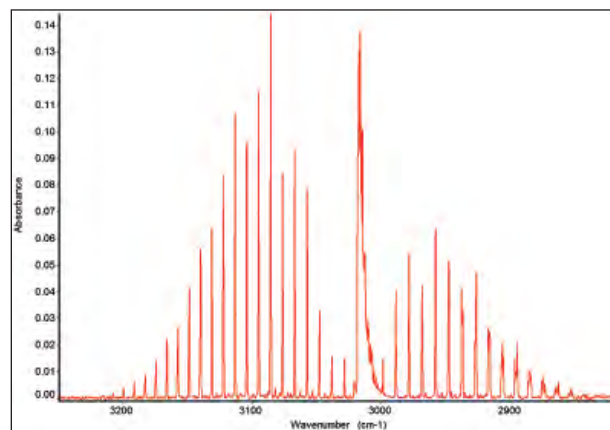
For optimal performance the mirrors have been diamond-turned and coated with the highest quality gold for maximum reflectivity and inertness. The accessory mirrors are mounted permanently with mechanical mirror mounts to eliminate out-gassing chemicals that may occur when using cements to secure the mirrors. Windows are easily replaceable and different window materials are available.

The anodized aluminum base includes spectrometer-specific transfer optics allowing placement of the accessory in the FTIR sample compartment. As a standard feature, the optical base is fully purgeable allowing for the elimination of atmospheric water vapor and CO<sub>2</sub> interference in the spectrum.

The construction and main components of the variable-path gas cells are identical with those described above, with an exception of the internal mirror assembly. The cell has an adjustable mirror located at the top of the enclosure (position controlled with a micrometer) and one stationary mirror. Adjustments to the mirror position allow selection of different pathlengths supported by the cell. The variable-path gas cell has an integrated laser that enables the determination of the pathlength by counting the number of laser reflections on the bottom mirror.



Laser reflections shown on the bottom mirror of the variable-path gas cell



C-H stretch spectral region for methane gas

Some gas measurement applications require temperature control for higher precision or to prevent condensation of specific components. PIKE Technologies offers heated versions of our fixed- and variable-path gas cells up to 200 °C. For high temperature accuracy, the temperature sensor has been imbedded inside the gas cell as opposed to mounted on the exterior of the cell. Contact PIKE Technologies on how to upgrade an existing cell to the heated version.

Custom pathlengths and cell materials are available. Contact PIKE Technologies for special orders.



5 m Heated Gas Cell

## ORDERING INFORMATION

### Long-Path Gas Cells (insert spectrometer code for XX)

PART NUMBER	DESCRIPTION
163-12XX	2.4 m Metal Gas Cell
163-13XX	2.4 m Stainless Steel Gas Cell
163-15XX	5 m Metal Gas Cell
163-14XX	5 m Stainless Steel Gas Cell
163-10XX	10 m Metal Gas Cell
163-17XX	10 m Stainless Steel Gas Cell
163-11XX	10 m Glass Gas Cell
163-16XX	1–16v m Glass Gas Cell
163-18XX	20 m Stainless Steel Gas Cell
163-20XX	20 m Glass Gas Cell
163-19XX	30 m Stainless Steel Gas Cell
163-30XX	30 m Glass Gas Cell

Notes: Metal Gas Cells are made of nickel-plated aluminum. Long-Path Gas Cells include KBr window(s) as specified in the table on this page. Please select the baseplate mount for your FTIR spectrometer model. Additional window materials can be ordered from the table in the next column. Please select the xx code from the fold-out on the last page of this catalog.

