



Air Quality Monitoring, Solutions, Reporting & Warning

EPA AQS & AIRNow Data Feeds
Air Quality Index
Ozone, NOx, SO², CO, Particulates
Automatic Gas Chromatographs
WRF Model Forecasting & much more...



**Portable Ozone
Photometer**



**Portable Zero
Air Source**



**Multi Gas
Calibrator**



**Portable Multi
Gas Calibrator**

Region	Current Conditions As of April 9, 2012 @ 2:00 pm EDT		Forecast for April 9, 2012		Forecast for April 10, 2012	
	Air Quality Index	Primary Pollutant	Forecast	Primary Pollutant	Forecast	Primary Pollutant
Richmond	100	Ozone	100	Ozone	100	Ozone
Hampton Roads	100	Ozone	100	Ozone	100	Ozone
Northern Virginia	100	Ozone	100	Ozone	100	Ozone
Roanoke	100	Ozone	100	Ozone	100	Ozone
Winston-Salem	100	Ozone	100	Ozone	100	Ozone

Air Quality Monitoring, Reporting & Warning Systems



Portable Ozone Photometer

Comprehensive Environmental Tools for Decision Makers in One Integrated System

Instrumentation, Software & Systems that Provide Environmental Solutions for the Planet

LEADS® Environmental Monitoring System (EMS), the ideal commercial solution for collecting, integrating, and processing meteorological, air and water quality data, is built on Numerical Weather Prediction Models. Our solutions deliver accurate data in real-time, providing agencies with the most proficient environmental monitoring systems available.

What does LEADS® EMS bring to the table?

- ▶ Automatic Data Flagging
- ▶ Graphical Validation
- ▶ Automatic Alerting
- ▶ Web based Reports
- ▶ Air Quality Pages
- ▶ Water Quality Pages
- ▶ Specialized Reports
- ▶ Hourly Air Quality Index

Virginia.gov Online Services | Agencies | Governor | Help

DEQ VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

My DEQ | Permits | Laws & Regulations | Programs | Locations | About Us | Connect With DEQ

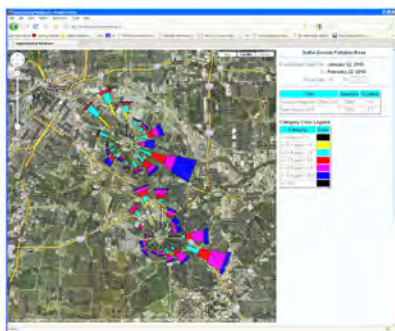
Air Quality Monitoring Data | Air Quality Maps | Additional Info | General Information

Air Quality Forecasting

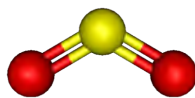
Email: Dan Salweg or Kristen Stangel or Mike Kiser
Current air quality and forecasts by region
Forecasts updated April 9, 2012 1:28 pm EDT.

Region	Current Conditions as of April 9, 2012 8:20 pm EDT		Forecast for April 9, 2012		Forecast for April 10, 2012	
	Air Quality Index	Primary Pollutant	Forecast	Primary Pollutant	Forecast	Primary Pollutant
Richmond	Good - 48	O3	Good	PM2.5	Good	PM2.5
Hampton Roads	Good - 47	O3	Good	PM2.5	Good	PM2.5
Northern Virginia	Good - 42	O3	Good	PM2.5	Good	PM2.5
Roanoke	Good - 49	O3	Good	PM2.5	Good	PM2.5
Winchester	Good - 41	O3	Good	PM2.5	Good	PM2.5

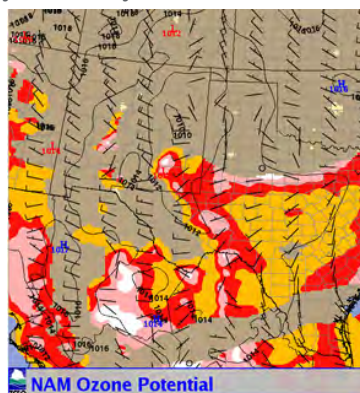
Legend: Good (Green), Moderate (Yellow), Unhealthy for Sensitive Groups (Orange), Unhealthy (Red), Very Unhealthy (Dark Red), Hazardous (Purple)



Sulfur Dioxide Pollution Rose Web Page



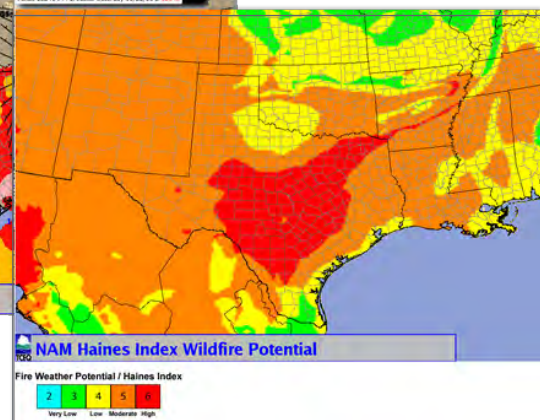
Sulfur Dioxide



Ozone Potential Web Page



Ozone



Fire Weather Forecasting



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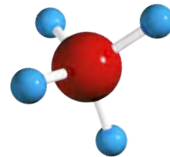
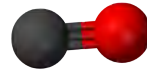
September 11, 2014

Customized Web-Based Data Products



In Texas, Indiana, Virginia, Nevada and across the USA over 500 continuous-monitoring air and water quality sites are powered by Sutron's Air Quality Division systems producing data that is continuously available on-line to view or plot within seconds. The Texas Commission on Environmental Quality, which operates one of the largest monitoring networks in the world, has collected air and water quality data for over 15 years using Sutron's* systems. Among the data display and reporting products provided are the following:

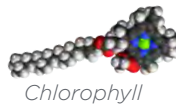
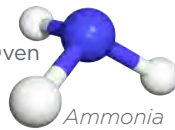
- ▶ Air Quality Monitoring Station Dynamic Monitoring Site Metadata
- ▶ Animated Pollution Displays & Pollution Rose Maps showing Maximum Concentration, Percentiles
- ▶ Web Based Graphical Plots
- ▶ Calibration/Span by Parameters & Web-Based Calibration/Span Reports
- ▶ Graphical Editing & Validation Tools
- ▶ Data Validation Cal/Span History
- ▶ Web-Based Operator Logs with Sorts & History
- ▶ Web-Based Data Query Tools
- ▶ Web-Based Plots
- ▶ Ozone Monitoring Forecasts
- ▶ Public Web Pages with Graphical AIQ Report
- ▶ EPA Air Quality Index Report
- ▶ Data Reports by Site, Daily, Monthly, Annually



Air Quality Monitoring Instrumentation

Sutron's Air Quality Division also manufactures measuring equipment.

