20m long optical path mid-infrared gas absorption cell

Product Description

The 20-meter long optical path gas absorption cell can be used for spectral analysis and detection. It mainly adopts the Herriot gas chamber structure and a stable optical packaging structure, which mainly includes the gas chamber cavity, concave reflector, standard optical fiber connector, shockproof base and gas inlet and outlet. The unique suspension path design can ensure the vibration and temperature stability of the gas chamber, and can monitor the gas absorption line in real time in various

complex environments. It has ultra-low system noise and is convenient for trace gas analysis

Product features

Optical fiber signal input, detector RF output、The gas chamber has a stable structure, which can effectively prevent vibration and temperature effects、The gas structure is compact and small in size, which is easy to carry、 The structure is small in size

Part Number

MP-OGC-1923-20-FF-SMA

Application area

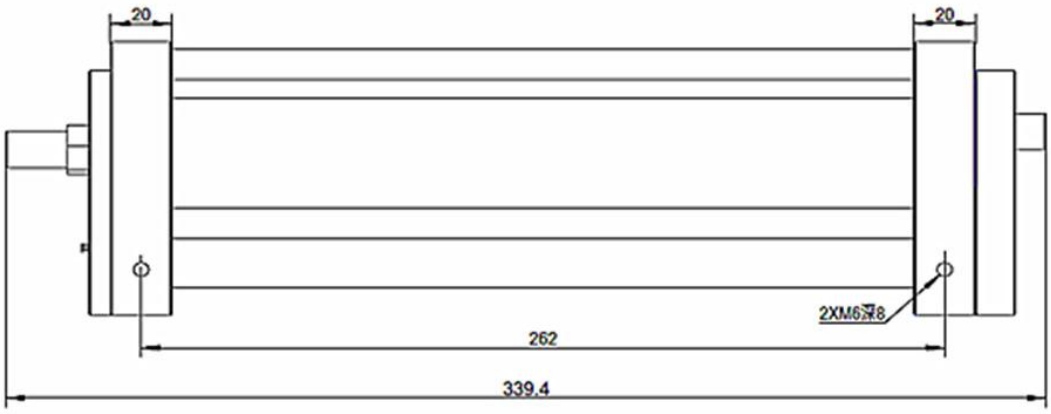
TDLAS measurement system、Ultra-high precision gas detection instrument

Core parameters

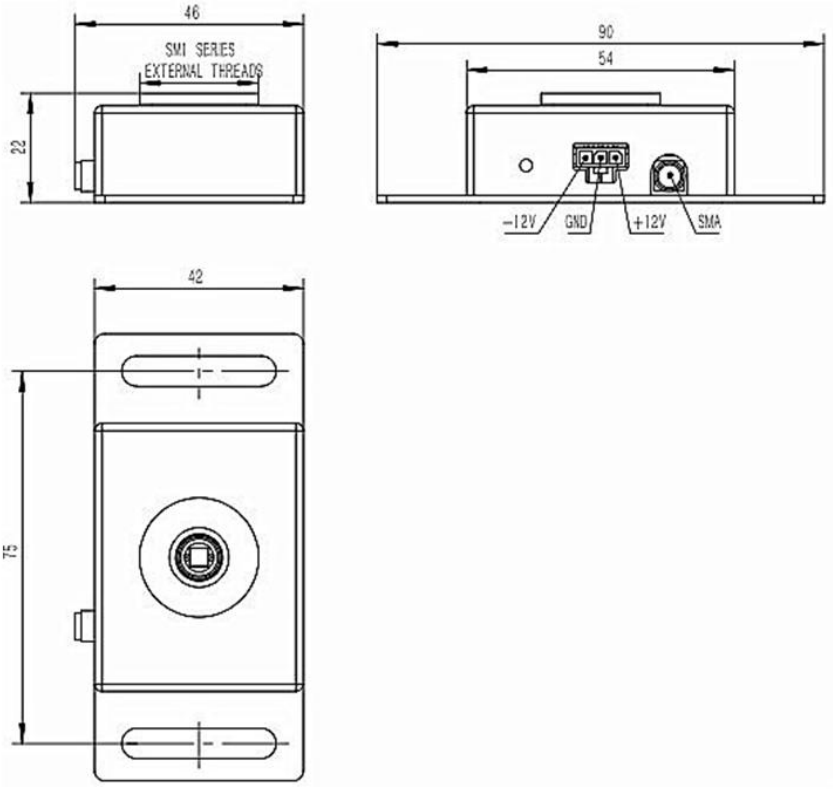
Wavelength	Effective Optical Path
1960-2370nm	20m

