

CERTIFICATE

of Product Conformity (QAL1)

Certificate No: 0000051691_02

AMS designation: FWE200DH for dust

Manufacturer: Endress+Hauser SICK GmbH + Co. KG
Bergener Ring 27
01458 Ottendorf-Okrilla
Germany

Test Institute: TÜV Rheinland Energy & Environment GmbH

This is to certify that the AMS has been tested and found to comply with the standards
**EN 15267-1 (2009), EN 15267-2 (2023),
EN 15267-3 (2007) as well as EN 14181 (2014).**

Certification is awarded in respect of the conditions stated in this certificate
(this certificate contains 13 pages).
The present certificate replaces certificate 0000051691_01 dated 31 July 2021.



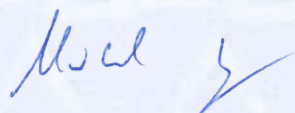
Publication in the German Federal Gazette
(BAnz) of 1 August 2016

German Environment Agency

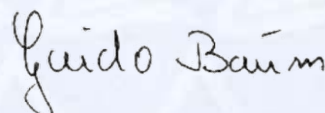
Dessau, 20 July 2026

This certificate will expire on:
31 July 2031

TÜV Rheinland Energy &
Environment GmbH
Cologne, 19 July 2026



Dr. Marcel Langner



i.V. Guido Baum

www.umwelt-tuv.eu
qal1-info@tuv.com
Tel. + 49 221 806-5200

TÜV Rheinland Energy & Environment GmbH
Am Grauen Stein
51105 Köln

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.

Test Report:	936/21225956/A of 25 February 2016
Initial certification:	01 August 2016
Expiry date:	31 July 2031
Certificate:	Renewal (of previous certificate 0000051691_01 of 31 July 2021 valid until 31 July 2026)
Publication:	BAnz AT 01.08.2016 B11, chapter I No. 1.2

Approved application

The tested AMS is suitable for use at combustion plants according to the Directive 2010/75/EC, chapter III (combustion plants / 13th BImSchV:2015), chapter IV (waste incineration plants / 17th BImSchV:2024), Directive 2015/2193/EC (44th BImSchV:2022), TA Luft:2021, 30th BImSchV:2022 and 27th BImSchV:2013. The measured ranges have been selected so as to ensure as broad a field of application as possible.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and an eight-month field test at a lignite-fired power plant.

The AMS is approved for an ambient temperature range of -20 °C to +50 °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 limit 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 in every case correspond to the current state of legislation at the time of certification. If necessary, each user should ensure, in consultation with the competent authority, that this AMS meets the legal requirements for the intended purpose. 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 certification

This certification is based on:

- Test report 936/21225956/A of 25 February 2016 by TÜV Rheinland Energie und Umwelt GmbH
- Suitability announced by the German Federal Environment Agency (UBA) as the relevant body
- The ongoing surveillance of the product and the manufacturing process

Publication in the German Federal Gazette: BAnz AT 01.08.2016 B11, chapter I No. 1.2,
UBA announcement dated 14 July 2016:

AMS designation:
FWE200DH for dust

Manufacturer:
SICK Engineering GmbH, Ottendorf-Okrilla

Field of application:
For plants requiring official approval and for plants according to the 27th BImSchV

Measuring ranges during performance testing:

Component	Certification Range	Supplementary measuring ranges					Unit
Dust	0 - 7,5	0 - 10	0 - 15	0 - 50	0 - 100	0 - 500	mg/m³

Software versions:
FWE200DH (control): V 01.02.06
DHSP100/SP200 (measuring cell): V 01.06.04
MCU: V 01.12.02

Restrictions:
None

Notes:

1. The maintenance interval is three months.
2. During performance testing in accordance with EN 15267-3, the requirement for the determination coefficient R^2 of the calibration function was not fulfilled.
3. The sampling line (length during the test 1.2 m) must always be laid descending towards the sampling probe.
4. The measuring device also meets the minimum requirements in the mains voltage range 126 V to 98 V.