- ▶ Multi-Gas Dilution Calibrator & Portable Multi-Gas Dilution Calibrator
- ▶ Heated Sample Manifold
- ▶ Methane Catalytic Oxidizer
- ▶ Ozone Transfer Standard Photometer
- ▶ Permeation Ovens (2 models) & Portable Permeation Oven
- ▶ Zero Air System & Portable Zero Air System



Capabilities

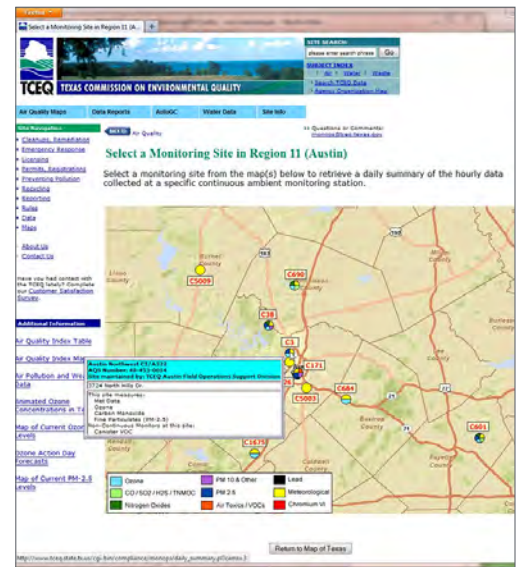
- ▶ System Integration
- ▶ Air Quality Monitoring W/Automatic Calibrations
- ▶ Trace Gas Monitoring
- ▶ Water Quality Monitoring (Surface and Well)
- ▶ EMRS Air & Water Quality Alert Systems
- ▶ Ozone Alerting
- ▶ Automatic Gas Chromatographs(with Data Flagging)
- ▶ FTIR Systems
- ▶ Single and Multi-Can Canisters
- ▶ NEXTRad, Satellite Imagery, Weather User Interface

Additional Services

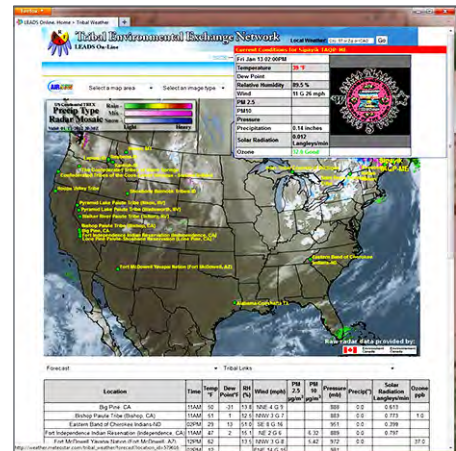
- ▶ Site Selection and Site Prep
- ▶ Site Installation and Retrofits
- ▶ Instrument Selection and Installation
- ▶ Communication Systems
- ▶ Shelters
- ▶ Station Plumbing
- ▶ Calibration Systems
- ▶ Meteorological Instruments & Towers
- ▶ Solar Powered Monitoring Stations



Clark County, Nevada Air Quality Monitoring Web Page



Texas Commission on Environmental Quality Web Page



Tribal Environmental Exchange Network



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Portable Gas Dilution Calibrator



Standard Features

Pneumatics

- ▶ Diluent Mass Flow Controller, 0-10 SLM
- ▶ Source Mass Flow Controller, 0-100 SCCM
- ▶ 2 Calibration Gas Input Ports and 1 Purge Port
- ▶ 4 Output Ports and 1 Vent Port
- ▶ 1 Diluent Gas Input Port

Electronics

- ▶ Bright Active Matrix Color Display
- ▶ 42-Button Membrane Keypad
- ▶ 8 Bits Digital Input/Output
- ▶ 2 Serial Ports for Data Communications
- ▶ External PC keyboard Input Port
- ▶ Centronics Parallel Printer Port
- ▶ Air Source Control Port

Electrical

- ▶ Standard 98-264 VAC, 150-300 VA, 50/60 Hz Operation

Optional Features

- ▶ Alternate Diluent Mass Flow Controller, Ranges 0-20 SLM
- ▶ Alternate Source Mass Flow Controller, Ranges 0-1 SLM
- ▶ Second Source Mass Flow Controller, Ranges 0-1 SLM
- ▶ Additional Calibration Gas Input Ports
- ▶ Multi-source Blending
- ▶ Permeation Port
- ▶ Additional Status I/O Bits up to 24 Total
- ▶ Internal Instrument Solenoid Driver, 6 Outputs, 24V @ 3W ea
- ▶ Internal Ozone Generator
- ▶ Ozone Generator UV Optical Servo Control Loop
- ▶ Side mounted carrying straps
- ▶ High-impact transport case
- ▶ Rack Mount Version Available in 5.25"H U-Chassis (2010D) with internal UV photometer



Users can easily perform gas dilution, ozone and GPT calibration with this Intelligent Portable Gas Dilution Calibrator from Sutron's Sabio Division.

The Model 2010 is small in size and weight for users who require true portability. Enhanced with the latest technology, the Model 2010 calibration system is an uncomplicated and effective way to precisely control the dilution of gas standards for calibration of ambient air and source monitoring analyzers.

The Model 2010 calibrator makes use of embedded microprocessor technology to enhance the accuracy and control of the featured calibration system. The unit can be operated manually, automatically, or semi-automatically by remote control. It also has the capability to produce and store in memory 20 calibration sequences, with up to 20 levels of source/dilution in each sequence.

Users can use either the front panel membrane keypad, external keyboard, or serial port to input calibration parameters.

The instrument's pneumatic system uses Mass Flow Controllers to precisely meter gas streams and implements multiple types of curve correction algorithms to linearize calibrations.

Calibrator design exceeds US EPA calibration method requirements. Dilution components are calibrated with standards and test equipment traceable to the National Institute of Standards and Technology (NIST).



