

CERTIFICATE

of Product Conformity (QAL1)

Certificate No: 0000036943_03

Certified AMS: DUSTHUNTER SB100 for dust

Manufacturer: SICK Engineering GmbH
Bergener Ring 27
01458 Ottendorf-Okrilla
Germany

Test Institute: TÜV Rheinland Energy 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 (2009), EN 15267-3 (2007)
and EN 14181 (2015).**

Certification is awarded in respect of the conditions stated in this certificate
(this certificate contains 12 pages).

The present certificate replaces certificate 0000036943_02 dated 18 July 2017.



Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

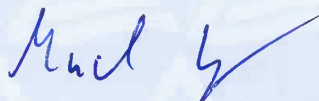
www.tuv.com
ID 0000036943

Publication in the German Federal Gazette
(BAnz) of 05 March 2013


German Environment Agency
Dessau, 20 July 2022

This certificate will expire on:
19 July 2027

TÜV Rheinland Energy GmbH
Cologne, 19 July 2022



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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 the certificate D-PL-11120-02-00.

Test report:	936/21219384/A dated 27 September 2012
Initial certification:	20 August 2012
Expiry date:	19 July 2027
Certificate:	Renewal (of previous certificate 0000036943_02 of 18. Juli 2017 valid until 19 July 2022)
Publication:	BAnz AT 05.03.2013 B10, Chap. I No. 1.6

Approved application

The tested AMS is suitable for use according to plants to Directive 2010/75/EU, chapter III (13th BImSchV:2009), chapter IV (17th BImSchV:2009), 30th BImSchV:2009, Directive 2015/2193/EC (44th BImSchV:2021), TA Luft:2002 and at plants according to the 27th BImSchV:2020. 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 a 12 month field test at a lignite fluidised bed combustion plant.

The AMS is approved for an ambient temperature range of -20° 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 emission limit values relevant to the application.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the installation at which it will be installed.

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 certification

This certification is based on:

- Test report 936/21219384/A dated 27 September 2012 of TÜV Rheinland Energie und Umwelt GmbH
- Suitability announced by the German 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 05.03.2013 B10, Chap. I No. 1.6,
Announcement by UBA dated 12 February 2013:

AMS designation:

DUSTHUNTER SB100 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 the performance test:

Component	Certification range	Supplementary measurement ranges			Unit
Dust	0 - 100	0 - 15	0 - 50	0 - 200	SE

100 SE (*scattered light units*) $\hat{=}$ 15 mg/m³ dust

Software version:

MCU Firmware version: 01.08.00

Sender and receiver unit: 01.03.10

Control software: SOPAS ET: 02.32

Restrictions:

None

Notes:

1. The maintenance interval is six months.
2. Dust concentration is determined in wet exhaust gas under operating conditions.
3. Requirements with regard to the determination coefficient R^2 of the calibration function in accordance with DIN EN 15267-3 were not satisfied during performance testing.
4. Supplementary testing (extension of the maintenance interval) as regards Federal Environmental Agency notices of 19 February 2009 (BAnz) p. 899, chapter I no. 1.3) and of 6 July 2012 (BAnz) AT 20.07.2012 B11, chapter IV notification 19).

Test report:

TÜV Rheinland Energie und Umwelt GmbH, Cologne

Report No.: 936/21219384/A dated 27 September 2012

Publication in the German Federal Gazette: BAnz AT 23.07.2013 B4, chapter V notification 10, Announcement by UBA dated 03 July 2013:

10 Notification as regards Federal Environment Agency (UBA) notice of 12 February 2013 (BAnz AT 5.03.2013 B10, chapter I no. 1.6)

The current software versions of the AMS DUSTHUNTER SB100 for dust as manufactured by SICK Engineering GmbH are:

MCU Firmware: 01.08.00
Software Sensor (measuring head): 01.04.00

The software platform SOPAS ET in a certified version is required for full control of the measuring system.

Statement of TÜV Rheinland Energie und Umwelt GmbH of 22 March 2013

Publication in the German Federal Gazette: BAnz AT 23.07.2013 B4, chapter V notification 13, Announcement by UBA dated 03 July 2013:

13 Notification to the announcement of the Federal Environmental Agency concerning suitability-tested measuring systems by SICK Engineering GmbH and SICK MAIHAK GmbH (Extract)

Ser. no.	Measuring system/ Manufacturer	Notification	Announcement	Statement of testing body
6	DUSTHUNTER SB100/ SICK Engineering GmbH	with regard to notification 10 of this confirmation	The current software version of the platform SOPAS ET for operating the measuring system is: SOPAS ET 2.38	TÜV Rheinland Energie und Umwelt GmbH of 25 March 2013
...

