Serinus® Cal 1000

OZONE TRANSFER STANDARD

The Serinus® Cal 1000 performs gas dilution calibrations and is used in conjunction with regulatory traceable gases and a zero air generator.

The most cost effective solution, the Serinus® Cal 1000 allows the most up-to-date calibrations technology to be available to all.

FEATURES

- Performs single and multi-point calibrations using the Serinus® Calibrator's precision mass flow controllers, for utmost confidence in the results
- Performs calibration manually through user interface or remotely via RS232, USB networks or digital inputs
- Designed and developed with wide-ranging customer input for easy, intuitive, accurate use.

DILUTION & SPAN FLOWS

Dilution Gas Inputs:	1 standard 100 - 200 kPa (g) (2 optional)
Source Gas Inputs:	4 standard 100 - 200 kPa (g) (8 optional)
Dilution Mass Flow Controller:	10 SLPM, 0 Deg, 1 ATM (std), 1 SLPM, 2 SLPM, 5 SLPM or 20 SLPM (optional), 2nd MFC (optional)
Source Mass Flow Controller:	50 SCCM, 0 Deg, 1 ATM (std), 10 SCCM, 20 SCCM, 100 SCCM, 500 SCCM or 1 SLPM, 2 SLPM (optional), 2nd MFC (optional)
Flow Accuracy (Constant Temp):	Within 1 % of full scale
Flow Repeatability:	Within 0.15 % of full scale
Linearity:	Within 0.15 % of full scale
Operating Gas Pressure:	100 - 200 kPa
Zero Drift:	< 0.6 % per year
Response Time:	< 5 seconds
Output Manifold:	4 output ports standard
Dilution Ratio:	Variable 10:1 to 2000:1 (std configuration)

Case Dimensions	
Rack length:	597 mm (23.5") (front to rear)
Total length (with latch release):	638 mm (25.1")
Chassis width:	418 mm (16.5")
Front panel width:	429 mm (16.9")
Chassis height:	163 mm / uses 4RU (6.4")
Front panel height:	175 mm (6.9")
Weight:	18.2 kg

COMMUNICATION

User Interface

- Via front panel keypad or computer

Programmable calibrations

- 16 separate programmable sequences
- 32 separate programmable points

Analog Input

- Three analog voltage inputs (0 - 5 VDC) CAT I rated

Digital Output

- RS232 port #1: Normal digital communication
- RS232 port #2: Multidrop port used for multiple analyser connections on a single RS232
- USB port connection on rear panel
- 25 pin connector with discrete status and user control
- USB stick memory (front panel) for data logging, event logging and parameter storage
- 8 Digital Outputs, open collector max 400 mA each at 12 VDC (max total output 2A)
- 8 Digital Inputs, 0 - 5 VDC,
- CAT I rated
- 1 Diluent Control, + 12 V output

POWER

Operating Voltage

- 100 - 240 V VAC 50 / 60 Hz (autoranging)

Power Consumption

- 165 VA maximum (typical at start-up) 95 VA after warm-up

Operating Conditions Ambient Temperature Range

- 0 - 45 °C (32 - 104 °F), 20 - 35 °C for optimum performance

Pressure

- Maximum altitude: 3000 m above sea level

bsi. ISO 9001 Quality Management FS 603790 AS/NZS 4801 Occupational Health and Safety Management OHS 603791

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acoem ECOTECH

Serinus® Cal 2000

OZONE TRANSFER STANDARD

Ecotech's reputation is built on air quality monitoring, and is based on keeping workforces, communities, businesses and the environment safe.

We know how important measuring ground-level ozone accurately can be. With all the features of its Serinus® Cal 1000 stablemate, the Serinus® Cal 2000 adds features essential for calibration of NO_x and O_3 analysis equipment. An internal ozone generator enables regular ozone checks and gas phase titrations (GPT).

FEATURES

- All the calibration ability and ease of use found in the Serinus® Cal 1000
- Internal ozone generator produces 3 ppm to 5 ppm of ozone
- Ability to premix ozone and source gas before dilution to perform gas phase titrations (GPT).

DILUTION & SPAN FLOWS

Dilution Gas Inputs:	1 standard 100 - 200 kPa (g) (2 optional)
Source Gas Inputs:	4 standard 100 - 200 kPa (g) (8 optional)
Dilution Mass Flow Controller:	10 SLPM, 0 Deg, 1 ATM (std), 1 SLPM, 2 SLPM, 5 SLPM or 20 SLPM (optional), 2nd MFC (optional)
Source Mass Flow Controller:	50 SCCM, 0 Deg, 1 ATM (std), 10 SCCM, 20 SCCM, 100 SCCM, 500 SCCM or 1 SLPM, 2 SLPM (optional), 2nd MFC (optional)
Flow Accuracy (Constant Temp):	Within 1 % of full scale
Flow Repeatability:	Within 0.15 % of full scale
Linearity:	Within 0.15 % of full scale
Operating Gas Pressure:	100 - 200 kPa
Zero Drift:	< 0.6 % per year
Response Time:	< 5 seconds
Output Manifold:	4 output ports standard
Dilution Ratio:	Variable 10:1 to 2000:1 (std configuration)