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Portable Gas Dilution Calibrator

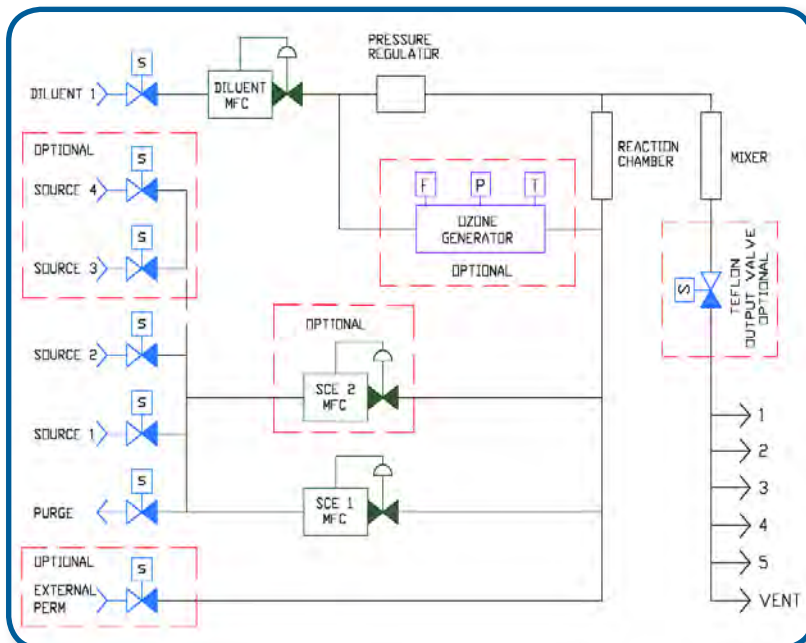


SPECIFICATIONS

Specifications subject to change without notice

Dilutions System	
Input Dilution Gases	1 Standard
Input Source Gases	1 Standard, 1 Purge
Additional Inputs	4 Additional
Dilution Mass Flow Controller	
Optional Ranges	0-20 SLPM
Source Mass Flow Controller	
Optional Ranges	0-1 SLPM
2nd Source Mass Flow Controller	
Optional Ranges	0 thru 2 SLPM
Flow Accuracy	< 31% full scale
Flow Repeatability	< 30.15% full scale
Linearity	< 30.5% full scale
Input Pressure	12-35 PSIG
Output Manifold	
Optional Outputs	4 Additional
Optional Internal Ozone Generator	
Output	0.05-1.5 ppm @ 5 SLPM
Accuracy	3 2% of Set Point or 3 3 ppb @ 5 SLPM
Nominal Flow	100 SCCM, 3 1 SCCM
UV Lamp Temperature	50°C, 3 0.1°C

Calibrator interface	
Operation	Manually through 42-button membrane keypad, keyboard, serial ports
Calibration Definitions	20 factory-defined calibration sequences with up to 20 points per sequence
Calibration Types	Gas Dilution, Ozone, GPT
Gas Definitions	1 Diluent Gas 20 Source Gases
Auto Calibrations	20 timer driven cal routines performing user-defined calibration sequences on a 7-day calendar
Digital Inputs/Outputs	8 status I/O bits control calibrator functions by contact closures or TTL logic & output bits monitor calibrator functions
Optional I/O	Additional 16 status I/O bits for a total of 24 I/O bits
Communications	RS232
Calibrator System	
Operating Temperature	5°C to 40°C
Dimensions	6.2 (15.6 cm) H 14.3 (36.4 cm) W 12.4 (31.6 cm) D
Average Weight	19 lbs. (8.6 kg)
Input Voltage	98-264 VAC, 100 VA, 50/60 Hz Operation



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Portable Zero Air Source Model 2020



Overview

The Model 2020 Portable Zero Air Source meets a wide range of requirements for the environmental industry. The unit achieves maximum proficiency when it operates with the Sabio Model 2010 Gas Dilution Calibrator (for testing of pollution monitoring analyzers).

The Model 2020 uses an internal drying system for removal of moisture and is coupled with filter canisters for scrubbing pollutants. Optional features such as the internal Carbon Monoxide Oxidizer or external Methane Oxidizer further the Model 2020's clean air capabilities.

The small package size and weight make the Model 2020 suitable for portable applications. The unit is ideal for field auditors who must travel with their testing equipment and for limited bench space environments.

User Benefits

The Model 2020 compressor can be activated remotely by all Sutron calibrators using a standard air source control cable. This allows the compressor to operate only when the calibrator requires zero air.

In addition, the Model 2020 is simple to operate. The unit has a front panel mounted pressure regulator with a locking mechanism and pressure gauge. Additionally, there is a front panel mounted condensate purge switch for manual purge. The internal air source control board can be adjusted for automatic purge frequency and duration. On power down or power failure the pressure tank is automatically drained of moisture and pressurized air.

Standard Features

- ▶ Standard 12 LPM @ 15 PSIG
- ▶ Condensate/purge valving for moisture removal. Operates automatically with internal circuitry or manually with the purge switch.
- ▶ Front panel mounted pressure gauge.
- ▶ Front panel mounted adjustable pressure regulator.
- ▶ Front panel mounted purge switch.
- ▶ Internal moisture removal system.
- ▶ Media canisters for removal of NOX, SO2, H2S, O3, low level organic compounds and CO.
- ▶ Side mounted carrying straps (shown in picture)



Optional Features

- ▶ Tilt-up front handle with tilt-up front feet
- ▶ High-impact transport case
- ▶ Internal CO catalytic oxidizer
- ▶ Model 2050 Methane Catalytic Oxidizer (separate portable chassis)

SPECIFICATIONS

Specifications subject to change without notice

AIR QUALITY	
Standard unit	NOX, NO, NO2, O3, SO2, H2S <0.5 ppb
Standard unit with CO catalytic Oxidizer:	NOX, NO, NO2, O3, SO2, H2S <0.5 ppb, CO <0.025 ppm
Standard unit with external methane catalytic oxidizer	NOX, NO, NO2, O3, SO2, H2S <0.5 ppb, Hydrocarbon ≤ 0.02 ppm
MECHANICAL	
Height	6.5 in. (16.5 cm)
Width	13.9 in. (35.3 cm)
Depth	15.0 in. (38.1 cm)
Average Weight	23 lbs (10.4 kg)
ELECTRICAL	
Standard	98-132 VAC
Optional	196-264 VAC, 50/60 Hz



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Zero Air Source #1001



Overview

Sutron's Zero Air Source is designed to meet the requirements of clean and dry air for dilution calibrators or other environmental applications. The units offer a wide range of standard features/options to accommodate a host of monitoring applications, including rack mount or portable environments

Equipped with dual coalescent filters and a permeation drier for removal of moisture from the source stream, further moisture removal is enabled by automatic drain removal using adjustable control circuitry, manual purging from the front panel, or upon completion of calibration, when controlled automatically by a Sutron dilution calibrator.