Publication in the German Federal Gazette: BAnz AT 26.08.2015 B4, chapter V notification 9, Announcement by UBA dated 22 July 2015:

9 Notification as regards Federal Environment Agency (UBA) notices of 12 February 2013 (BAnz AT 5.03.2013 B10, chapter I number 1.6) and of 3 July 2013 (BAnz AT 23.07.2013 B4, chapter V notification 10 and 13/ 6)

The current software versions for the DUSTHUNTER SB100 measuring system for dust, manufactured by SICK Engineering GmbH, are:

MCU firmware: 01.12.00
Software sensor: 1.06.00

The SOPAS ET software platform is required in a notified version for operating the AMS. The latest notified version is: SOPAS ET 2.38.

Statement of TÜV Rheinland Energie und Umwelt GmbH of 24 March 2015

Publication in the German Federal Gazette: BAnz AT 01.08.2016 B11, chapter V notification 13, Announcement by UBA dated 14 July 2016:

13 Notification as regards Federal Environment Agency (UBA) notices of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter I number 1.6) and of 22 July 2015 (BAnz AT 26.08.2015 B4 chapter V notification 9)

The current software versions of the DUSTHUNTER SB100 particle monitor manufactured by SICK Engineering GmbH are:

MCU Firmware: 01.12.02
Software Sensor: 1.06.02

For the control of the measuring system the SOPAS ET software platform is required in a notified version. The most recent notified version is: SOPAS ET 2.38

Statement issued by TÜV Rheinland Energy GmbH dated 25 April 2016

Publication in the German Federal Gazette: BAnz AT 26.03.2018 B8, chapter V notification 42, Announcement by UBA dated 21 February 2018:

42 Notification as regards Federal Environment Agency (UBA) notices of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter I number 1.6) and of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter V notification 13)

The current software versions of the DUSTHUNTER SB100 particle monitor for dust manufactured by SICK Engineering GmbH are as follows:

MCU: 01.12.03
Software sensor: 1.06.02

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 28 September 2017

Publication in the German Federal Gazette: BAnz AT 17.07.2018 B9, chapter III notification 26, Announcement by UBA dated 03 July 2018:

26 Notification as regards Federal Environment Agency (UBA) notices dated 12 February 2013 (BAnz AT 05.03.2013 B10, chapter I number 1.6) and dated 21 February 2018 (BAnz AT 26.03.2018 B8, chapter V notification 42)

The DUSTHUNTER SB100 measuring system for dust manufactured by SICK Engineering GmbH may also be used with a quick action flap for protecting the AMS in the event of a purge air outage or power failure. Retrofitting existing systems is possible. This needs to be done by the instrument manufacturer.

Statement issued by TÜV Rheinland Energy GmbH dated 2 May 2018

Publication in the German Federal Gazette: BAnz AT 22.07.2019 B8, chapter V notification 15, Announcement by UBA dated 28 June 2019:

15 Notification as regards Federal Environment Agency (UBA) notices of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter I number 1.6) and of 3 July 2018 (BAnz AT 17.07.2018 B9, chapter III notification 26)

Instead of the MCU used so far, the DUSTHUNTER SB100 measuring system for dust manufactured by SICK Engineering GmbH may also be operated with the new MCU100 control unit. The latest software versions of the measuring system are:

SB 100: 1.06.03
MCU: 01.12.04
MCU100: r2.3.6

Statement issued by TÜV Rheinland Energy GmbH dated 28 February 2019

Publication in the German Federal Gazette: BAnz AT 03.05.2021 B9, chapter III notification 48, Announcement by UBA dated 31 March 2021:

48 Notification as regards Federal Environment Agency (UBA) notices of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter I number 1.6) and of 28 June 2019 (BAnz AT 22.07.2019 B8, chapter V notification 15)

The latest software versions of the DUSTHUNTER SB100 measuring system for dust manufactured by SICK Engineering GmbH are:

SB 100: 1.06.03,
MCU: 01.12.05,
MCU100: r2.3.6.

