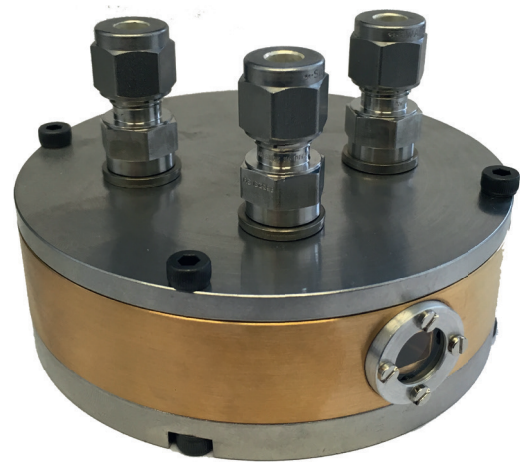


## IRcell – long path in a compact design

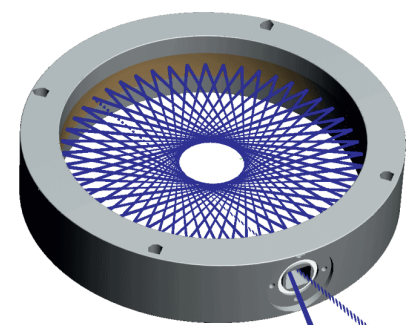
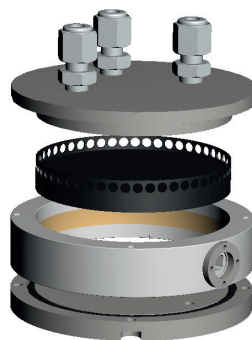
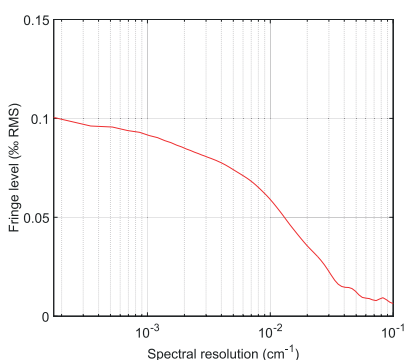
Keeping track of trace gas levels is of critical importance in a wide range of applications. For low abundance trace gases, small absorptions can be observed by increasing the optical path length. This is achieved using multi pass cells.

With the IRcell, we offer a multi pass cell consisting of only a single, circular mirror. The cell body is at the same time the mirror reflecting the optical beam.

The advantage of such a configuration lies in its robustness towards mechanical stress such as vibrations or temperature changes. With this design, we offer an optical path of 3.5 m.



### Unique features

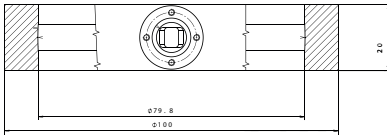


**Sub-permille optical noise:**  
Very low optical fringe levels <0.2‰ rms are specified for the IRcell. Typical values are closer to 0.1‰ as seen in the figure. The fringe level further reduces drastically at decreased spectral resolution.

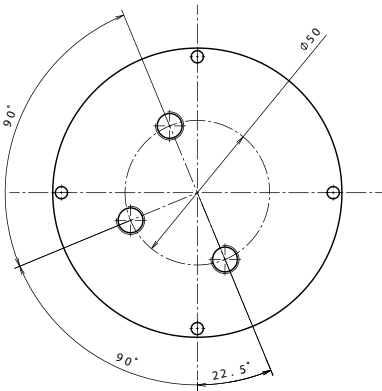
**Compact design:**  
A 2-dimensional beam-pattern enables low sample volume. Patented absorption mask shown in black.

**High Optical throughput:**  
IRcell provides improved performance by combining high optical throughput with an enhanced path-to-volume ratio.

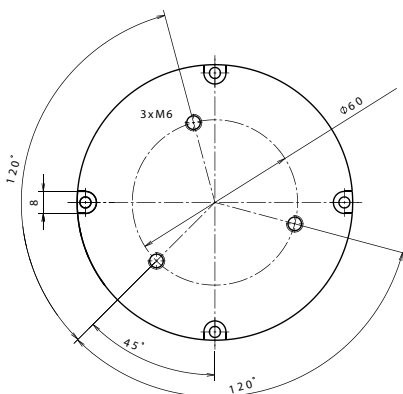
Side view



Top view with gas fittings



Bottom view with threaded holes for mounting



All measures in mm unless stated otherwise.

## System Specifications

Optical path length	349 cm / 137"
Input-output beam angle	28 degree horizontal 3 degree vertical
Beam alignment tolerance	±0.002 degree horizontal ±0.1 degree vertical
Ideal numerical aperture (NA)	0.027
Input hole diameter	4 mm / 0.157"
Fringe level	< 2.0 x 10 <sup>-4</sup> rms@ λ=4.3 μm
Wavelength range	IR / mid-IR / THz
Gas volume	38 ml
Gas fittings	Swagelok 6 mm or 1/4" or Whitworth G 1/8"
Absolute pressure range	0-1 bar / 0-750 torr
Leak rate	< 1 x 10 <sup>-7</sup> bar x l/s
Mirror surface	Gold
O-Ring material	NBR
Absorption mask material	Teflon, others on request
Window material options	BaF <sub>2</sub> , CaF <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , N-BK7, others on request
Dimensions	10 cm diameter, 3 cm height (excluding gas connectors)
Mounting	3 x M6

## Example Applications

- Industrial process control
- Ambient air analysis
- Safety and security screening