Test Report:
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report no.: 936/21225956/A of 25 February 2016

Publication in the German Federal Gazette: BAnz AT 15.03.2017 B6, chapter V 23rd notification, UBA announcement dated 22 February 2017:

23 Notification as regards Federal Environment Agency (UBA) notice of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter I number 1.2)

The FWE200DH measuring system for dust from SICK Engineering GmbH can be optionally equipped with a valve for backwashing the sampling line. The results of the tests are presented in test report 936/21232260/A of 10 October 2016 by TÜV Rheinland Energy GmbH.

Statement issued by TÜV Rheinland Energy GmbH dated 10 October 2016

Publication in the German Federal Gazette: BAnz AT 26.03.2018 B8, chapter V 39th notification, UBA announcement dated 21 February 2018:

39 Notification as regards Federal Environmental Agency (UBA) notices of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter I number 1.2) and of 22 February 2017 (BAnz AT 15.03.2017 B6, chapter V 23rd notification)

The latest software versions of the FWE200DH dust monitor manufactured by SICK Engineering GmbH are:

FWE200DH (control): 01.02.06
DHSP100/SP200 (measuring cell): 01.06.04
MCU: 01.12.03

Statement issued by TÜV Rheinland Energy GmbH dated 28 September 2017

Publication in the German Federal Gazette: BAnz AT 17.07.2018 B9, chapter III 17th notification, UBA announcement dated 3 July 2018:

17 Notification as regards Federal Environmental Agency (UBA) notices of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter I number 1.2) and of 21 February 2018 (BAnz AT 26.03.2018 B8, chapter V 39th notification)

The latest software versions of the FWE200DH dust monitor manufactured by SICK Engineering GmbH are:

FWE200DH (control): 01.02.08
DHSP100/SP200 (measuring cell): 01.06.06
MCU: 01.12.03

For the control of the measuring system the SOPAS ET software platform is required in a publically notified version.

The most recent publically notified version is:
SOPAS ET 2.38

Statement issued by TÜV Rheinland Energy GmbH dated 2 May 2018

Publication in the German Federal Gazette: BAnz AT 24.03.2020 B7, chapter IV 63rd notification, UBA announcement dated 24 February 2020:

63 Notification as regards Federal Environmental Agency notices of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter I number 1.2) and of 3 July 2018 (BAnz AT 17.07.2018, chapter III 17th notification)

The latest software versions of the FWE200DH dust monitor manufactured by SICK Engineering GmbH are:

FWE200DH (control):	01.02.12
DHSP100/SP200 (measuring cell):	01.06.06
MCU:	01.12.04

Software version 01.02.10 may also be used for the controller of the FWE200DH measuring system.

Statement issued by TÜV Rheinland Energy GmbH dated 4 October 2019

Publication in the German Federal Gazette: BAnz AT 31.07.2020 B10, chapter II 20th notification, UBA announcement dated 27 May 2020:

20 Notification as regards Federal Environmental Agency (UBA) notices of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter I number 1.2) and of 24 February 2020 (BAnz AT 24.03.2020 B7, chapter IV 63rd notification)

The latest software versions of the FWE200DH dust monitor manufactured by SICK Engineering GmbH are:

FWE200DH (control):	01.02.12
DHSP100/SP200 (measuring cell):	01.06.06
MCU:	01.12.05

Statement issued by TÜV Rheinland Energy GmbH dated 10 March 2020

Publication in the German Federal Gazette: BAnz AT 05.08.2021 B5, chapter IV 44th notification, UBA announcement dated 29 June 2021:

44 Notification as regards Federal Environment Agency (UBA) notices of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter I number 1.2) and of 27 May 2020 (BAnz AT 31.07.2020 B10, chapter II notification 20)

The latest software versions of the FWE200DH measuring system for dust manufactured by SICK Engineering GmbH are:

FWE200DH (control):	01.02.12
DHSP100/SP200 (measuring cell):	01.08.00
MCU:	01.14.00

Statement issued by TÜV Rheinland Energy GmbH dated 16 February 2021

Publication in the German Federal Gazette: BAnz AT 28.07.2022 B4, chapter III 24th notification, UBA announcement dated 28 June 2022:

24 Notification as regards Federal Environment Agency (UBA) notices of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter I number 1.2) and of 29 June 2021 (BAnz AT 05.08.2021 B5, chapter IV notification 44)

The current software versions of the measuring device FWE200DH for dust of the company SICK Engineering GmbH are:

FWE200DH (control system): 01.02.14

DHSP100/SP200 (measuring cell): 01.08.00

MCU: 01.16.00

The measuring device is also suitable for use at plants of the 44th BImSchV.

