

Model 322 Gas Dilution Calibrator

A precision instrument for the calibration of gas analyzers

Model 322 Gas Dilution Calibrator (Drop-In Replacement for the Dasibi Model 5008 and Tanabyte Model 300 and Tanabyte Model 300T)



Model SA1-322-G-P Dilution Calibrator with Photometer (SA1 Enclosure Type)



Model SA2-322-G-732 Dilution Calibrator with Photometer (SA2 Enclosure Type)

Tanabyte latest generation of gas calibration instruments are designed with the specific needs of field auditors, quality assurance engineers, laboratory researchers, CEM operators and air monitoring station operators in mind. Tanabyte Model 322 Calibrator precisely dilutes high gas concentrations to user selected lower concentrations by blending it with zero air. Its specially designed O3 Generator is renowned for its production of accurate-stable-repeatable concentrations of O3 gas. This superior performance of the O3 Generator also results in the creation of precise NO2 concentrations by means of GPT. An optional photometer can be added to compliment the O3 generation as a photometer feedback. The 322 is very easy to operate and its operation is further simplified by the utilizations of the user programmable levels and sequences. The Model 322 Calibrator is a direct replacement for the industry standard Dasibi Model 5008 Calibrator in that it inherited all the 5008 main functions and also exceeds all 5008 specifications. The 322 shares many common components with the Model 5008, including the Dasibi "Dot Commands" protocol and LEADS compatibility.

Advantages and Features

- ➔ Gas Dilution, optional Ozone Generator and GPT to create NO2, and optional Photometer Feedback. Three Mass Flow Controllers option.
- ➔ Optional USEPA Approved Ozone Primary Standard (OPS) Photometer Feedback or Ozone Transfer Standard (OTS) Photometer Feedback. The Model 322 can also be operated as an Ozone Analyzer when the OTS Photometer is installed.
- ➔ Superior performing Tanabyte designed Ozone Generator, producing the most accurate-stable-repeatable ozone even at very low concentrations
- ➔ New smaller and light weight design (less than 25 Lbs), ideal for station monitoring, field auditors, QA lab operators, and mobile air monitoring.
- ➔ Lowest instrument height profile of only 5.25 inches, rack space saving.
- ➔ Pre-programmed calibration Sequences and Levels may be entered and initiated manually, or automatically at preset times, or by digital input command, or by Dasibi "Dot Commands".
- ➔ Dasibi 5008 compatible. Similar menu system, easy to learn and easy to use.
- ➔ The modular design simplifies maintenance. By using an extension cable, the module can be decoupled and operated outside the SA1 or SA2 enclosure for easy servicing.

Specifications

Model 322 Dilution System	
Accuracy of Flow Measurements	+/- 0.5%
Repeatability of Flow Control	+/- 0.1%
Linearity of Flow Measurement	+/- 0.5%
MFC Ranges for Dilution Air	0 – 5, 10, 20 SLPM (Other ranges available on request)
MFC Ranges for Gases	0 – 50, 100, 200 SCPM (Other ranges available on request)
Model 322 Ozone Generator	
Range (at 5 SLPM dilution flow)	0.002 – 1.5 PPM
Accuracy (at 5 SLPM dilution flow)	+/- 2% of set point or +/- 3 PPB
Nominal Ozone Flow	100 SCCM
Ozone Photometer	
Measurement Range	0.000 – 10.000 PPM
Sample Flow Rate	Adjustable 0.5 to 2.0 LPM
Zero Noise	< 0.3 PPB
Span Noise (above 100 PPB)	< 0.5% of reading
Lower Detectable Limit (LDL)	< 0.5 PPB
Precision	< 0.5% of reading
Linearity	< 1% of full scale
Zero Drift	< .001 PPM per month
Span Drift (per 24 hours)	Less than 1% of reading
Lag / Rise / Fall Times (with fast cycle setting)	10 / 20 / 20 seconds
Mass Flow Controller (MFC) Combinations	
Model 322 supports up to three MFCs	1 Air MFC + 0 Gas MFC - Ozone only Calibrator 1 Air MFC + 1 Gas MFC - Gas Dilution Calibrator 1 Air MFC + 2 Gas MFCs - Gas Dilution Calibrator w/ two Gas ranges 2 Air MFCs + 1 Gas MFC - Gas Dilution Calibrator w/ two Air ranges
Power	
AC Input Power	90 to 264 VAC, 50 or 60 Hz
Model 322 Digital I/O	
Number of Digital I/Os	24 bit processor
Status input voltage range	Up to 35V, TTL, or contact closure
Control output maximum voltage	35VDC
Control output maximum current	500mA with all outputs active; 1.2A with one output active
Number of Isolated Relay Outputs	2 (Magnecraft W117SIP)
Relay Contact Output Voltage	24 VDC to operate external valve
Model 322 Analog I/O	
Number of Analog Outputs	4, outputs
Analog Output Full Scale Ranges	100mV, 1V, 5V or 10V
Analog Output Resolution	15 bits
Digital Ports	
RS232 Ports	2 (9Db)
Ethernet (Optional)	1 (RJ45)

