



### Wavelength Calibrator Carbon Monoxide Gas Cell $^{12}\text{CO}$

Gas cells are precision filters whose absorption wavelengths depend on specific molecular energy level transitions. Carbon Monoxide molecular absorption lines have been identified by national standards bodies as a primary wavelength reference in the L band from 1560nm to 1596nm.

Our NIST-traceable CO cells ship in a standard 500 Torr, 80cm path multi-pass fiber-coupled configuration with FCAPC-connectorized SMF28e fiber. Custom configurations are available with changes to pressure, concentration, and connector style including a photodetector output.

The cells are hard-sealed for long life and feature advanced optical design for very low level of interference artifacts.

The cells are filled with the natural isotopic abundance of carbon monoxide which, for  $^{12}\text{C}^{16}\text{O}$  is > 98.6% (per HITRAN).

We do many custom gas cells so please contact us with your specific requirements or questions.

### Specifications<sup>1</sup>

Wavelength Range	1560nm – 1596nm
Wavelength Accuracy	$\leq 0.3\text{pm}$ (expanded uncertainty)
Line Depth <sup>2</sup> @ R7 (1568nm)	0.87 dB
Line Width <sup>3</sup>	23 pm typical
Temperature Dependence	<0.01 pm/°C
Custom Pressures	Please inquire
Gas Purity	>98% (nat. iso. abundance)
Cell Transmission	>45%; fiber to fiber
Spectral Ripple (P-P)	<0.1dB any 2 nm span
Cell Lifetime	> 10 years
Operating Temperature	0°C to 70°C
Storage Temperature	-40°C to +85°C
Connector Type	FCAPC, SCAPC, FCPC, SCPC, none, PD (photodetector)
<b>Photodetector:</b>	
Net Responsivity	>0.5 A/W
Capacitance (0V)	4 pF typical
Shunt Resistance	>5 MΩ

1. 25 °C; Specifications subject to change without notice.

2. See table next page

3. Increasing/decreasing pressure will increase/decrease linewidth



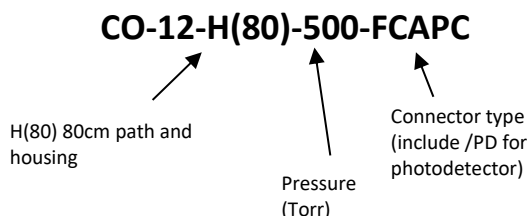
### Features

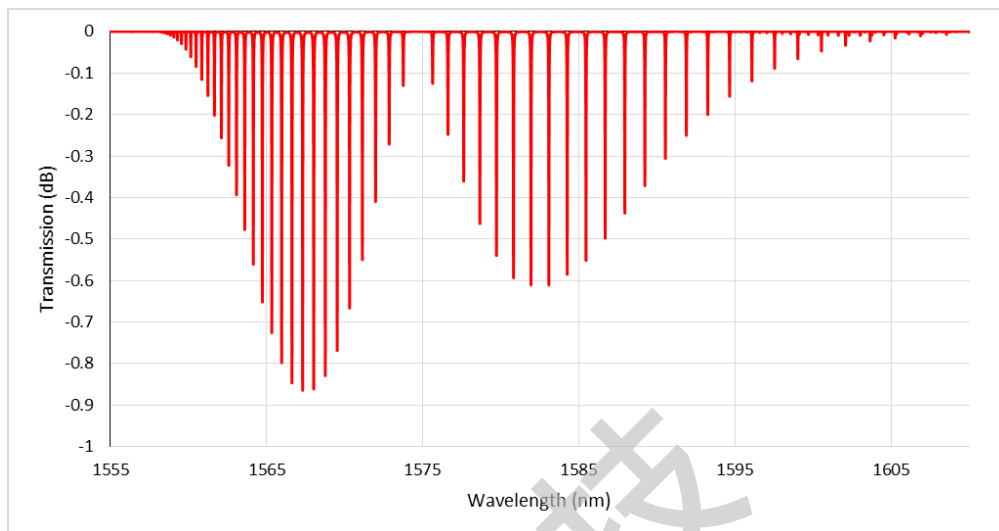
- Hermetic seal, >10 year life
- Wedged windows and coated optics for minimum interference artifacts
- Folded optics for compact design
- Custom pressures and options available
- Low cost
- L-band wavelength coverage

### Applications

- Tunable laser calibration
- OSA or tunable filter calibration
- Wavelength/frequency stabilization
- Chemical detection systems

### Ordering Information (example)





Sample transmission spectrum

R Branch	Wavelength (nm)	P Branch	Wavelength (nm)
21	1560.5013(3)	1	1575.6491(3)
20	1560.8668(3)	2	1576.6303(2)
19	1561.2588(3)	3	1577.6389(2)
18	1561.6775(3)	4	1578.6749(2)
17	1562.1226(3)	5	1579.7382(2)
16	1562.5943(3)	6	1580.829(2)
15	1563.0925(2)	7	1581.9475(2)
14	1563.6173(2)	8	1583.0934(2)
13	1564.1687(2)	9	1584.2672(2)
12	1564.7467(2)	10	1585.4687(2)
11	1565.3513(1)	11	1586.6982(2)
10	1565.9825(1)	12	1587.9555(2)
9	1566.6404(1)	13	1589.241(2)
8	1567.3251(1)	14	1590.5547(2)
7	1568.0365(2)	15	1591.8966(3)
6	1568.7747(2)	16	1593.2669(2)
5	1569.5396(2)	17	1594.6657(2)
4	1570.3314(2)	18	1596.093(3)
3	1571.1501(2)	19	1597.5489(3)
2	1571.9957(2)		
1	1572.8684(2)		
0	1573.7681(3)		

### 500 Torr <sup>12</sup>CO NIST Center Wavelengths

Values as stated by NIST and adjusted for pressure with +/- 25 Torr uncertainty . Expanded (2 sigma) uncertainties are stated in parenthesis and apply to least significant digits.

## NIST Traceability

The resulting absorption spectra exhibited by Wavelength References <sup>12</sup>CO Cells are determined by fundamental molecular energy level transitions that have been well characterized by standards bodies such as NIST. As such, the presence of <sup>12</sup>CO at a specified pressure guarantees repeatable absorption spectra characteristics. Our pressure uncertainty of +/-5% falls within NIST's stated uncertainty of +/-20%. We can therefore state with assurance that our cells are NIST-traceable.

## H(80): 80cm Package