Statement issued by TÜV Rheinland Energy GmbH dated 12 May 2022

Publication in the German Federal Gazette: BAnz AT 20.03.2023 B6, chapter IV 35th notification, UBA announcement dated 21 February 2023:

35 Notification as regards Federal Environment Agency (UBA) notices of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter I number 1.2) and of 28 June 2022 (BAnz AT 28.07.2022 B4, chapter III notification 24)

The current software versions of the FWE200DH measuring system for dust from the company SICK Engineering GmbH are:

FWE200DH (controller): 01.02.14

DHSP100/SP200 (measuring cell): 01.10.10

MCU: 01.16.00

Statement issued by TÜV Rheinland Energy GmbH dated 16 September 2022

Publication in the German Federal Gazette: BAnz AT 02.08.2023 B7, chapter III 20th notification, UBA announcement dated 5 July 2023:

20 Notification as regards Federal Environment Agency (UBA) notices of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter I number 1.2) and of 21 February 2023 (BAnz AT 20.03.2023 B6, chapter IV notification 35)

The current software versions of the FWE200DH measuring system for dust from SICK

Engineering GmbH are:

FWE200DH (control system): 01.04.05

DHSP100/SP200 (measuring cell): 01.14.03

MCU: 01.16.00

The software version for the DHSP100/SP200 (measuring cell) of 01.10.10 mentioned previously in the announcement is not correct and should read 01.10.00.

Statement issued by TÜV Rheinland Energy GmbH dated 31 March 2023

Publication in the German Federal Gazette: BAnz AT 10.05.2024 B7, chapter V 36th notification, UBA announcement dated 19 March 2024:

36 Notification as regards Federal Environment Agency (UBA) notices of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter I number 1.2) and of 5 July 2023 (BAnz AT 02.08.2023 B7, chapter III notification 20)

The current software versions for the FWE200DH measuring system for dust from SICK Engineering GmbH are as follows:

FWE200DH (controller): 01.04.05

DHSP100/SP200 (measuring cell): 01.14.03

MCU: 01.20.00

Statement issued by TÜV Rheinland Energy GmbH dated 27 September 2023

Publication in the German Federal Gazette: BAnz AT 31.10.2024 B9, chapter IV 38th notification, UBA announcement dated 21 August 2024:

38 Notification as regards Federal Environment Agency (UBA) notices of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter I number 1.2) and of 19 March 2024 (BAnz AT 10.05.2024 B7, chapter V notification 36)

The current software versions for the FWE200DH measuring system for dust from the

company SICK Engineering GmbH are:

FWE200DH (control unit): 01.04.05

DHSP100/SP200 (measuring cell): 01.14.05

MCU: 01.22.00

Software version 01.14.04 can also be used for the measuring cell.

Statement issued by TÜV Rheinland Energy & Environment GmbH dated 10 May 2024

Publication in the German Federal Gazette: BAnz AT 19.05.2025 B3, chapter IV 15th notification, UBA announcement dated 2 April 2025:

15 Notification as regards Federal Environment Agency (UBA) notices of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter I number 1.2) and of 21 August 2024 (BAnz AT 31.10.2024 B9, chapter IV notification 38)

Change of the manufacturer's company name for the FWE200DH measuring system for dust of the former company SICK Engineering GmbH.

The analysis division of Sick AG and Sick Engineering GmbH (flow and dust measurement technology) have entered into a joint venture with Endress+Hauser. The companies will operate under the new company name "Endress+Hauser SICK GmbH + Co. KG" from 9 December 2024. As a result, the QAL1-certified products will be sold under this joint company name in future.