Air pollutants are removed using re-usable dual rear-mounted filter canisters. Other pollutants such as carbon monoxide or hydrocarbons can be removed with an internal oxidizer. Both types of internal oxidizers come equipped with front panel mounted temperature controllers that display the set-point as well as the temperature monitor.



Standard Features

- ▶ Standard 22 SLM at 25 psig air delivery (flow may decrease 2-4 SLM with addition of some options or changes in line frequency)
- ▶ 3.4 liter surge/condensate tank
- ▶ Condensate/purge valve that operates both automatically and manually to drain condensate
- ▶ Front panel mounted pressure gauge
- ▶ Front panel mounted adjustable pressure regulator
- ▶ Front panel mounted purge switch
- ▶ Automatic Control via contact control or a switched low voltage DC power source
- ▶ Internal moisture removal system
- ▶ Media canisters for removal of NOX, SO₂, H₂S, O₃, low level organic compounds and CO
- ▶ Long-life brushless, oil-free compressor
- ▶ Quiet operation

Optional

- ▶ Internal or external CO catalytic oxidizer
- ▶ Internal or external hydrocarbon oxidizer
- ▶ Digital pressure meter
- ▶ Output flow meter (Model 1001)
- ▶ Rack-mount kit (Model 1001)

Specifications

Specifications subject to change without notice

Air Quality	Standard Unit	
		NOX, NO, NO ₂ , O ₃ , SO ₂ , H ₂ S, < 0.5 ppb
	Standard unit with CO catalytic Oxidizer	NOX, NO, NO ₂ , O ₃ , SO ₂ , H ₂ S < 0.5 ppb, CO < 0.025 ppm
	Standard unit with hydrocarbon oxidizer	NOX, NO, NO ₂ , O ₃ , SO ₂ , H ₂ S < 0.5 ppb, Hydrocarbons < 0.02 ppm
Mechanical	Rack Mount Unit Model 1001	Size 8.75 in. (22.2 cm) H X 19.0 in. (48.3 cm) X W 19.0 in. (48.3 cm) D, Average Weight: 55-70 lbs. (25-32 kg)
	High Output Portable Unit Model 1001P	Size 14.24 in. (36.2 cm) H X 21.0 in. (53.3 cm) X W 24.75in. (62.9 cm) D, Average Weight: 51-61 lbs. (23.1-27.7 kg) Portable Unit
Electrical	Standard	120 VAC 60 Hz, 470 VA operation
	Optional	240 VAC, 50 Hz, 340 VA operation

*Model 1001P - Portable
Smaller portable units
available for lower output
applications
(Model 2020).*



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Methane Catalytic Oxidizer

Model 1000M Methane Catalytic Oxidizer



Specifications

SPECIFICATIONS	
<i>Specifications subject to change without notice</i>	
Temperature Controller	Microprocessor-based
Features	Proportional heater control
	Digital display of set point
	Digital display of over temperatures
Dimensions	5.25" (13.3 cm) H x 19" (48.3 cm) W x 15" (38.1cm) D
Weight	18 lbs (8.2 kg)
Communications	RS232
Power Requirements	98-132 VAC (optional 196-264) 360 VA, 50/60 Hz

Note: The methane catalytic oxidizer is available as an internal option for the Model 1001 and Model 1001P series Zero Air Sources.

Overview

The Model 1000M Methane Catalytic Oxidizer is a reliable method for the removal of methane or carbon monoxide. Ideal for use with any of Sutron's air sources, this oxidizer is efficient in furthering the reduction of air pollutants before the zero air.

The Model 1000M Methane Oxidizer meets industry requirements for a thermal oxidizer with increased oven reliability and stability; faster rise times; higher converter efficiencies; ease of use; and packaging tailored to meet the customer's needs.

The proprietary two-stage, multiple path tube design and highly efficient oven design enable the Model 1000M Methane Oxidizer to efficiently oxidize at relatively low temperatures. The oven temperature is precisely maintained by a microprocessor-based temperature controller driving a high-capacity optically isolated triac control module. The dual display temperature controller uses pulse width modulation to regulate the heat cycle to prevent over shooting and minimize thermal noise from on/off cycling. A thermal cutoff switch works with the heating element to protect the electronic circuitry and oven from thermal overload conditions.

Average Model 1000M Methane Oxidizer converter efficiency is 95 to 98 percent. Insertion of the Model 1000M into the analyzer sample loop results in a decrease of analyzer sensitivity by about one percent of full scale setting and an increase in analyzer rise/fall time by five to 10 percent.

Optional Features / Spares

- ▶ Catalyst Recharge Kit
- ▶ Rack Mount Kit



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Heated Sample Manifold

Model 1002/1004 Heated Sample Manifolds



Overview

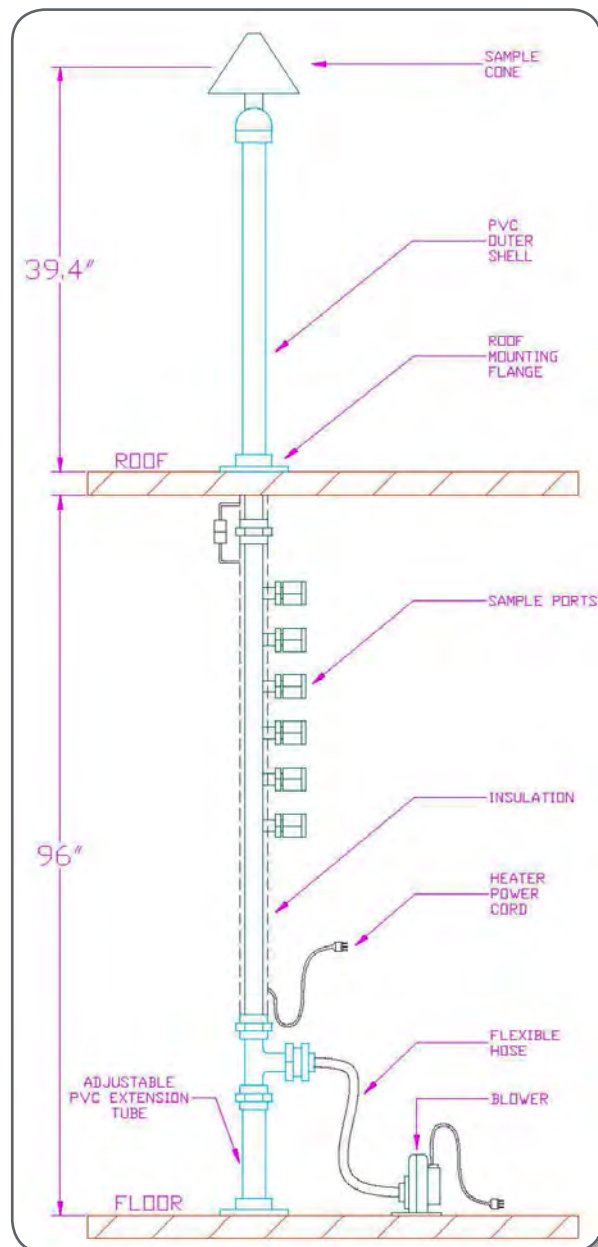
Collecting and distributing homogenous ambient air samples for gas analysis is easy with the Sutron Model 1002 and 1004 heated Sample Manifolds. Able to work equally well in dry or humid and salty environments, the manifold is well suited for collecting reactive air toxic data.