Configurations

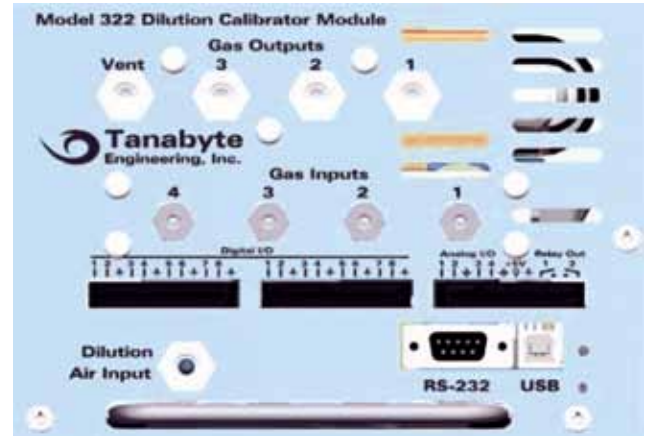
Tanabyte 322 Calibrator comprise of two main sections, the calibration or analysis modules and the SA1 or SA2 enclosures. During production one enclosure with one or two modules are coupled together to produce one Model 322 Calibrator instrument. Tanabyte offers two types of enclosures, the SA1 enclosure which support one module and the SA2 enclosure which can supports one or two modules. The SA1 is very versatile, durable, and light weight with a small foot print of only 8" wide and is classified as our portable-bench mounting version. The SA2 has the conventional width of 17" wide to fit instrument racks and can be configured for bench mounting or rack mounting and has a height of only 5.25" (same as Dasibi Model 1008 series) to economize space in instrument racks. To implement the photometer feedback option the 732 Module with an Ozone Primary Standard (OPS) photometer or the 732S Module with an Ozone Transfer Standard (OTS) photometer is positioned in the second docking bay of the SA2 Enclosure. For the SA1 version the OPS or OTS photometer is not tray mounted but installed directly onto the enclosure.

322 Calibrator Model Numbers

SA1-322	Gas Dilution Calibrator
SA1-322-O	Ozone Calibrator
SA1-322-G	Gas Dilution Calibrator with ozone generator
SA1-322-G-P	Gas Dilution Calibrator with ozone generator
SA1-322-G-P-S	Gas Dilution Calibrator with ozone generator
SA2-322	Gas Dilution Calibrator
SA2-322-O	Ozone Calibrator
SA2-322-G	Gas Dilution Calibrator with ozone generator
SA2-322-G-732	Gas Dilution Calibrator with ozone generator
SA2-322-G-732-S	Gas Dilution Calibrator with ozone generator and (OTS) photometer

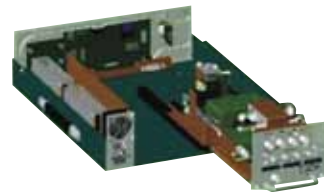
322 Gas Dilution Module Back Panel

Number of Gas Outputs	4 Outputs
Gas Outputs Fittings Size	1/4" Tube OD
Number of Gas Inputs	4 Inputs
Inputs Gas Input Fittings Size	1/8" Tube OD
Number of Analog Outputs	4 Outputs
Number of Digital I/Os	16 I/Os
Number of Air Inputs	1 Input
Air Input Fitting Size	1/4" Tube O



Physical Specifications

SA1 enclosure supports one module
(optional photometer is installed inside SA1 enclosure bottom compartment)



SA2 enclosure with one module



SA2 enclosure with two modules

SA1 Calibrator Dimension	8.1" W x 9" H x 23.4" L
Weight	SA1-322 = 20 Lbs SA1-322-G = 25 Lbs SA1-322-G-P = 30 Lbs
SA2 Calibrator Dimension	17" W x 5.25" H x 21" L
Weight	SA2-322 = 22 Lbs SA2-322-G = 27 Lbs SA2-322-G-732 = 32 Lbs Environmental
Specifications Operating Temperature	5° to 45°C
Humidity	0 to 90%, non-condensing

Calibrator Operations

Module: The heart of the Model 322 Calibrator is the 322 Gas Dilution Module. Each module consists of its tray and rear panel with all the pneumatics, electronics and software needed to perform the specific calibrations or analysis functions.