The joint venture company address is:
Endress+Hauser SICK GmbH + Co. KG
Bergener Ring 27
01458 Ottendorf-Okrilla
Germany

Statement issued by TÜV Rheinland Energy & Environment GmbH
dated 20 December 2024

Certified product

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

The FWE200DH measuring system is a dust measuring device that works according to the scattered light principle (forward scattering). The FWE200DH measuring system monitors dust concentrations up to 200 mg/m³ in wet gases, too, with a resolution of up to 0.1 mg/m³. The instrument is an extractive AMS and is thus particularly appropriate for the measurement in wet gases.

A laser diode radiates modulated light in the visible range (wavelength approx. 650 nm) through the dust particles in the measuring path. A highly sensitive receiver detects light reflected by the particles and amplifies it. A microprocessor in the electronics unit of the sensor ("DHSP200") processes the signal. The measured volume is defined by intersection of the sensor beam and the receiving aperture.

Minute changes in light intensity of the transmitted light beam are detected by continuously monitoring the sensor output. These are taken into consideration when establishing the measured signal.

The FWE200DH operates as a bypass system. A partial flow is taken from the gas duct with the help of a sample gas probe. It is then overheated in a thermocyclone to vaporize water and aerosols before being transported to a measurement cell. A light beam illuminates the sample gas inside the measurement cell and the light scattered by the particles present in the gas flow is detected by a receiver. The measured intensity of the scattered light forms the basis for establishing the dust concentration. Finally, the sample gas is transported to the sample gas probe which directs it back into the duct.

The gas flow through the measuring system is generated by an ejector. The ejector is operated with a blower. A partial flow inside the measurement cell serves to purge and cool the optical components.

The main components of the FWE200DH measuring system are:

- The sampling probe with the waste gas recirculation and a replaceable suction hose
- The sampling line
- The thermocyclone
- The measurement cell
- The control unit
- The recirculation line

A PC with a performance tested version of the SOPAS ET software may optionally be used to parameterize and control the AMS.

General remarks

This certificate is based upon the equipment tested. The manufacturer is responsible for ensuring that on-going production complies with the requirements of the EN 15267. The manufacturer is required to maintain an approved quality management system controlling the manufacturing process for the certified product. Both the product and the quality management systems shall be subject to regular surveillance.

If a product of the current production does not conform to the certified product, TÜV Rheinland Energy & Environment GmbH must be notified at the address given on page 1.

A certification mark with an ID-Number that is specific to the certified product is presented on page 1 of this certificate. This certification mark may be applied to the product or used in advertising materials for the certified product.

This document as well as the certification mark remains property of TÜV Rheinland Energy & Environment GmbH. Upon revocation of the publication the certificate loses its validity. After the expiration of the certificate and on request of TÜV Rheinland Energy & Environment GmbH this document shall be returned and the certificate mark must no longer be used.

The relevant version of this certificate and its expiration date are also accessible on the internet at qal1.de.

Document history

Certification of the FWE200DH measuring system is based on the documents listed below and the regular, continuous surveillance of the manufacturer's quality management system:

Initial certification according to EN 15267

Certificate no. 0000051691_00: 19 August 2016
Expiry date of the certificate: 31 July 2021
Test report 936/21225956/A of 25 February 2016
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Publication: BAnz AT 01.08.2016 B11, chapter I number 1.2
UBA announcement dated 14 July 2016

Notifications in accordance with EN 15267

Statement issued by TÜV Rheinland Energy GmbH dated 10 October 2016
Publication: BAnz AT 15.03.2017 B6, chapter V notification 23
UBA announcement dated 22 February 2017
(New backwash valve)

Statement issued by TÜV Rheinland Energy GmbH dated 28 September 2017
Publication: BAnz AT 26.03.2018 B8, chapter V notification 39
UBA announcement dated 21 February 2018
(New software version)

Statement issued by TÜV Rheinland Energy GmbH dated 02 May 2018
Publication: BAnz AT 17.07.2018 B9, chapter III notification 17
UBA announcement dated 03 July 2018
(New software version)