Statement issued by TÜV Rheinland Energy GmbH dated 18 September 2020

Publication in the German Federal Gazette: BAnz AT 05.08.2021 B5, chapter IV notification 39, Announcement by UBA dated 29 June 2021:

39 Notification as regards Federal Environment Agency (UBA) notices of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter I number 1.6) and of 31 March 2021 (BAnz AT 03.05.2021 B9, chapter III notification 48)

The latest software versions of the DUSTHUNTER SB100 measuring system for dust manufactured by SICK Engineering GmbH are:

SB 100: 1.06.03,
MCU: 01.14.00,
MCU100: r2.3.6

Statement issued by TÜV Rheinland Energy GmbH dated 03 May 2021

Certified product

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

The measuring system functions under the principle of scattered light measurement (backward scattering). A laser diode irradiates dust particles in the gas flow with modulated light in a visible range (wavelength: approx. 650 nm). The light scattered by the particles is captured by a highly sensitive detector, which amplifies it electrically and conducts it to the measurement channel of a microprocessor as central part of the electronic measurement, control and evaluation system. The measuring volume at the gas duct is defined by the overlapping of the transmitted beam and receiver aperture.

The smallest changes in brightness of the transmitted light beam are detected through continuous monitoring of the transmission performance and taken into account when determining the measurement signal.

The tested measuring system DUSTHUNTER SB100 comprises the following parts:

- DHSB-T sender/receiver unit
- signal cable for connecting the sender/receiver unit to the control unit (lengths: 5 m, 10 m)
- flange with tube
- MCU control unit for control, evaluation and output of data from the sender/receiver unit(s) connected via a RS485 interface
 - MCU-P with integrated purge air supply, for internal duct pressure of -50 ... +2 mbar
 - MCU-N without integrated purge air supply, in this case the following is required:
- external purge air unit, for internal duct pressure of -50 ... +30 mbar

Communication between sender/receiver unit and MCU

By default, every sender/receiver unit is connected via signal cable to an individual control unit. Nevertheless, more than one sender/receiver units can be optionally connected to a single MCU-N control unit. In this case, every sender/receiver unit must be supplied with purge air separately.

Sender/Receiver unit

The sender/receiver unit contains the optical and electronic modules for sending and receiving the light beam. It also holds the modules for processing and evaluating signals. Data transfer to the control unit, and voltage supply from it (24 V DC) is carried out with a 7 pole cable with plug-type connector. A RS485 interface is available for service purposes. A purge air nozzle provides clean air for cooling the probe and avoiding contamination of the optical surfaces.

The sender/receiver unit is mounted to the duct by a flange with tube.

Flange with tube

The flange with tube serves the purpose of mounting the sender/receiver unit to the duct wall. It is available in different steel grades and nominal lengths (NL). The selection depends on the insulation and wall thickness of the duct wall (? nominal length), and on the duct material.

MCU Control unit

The control unit has the following functions:

- control of data traffic and processing of data from the unit(s) connected via RS485 interface
- signal output via analogue output (measured value) and relay outputs (device status)
- signal input via analogue and digital inputs
- voltage supply to the connected units using a 24 V switching power supply with wide-range input
- communication with supervisory control systems via optional modules

The control unit can be connected to external devices over an USB interface. In this way, the setup of plant and device parameters can be easily and comfortably carried out via laptop with the operating software (SOPAS). The parameters are efficiently saved in the MCU in the event of a power outage. By default, the control unit is housed in a sheet steel enclosure.

Versions

- MCU-N without integrated purge air supply.
- MCU-P with integrated purge air supply

This version also contains a purge air blower, an air filter, and purge air nozzles used for connecting the air hose to the sender/receiver unit.

General notes

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 manufacture of 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 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 and the certification mark remains property of TÜV Rheinland Energy GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energy GmbH this document shall be returned and the certificate mark must not be employed anymore.

The relevant version of this certificate and its expiration is also accessible on the internet: qal1.de.