### Heated Long-Path Gas Cells (insert spectrometer code for XX)

PART NUMBER	DESCRIPTION
163-42XX	2.4 m Heated Metal Gas Cell, 115 V
163-42XX-30	2.4 m Heated Metal Gas Cell, 230 V
163-35XX	2.4 Heated Stainless Steel Gas Cell, 115 V
163-35XX-30	2.4 Heated Stainless Steel Gas Cell, 230 V
163-45XX	5 m Heated Metal Gas Cell, 115 V
163-45XX-30	5 m Heated Metal Gas Cell, 230 V
163-31XX	5 m Heated Stainless Steel Gas Cell, 115 V
163-31XX-30	5 m Heated Stainless Steel Gas Cell, 230 V
163-40XX	10 m Heated Metal Gas Cell, 115 V
163-40XX-30	10 m Heated Metal Gas Cell, 230 V
163-41XX	10 m Heated Glass Gas Cell, 115 V
163-41XX-30	10 m Heated Glass Gas Cell, 230 V
163-32XX	10 m Heated Stainless Steel Gas Cell, 115 V
163-32XX-30	10 m Heated Stainless Steel Gas Cell, 230 V
163-46XX	1–16v Heated Glass Gas Cell, 115 V
163-46XX-30	1–16v Heated Glass Gas Cell, 230 V
163-43XX	20 m Heated Glass Gas Cell, 115 V
163-43XX-30	20 m Heated Glass Gas Cell, 230 V
163-33XX	20 m Heated Stainless Steel Gas Cell, 115 V
163-33XX-30	20 m Heated Stainless Steel Gas Cell, 230 V
163-47XX	30 m Heated Stainless Steel Gas Cell, 115 V
163-47XX-30	30 m Heated Stainless Steel Gas Cell, 230 V

Notes: Metal Gas Cells are made of nickel-plated aluminum. Heated Long-Path Gas Cells include KBr window(s) as specified in the table on this page. Please select the baseplate mount for your FTIR spectrometer model. Additional window materials can be ordered from the table in the next column. Heated Long-Path Gas Cells include a digital temperature controller and heating jacket. Heated Long-Path Gas Cells may be heated to 200 °C. Please select the xx code from the fold-out on the last page of this catalog.

### Replacement Parts for Long-Path Gas Cells

PART NUMBER	DESCRIPTION
076-1240	Heated Long-Path Gas Cell Temperature Controller 115 V/230 V
163-1009	Pathlength Verification Tool

Notes: Please call PIKE Technologies for replacement O-rings.

### Replacement Windows for Long-Path Gas Cells

DESCRIPTION	PART NUMBER	
	25 X 4 MM	37.5 X 4 MM
BaF <sub>2</sub>	160-1217	–
CaF <sub>2</sub>	160-1211	160-1287
KBr	160-1133	160-1288
KCl	160-1178	160-1289
KRS-5	160-1127	–
NaCl	160-1124	160-1290
ZnSe	160-1114	160-1291
ZnSe, Anti-Reflective Coating 1-Side	160-1110	160-1286
ZnSe, Anti-Reflective Coating 2-Sides	160-1109	–

#### LONG-PATH GAS CELLS SPECIFICATIONS

	2.4 m Fixed	5.0 m Fixed	10.0 m Fixed	20.0 m Fixed	1–16 m Variable
Base Path (mm)	100	157	250	500	333
Body Material	Metal	Metal	Glass or Metal	Glass	Glass
Optics Coatings	Gold	Gold	Gold	Gold	Gold
Window Material	KBr	KBr	KBr	KBr	KBr
Window Dimension (mm)	37.5 x 4	25 x 4	25 x 4	25 x 4	25 x 4
# Window	1	2	2	2	2
Cell Volume (L)	0.1	0.5	2.2	7.2	3.5

#### HEATED LONG-PATH GAS CELLS SPECIFICATIONS

Temperature Range	Ambient to 200 °C
Accuracy	+/- 0.2%
Voltage	115 or 230 VAC
Sensor Type	RTD
Controllers	
Digital	+/- 0.1 °C
Input Voltage	115 or 230 V, specify
Output Voltage	115 or 230 VAC/10A, specify

Notes: Other line voltages may require an additional transformer.