

# Thermo Scientific Model 146i Multi-Gas Calibrator

Mass flow calibrator for ambient air monitoring

The Thermo Scientific™ Model 146i Multi-Gas Calibrator supplies precise levels of ozone, carbon monoxide, non-methane hydrocarbons, sulfur dioxide, nitric oxide and nitrogen dioxide or other gases that a user may require. The gas levels are used to calibrate instruments that perform zero, precision and level 1 span checks, audits and multipoint measurements.

- Ethernet connectivity for efficient remote access
- Enhanced user interface with one button programming and large display screen
- Flash memory for increased data storage and user downloadable software
- Enhanced electronics design optimizes product commonality
- Gas Phase Titration for generation of O<sub>3</sub> and NO<sub>2</sub>



The design of the Thermo Scientific Model 146i calibrator meets or exceeds all published U.S. EPA requirements for multipoint calibration, audit, Level 1 and 2 span and precision checks. Options include Gas Phase Titration, UV Photometer, and Permeation Oven.

The mass flow controller, ozone generator, permeation tube oven, power supply, and solenoid valves are integrated into a single microprocessor controlled unit. This permits easy to use, menu driven software and a consistent set of operation screens for all calibration procedures.

Additionally, the microprocessor can make many of the necessary calculations, thereby freeing the operator from having to make the calculations in the field or laboratory. If desired, the Model 146i calibrator can be operated remotely by a data logger to perform multipoint calibrations.



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## Thermo Scientific Model 146i Multi-Gas Calibrator

Flow Measurement Accuracy	+/- 2% of reading or 1% of full scale, whichever is less (20 to 100% full-scale)
Linearity of Mass Flow Measurement	+/- 0.5% of full scale
Repeatability of Mass Flow Measurement	+/- 2% of reading or 1% of full scale, whichever is less (20 to 100% full-scale)
Flow Range of Dilution Air	0-10 SLPM. Optional ranges: 0-5/0-20 SLPM
Flow Range of Cylinder Gases	0-100SCCM. Optional ranges: 0-50/0-200 SCCM
Zero Air Requirements	10 SLPM @ 30 PSI Optional ranges: 20 SLPM @ 30 PSI
Calibration Gas Input Ports	3, optional 6
Diluent Gas Input Ports	1
Response Time	99% of target (at manifold) within 60 seconds
Ozone Generator Option	Maximum output: 1 ppm @ 6 SLPM. Minimum output: 10 ppb @ 6 SLPM
Photometer System	Full Scale Range: 100 ppb to 5 ppm user selectable. Linearity: 1% of Full Scale.
Precision:	1 ppb. Response Time: 180 Seconds to 95% of Target. Minimum Detectable Limit 3 ppb.
Test Channel Analog	6 @ +/- 100 mv, 1,5,10 volts (user selectable)
Digital Control Outputs	10 relay and 8 24vdc solenoid
Digital Control Inputs	16
Temperature Range	0°- 45° C
Weight	51 lbs (58 lbs for 220-240 VAC)
Dimensions	16.75" W x 8.62" H x 23" D
Power	100 VAC 50/60Hz, 115 VAC 50/60Hz, 220-240 VAC 50/60Hz, 275 watts (with all options)

### Ordering Information

#### Thermo Scientific Model 146i Multi-Gas Calibrator

Choose from the following configurations/options to customize your own Model 146i

#### 1. Voltage options:

A = 120 VAC 50/60 Hz (standard)  
B = 220 VAC 50/60 Hz  
J = 100 VAC 50/60 Hz

#### 2. Calibration Sources

N = No Optional Calibration Sources (standard)  
P = Internal Permeation Span Source  
T = Gas Phase Titration  
B = Gas Phase Titration with Photometer  
C = Internal Permeation Span Source with Gas Phase Titration  
D = Internal Permeation Span Source with Gas Phase Titration and Photometer

#### 3. Span Ports

3 = Three Span Inputs (standard)  
6 = Six Span Inputs

#### 4. Span Gas Mass Flow Controller

A = 50 SCCM  
B = 100 SCCM (standard)  
C = 200 SCCM

#### 5. Zero Gas Mass Flow Controller

D = 5 SLPM  
E = 10 SLPM (standard)  
F = 20 SLPM

#### 6. Optional I/O:

A = None (standard)  
C = I/O expansion board (4-20mA outputs - 6 channels, 0-10v inputs - 8 channels)

#### 7. Mounting Hardware:

A = Bench mounting (standard)  
B = Ears & handles, EIA  
C = Ears & handles, Retrofit

#### Other options:

- Rack mounts
- Cable, DB37M to open end, 6' LG.
- Rear extender
- Cable, DB37F to open end, 6' LG.
- Terminal Block Kit & Cable 37 pin
- Terminal Block Kit & Cable 25 pi
- Cable, DB25M to open end, 6' LG.
- Cable, RS232 Null Modem

#### Your Order Code:

146i - \_ \_ \_ \_ \_

To maintain optimal product performance, you need immediate access to experts worldwide, as well as priority status when your air quality equipment needs repair or replacement. We offer comprehensive, flexible support solutions for all phases of the product life cycle. Through predictable, fixed-cost pricing, our services help protect the return on investment and total cost of ownership of your Thermo Scientific products.

For more information, visit our website at [thermoscientific.com/air](http://thermoscientific.com/air)

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This product is manufactured in a plant whose quality management system is ISO 9001 certified.

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