

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

Mass flow calibrator for ambient air monitoring



### Key Features

- 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 Thermo Scientific Multi-Gas Calibrator, Model 146i 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.

The design of the Model 146i meets or exceeds all published U.S. Environmental Protection Agency 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 can be operated remotely by a data logger or to perform multipoint calibrations.

# Product Specifications

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 air quality products.

## Multi-Gas Calibrator, Model 146i

### Dilution System

<b>Flow Measurement Accuracy</b>	+/- 2% set point or +/- 1% FS, whichever is less from 20 to 100% FS
<b>Repeatability of flow control</b>	+/- 0.2% FS (Porter flow controller spec - better than 146C)
<b>Linearity of mass flow measurements</b>	+/- 0.5% FS
<b>Flow range of dilution air</b>	0-10 SLPM
<i>Optional ranges</i>	0-5/0-20 SLPM
<b>Flow range of cylinder gases</b>	0-100SCCM
<i>Optional ranges</i>	0-50/0-200 SCCM
<b>Zero Air requirements</b>	10 SLPM @ 30 PSI
<i>Optional ranges</i>	20 SLPM @ 30 PSI
<b>Calibration gas input ports</b>	3, optional 6
<b>Diluent gas input ports</b>	1
<b>Response time</b>	<60 sec. To 99% (146C spec)
<b>Ozone Generator Option</b>	
<i>Maximum output</i>	1 ppm @ 6 SLPM
<i>Minimum output</i>	10 ppb @ 6 SLPM
<b>Photometer System</b>	
<i>Full Scale Range</i>	100 ppb to 5 ppm user selectable
<i>Linearity</i>	1% of Full Scale
<i>Precision</i>	1 ppb
<i>Response Time</i>	180 Seconds to 95% of Target
<i>Minimum Detectable Limit</i>	3 ppb
<b>Test channel analog</b>	6 @ +/- 100 mv, 1,5,10 volts (user selectable)
<b>Digital control outputs</b>	10 Relay and 8 24vdc Solenoid
<b>Digital control inputs</b>	16
<b>Temperature range</b>	0-40 deg C
<b>Weight</b>	51 lbs (58 lbs for 220-240VAC)
<b>Dimensions</b>	16.75" W x 8.62" H x 23" D
<b>Power</b>	100VAC 50/60Hz, 115VAC 50/60Hz, 220-240VAC 50/60Hz, 275 watts (with all options)

## Ordering Information

### Model 146i 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

#### 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

#### 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

Your Order Code: 146i - \_ \_ \_ \_ \_

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

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