

CERTIFICATE

of Product Conformity (QAL1)

Certificate No: 0000036947_02

Certified AMS: DUSTHUNTER T200 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 14 pages).

The present certificate replaces certificate 0000036947_01 dated 18 July 2017.



Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000036947

Publication in the German Federal Gazette
(BAnz) of 20 July 2012

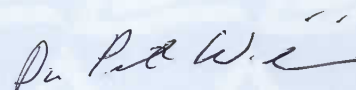
German Environment Agency
Dessau, 20 July 2022

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 DAKS (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:	936/21210461/C dated 17 March 2009
Initial certification:	20 August 2012
Expiry date:	19 July 2027
Certificate:	Renewal (of previous certificate 0000036947_01 of 18. Juli 2017 valid until 19 July 2022)
Publication:	BAnz. 25 August 2009, No. 125, p. 2929, chapter I no. 2.3

Approved application

The tested AMS is suitable for use at plants according to directive 2001/80/EC (13th BImSchV:2009), 2000/76/EC (17th BImSchV:2009), 30th BImSchV:2009, Directive 2015/2193/EC (44th BImSchV:2021), TA Luft:2002 and at plants according to the 27th BImSchV:1997 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 14 month field test at a waste incineration 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 936/21210461/C dated 17 March 2009 of TÜV Rheinland Immissionschutz und Energiesysteme 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. 25 August 2009, No. 125, p. 2929,
chapter I No. 2.3, Announcement by UBA from 03 August 2009:

AMS designation:

DUSTHUNTER T200 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:

Dust (Transmission measurement):

0 – 0,1 Ext. \triangleq 15 mg/m³ dust at 5 m measurement path length
and

0 – 0,05 Ext.

0 – 0,2 Ext.

0 – 0,5 Ext.

0 – 1,0 Ext.

Software versions:

MCU: 1.026,

Sensor: 1.3.04,

SOPAS ET: 02.16

Restriction:

The measuring system shall only be employed if a fall below the dew point can be excluded.

Notes:

1. A six-month period has been specified as maintenance interval.
2. Dust concentrations are measured in wet stack gas under operating conditions.
3. Complementary test to the announcement of the German Federal Environmental Agency of 12 August 2008 (BAnz. p. 3243) and 19 February 2009 (BAnz. p. 901).

Test report:

TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne

Report No.: 936/21210461/C dated 17 March 2009

Publication in the German Federal Gazette: BAnz. 26 January 2011, No. 14, p. 294, chapter IV notification 14, Announcement by UBA dated 10 January 2011:

14 Notification as regards Federal Environment Agency (UBA) notice of 3 August 2009 (BAnz. p. 2929, chapter I no. 2.3)

The current software versions of the dust concentration measuring system DUSTHUNTER T200 by SICK Engineering GmbH are:

MCU Firmware: 01.04.00
MCU Hardware: 1.8
Software Sensor (measuring head): 01.06.00

A notified version of the software platform SOPAS ET is necessary to ensure a full operation of the measuring system.

Statement of TÜV Rheinland Energie und Umwelt GmbH dated 5 October 2010

Publication in the German Federal Gazette: BAnz. 26 January 2011, No. 14, p. 294, chapter IV notification 30, Announcement by UBA dated 10 January 2011:

30 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 T200/ Sick Engineering GmbH	to announce-ment 14 of this notification	The current software version of the platform SOPAS ET for operating the measuring system is: SOPAS ET 2.32	TÜV Rheinland Energie und Umwelt GmbH of 8 November 2010
...

Publication in the German Federal Gazette: BAnz AT 20.07.2012 B11, chapter IV notification 21, Announcement by UBA from 06 July 2012:

21 Notification as regards Federal Environmental Agency (UBA) notices of 3 August 2009 (BAnz. p. 2929, chapter I no. 2.3) and of 10 January 2011 (BAnz. p. 294, chapter IV notification 14 and 30)

The measuring system DUSTHUNTER T200 for dust by SICK Engineering GmbH and its manufacture and quality management system fulfil the requirements of Directive EN 15267.