Dimension Drawing

Gas chamber dimension



Detector dimension



General Parameters

Gas chamber parameter

Parameter	Condition	Technical specifications
Effective optical path	---	20m
Gas volume	---	About 271mL
Dimensions	---	314mm*89mm*104mm
Wavelength range	---	1960~2370nm
Gas interface	---	Straight-through Φ6 fast plug
Optical interface	---	FC/APC
Insertion loss	λ=2064nm，T=22℃	⩽2dB
Saturated optical power	λ=2064nm，T=22℃	⩽4mW
Total product weight	---	About 2700g
Operating temperature	---	-10℃~+85℃
Storage temperature	---	-40℃~+85℃
Leakage rate	---	10^{-7}
Pressure resistance	---	0.7MPa

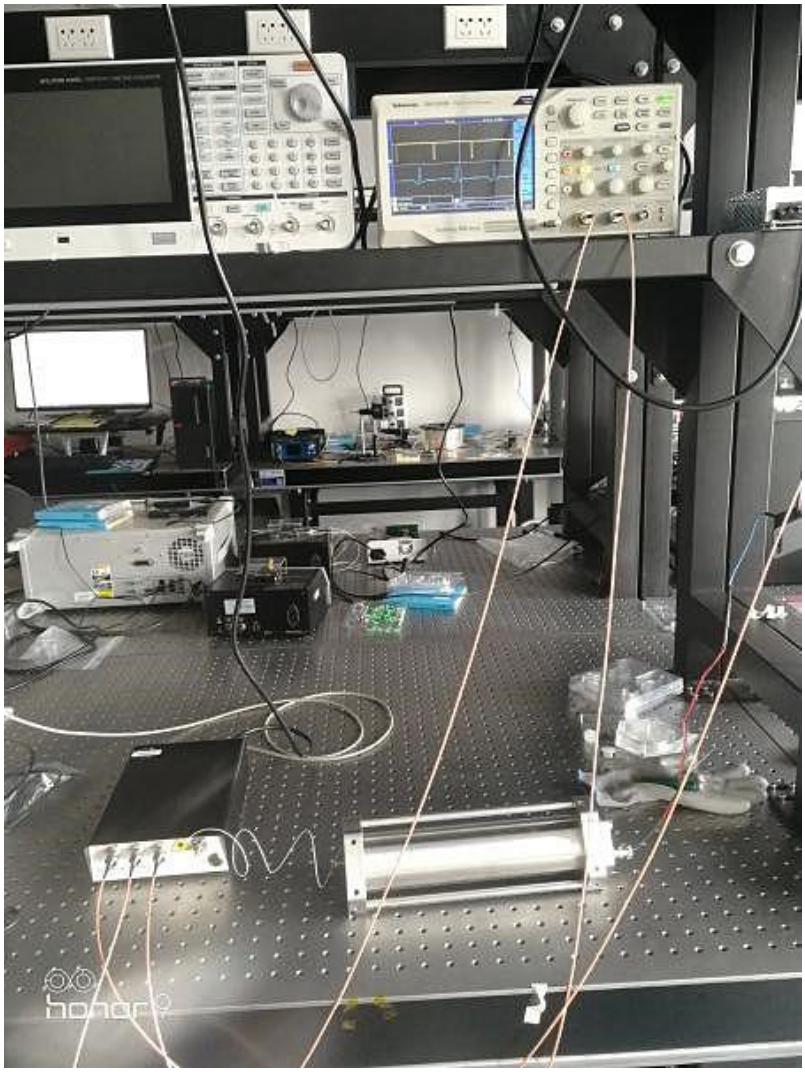
Detector parameter

Parameter	Symbol	Condition	Indicator	Unit
Forward current	I_f	---	⩽4	mA
Backward current	V_r	---	⩽1	V
Dark current	I_d	Tc=+22℃、VR=0.5V	⩽4	uA
Junction capacitance	Ct	VR=0V、f=1MHz	⩽100	pF

Parameter	Indicator
Signal bandwidth	5MHz
Output voltage	±10V (high impedance), ±5V (50Ω load)
Signal output interface	SMA
Power supply	±12V

Example of using a gas chamber to measure CO_2 gas

I. Test instrument connection and steps



Steps:

1. Install a 2004nm laser, and connect the laser output fiber to one end of the 20-meter optical path gas chamber.

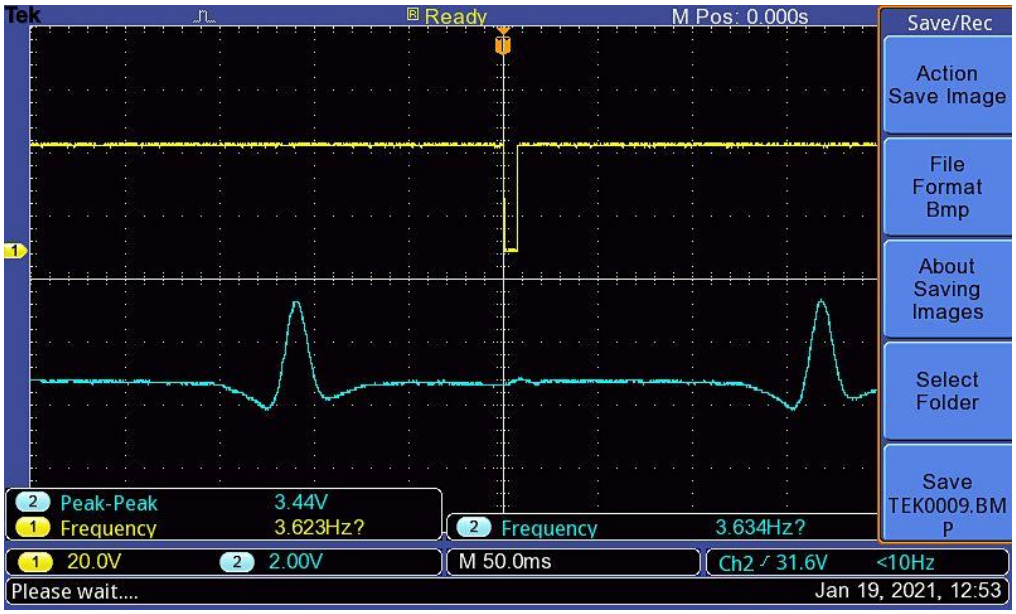
2. Connect the other end of the 20-meter gas chamber to the detector.

3.Use a BNC to SMA cable to connect the detector and the oscilloscope.

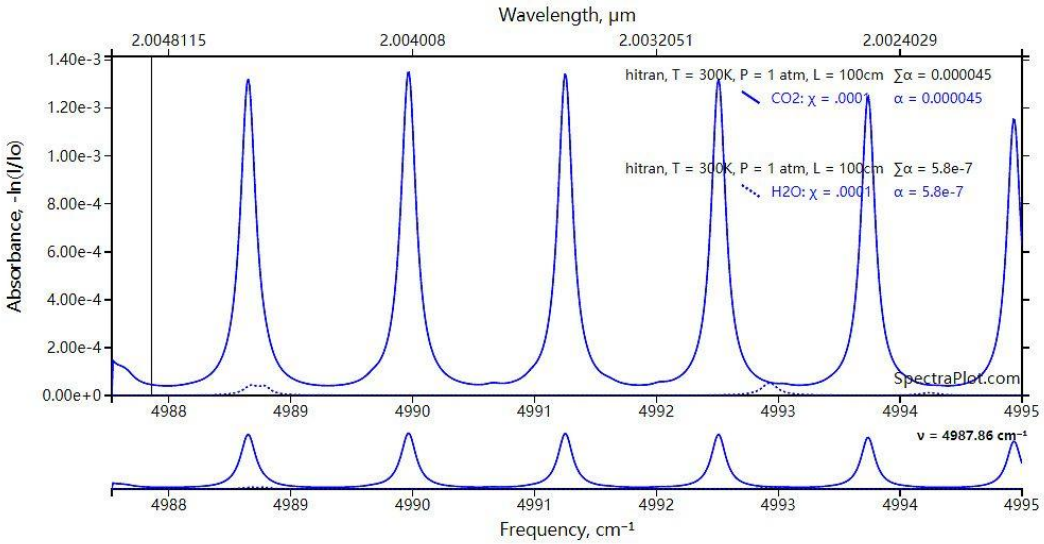
Turn on the laser, adjust the current and temperature, and view the second harmonic absorption spectrum of the CO_2 molecule on the oscilloscope.

2. Test results and analysis verification:

We adjusted the current and temperature of the laser to make the laser wavelength sweep across the absorption peak of the CO_2 molecule at around 2004nm, and measured the second harmonic absorption spectrum as shown in the figure below:



In order to verify that it is the absorption of CO_2 molecules, we queried the parameters of the Hritral database as follows:



We can see that the absorption peak in the database corresponds exactly to the absorption peak measured on the oscilloscope, which also verifies that the absorption spectrum on our oscilloscope is the absorption of CO_2 molecules.

Ordering Information

MP-OGC-1923-20-FF-SMA

Optical path: 20:20 meters

Material: S3:SUS304

Gas port diameter: AR6:6mm

Fiber optic and connector: FSA:SM2000, FC/APC