For durability and reactive inertness, Model 1002 is constructed of 316 stainless steel. Model 1004 is constructed with highgrade glass. Particulate build-up and sample degradation are minimized with the full-length, heated, vertical design.

SPECIFICATIONS

Specifications subject to change without notice

Models 1002, 1004	
Rain protection	Sample cone
Sample heating	Full length
Sample outlet ports	Six ¼" (6.35 cm)
Temperature	Over temperature cutout
Construction	Fully wired & insulated
Blower	High capacity 40 CFM with flexible connecting hose
Mounting	Flange & gasket hardware for roof & flood mounting
Power	Standard 98-132 VAC (optional 196-264 VAC) Operation, 250 VA, 50/60 Hz Add 50 VA for 24" (60.96 mm) sample manifold extension
Options, Accessories	Model 1003 Manifold Valve Controller
	Custom Manifold lengths
	Additional sample ports
	Gas analyzer sample stream valves
	24 volt DC blower
	Bug Screen
	Cleaning kit



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Portable Permeation Oven

Model 2505



Overview

Sutron's Model 2505 Portable Permeation Oven generates precise gas concentrations for calibration of air quality analyzers, source monitors and other instruments. The Model 2505 may be combined with the Model 2010 and 4010 Gas Dilution Calibrators to form a very powerful intelligent calibration system.

Carrier air is provided by an internal air supply featuring an inlet filter, quiet internal pump and rear mounted scrubber canister. A precision regulator and critical orifice is used to regulate carrier flow through the permeation oven. A 0-15 psig pressure gauge is calibrated to provide carrier flow reference points.

The heart of the Model 2505 is a large capacity Teflon coated permeation chamber that can accommodate many types and sizes of permeation tubes concurrently. A front-panel-mounted knurled screw-in stopper is provided for easy access of the permeation chamber. The permeation chamber is housed in a precise temperature controlled insulated oven that features a carrier pre-heater, heaters and RTD sensor.

The oven temperature is precisely maintained by a microprocessor based temperature controller driving an optically isolated DC control module. Pulse width modulation is used to regulate the heat cycle to minimize thermal noise due to heater on/off cycling.

Dual displays on the temperature controller provide direct readout of set point temperature and actual oven temperature. Oven temperature is maintained within +/- 0.1 deg. C of setpoint.

The oven temperature control system and carrier air supply are battery backed for 8 hours of operation.



SPECIFICATIONS

Specifications subject to change without notice

Mechanical	6.0" (15.2 cm) H 14.5" (36.8 cm) W 18.0" (45.7 cm) D
Weight	24 Lbs. (10.9 kg)
Electrical	Standard: 98-264 VAC, 150 VA, 50/60 Hz
Battery	Approximately 8 hours
Accessory	High Impact Transport Case

Standard Features Permeation Oven

- ▶ Teflon Coated Chamber: 3.09 cm inside chamber diameter, 13.4 usable length, 107 cubic cm volume. Nominal carrier gas flow is 100 sccm
- ▶ Stainless Steel and Teflon gas handling materials
- ▶ Oven operating range 5 deg. C above ambient to 60 deg. C,
- ▶ Unit operating temperature 5-40 deg. C



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September 5, 2014

Permeation Oven

Model 2500C



Overview

Sutron's Model 2500C Permeation Oven Calibrator generates precise gas concentrations for calibration of air quality analyzers, source monitors and other instruments. The Model 2500C generates span and zero reference points for calibration of analyzers. The span concentration is adjusted using a precision front panel mounted potentiometer. The calibration selection knob is used to determine whether a span point is active, zero point is active or to place the unit in Standby mode for either non-use or remote activation using digital I/O. An internal calibration solenoid switches the instrument sample inlet from the Sample Manifold Port to the Model 2500C permeation calibration facilities.

The Model 2500C contains an internal zero air supply for supplying carrier and diluent air for diluting generated source gas. The zero air source consists of an inlet particulate filter, air compressor, dual coalescing filters with float drain valves, pollution scrubber canister and pressure regulator with gauge. Dilution flow is maintained by a 10 SLM mass flow controller with dual readouts and is front panel mounted for visual confirmation of flow

The heart of the Model 2500C consists of a large capacity permeation chamber that can accommodate many types and sizes of permeation tubes through a front panel accessed stopper. The well insulated chamber is equipped with an RTD sensor connected to a microprocessor based temperature controller with dual displays drives an optically isolated control module to precisely maintain oven temperature within +/- 0.1 deg. C of set point.

Standard Features

- ▶ Teflon Coated Chamber: 3.09 cm inside chamber diameter, 13.4 usable length, 107 cubic cm volume.
- ▶ Nominal carrier gas flow is 100 sccm.
- ▶ Stainless Steel and Teflon gas handling materials
- ▶ Oven operating range 5 deg. C above ambient to 60 deg. C.
- ▶ Unit operating temperature 5-40 deg. C
- ▶ Mass Flow Controller operating range: 1-10 SLM
- ▶ Air Cleanup of NOX, SO2, H2S, O3 and

SPECIFICATIONS

Specifications subject to change without notice

Mechanical	5.25" (13.3 cm) H 19" (48.3 cm) W 22" (55.9 cm) D
Weight	30 Lbs. (13.6 kg)
Electrical	Standard: 98-132 VAC or 196-264 VAC, 50/60 Hz, 650 VA
Accessories	Unit without internal zero air Rack Mount Kit



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September 5, 2014

Permeation Oven

Model 2500



Overview

Sutron's Model 2500 Permeation oven is a simple, effective tool for generating precise gas concentrations for calibrating air quality analyzers, source monitors and other instruments. When combined with Sutron's Gas Dilution Calibrators, it creates a powerful and intelligent calibration system.

