

UV-NIR ABSORBANCE DETECTORS

*NH₃, Hg, Ozone, H₂S, SO₂, Mercaptans, CS₂, Cl₂, Br₂, I₂,
Aromatics, Aldehydes, Ketones in air, water & process streams*

Introduction

The **Model 201 B UV-NIR Absorbance Analyzer** is a flexible and versatile non dispersive (ND) Spectroscopic Analyzer. The design is based on ultra stable lamps with single or dual beam optical benches, a detachable sample cell, a photodiode detector and very stable electronics. This Analyzer has a wide dynamic range (from ppb to > percent levels). This rugged and durable design is characteristic of all PID Analyzers products.

Principle of Operation

The technique for measuring the concentration depends upon the Lambert Beer Law:

$$I = I_0 e^{-kx}$$

Where- I is the measured intensity, I₀ is the incident intensity, k is the absorption coefficient, and x is the pathlength

The instrument consists of a UV source, a fixed path length cell (can be varied for the application), an interference filter and an UV detector.

This instrument operates in the near UV to near IR region (200-1,500 nm). The types of electronic transitions in this region are electronic and for organic molecules involve sigma electrons (unsaturated compounds). The types of electrons are found in C=C (PI-PI* transitions) or C=O (N-PI* transitions) in organic compounds.

Features-

The LED meter displays three parameters (concentration (ppb/ppm/%) , temperature, and pressure) and will provide an output for a single parameter.

Easy to operate- In the event of a power outage, the instrument will automatically restart

Wide operating range with no range changing necessary- **16 Bit ADC**

Push button Automatic calibration ; automatically adjusts response

No span or zero pots; all calibration data stored in RAM

Automatic calibration for Absorbance

Can be setup to run without a cal gas standard via an absorbance standard

UV/Visible/Near IR lamp out alarm

Temperature & Pressure correction

Digital Outputs:

Standard- RS232 Optional- RS485, Device Net

Analog Outputs:

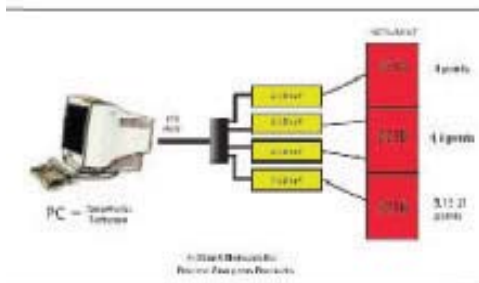
Standard-0-1 VDC analog output; Optional- 4-20 mA

DataWorks

Data Works is PIDs data collection and logging software that can be used with a wide variety of Sensor or Analyzer outputs such as Ethernet, RS485 & 4-20 mA . The latter two outputs are for long distance transmission of data as shown in Table I below. In-plant installations are typically 4-20 mA or RS485 because of the long distances involved 1,000-5,000'.

The software is written in visual C++ as an overlay/interface for various hardware devices. One hardware version used for our Model 201-B, 202, 203, 204, 210, 301B GC, 501 B GC or other manufacturer's instruments that have 4-20 mA outputs or an RS485 output. There is a 12 bit ADC on board with 16 digital input/outputs. The latter can be used to control calibration,diagnostics for the PID Analyzers units. Low and high alarm levels and concentration range can be set in the PC.

Each day at midnight, a new CSV or text file is created and named (by date). These files can be directly imported into EXCEL. The 4-20 mA output from multiple PID Analyzers instruments can be networked as shown below.



Multipoint Sequencer

The 201-B has several multipoint options The first is a simple 2 point system that can be used to monitor the input and output of a scrubber, carbon bed etc. to determine the efficiency of the system. This 201-B has a two channel display; one for each channel.

The second option is a 4, 8, 12, 16, 24 or 32 point system. This system employs a manifold with a needle valve and a 3 way valve for each channel. This version has a three channel display. One channel is for the concentration, the second is for the channel # and the third is for the sample flow for that channel. The flow is measured with a mass flow sensor. The setpoint for the flow channel can be set to indicate a low flow or blockage for a channel. An alarm can be programmed for each channel in the system. this system provides an inexpensive alternative to a sensor for each point. The cost of maintaining and/or calibrating this single system is considerably less expensive than maintaining a 16 or 24 sensor system.

The multipoint system can be interfaced with DataWorks, a PLC or DCS system that is already at the Plant. Contact PID for additional information on in this area.

A three channel display for the multipoint is shown below:



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