History of documents

Certification of DUSTHUNTER SB100 is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Basic test

Test report 936/21208609/A dated 24 October 2008
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH
Publication BAnz. 11 March 2009, No. 38, p. 899, chapter I number 1.3
UBA announcement dated 19 February 2009

Notifications

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 5 October 2010
Publication BAnz. 26 January 2011, No. 14, p. 294, chapter IV notification 10
UBA announcement dated 10 January 2011
(Software changes)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 8 November 2010
Publication BAnz. 26 January 2011, No. 14, p. 294, chapter IV notification 30
UBA announcement dated 10 January 2011
(Software changes)

Initial certification according to EN 15267

Certificate No. 0000036943_00: 20 August 2012
Expiry date of the certificate: 19 July 2017
Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 20 March 2012
Test report 936/21208609/A dated 24 October 2008
Publication BAnz AT 20.07.2012 B11, chapter IV number 19
UBA announcement dated 6 July 2012

Supplementary testing according to EN 15267

Certificate No. 0000036943_01: 22 March 2013
Expiry date of the certificate: 19 July 2017
Test report 936/21219384/A dated 27 September 2012
TÜV Rheinland Energie und Umwelt GmbH
Publication BAnz AT 05.03.2013 B10, chapter I number 1.6
UBA announcement dated 12 February 2013

Notifications

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 22 March 2013
Publication BAnz AT 23.07.2013 B4, chapter V notification 10
UBA announcement dated 3 July 2013
(Software changes)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 25 March 2013
Publication BAnz AT 23.07.2013 B4, chapter V notification 13
UBA announcement dated 3 July 2013
(Software changes)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 24 March 2015
Publication BAnz AT 26.08.2015 B4, chapter V notification 9
UBA announcement dated 22 July 2015
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 25 April 2016
Publication BAnz AT 01.08.2016 B11, chapter V notification 13
UBA announcement dated 14 July 2016
(Software changes)

Renewal of certificate

Certificate No. 0000036943_02: 18 July 2017
Expiry date of the certificate: 19 July 2022

Notifications

Statement issued by TÜV Rheinland Energy GmbH dated 28 September 2017
Publication BAnz AT 26.03.2018 B8, chapter V notification 42
UBA announcement dated 21 February 2018
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 2 May 2018
Publication BAnz AT 17.07.2018 B9, chapter III notification 26
UBA announcement dated 3 July 2018
(Hardware changes)

Statement issued by TÜV Rheinland Energy GmbH dated 28 February 2019
Publication BAnz AT 22.07.2019 B8, chapter V notification 15
UBA announcement dated 28 June 2019
(Soft- and hardware changes)

Statement issued by TÜV Rheinland Energy GmbH dated 18 September 2020
Publication BAnz AT 03.05.2021 B9, chapter III notification 48
UBA announcement dated 31 March 2021
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 3 May 2021
Publication BAnz AT 05.08.2021 B5, chapter IV notification 39
UBA announcement dated 29 June 2021
(Software change Softwareänderung)

Renewal of certificate

Certificate No. 0000036943_03: 20 July 2022
Expiry date of the certificate: 19 July 2027

EN ISO 14956 and EN 15267-3 calculation for QAL1 in EN 14181

Manufacturer data

Manufacturer	Sick Engineering GmbH
Name of measuring system	DUSTHUNTER SB100
Serial Number	07498579 / 07498578
Measuring Principle	Scattering light (backwards)

TÜV Data

Approval Report	936/21219384/A
Date	27.09.2012
Editor	Baum

Measurement Component

certificated range	Dust	15 mg/m ³
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Calculation of the combined standard uncertainty

Test Value

		$\Delta X_{max,j}$	u^2
Repeatability standard deviation at span *	u_{inf}	0.11 mg/m ³	0.012
Lack of fit	u_{rl}	0.09 mg/m ³	0.003
Zero drift from field test	u_{rls}	-0.29 mg/m ³	0.027
Span drift from field test	u_t	-0.28 mg/m ³	0.027
Influence of ambient temperature at span	u_n	0.00 mg/m ³	0.000
Influence of supply voltage	u_f	0.11 mg/m ³	0.004
Uncertainty of reference material	u_{rm}	0.30 mg/m ³	0.030

* The greater value of: "Repeatability standard deviation at span" or "Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_c)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.320
Total expanded uncertainty	$U = u_c * k = u_c * 1,96$	0.627
Relative total expanded uncertainty	U in % of the ELV 10 mg/m ³	6.3
Requirement	U in % of the ELV 10 mg/m ³	22.5