TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
Everywhereyoulook™

T500U

"The next generation of nitrogen dioxide gas analyzer technology"

Model T500U CAPS NO_2 Analyzer

Cavity Attenuated Phase Shift Spectroscopy

- Direct NO_2 Measurement – No converter or reagents
- Fast Response, High Sensitivity and Stability
- Low Maintenance and Simple Operation
- US EPA Federal Equivalent Method (EQNA-0514-212)
  EN14211, EN15267
- Includes all the advanced T-Series features
- Available with NumaView™ software

Free Customer Support by telephone and email for the life of the instrument

Model T500U CAPS NO_2 Analyzer

Teledyne Advanced Pollution Instrumentation is pleased to introduce the next generation of nitrogen dioxide (NO_2) measurement technology in the Model T500U CAPS NO_2 Analyzer. The Model T500U is a significant advancement in the measurement of NO_2 gas packaged into a simple and cost effective instrument.

CAPS Measurement Principle

The Cavity Attenuated Phase Shift* (CAPS) spectroscopy technique is a direct, real-time and continuous measurement which leverages the principle of optical absorption.

High frequency square wave modulated LED

Light builds up in cavity due to highly reflective mirrors, distorting wave form

Low frequency, distorted wave form at the detector due to cavity attenuation and ***heterodyne detection*** *scheme*

The presence of absorbing gas reduces the initial phase shift in direct proportion to the concentration of absorbing gas inside the cavity.

By measuring optical absorption based on frequency, rather than intensity, the T500U ***eliminates***:

- Expensive lasers and detector electronics
- Compensation for light source output intensity
- Laser alignment

The T500U provides the same highly accurate direct measurement quality in an instrument package that is a fraction of the cost of other direct measurement techniques.

Heterodyne detection refers to the mixing of two frequencies — one signal and one local, to create a small and easily measurable "beat" frequency at the detector.

ADVANTAGE: *Cost effective electronics*

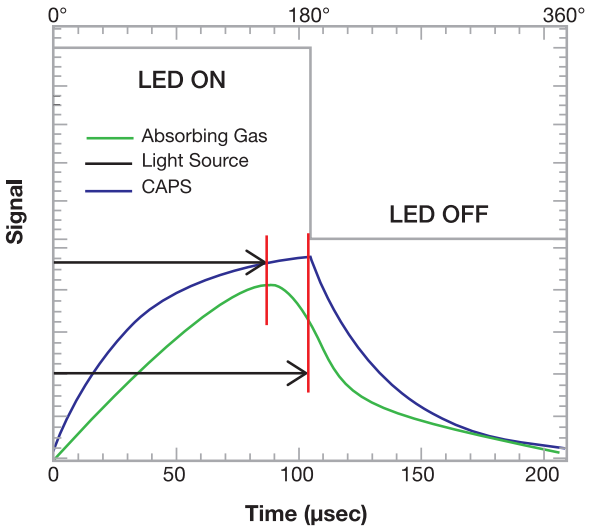
* *licensed from Aerodyne Research, Inc.*

Model T500U CAPS NO_2 Analyzer

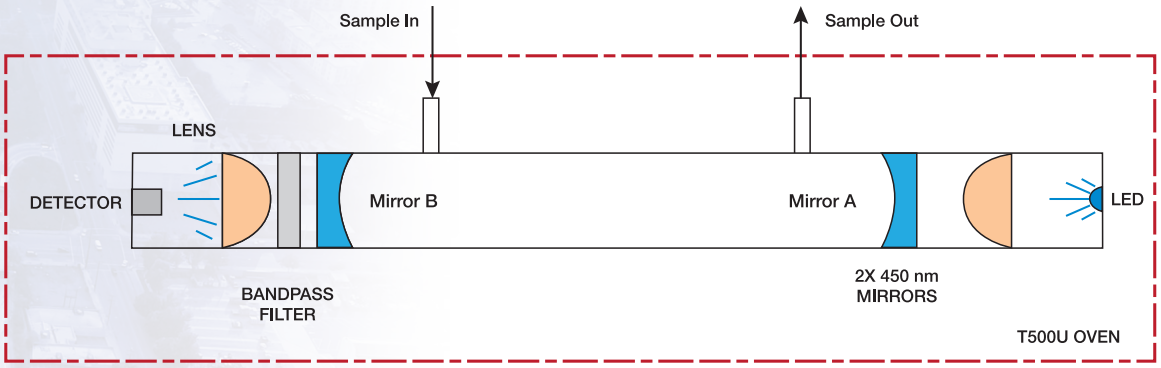
Phase shift measurements are made using a quadrature technique with picosecond time resolution, resulting in both faster response and lower detection limits than traditional methods.

Quadrature mathematics are used in the T500U to resolve the change in phase shift.

ADVANTAGE: *Fast, accurate response*



Measurement of NO_2 Using the Model T500U



The instrument comes ready to meet the requirements of regulatory monitoring of NO_2 in ambient air. The T500U is easily user-customized to meet other data quality objectives.

ADVANTAGE: *Flexibility*

The CAPS measurement technique is used to derive the concentration of NO_2 directly through the combination of a highly specific LED source, bandpass filter, and mirrors centered at 450nm with virtually no interferences in ambient air.

Model T500U CAPS NO_2 Analyzer

Simple Operation and Low Maintenance

The Model T500U is ultra-low maintenance, averaging a one year service interval under typical ambient monitoring conditions.

The Model T500U ***eliminates***:

- High-Temperature Molybdenum Converters
- Ozone Generators and Scrubbers
- External Pumps
- High Energy Costs
- NH_3, CO_2 and HNO_3 Artifacts
- Lengthy Calibration Routines
- Negative NO_2 Artifacts (Skew Error)

The Model T500U CAPS does not require an external pump, converter, or ozone generator.

ADVANTAGE: *Low power consumption and minimal maintenance*

T-Series Platform

The Model T500U shares the same instrument chassis, electronic components, functionality and intuitive interface with our other T-Series platform gas analyzers.

The T500U is available with NumaView™ premium T Series software which provides an enhanced and customizable touch screen interface, real-time graphs, custom alerts and logging, among many other features.

The Model T500U CAPS uses our standard T-Series interface, electronics, and I/O.

ADVANTAGE: *Network Ready*

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CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2008 DNV