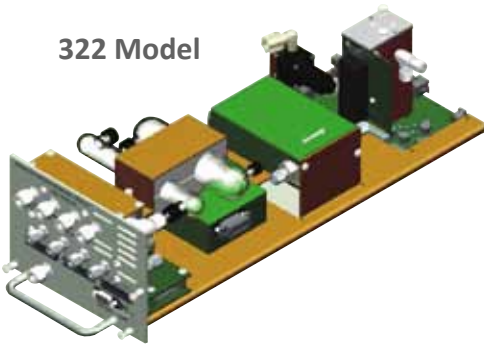
Dilution: The 322 dilution is accomplished by precisely commanding two (or 3) mass flow controllers to accurately blend zero air and input gases which are first feed into a mixing chamber (for NO + O3 creation) then a dilution chamber, and finally to the output manifold.

Ozone Generator: Tanabyte has designed its Ozone Generator to excel as the most superior performing with accurate, stable, and repeatable

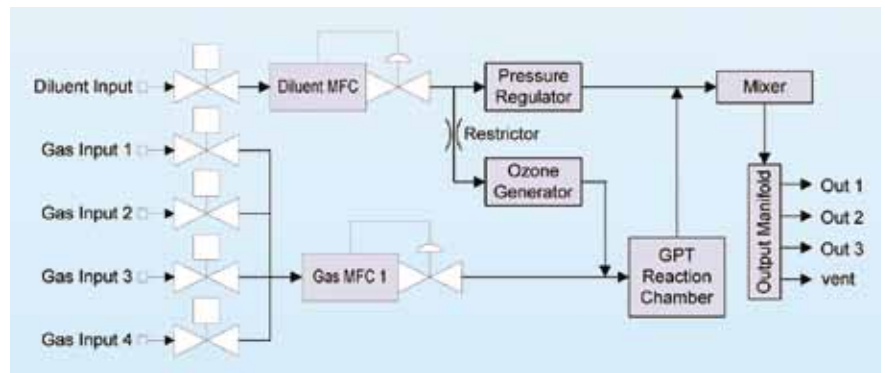
ozone production. With this superiority of O3 generation, very low ozone concentrations even below 5 ppb is easily attained. Similarly, NO2 creation or GPT benefits greatly by this performance, resulting in very accurate NO2 and NOx gas concentrations.

Photometer: When a US EPA Approved photometer is required, then the 732 Module with an Ozone Primary Standard (OPS) photometer or the 732-S Module with an Ozone Transfer Standard (OTS) photometer is added to provide the photometer feedback feature.

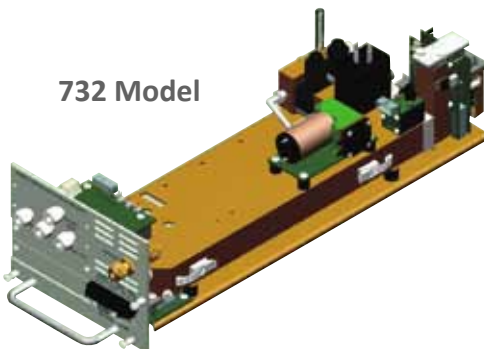
322 Model



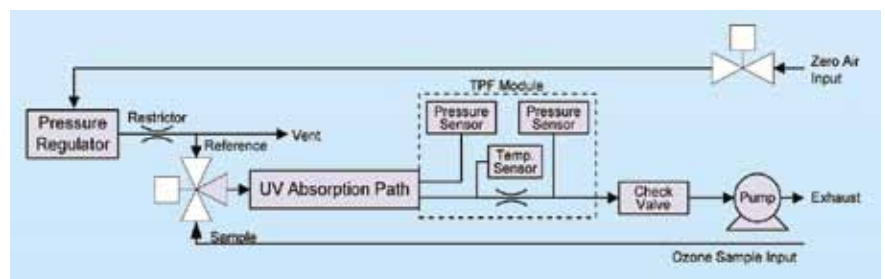
322 Module - Gas Dilution with Ozone Generator



732 Model



Ozone Primary Standard Photometer



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