Statement issued by TÜV Rheinland Energy GmbH dated 04 October 2019
Publication: BAnz AT 24.03.2020 B7, chapter IV notification 63
UBA announcement dated 24 February 2020
(New software version)

Statement issued by TÜV Rheinland Energy GmbH dated 10 March 2020
Publication: BAnz AT 31.07.2020 B10, chapter II notification 20
UBA announcement dated 27 May 2020
(New software version)

Renewal of the certificate

Certificate no. 0000051691_01: 31 July 2021
Expiry date of the certificate: 31 July 2026

Notifications in accordance with EN 15267

Statement issued by TÜV Rheinland Energy GmbH dated 16 February 2021
Publication: BAnz AT 05.08.2021 B5, chapter IV notification 44
UBA announcement dated 29 June 2021
(New software version)

Statement issued by TÜV Rheinland Energy GmbH dated 12 May 2022
Publication: BAnz AT 28.07.2022 B4, chapter III notification 24
UBA announcement dated 28 June 2022
(New software version, approved for use at plants according to the 44th BImSchV)

Statement issued by TÜV Rheinland Energy GmbH dated 16 September 2022
Publication: BAnz AT 20.03.2023 B6, chapter IV notification 35
UBA announcement dated 21 February 2023
(New software version)

Statement issued by TÜV Rheinland Energy GmbH dated 31 March 2023
Publication: BAnz AT 02.08.2023 B7, chapter III notification 20
UBA announcement dated 5 July 2023
(New software version)

Statement issued by TÜV Rheinland Energy GmbH dated 27 September 2023
Publication: BAnz AT 10.05.2024 B7, chapter V notification 36
UBA announcement dated 19 March 2024
(New software version)

Statement issued by TÜV Rheinland Energy & Environment GmbH dated 10 May 2024
Publication: BAnz AT 31.10.2024 B9, chapter IV notification 38
UBA announcement dated 21 August 2024
(New software version)

Statement issued by TÜV Rheinland Energy & Environment GmbH dated 20 December 2024
Publication: BAnz AT 19.05.2025 B3, chapter IV notification 15
UBA announcement dated 2 April 2025
(Manufacturer name change)

Renewal of the certificate

Certificate no. 0000051691_02: 20 July 2026
Expiry date of the certificate: 31 July 2031

Calculation of overall uncertainty according to EN 14181 and EN 15267-3

Measuring system

Manufacturer	SICK Engineering GmbH
AMS designation	FWE200DH
Serial number of units under test	14258515/14258516
Measuring principle	Vorwärtsstreuung extraktiv

Test report

Test laboratory	936/21225956/A
Date of report	TÜV Rheinland 2016-02-25

Measured component

Certification range	Dust 0 - 7.5 mg/m³
---------------------	-----------------------

Calculation of the combined standard uncertainty

Tested parameter

			u^2
Standard deviation from paired measurements under field conditions *	u_D	0.094 mg/m³	0.009 (mg/m³)²
Lack of fit	u_{lof}	0.052 mg/m³	0.003 (mg/m³)²
Zero drift from field test	$u_{d,z}$	0.022 mg/m³	0.000 (mg/m³)²
Span drift from field test	$u_{d,s}$	-0.108 mg/m³	0.012 (mg/m³)²
Influence of ambient temperature at span	u_t	0.058 mg/m³	0.003 (mg/m³)²
Influence of supply voltage	u_v	0.035 mg/m³	0.001 (mg/m³)²
Influence of sample gas flow	u_p	-0.043 mg/m³	0.002 (mg/m³)²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.061 mg/m³	0.004 (mg/m³)²

* The larger value is used :
"Repeatability standard deviation at set point" or
"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_c)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.18 mg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.36 mg/m³

Relative total expanded uncertainty

Requirement of 2010/75/EU	U in % of the ELV 5 mg/m³	7.2
Requirement of EN 15267-3	U in % of the ELV 5 mg/m³	30.0
	U in % of the ELV 5 mg/m³	22.5