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CONFIRMATION

of Product Conformity (QAL1)

Approved AMS:	5014iQ with PM_{10} pre separator for PM_{10}
Manufacturer:	Thermo Fisher Scientific 27, Forge Parkway Franklin, MA 02038 USA
Test Institute::	TÜV Rheinland Energy & Environment GmbH

This is to certify that the AMS has been tested according to the standards

VDI 4202-3 (2019), EN 12341 (2014), EN 16450 (2017), Guide for Demonstration of Equivalence of Ambient Air Monitoring Methods (2010) as well as EN 15267-1 (2009) and EN 15267-2 (2023).

The AMS underwent independent expert testing and was accepted.
This confirmation is valid up to the publication of the certificate,
but no longer than 9 months from the date of issue
(this document contains 4 pages).

This confirmation is valid until: 31 December 2026

TÜV Rheinland Energy & Environment GmbH
Cologne, 10 April 2026

i. V. Dipl.-Ing. G. Baum

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Test institute accredited to EN ISO/IEC 17025 by DAkkS (German Accreditation Body).
This accreditation is limited to the accreditation scope defined in the enclosure to certificate D-PL-11120-02-00.

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Test Report: EuL/21255708/B dated 19 September 2025

Expiry date: 31 December 2026

Approved application

The tested AMS is suitable for continuous immission measurement of PM_{10} in stationary use.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a field test at four different locations with different time periods.

The AMS is approved for an ambient temperature range of +5° to 40°C.

The notification of suitability of the AMS, performance testing and the uncertainty calculation have been effected on the basis of the regulations applicable at the time of testing. As changes in legal provisions are possible, any potential user should ensure that this AMS is suitable for monitoring the measured values relevant to the application.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the intended purpose.

Note

The legal regulations mentioned do not correspond to the current state of legislation in every case. Each user should, if necessary, in consultation with the competent authority, ensure that this AMS meets the legal requirements for the intended use. In addition, it cannot be ruled out that legal regulations governing the use of a measuring device for emission monitoring may change during the lifetime of the certificate.

Basis of the confirmation

This confirmation is based on:

- Test report EuL/21255708/B dated 19 September 2025 issued by TÜV Rheinland Energy & Environment GmbH
- The ongoing surveillance of the product and the manufacturing process
- Expert testing and approval by an independent body

AMS designation:
5014iQ with PM_{10}- pre separator for PM_{10}

Manufacturer:
Thermo Fisher Scientific, Franklin, USA

Field of application:
For continuous emission measurement of the PM_{10}-fraction in particulate matter in stationary applications

Measuring ranges during performance testing:

Component	Certification range	Unit
PM_{10}	0 – 1,000	µg/m³

Software version:
1.0.11.34542

Restrictions:
none

Notes:
1. The measuring equipment also meets the requirements for the equivalence test, taking into account the future daily limit value for PM_{10} of 45 µg/m³ (to be achieved by 1 January 2030) in accordance with Annex I of Directive (EU) 2024/2881.
2. The test report on the suitability test is available online at www.qal1.de.

Test Institute: TÜV Rheinland Energy & Environment GmbH, Cologne
Report No.: EuL/21255708/B dated 19 September 2025

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Tested product

This confirmation applies to automated measurement systems conforming to the following description:

The 5014iQ measuring system with PM_{10} pre-separator is a device for measuring particulate matter in ambient air. It is based on the beta-attenuation measurement principle.

The measuring system consists of the PM_{10} sampling head, the heated sampling tube, the (optional) extension tube, the ambient air sensor (including radiation shield), the vacuum pump, the 5014iQ central unit including a glass fibre filter tape, the respective connecting pipes and cables as well as adapters, and the roof ducting including a flange.

A PM_{10} sampling inlet (manufacturer: Digitel, type: DPM_{10}/01/00/16) is used as the sampling head; this acts as a pre-separator for the particulate matter drawn in from the outside air. The devices are operated at a constant, regulated flow rate of 16.67 l/min = 1.0 m³/h. Alternatively, PM_{10} and PM_1 sampling inlets may also be used.

The particle sample passes through the PM10 sampling head at a flow rate of 1 m³/h (=16.67 l/min) and travels via the heated sampling tube to the actual 5014iQ measuring instrument.

The heated sampling tube (approx. 0.9 m long) and the (optional) extension tube (approx. 1.8 m long) form the connection between the sampling head and the actual measuring instrument. The sampling heater is controlled dynamically during the suitability test with a threshold value of 35% RH (Setting RH). If the relative humidity of the sample air is below the threshold value, the sample is not heated; if the relative humidity is above the threshold value, dynamic heating takes place so that the threshold value is reached again. The heating conditions (relative humidity rF or temperature threshold value) can be configured according to the requirements of the monitoring network.

Directly below the heated tube is the housing of the 5014iQ measuring instrument – the particulate matter flows from the sampling tube into the radial tube above the radiometric assembly.

There, the particles are collected on the glass fibre filter tape used for radiometric measurement. Particles are collected on the filter tape up to a threshold value (during the test: fast-forwarding of the filter tape after 24 hours or when the mass on the filter tape exceeds 1500 µg, or if the current flow rate deviates by more than 2.5% from the nominal flow rate).

The filter tape is located between the scintillation photomultiplier (detector) and the 14C beta emitter. The beta beam passes from bottom to top through the filter tape and the accumulating dust layer. The intensity of the beta beam is attenuated by the increasing mass loading, which in turn leads to a reduced beta intensity measured by the detector. The mass on the filter tape is calculated from the continuously integrated count rate. The determined count rate is continuously corrected for changes in air density.

The radiometric mass determination is further optimised by the simultaneous detection and consideration of the natural alpha activity of aerosols. This additional alpha count rate is used to measure the presence of radon, which causes unwanted interference in the radiometric mass determination of the particles and is compensated for accordingly.

To maintain the sampling flow rate at its setpoint, the flow is continuously measured and controlled via a proportional valve.

The PM concentrations are displayed on the front panel of the measuring device as PM (= radiometric readings). The measured values can be made available as data via a variety of output channels (analogue, digital, Ethernet).