Concerning the application of EN 15267 to this measuring system, the following remark is added: The requirement of suitability testing according to EN 15267-3 regarding the determination coefficient R^2 of the calibration function were not fulfilled.

Statement of TÜV Rheinland Energie und Umwelt GmbH dated 20 March 2012

Publication in the German Federal Gazette: BAnz AT 05.03.2013 B10, chapter V notification 23, Announcement by UBA dated 12 February 2013:

23 Notification as regards Federal Environment Agency (UBA) notices of 3 August 2009 (BAnz. p. 2929, chapter I no. 2.3) and of 6 July 2012 (BAnz. AT 20.07.2012 B11, chapter IV notification 21)

The current software versions of the DUSTHUNTER T200 dust measuring system manufactured by SICK Engineering GmbH are:

MCU Firmware:	01.08.00
MCU Hardware:	1.8
Software Sensor (measuring head):	01.09.00

Statement of TÜV Rheinland Energie und Umwelt GmbH dated 15 October 2012

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 as regards Federal Environmental Agency notices regarding performance tested AMS manufactured by SICK Engineering GmbH and by SICK AG (Extract)

Ser. no.	Measuring system/ Manufacturer	Notification	Announcement	Statement of testing body
2	DUSTHUNTER T200/ SICK Engineering GmbH	of 3 August 2009 Federal Gazette (BAnz. p. 2929, chapter I no. 2.3) and 12 February 2013 Federal Gazette (BAnz AT 05.03.2013 B10, chapter V notification 23)22)	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 13, Announcement by UBA dated 22 July 2015:

13 Notification as regards Federal Environment Agency (UBA) notices of 3 August 2009 (BAnz. p. 2929, chapter I number 2.3) and of 3 July 2013 (BAnz AT 23.07.2013 B4, chapter V notification 13, seq. no. 2)

The current software versions for the DUSTHUNTER T200 measuring system for dust, manufactured by SICK Engineering GmbH, are:

MCU firmware: 01.12.00
Software sensor: 1.10.02

The SOPAS ET software platform is available 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 11, Announcement by UBA dated 14 July 2016:

11 Notification as regards Federal Environment Agency (UBA) notices of 3 August 2009 (BAnz. p. 2929, chapter I number 2.3) and of 22 July 2015 (BAnz AT 26.08.2015 B4, chapter V notification 13)

The current software versions of the DUSTHUNTER T200 particle monitor manufactured by SICK Engineering GmbH are:

MCU Firmware: 01.12.02
Software Sensor: 1.10.02

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 31.07.2017 B12, chapter II notification 25, Announcement by UBA dated 13 July 2017:

25 Notification as regards Federal Environment Agency (UBA) notices of 3 August 2009 (BAnz p. 2929, chapter I number 2.3) and of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter V, notification 11)

As an alternative light source to the XR-E LED the XM-L LED manufactured by the same manufacturer may be used for the DUSTHUNTER T200 measuring system monitoring dust manufactured by SICK Engineering GmbH. This change does not significantly affect the performance of the AMS.

Statement issued by TÜV Rheinland Energy GmbH dated 27 January 2017

Publication in the German Federal Gazette: BAnz AT 26.03.2018 B8, chapter V notification 46, Announcement by UBA dated 21 February 2018:

46 Notification as regards Federal Environment Agency (UBA) notices of 3 August 2009 (BAnz. p. 2929, chapter I no. 2.3) and of 13 July 2017 (BAnz AT 31.07.2017 B12, chapter II notification 25)

The current software versions of the DUSTHUNTER T200 particle monitor for dust manufactured by SICK Engineering GmbH are as follows:

MCU: 01.12.03
Software Sensor: 1.12.00

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 22, Announcement by UBA dated 03 July 2018:

22 Notification as regards Federal Environment Agency (UBA) notices of 3 August 2009 (BAnz. p. 2929, chapter I number 2.3) and of 21 February 2018 (BAnz AT 26.03.2018 B8, chapter V notification 46)

The current software versions of the DUSTHUNTER T200 particle monitor manufactured by SICK Engineering GmbH are:

MCU: 01.12.03
Software Sensor: 1.12.02

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 2 May 2018

Publication in the German Federal Gazette: BAnz AT 22.07.2019 B8, chapter V notification 18, Announcement by UBA dated 28 June 2019:

18 Notification as regards Federal Environment Agency (UBA) notices of 3 August 2009 (BAnz. p. 2929, chapter II number 2.3) and of 3 July 2018 (BAnz AT 17.07.2018 B9, chapter III notification 22)

Instead of the MCU used so far, the DUSTHUNTER T200 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:

DH T200: 1.12.02
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 50, Announcement by UBA dated 31 March 2021:

**50 Notification as regards Federal Environment Agency (UBA) notices
of 3 August 2009 (BAnz. p. 2929, chapter I number 2.3) and
of 28 June 2019 (BAnz AT 22.07.2019 B8, chapter V notification 18)**

The latest software versions of the DUSTHUNTER T200 measuring system for
dust manufactured by SICK Engineering GmbH are:

T200: 01.12.02
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 42, Announcement by UBA dated 29 June 2021:

**42 Notification as regards Federal Environment Agency (UBA) notices
of 3 August 2009 (BAnz p. 2929, chapter I number 2.3) and
of 31 March 2021 (BAnz AT 03.05.2021 B9, chapter III notification 50)**

The latest software versions of the DUSTHUNTER T200 measuring system for
dust manufactured by SICK Engineering GmbH are:

T200: 01.12.03,
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 uses the measured quantities of transmission, opacity and extinction, wherein transmission is determined as the primary optical quantity. The other measured quantities are derived thereof.

The DUSTHUNTER T200 measuring system comprises the following parts in its tested device version:

- DHT-T sender/receiver unit
- Signal cable for connecting the sender/receiver unit to the control unit
- DHT-R reflector
- Signal cable for connecting the reflector to the sender/receiver unit
- MCU control unit for control, evaluation and output of data
 - with integrated purge air supply, for internal duct pressure of -50 ... +2 mbar
 - without integrated purge air supply, in this case the following is required:
- external purge air unit, for internal duct pressure of -50 ... +30 mbar

Sender/Receiver unit

The sender/receiver unit contains the optical and electronic modules for sending and receiving the reflected light beam during transmission measurement. It also holds the modules for processing and evaluating signals. For contamination measurement and self-alignment, additional swivel elements are integrated.

A purge air nozzle provides clean air for avoiding contamination of the optical surfaces. The sender/receiver unit is mounted to the duct by a flange with tube.

Reflector

This unit contains a reflector used for redirecting the sent light beam back to the receiver in the sender/receiver unit.

MCU Control unit

The control unit has the following functions:

- Control of data traffic and processing of data from the connected unit(s)
- 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
- Communication with external systems, e.g. over 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. The parameters are efficiently saved in the MCU in the event of a power outage.

Standard interfaces

Analogue outputs:

3 outputs 0/2/4 - 22 mA (active, galvanically isolated) for output of transmission and scattered light intensity, 12 bit resolution

Relay outputs:

5 changeover contacts (120 V AC, 1 A, 30 V DC 2A) for output of status signals:

• Operation/Malfunction • Maintenance • Function check • Service requirement • Limit value

Analogue inputs:

2 inputs 0 ... 20 mA (standard; without galvanic isolation) or 0 ... 5/10 V, 10 bit resolution

Digital inputs:

4 inputs for connecting potential-free contacts (e.g. for connecting a maintenance switch or triggering control cycle)

