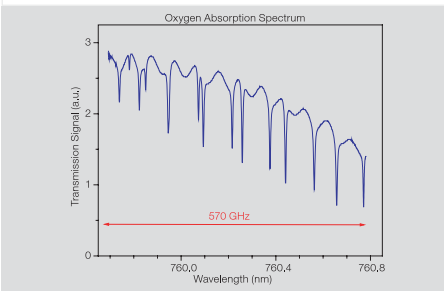
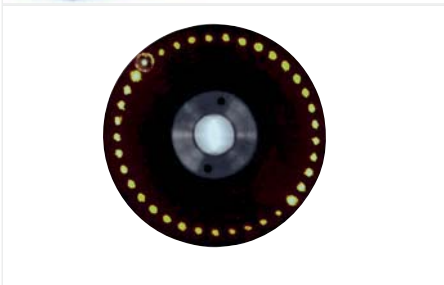
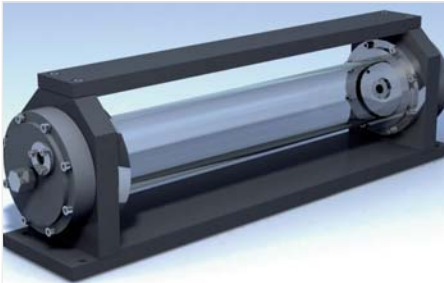


Multipass Cell

Herriott Cell for Absorption Spectroscopy



30 m absorption length in 1 l volume

The CMP-30 multipass cell is a Herriott absorption cell with a total optical path length of 30 m. It lends itself to applications which require a long interaction path between an electromagnetic wave and a gaseous sample, e.g. for monitoring tasks in industrial environments, but also for infrared absorption spectroscopy in scientific research.

An incident beam enters the cell through a hole in one of the mirrors. The beam then undergoes 73 reflections, describing a circle of spots on each mirror surface, before exiting the cell again. The dimensions of mirrors, separation between adjacent spots and the diameter of the entrance/exit hole have been designed to avoid spot overlap and thus, unwanted interference, up to wavelengths of 3 μm .

Unambiguous beam paths

The beam enters the cell in the horizontal plane, whereas the output beam travels upwards. This ensures a clear separation between input and output beam, permitting accurate absorption measurements even in case of misalignment or incorrect focussing.

The cell is resistant to the most common chemicals. Materials in contact with the gas are Pyrex and BK7 glass, stainless steel, CaF_2 , Gold, Viton and Teflon. The cell can be operated at any pressure from 10^{-3} Torr up to one atmosphere. Gas inlet and outlet ports at both ends of the cell allow for examining flowing gases. On the other hand, the Pyrex glass pipe can be removed in-situ without dismantling the cell, when "room air" measurements are to be performed.

Compact Herriott cell.

Light pattern on the input mirror, upon illumination with a green HeNe-laser.

Absorption spectrum of molecular oxygen, recorded with a thermally tuned DL DFB laser and a CMP-30 multipass cell.

Key features

- 30 m optical path length within 0.9 l volume
- Unambiguous input / output beam separation
- No interference of beam spots for wavelengths up to 3 μm
- OEM version on request

Specifications

Parameter	Value
Optical path length	29.9 m
Volume	900 cm^3
Overall length	50.2 cm
Overall height	13.7 cm
Overall width	9.4 cm
Wavelength range	500 .. 3000 nm
Mirror reflectivity ($\lambda > 1 \mu\text{m}$)	> 98.2 %
Transmission (window excluded, $\lambda > 1 \mu\text{m}$)	> 26.6 %
Operating pressure	10^{-3} .. 760 Torr
Window transmission (CaF_2)	0.2 .. 9.5 μm
Window free aperture	4 mm
Gas inlet ports	Provided for pipes of 10 mm outer diameter; NPT 1/4" threads (other connectors on request).