

Automated ambient particulate measurement utilizing beta attenuation

Product Specifications

## Thermo Scientific Model 5014*i* Beta Continuous Particulate Monitor



### Key Features

- U.S. EPA Approved PM-10 (EQPM1102-150) and PM-2.5 (EQPM0609-183) equivalent monitor
- Continuous, non-stepwise measurement
- Volatile loss mitigation via Dynamic Heating System
- Long term, unattended operation
- Low detection limit, high accuracy and resolution
- Enhanced user interface and *i*Port communication software

The Thermo Scientific Model 5014*i* Beta Continuous Particulate Monitor uses beta attenuation technology in combination with the established *i*Series platform design.

The Model 5014*i* monitor utilizes the combined real-time principles of beta-attenuation, density and background beta rejection as the means toward a refined mass measurement of the collected aerosol. The air sample volume is precisely controlled and accurately measured through a subsonic orifice.

A known volume of air is drawn through a size-selective inlet, which can be configured to measure PM-10, PM-2.5, PM-1 or TSP, and deposited onto the auto-advancing filter tape. The combined measurement of mass and air volume are used to obtain the mass concentration readings. Supplied with user-selectable data logging options, concentrations can be reported in actual or

standard conditions. The Model 5014*i* monitor auto-advances the particulate-laden sample filter in accordance with user-defined parameters such as mass accumulation limits, timed intervals or the continuous flow rate relative to pressure changes. The filter tape will advance in a continuous pattern, as compared to stepwise measurement, resulting in the mitigation of particle losses. In addition, the filter tape will advance if the sample exceeds maximum loading criteria.

To accurately address potential water bias and volatile loss, the Dynamic Heating System allows the user to hold the sample temperature at a fixed value or below a relative humidity threshold.

This state-of-the-art monitor also features:

- Flash memory for increased data storage
- Enhanced Ethernet connectivity
- Remote data access

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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.

## Thermo Scientific Model 5014i Beta Continuous Particulate Monitor

<b>Source</b>	Carbon-14 (C-14), < 3.7 MBq (< 100 µCi)
<b>Measurement Range</b>	0 to 1.0, 2.0, 3.0, 5.0, 10.0 mg/m <sup>3</sup> 0 to 100, 1,000, 2,000, 3,000, 5,000, 10,000 µg/m <sup>3</sup>
<b>Minimum Detection Limit</b>	6 µg/m <sup>3</sup> (1/2 hour), 4 µg/m <sup>3</sup> (1 hour) 3 µg/m <sup>3</sup> (3 hour), 1 µg/m <sup>3</sup> (24-hour)
<b>Resolution</b>	0.1 µg/m <sup>3</sup>
<b>Precision</b>	±2.0 µg/m <sup>3</sup> < 80 µg/m <sup>3</sup> , 4-5 µg/m <sup>3</sup> > 80 µg/m <sup>3</sup> (24-hour average)
<b>Accuracy (for mass measurement)</b>	± 5% using NIST-traceable mass foil set
<b>Air Flow Rate</b>	1m <sup>3</sup> /h (16.67L/min) measured across an internal subsonic orifice
<b>Sample Flow Precision</b>	±2% of measured value
<b>Sample Flow Accuracy</b>	< 5% of measured value
<b>Mass Concentration</b>	60 to 3,600 seconds and 24-hour
<b>Data Output Rate</b>	Every 1 second
<b>Operating Temperature</b>	The temperature of sampled air may vary -30° to 50°C. 5014i must be weather protected within range 4° to 50°C <i>An optional Complete Outdoor Enclosure provides complete weather protection</i>
<b>Non-condensing Output</b>	< 95% RH inside 5014i RS232/RS485, TCP/IP, 10 Status relays and power fail indication (standard). 6 user defined analog outputs (0-100mV, 0-1, 0-5 or 0-10 Vdc), Six 0-20 or 4-20 mA isolated current output (optional)
<b>Input</b>	16 Digital inputs (standard), Eight 0 to 10 Vdc Analog inputs (optional), 8 User-defined Analog outputs (0-1 or 0-5 Vdc)
<b>Power Requirements</b>	100 - 240 VAC, 50-60 Hz Recommended 805 Watts (115V); 880 Watts (220-240V) Watts Maximum (instrument, heater & pump) 120 VAC/60 Hz: 4.25A; 240 VAC/50Hz: 2.25A
<b>Pump</b>	
<b>Physical Dimensions</b>	16.75" (42.5cm) W x 23" (58.4cm) D x 8.62 (21.9cm) H 19" rack mountable with optional ears and handles
<b>Weight</b>	40 lbs. (19kg)
<b>Protocols</b>	C-Link, MODBUS TCP/IP, Gesytec (Bayern-Hessen), ESM Protocol, Streaming data and NTP (Network Time Protocol) protocols. Simultaneous connections from different locations over Ethernet
<b>Safety and Electrical Designations</b>	Designed to meet CE: EN61326:1997 + A1:1998 + A2:2001 + A3:2003, EN61010-1 UL: 61010-1:2004; CSA: C22.2 No. 61010-1:2004; FCC: Part 15 Subpart B, Class B
<b>Approvals and Certifications</b>	U.S. EPA PM-10 Equivalent Monitor: EQPM1102-150 U.S. EPA PM-2.5 Equivalent Monitor: EQPM0609-183

## Ordering Information

### Model 5014i Beta

Choose from the following configurations/options to customize your own Model 5014i Beta

#### 1. Voltage options:

A = 110 VAC 50/60 Hz  
B = 220 VAC 50/60 Hz  
D = 220 VAC 50/60 Hz (with China power cord)

#### 2. Tube options:

H = Extended tube assembly (6')  
Includes SS tube union and teflon ferrule  
N = No extended tube assembly  
T = Tripod  
B = Tripod & extended tube assembly (6')  
Includes SS tube union and teflon ferrule

#### 3. Inlet options:

C = TSP with bug screen  
E = PM-10 USEPA  
T = PM-10 Traditional  
S = SCC inlet combo (PM-10 USEPA, 1st stage w/ PM-2.5 SCC)  
U = SCC inlet combo (PM-10 Traditional, 1st stage w/ PM-2.5 SCC)  
V = VSCC inlet combo (PM-10 USEPA, 1st stage w/ PM-2.5 VSCC)  
W = VSCC inlet combo (PM-10 traditional, 1st stage w/ PM-2.5 VSCC)  
1 = SCC inlet combo (PM-10 USEPA, 1st stage w/ PM-1 SCC)  
2 = SCC Inlet Combo (PM-10 Traditional, 1st stage w/ PM-1 SCC)  
3 = PM-10 Inlet (EU-style DPM10/01/00), 1 m<sup>3</sup>/h  
4 = PM-2.5 Inlet (EU-style DPM 25/01/00), 1 m<sup>3</sup>/h  
N = No inlet

#### 4. Optional I/O:

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

#### 5. Mounting Hardware:

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

#### Included:

- Heated sample tube (1m)
- Sample pump (Universal)

Your Order Code: Model 5014i - \_ \_ \_ \_ \_

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

#### Air Quality Instruments

27 Forge Parkway  
Franklin, MA 02038 USA

(866) 282-0430  
(508) 520-0430  
(508) 520-1460 fax

[www.thermoscientific.com/AQL](http://www.thermoscientific.com/AQL)

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