The Model 2500 Permeation Oven chamber is large enough for a variety of tasks and was designed to be used in a number of different settings.

Operators can use many types and sizes of permeation tubes concurrently in the Model 2500's large-capacity gas permeation chamber. A front panel mounted precision pressure regulator, reference pressure gauge, temperature controller and oven inlet give the operator easy access to the unit controls at all times. Carrier air is provided by the Model 2500's clean air system.

Model 2500 Optional Features

- ▶ Rack Mount Kit
- ▶ Dual Permeation Oven

Note: The permeation oven is available as an internal option for the Model 4010 Gas Dilution Calibrator.

Model 2505 Portable Permeation Oven

The Model 2505 enjoys the same basic features as the Model 2500, but it offers a battery backup for continuous control of the permeation oven while the unit is in transit. In addition, the portable unit is housed in a smaller chassis for easy transport and handling.

Model 2505 Specification Variances

- ▶ Battery Backup: 10 hours operation when fully charged
- ▶ Size Approximately: Height 6.2 in. (15.6 cm) x Width 14.3 in. (36.4 cm) x Depth 14.4 in. (36.6 cm)
- ▶ Weight 18 lbs (8.2 kg)

Model 2505 Optional Features

- ▶ High Impact Transport Case
- ▶ Dual Permeation Oven



Model 2500 Specifications

Specifications subject to change without notice

Temperature controller	Microprocessor-based
	Proportional heater control
	Digital display of set point & oven temperatures
Temperature & set point	Digital display
Temperature sensor	RTD
Front panel mounted	Pressure regulator, pressure gauge, temperature controller and oven inlet
Glass Oven Size	3.20 cm inside chamber diameter, 13.4 cm usable length, 107 cubic cm volume
Teflon Coated Oven Size	3.09 cm inside chamber diam, 12.7 cm usable length, 123.6 cubic cm volume
Operating Range	2 deg. C above ambient to 60 deg. C, alternate ranges available upon request
Other Features	Quiet, long life Diaphragm pump
	Air inlet filter
	Moisture removal system
Unit Operating Temperature:	5 deg. C to 40 deg. C
Warm Up:	Less than 30 minutes
Electrical:	98-132 VAC (Optional 196-264 VAC), 150 VA, 50/60 Hz
Unit Size	5.25" (13.3 cm) x 19" (48.3 cm) W x 15" (38.1cm) D
Weight	18 lbs (8.2 kg)



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September 5, 2014

Gas Dilution Calibrator 4010L



Overview

Users can easily perform gas dilution, ozone, and GPT calibration with Sabio Instrument's intelligent Model 4010 Gas Dilution Calibrator. The Model 4010 was designed to set a new standard of quality and performance for gas dilution calibrators. Enhanced with the latest technology, Sabio's Model 4010 calibration system is an uncomplicated and effective way to precisely control the dilution of gas standards for calibration of ambient air and source monitoring analyzers.

The Model 4010 calibrator uses embedded microprocessor technology to enhance the accuracy and control of the featured calibration system. The unit can be operated manually, automatically, or semi-automatically by remote control to conduct calibrations. The calibrator has the capability to produce and store in memory 20 calibration sequences, with up to 20 levels of source/dilution in each sequence. Users can employ the front panel membrane keypad, an external keyboard, or use the serial port to input calibration parameters.

The pneumatic system for the Model 4010 utilizes Mass Flow Controllers to precisely meter all gas streams and implements multiple types of curve correction algorithms to linearize calibrations.

The Model 4010 design exceeds the United States EPA calibration method requirements. Dilution components are calibrated with standards and test equipment traceable to the National Institute of Standards and Technology (NIST).

Standard Features

Pneumatics

- ▶ Diluent Mass Flow Controller, 0-10 SLM
- ▶ Source Mass Flow Controller, 0-100 SCCM
- ▶ 4 Calibration Gas Input Ports and 1 Purge Port
- ▶ 5 Output Ports and 1 Vent Port
- ▶ 1 Diluent Gas Input Port

Electronics

- ▶ Bright Active Matrix Color Display, 25 line x 80-character
- ▶ 55-Button Membrane Keypad
- ▶ 24 Bits Digital Input/Output
- ▶ 2 Serial Ports for Data Communications
- ▶ External PC Keyboard Input Port
- ▶ Centronics Parallel Printer Port
- ▶ Air Source Control Port

Electrical

- ▶ Standard 98-264 VAC, 150-300 VA, 50/60 Hz Operation



Optional Features

- ▶ Alternate Diluent Mass Flow Controller, Ranges 0-20 SLM
- ▶ Alternate Source Mass Flow Controller, Ranges 0-10,000 SCCM
- ▶ Second Source Mass Flow Controller, Ranges 0-10,000 SCCM
- ▶ Additional Calibration Gas Input Ports
- ▶ Permeation Port
- ▶ Additional Output Ports
- ▶ Second Diluent Gas Input Port
- ▶ Internal Ozone Generator
- ▶ Ozone Generator UV Optical Servo Control Loop
- ▶ Internal Ozone UV Absorption Photometer
- ▶ Internal Permeation Oven
- ▶ Master Output Solenoid
- ▶ Internal Instrument Solenoid Driver, 6 Outputs, 24V @ 3W ea
- ▶ Rack Mount Kit
- ▶ Ethernet TCP/IP, RS-232



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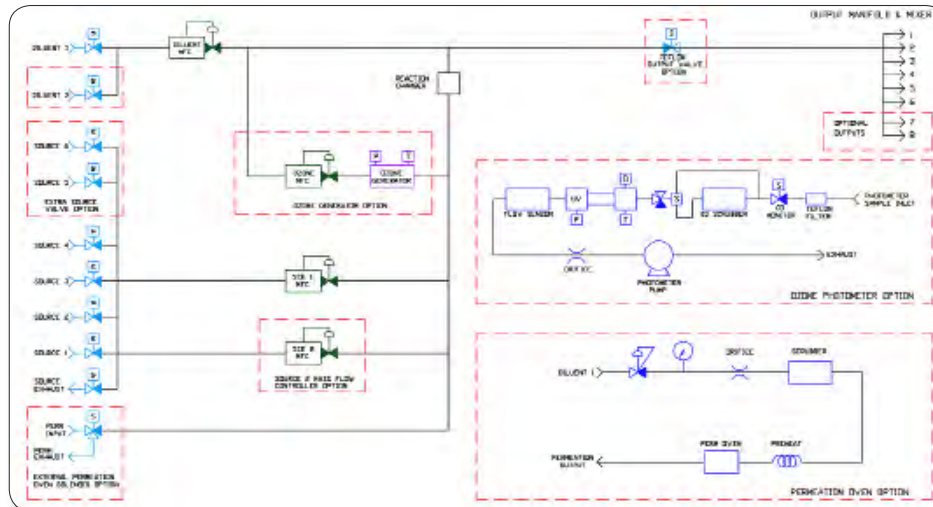
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September 26, 2014