Communication:

- USB 1.1 and RS232 (on grips) for measured value enquiry, parameterisation and software update
- RS485 for sensor connection

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 T200 is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Basic test

Test report 936/21207351/C dated 10 March 2008
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH
Publication BAnz. 03 September 2008, No. 133, p. 3243, chapter I number 1.2
UBA announcement dated 12 August 2008

Supplementary testing

Test report 936/21207351/F dated 10 October 2008
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH
Publication BAnz. 11 March 2009, No. 38, p. 899, chapter I number 1.6
UBA announcement dated 19 February 2009

Supplementary testing

Test report 936/21210461/C dated 17 March 2009
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH
Publication BAnz. 25 August 2009, No. 125, p. 2929, chapter I number 2.3
UBA announcement dated 3 August 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 14
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. 0000036947_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 936/21210461/C dated 17 March 2009
Publication BAnz AT 20.07.2012 B11, chapter IV number 21
UBA announcement dated 6 July 2012

Notifications

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 15 October 2012
Publication BAnz AT 05.03.2013 B10, chapter V notification 23
UBA announcement dated 12 February 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 13
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 11
UBA announcement dated 14 July 2016
(Software changes)

Renewal of certificate

Certificate No. 0000036947_01: 18 July 2017
Expiry date of the certificate: 19 July 2022

Notifications

Statement issued by TÜV Rheinland Energy GmbH dated 27 January 2017
Publication BAnz AT 31.07.2017 B12, chapter II notification 25
UBA announcement dated 13 July 2017
(Hardware changes)

Statement issued by TÜV Rheinland Energy GmbH dated 28 September 2017
Publication BAnz AT 26.03.2018 B8, chapter V notification 46
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 22
UBA announcement dated 3 July 2018
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 28 February 2019
Publication BAnz AT 22.07.2019 B8, chapter V notification 18
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 50
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 42
UBA announcement dated 29 June 2021
(Software change Softwareänderung)

Renewal of certificate

Certificate No. 0000036947_02: 20 July 2022
Expiry date of the certificate: 19 July 2027

Calculation of overall uncertainty for QAL1 in EN 14181 and EN 15267-3

Manufacturer data

Manufacturer	SICK
Name of measuring system	Dusthunter T200
Serial Number	SN 07478637 / -656 / -660 / -638 / -658 / -661 / -580 / -574 / -573 / -583 / -575 / -572
Measuring Principle	Transmission

TÜV Data

Approval Report	936/21210461/C
Editor	2009-03-17
Date	Röllig
	2009-03-17

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	u ²	
Standard deviation from paired measurements under field conditions *	0.22	mg/m ³	u_r	0.22	0.049
Lack of fit	0.15	mg/m ³	u_{lof}	0.09	0.008
Zero drift from field test	- 0.08	mg/m ³	u_{dz}	-0.04	0.002
Span drift from field test	- 0.44	mg/m ³	u_{ds}	-0.25	0.063
Influence of ambient temperature at span	0.11	mg/m ³	u_t	0.06	0.004
Influence of supply voltage	0.11	mg/m ³	u_v	0.06	0.004
Uncertainty of reference material at 70% of certification range	0.21	mg/m ³	u_{rm}	0.12	0.015
Excursion of measurement beam	0.30	mg/m ³	u_{mb}	0.17	0.030

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

Combined standard uncertainty (u_c)	$u_c = \sqrt{\sum (u_{\max, j})^2}$	0.42	mg/m ³
Total expanded uncertainty	$U = u_c * k = u_c * 1,96$	0.82	mg/m ³

Relative total expanded uncertainty

Requirement of 2000/76/EC and 2001/80/EC	U in % of the ELV 10 mg/m³	8.2
Requirement of EN 15267-3	U in % of the ELV 10 mg/m³	30.0
	U in % of the ELV 10 mg/m³	22.5