Case Dimensions	
Rack length:	597 mm (23.5") (front to rear)
Total length (with latch release):	638 mm (25.1")
Chassis width:	418 mm (16.5")
Front panel width:	429 mm (16.9")
Chassis height:	163 mm / uses 4RU (6.4")
Front panel height:	175 mm (6.9")
Weight:	20.5 kg

COMMUNICATION

User Interface

- Via front panel keypad or computer

Programmable calibrations:

- 16 separate programmable sequences
- 32 separate programmable points

Analog Input

- Three analog voltage inputs (0 - 5 VDC) CAT I rated

Digital Output

- RS232 port #1: Normal digital communication
- RS232 port #2: Multidrop port used for multiple analyser connections on a single RS232
- USB port connection on rear panel
- 25 pin connector with discrete status and user control
- USB stick memory (front panel) for data logging, event logging and parameter storage
- 8 Digital Outputs, open collector max 400 mA each at 12 VDC (max total output 2A)
- 8 Digital Inputs, 0 - 5 VDC,
- CAT I rated
- 1 Diluent Control, + 12 V output

POWER

Operating Voltage

- 100 - 240 V VAC 50 / 60 Hz (autoranging)

Power Consumption

- 165 VA maximum (typical at start-up) 95 VA after warm-up

Operating Conditions Ambient Temperature Range

- 0 - 45 °C (32 - 104 °F), 20 - 35 °C for optimum performance

Pressure

- Maximum altitude: 3000 m above sea level

OZONE GENERATOR

Output Concentration:

- 3 ppb to 5000 ppb

Flow Rate:

- Variable dependent on Dilution Mass Flow Controller installed

Repeatability:

- < 1 % short term (24 hours) 5 % long term at constant temperature and humidity

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acoem ECOTECH

Serinus® Cal 3000

OZONE TRANSFER STANDARD

Reliability, accuracy and precision are hallmarks of ACOEM Ecotech's product range. It's why Ecotech's Calibrators have long been trusted worldwide.

The Serinus® Cal 3000 includes an ozone photometer for the accurate creation and delivery of ozone concentrations when calibrating ozone analysers. The photometer accurately and continuously measures the ozone concentration to control output of the internal ozone generator, providing an accurate ozone source for routine ozone calibration.

FEATURES

- New Serinus® Cal user interface makes all functions simple and intuitive
- In-built photometer and ozone generator for use as a Level 3 ozone transfer standard
- Ozone photometer based on the reliable and proven technology used in the Serinus® 10 gas analyser.

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Source Gas Inputs:	4 standard 100 - 200 kPa (g) (8 optional)
Dilution Mass Flow Controller:	10 SLPM, 0 Deg, 1 ATM (std), 1 SLPM, 2 SLPM, 5 SLPM or 20 SLPM (optional), 2nd MFC (optional)
Source Mass Flow Controller:	50 SCCM, 0 Deg, 1 ATM (std), 10 SCCM, 20 SCCM, 100 SCCM, 500 SCCM or 1 SLPM, 2 SLPM (optional), 2nd MFC* (optional)
Flow Accuracy (Constant Temp):	Within 1 % of full scale
Flow Repeatability:	Within 0.15 % of full scale
Linearity:	Within 0.15 % of full scale
Operating Gas Pressure:	100 - 200 kPa
Zero Drift:	< 0.6 % per year
Response Time:	< 5 seconds
Output Manifold:	4 output ports standard
Dilution Ratio:	Variable 10:1 to 2000:1 (std configuration)

Case Dimensions	
Rack length:	597 mm (23.5") (front to rear)
Total length (with latch release):	638 mm (25.1")
Chassis width:	418 mm (16.5")
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Chassis height:	163 mm / uses 4RU (6.4")
Front panel height:	175 mm (6.9")
Weight:	23.8 kg

* Additional source MFC reduces available source ports by 1 and results in no analog output being available.

COMMUNICATION

User Interface

- Via front panel keypad or computer

Programmable calibrations:

- 16 separate programmable sequences
- 32 separate programmable points

Analog Output:

- Voltage output of 0 to 5 V, with menu selectable zero off set of 0, 5 or 10 %

Analog Input

- Three analog voltage inputs (0 - 5 VDC) CAT I rated

Digital Output

- RS232 port #1: Normal digital communication
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- CAT I rated
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POWER

Operating Voltage

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Power Consumption

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Operating Conditions Ambient Temperature Range

- 0 - 45 °C (32 - 104°F), 20 - 35 °C for optimum performance

Pressure

- Maximum altitude: 3000 m above sea level

OZONE GENERATOR

Output Concentration:

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Flow Rate:

- Variable dependent on Dilution Mass Flow Controller installed

Repeatability:

- < 1 % short term (24 hours) 5 % long term at constant temperature and humidity

PHOTOMETER

Range:

- 0 - 20 ppm

Precision:

- 0.5 ppb or 0.2 % of reading, whichever is greater

Linearity:

- < 1 % of full scale

Noise At Zero:

- < 0.25 ppb

Response Time:

- 30 seconds to 95 %

Zero Drift:

- Temperature: 1.0 ppb per °C
  24 hours: < 0.3 ppb
  7 days: < 0.3 ppb

Span Drift:

- Temperature: 0.1 % per °C
  7 days: 0.5 % of reading

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