Gas Dilution Calibrator

4010L



Specifications

Specifications subject to change without notice

Dilutions System

Input Distribution Gases	1 Standard (2 Optional)
Input Source Gases	4 Standard, 1 Purge, Optional 2 Additional
Dilution Mass Flow Controller	0-10 SLPM, Optional 0-20 SLPM
Source Mass Flow Controller	0-100 SCCM, 0-10,000 SCCM
2nd Source Mass Flow Controller	0-10,000 SCCM
Flow Accuracy	$\leq \pm 1\%$ Full Scale
Flow Repeatability	$\leq \pm 0.15\%$ Full Scale
Linearity	$\leq \pm 0.5\%$ Full Scale
Input Pressure	20-35 psig
Output Manifold	6 Outputs Standard, Optional 2 Additional

Optional Internal Ozone Generator

Output	0.05-1.5 ppm @ 5 SLPM
Accuracy	$\pm 1\%$ of Set Point or ± 2 ppb @ 5 SLPM
Nominal Flow	100 SCCM, ± 1 SCCM
UV Lamp Temp.	50° C, ± 0.1 ° C

Optional Internal UV Absorption Photometer

Standard Ranges	0-0.5, 1.0, 2.0 ppm
Linearity	± 1 ppb or $\pm 1\%$ of full scale (greater of two)
Precision	± 1 ppb
Zero Drift	$< \pm 1$ ppb for 24 hrs or 30 days

Flow Rate	1 Liter (nominal)
Analog Outputs	3 Ranges 5V, 1V, 100 mV
Optional Internal Permeation Oven	
Chamber Materials	Glass or Teflon
Chamber Size	1 Perm Tube (Any Size)
Adjustable Temperature	5° C Above Ambient Temperature to 65 °C
Temperature Accuracy	$\leq \pm 0.1$ ° C
Calibrator Interface	
Operation	manually (55-button keypad, keyboard, serial ports)
Calibration Definitions	20 factory-defined calibration sequences (≤ 20 points each)
Calibration Types	Gas Dilution, Ozone, GPT
Gas Definitions	2 Diluent Gases, 20 Source Gas
Auto Calibrations	20 timer driven cal routines that perform user-defined calibration sequences on a 7 day calendar of events
Digital Inputs	24 status I/O bits for calibrator functions
Digital Input Types	contact closure or TTL logic
Digital Outputs	24 status output bits for monitoring calibrator functions
Communications	RS232, Ethernet TCP/IP
Calibrator System	
Operating Temperature	5 deg. C to 40 deg. C
Dimensions	8.75" (22.2 cm) H x 17" (43.2 cm) W x 20" (50.8 cm) D
Average Weight	40 lbs. (18.1 kg)
Input Voltage	98-264 VAC, 150-300 VA, 50/60 Hz operation



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September 26, 2014

Ozone Transfer Standard Model 2030 Ozone Photometer



Overview

The Model 2030 is a portable ozone photometer transfer standard for calibrating, certifying or auditing ozone analyzers and ozone generators.

Using Beer-Lambert's Law, the Model 2030 measures the amount of ultraviolet (UV) light attenuated at 254 nm across the sample path for ozone.

The acquired sample is divided into two sample streams: a reference gas and a sample gas. Real-time comparison of the UV light intensity of the sample gas to the reference gas yields the precise concentration of ozone.

Advanced, easy to use, menu-driven software allows access to sample conditions, diagnostics and measured ozone concentrations. Users can operate the Model 2030 from the keypad or through the front panel buttons for quick access.

An optional internal ozone generator is available for generating ozone concentrations between 0.05- 1.5 PPM.

Standard Features

- ▶ Microprocessor Controlled
- ▶ 33-Button Membrane Keypad
- ▶ 8 Line x 40 Character, 256 x 64 Pixel Graphics Vacuum Fluorescent Display

Optional Features

- ▶ Internal Ozone Generator
- ▶ Tilt-up Front Feet
- ▶ Portable Side Handles
- ▶ High-Impact Transport Case
- ▶ Internal Zero Air Source



Specifications

Specifications subject to change without notice

Ranges	0-100, 0-200, 0-500 ppb or 0-1, 0-2, ppm
Zero Noise 0.6 ppb RMS	0.6 ppb RMS
Lower Detectable Limit	1 ppb
Zero Drift	< 1.0 ppb/24 hr, < 2.0 ppb/7 days
Span Drift	< 1% per month
Response Time	20 seconds, 10 seconds lag time
Precision	1 ppb
Linearity	+/- 1% Full Scale
Sample Flow Rate	1 Liter/Minute
Operating Temperature	5 - 45 Deg. C
Power Requirements	Universal Power Supply, 98-264 VAC, 100 VA, 50/60 Hz
Analog Outputs	0.1V, 1V, 2V, 5V, 10V, Standard DB-9 Connector
RS-232/RS-485	Port Standard DB-9 Connector
Physical Dimensions	6.2 in. (15.6 cm) H x 14.3 in. (36.4 cm) x 12.4 in. (31.6 cm) D
Average Weight	20 lbs. (9.1 kg)



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December 2, 2014

Gas Dilution Calibrator Model 2010D



Overview

The Model 2010D represents the latest generation of calibrator technology for ambient air monitoring, continuous emission monitoring (CEM), fugitive emissions, point source, odor and process monitoring.

Gas dilution, ozone, or gas phase titrations (GPT's) are easily accomplished using this small, portable offering from Sabio.

The Model 2010D calibrator uses embedded microprocessor technology to precisely deliver and control gas concentrations along with multiple curve fits to linearize the desired output for the intended purpose. The unit can be operated manually or automatically to conduct calibrations, audits or certifications that exceed U.S. Environmental Protection Agency (EPA) and European Standard (EN) method requirements.

