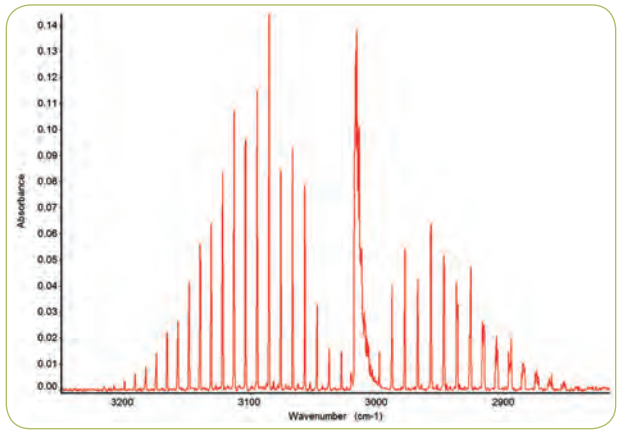
Long-Path Gas Cells –
For Measurement of Low Concentration Vapor Components



C-H stretch spectral region for methane gas.

The anodized aluminum base includes spectrometer-specific baseplate 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_2 interference in the spectrum.

Features

- **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**

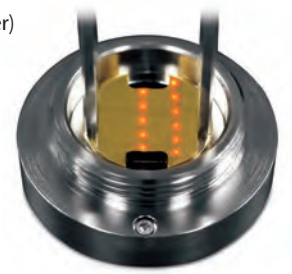
PIKE Technologies offers several Long-Path Gas Cells for analysis of trace components in gas samples – typical concentrations may range from the ppm to ppb levels. The Long-Path Cells feature a folded path design providing an extended pathlength within a compact dimension. The FTIR beam enters the cell 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 cell). Typical applications 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 body assemblies are nickel-coated aluminum, stainless steel or heavy-wall borosilicate glass. Gas cells may be operated under vacuum or pressure. The top of the cell is enclosed by the valve assembly with stainless steel Swagelok® valves with barb fittings. 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 epoxies to secure the mirrors. Windows are easily replaceable and a variety of window materials are available.

Variable-Path Gas Cell

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 for pathlength determination.

Long-Path Gas Cell Specifications

	2.4 m Fixed	5.0 m Fixed	10.0 m Fixed	20.0 m Fixed	30.0 m Fixed	1–16 m Variable
Base Path (mm)	100	157	250	500	625	333
Body Material	Metal	Metal	Glass or Metal	Glass or Metal	Glass	Glass
Optics Coatings	Gold	Gold	Gold	Gold	Gold	Gold
Window Material	KBr	KBr	KBr	KBr	KBr	KBr
Window Dimension (mm)	37.5 x 4	25 x 4	25 x 4	25 x 4	25 x 4	25 x 4
# Window	1	2	2	2	2	2
Cell Volume (L)	0.1	0.5	2.2	7.2	12.8	3.5

Heated Long-Path Gas Cell Specifications

Temperature Range	Ambient to 200 °C
Accuracy	+/- 0.5% of set point
	115 or 230 VAC
Sensor Type	RTD
Temperature Controller	Touch-panel display with USB interface. PIKE TempPRO software (sold separately) for PC control with unlimited ramps and automated data collection.
Digital Display	+/- 0.1 °C
Input	115 or 230 V, specify
Output	115 or 230 VAC/10A 2400W maximum depending on pathlength

Note: Other line s may require an additional transformer.

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 temperature accuracy, the temperature sensor has been embedded 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, cell materials and heated transfer line are available. Contact us for special orders.

5-m Heated Gas Cell

Ordering Information

Long-Path Gas Cells

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
163-30XX	30 m Glass Gas Cell

Notes: Replace XX with your spectrometer's Instrument Code listed on page 164. Metal Gas Cell bodies are made of nickel-plated aluminum. Long-Path Gas Cells include KBr window(s) and Swagelok™ valves with barb fittings. Compression fittings are available upon request; specify size. Additional window materials can be ordered from the table in the next column.

Replacement Parts

Part Number	Description
076-2710	Long-Path Gas Cell Temperature Control Module, 115 VAC
076-2720	Long-Path Gas Cell Temperature Control Module, 230 VAC
007-0207	PIKE TempPRO Software
163-1009	Pathlength Verification Tool, 2.4 m and 5 m
163-100910	Pathlength Verification Tool, 10 m and 20 m
163-1001	Viton Gas Cell Window O-Ring, 5, 10, 20, 16v m (4 ea.)
163-1208	Perfluoroelastomer O-Ring Kit, 2.4 m
163-1506	Perfluoroelastomer O-Ring Kit, 5 m
163-1007	Perfluoroelastomer O-Ring Kit, 10 m
163-2006	Perfluoroelastomer O-Ring Kit, 20 m

Note: Please call PIKE Technologies for replacement O-rings or other parts not listed here.

Heated Long-Path Gas Cells

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
163-32XX	10 m Heated Stainless Steel Gas Cell, 115 V
163-32XX-30	10 m Heated Stainless Steel 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
163-46XX	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

Notes: Replace XX with your spectrometer's Instrument Code listed on page 164. Metal Gas Cell bodies are made of nickel-plated aluminum. Heated Long-Path Gas Cells include KBr window(s) and Swagelok™ valves with barb fittings. Compression fittings are available upon request; specify size. Additional window materials can be ordered from the table below. Heated Long-Path Gas Cells include a digital temperature controller and heating jacket. If PC control is desired, PIKE TempPRO software (sold separately) can be used for graphical setup and automated data collection for thermal experiments. TempPRO is compatible with most FTIR spectrometers. Heated Long-Path Gas Cells may be heated to 200 °C.

Replacement Windows

Part Number		
25 x 4 mm	37.5 x 4 mm	Description
160-1217	160-1281	BaF_2
160-1211	160-1287	CaF_2
160-1133	160-1288	KBr
160-1178	160-1289	KCl
160-1127	----------	KRS-5
160-1124	160-1290	NaCl
160-1114	160-1291	ZnSe
160-1110	160-1286	ZnSe, Anti-Reflective Coating 1-Side
160-1109	----------	ZnSe, Anti-Reflective Coating 2-Sides