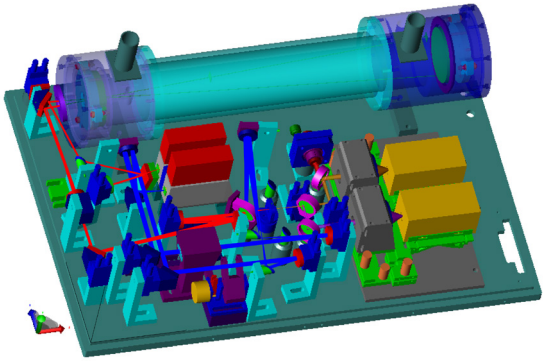
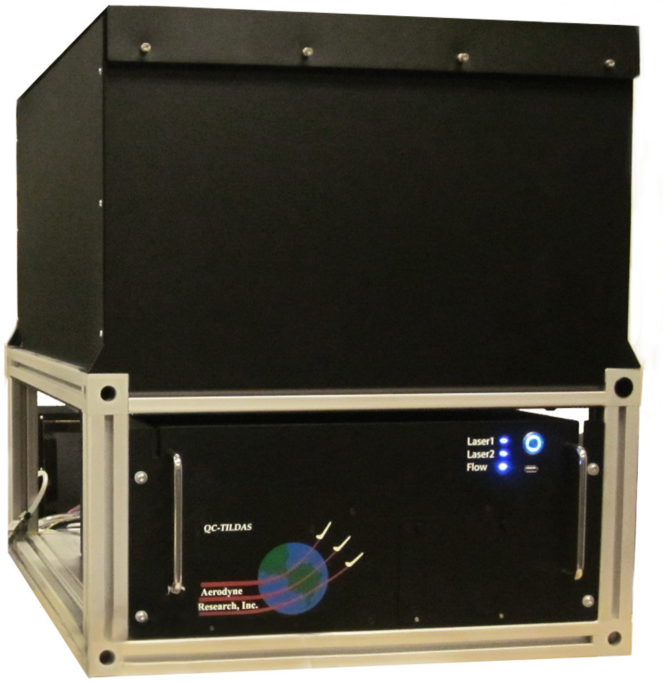
AERODYNE RESEARCH, Inc.

Dual Laser Quantum Cascade Laser Trace Gas Monitor

Sensitive, rapid, highly specific and continuous measurements of multiple atmospheric trace gases in ambient air.





APPLICATIONS

- Extremely sensitive detection of a wide variety of atmospheric trace gases, such as: methane, nitrous oxide, nitric oxide, nitrogen dioxide, carbon monoxide, carbon dioxide, formaldehyde, formic acid, ethylene, acetylene, carbonyl sulfide, acrolein, ammonia and others.
- Combustion monitoring and characterization.
- Isotopic monitoring of CH_4 and N_2O for source/ sink characterization.
- Eddy Covariance measurements.
- Fast response plume studies.
- Air quality monitoring.
- Mobile measurements from ship, truck, and Aircraft platforms.

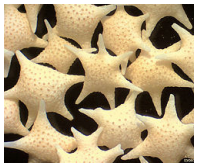
ADVANTAGES

- Absolute trace gas concentrations with out calibration gases.
- Fast time response.
- Free from interferences by other atmospheric gases or water vapor.
- Turnkey and unattended operation.
- Cryogen free.
- Ready to be deployed in field measurements and on moving platforms.
- Two lasers allow simultaneous measurement of more species.
- Optical pathlength of either 76 meters or 210 meters.

AERODYNE RESEARCH, Inc. 45 MANNING ROAD, BILLERICA, MA 01821 (978) 663 9500
www.aerodyne.com

POPULAR INSTRUMENTS

HIGHER PRECISION AND ACCURACY IS OBTAINABLE WITH MID-INFRARED LASERS



Clumped CO_2 Isotopes*

CH_4 Isotopes

CO_2, Water Isotopes

N_2O Isotopes

NO, NO_2

CH_4, N_2O, CO,CO_2, H_2O

MECHANICAL SPECIFICATIONS FOR DUAL QCL:
Dimensions: 530 mm x 660 mm x 710 mm (W x D x H)
Weight: 72 kg
Electrical Power: 500 W, 120/240 V, 50/60 Hz (with Varian IDP-3 vacuum pump)

MULTIPASS CELL:
Choice of 76 meter standard cell (V=0.5 liters) or 210 meter “Super Cell” (V=2liters)

*Image attribution by Psammophile [GFDL (http://www.gnu.org/copyleft/fdl.html) or CC-BY-SA-3.0-2.5-2.0-1.0 (http://creativecommons.org/licenses/by-sa/3.0)], via Wikimedia Commons

REFERENCES:

Nelson, D.D. et al., Optics Let. 31, 2012-2014, 2006.
McManus, J.B. et al., Applied Physics B, DOI: 10.1007/s00340-006-2407-7 (2006).
McManus, J.B., M.S. Zahniser, D.D. Nelson, L.R. Williams, and C.E. Kolb, Infrared laser spectrometer with balanced absorption for measurements of isotopic ratios of carbon gases,, Spectrochim. Acta A, 58, 2465-2479, (2002).
McManus, J.B., D.D. Nelson, J.H. Shorter, R. Jiménez, S. Herndon, S. Saleska, and M.S. Zahniser, A high precision pulsed QCL spectrometer for measurements of stable isotopes of carbon dioxide, J. Modern Optics, 52, 2309-2321 (2005).
Saleska, SR; J. Shorter, S. Herndon, R. Jimenéz, B. McManus, D. Nelson, M. Zahniser, What are the instrumentation requirements for measuring the isotopic composition of net ecosystem exchange of CO2 using eddy covariance methods? Isotopes in Environmental and Health Studies, 42 (1), 117 (2006).
Nelson, D.D., J. B. McManus, S. C. Herndon, M. S. Zahniser, B. Tuzson and L. Emmenegger, New Method for Isotopic Ratio Measurements of Atmospheric Carbon Dioxide Using a 4.3 μm Pulsed Quantum Cascade Laser, Appl. Phys. B 90, 301–309 (2008).
Tuzson, B , J. Mohn, M. J. Zeeman, R. A. Werner, W. Eugster, M. S. Zahniser, D. D. Nelson,
J. B. McManus, L. Emmenegger, High precision and continuous field measurements of δ13C and
δ18O in carbon dioxide with a cryogen-free QCLAS, Appl. Phys. B 92, 451-458 (2008).