The Model 2010D can store 20 calibration sequences, with up to 20 concentration levels in each sequence. Menu driven software allows users access from the front panel keypad, external keyboard, or serial port for operation, feedback and real-time diagnostics.

Pneumatics for the Model 2010D utilize Mass Flow Controllers (MFC's) to accurately meter all gas streams for reliable and repeatable gas concentrations.

Standard Features

Pneumatics

- ▶ Diluent Mass Flow Controller, 0-10 SLM
- ▶ Source Mass Flow Controller, 0-100 SCCM
- ▶ 4 Calibration Gas Input Ports and 1 Purge Port
- ▶ 5 Output Ports and 1 Vent Port
- ▶ 1 Diluent Gas Input Port

Electronics

- ▶ Bright Active Matrix Color Display
- ▶ 42-Button Membrane Keypad
- ▶ 24 Bits Digital Input/Output
- ▶ 2 Serial Ports for Data Communications
- ▶ External PC Keyboard Input Port
- ▶ Parallel Printer Port
- ▶ Air Source Control Port

Electrical

- ▶ Standard 98-264 VAC, 150-300 VA, 50/60 Hz Operation



Optional Features

- ▶ Alternate Diluent Mass Flow Controller, Ranges 0-20 SLM
- ▶ Alternate Source Mass Flow Controller, Ranges 0-10,000 SCCM
- ▶ Second Source Mass Flow Controller, Ranges 0-10,000 SCCM
- ▶ Additional Calibration Gas Input Ports
- ▶ Permeation Port
- ▶ Additional Output Ports
- ▶ Second Diluent Gas Input Port
- ▶ Internal Ozone Generator
- ▶ Ozone Generator UV Optical Servo Control Loop
- ▶ Internal Ozone UV Absorption Photometer
- ▶ Permeation Oven
- ▶ Master Output Solenoid
- ▶ Instrument Solenoid Driver, 6 Outputs, 24V @ 3W ea
- ▶ Rack Mount Kit
- ▶ Ethernet TCP/IP, RS-232, RS-485 and USB



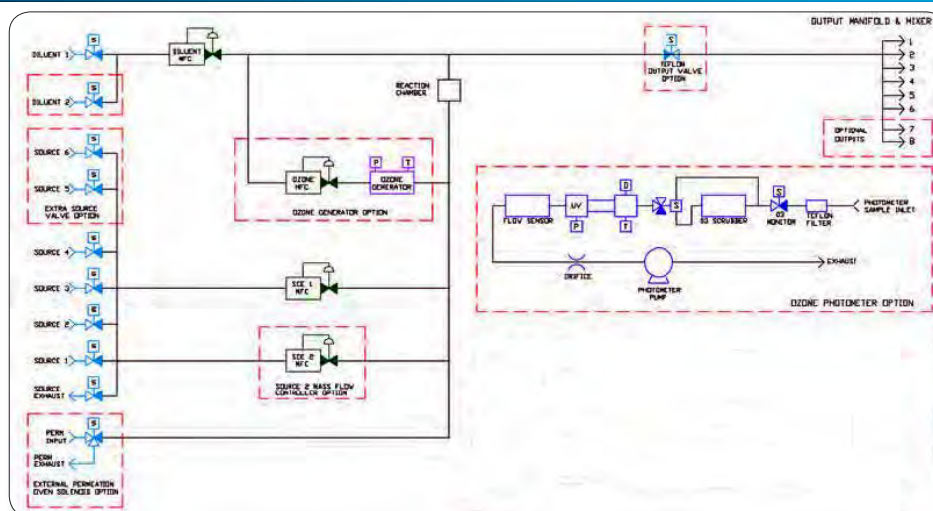
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December 2, 2014

Gas Dilution Calibrator 2010D



Specifications

Specifications subject to change without notice

Dilution System

Input Dilution Gases	1 Standard 1 Additional Option
Input Source Gases	4 Standard, 1 Purge 2 Additional Option
Dilution Mass Flow Controller	0-10 SLPM Optional Range 0-20 SLPM
Source Mass Flow Controller:	0-100 SCCM Optional Ranges 0-10,000 SCCM
2nd Source Mass Flow Controller	0-10,000 SCCM
Flow Accuracy	$\leq \pm 1\%$ Full Scale
Flow Repeatability	$\leq \pm 0.15\%$ Full Scale
Linearity	$\leq \pm 0.5\%$ Full Scale
Input Pressure	20-35 psig
Response Time at Output	< 1 minute

Optional Internal Ozone Generator

Output	0.05-1.5 ppm @ 5 SLPM
Accuracy	$\pm 1\%$ of Set Point or ± 2 ppb @ 5 SLPM
Nominal Flow	100 SCCM, ± 1 SCCM
UV Lamp Temperature	50° C, ± 0.1 ° C

Optional Internal UV Absorption Photometer

Standard Ranges	0-0.5, 1.0, 2.0 ppm
Linearity	± 1 ppb or $\pm 1\%$ of full scale (greater of two)
Precision	± 1 ppb

Zero Drift	$< \pm 1$ ppb for 24 hrs or 30 days
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Flow Rate	1 Liter (nominal)
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Analog Outputs	3 Ranges 5V, 1V, 100 mV
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Optional Internal Permeation Oven

Chamber Materials	Glass or Teflon
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Chamber Size	1 Perm Tube (Any Size)
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Adjustable Temperature	5° C Above Ambient Temperature to 65 °C
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Temperature Accuracy	$\leq \pm 0.1$ ° C
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Calibrator Interface

Operation	42-button keypad, keyboard or serial ports
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Calibration Definitions	20 factory-defined calibration sequences (≤ 20 points each)
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Calibration Types	Gas Dilution, Ozone, GPT (Gas Phase Titration)
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Gas Definitions	2 Diluent Gases, 20 Source Gas
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Auto Calibrations	20 timer driven cal routines that perform user-defined calibration sequences on a daily schedule
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Digital Inputs	24 status I/O bits for calibrator functions
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Digital Input Types	Contact closure or TTL logic
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Digital Outputs	24 Status I/O bits
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Communications	Ethernet TCP/IP, RS-232, RS-485 & USB
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Physical & Operational Specifications

Operating Temperature	5°C to 40°C
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Dimensions	5.25" (13.3 cm) H x 16.2" (41.2 cm) W x 19.25" (48.9 cm) D
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Average Weight	24 lbs. (10.9 kg)
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Input Voltage	98-264 VAC, 150-300 VA, 50/60 Hz operation
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