

# CERTIFICATE

## of Product Conformity (QAL1)

Certificate No: 0000053816\_03

**Certified AMS:** U 3600-QAL1 for dust

**Manufacturer:** Auburn FilterSense  
800 Cummings Center Suite 355W  
Beverly, MA 01915  
USA

**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 (2014).**

Certification is awarded in respect of the conditions stated in this certificate  
(this certificate contains 7 pages).

The present certificate replaces certificate 0000053816\_02 dated 04 September 2018.



Suitability Tested  
EN 15267  
QAL1 Certified  
Regular  
Surveillance

www.tuv.com  
ID 0000053816

Publication in the German Federal Gazette  
(BAnz) of 17 July 2018

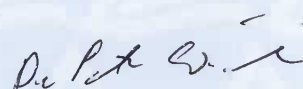
German Environment Agency  
Dessau, 29 July 2022

This certificate will expire on:  
30 July 2027

TÜV Rheinland Energy GmbH  
Cologne, 28 July 2022



Dr. Marcel Langner  
Head of Section II 4.1



ppa. Dr. Peter Wilbring

[www.umwelt-tuv.eu](http://www.umwelt-tuv.eu)  
tre@umwelt-tuv.eu  
Tel. + 49 221 806-5200

TÜV Rheinland Energy 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 the certificate D-PL-11120-02-00.

<b>Test report:</b>	936/21232911/D dated 28 February 2018
<b>Initial certification:</b>	08 September 2017
<b>Expiry date:</b>	30 July 2027
<b>Certificate:</b>	Renewal (of previous certificate 0000053816_02 of 04. September 2018 valid until 30 July 2022)
<b>Publication:</b>	BAnz AT 17.07.2018 B9, Chap. I No. 1.1

### **Approved application**

The tested AMS is suitable for use combustion plants according to Directive 2010/75/EU, chapter III (13th BImSchV:2017), 27th BImSchV:2013, Directive 2015/2193/EC (44th BImSchV:2021), and TA Luft:2002. 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 drying plant for the production of mineral floor covering.

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 936/21232911/D dated 28 February 2018 of TÜV Rheinland Energy 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 17.07.2018 B9, Chap. I No. 1.1,  
Announcement by UBA dated 03 July 2018:

**AMS designation:**

U 3600-QAL1 for dust

**Manufacturer:**

Auburn Systems, Beverly, USA

**Field of application:**

For plants requiring official approval according to TA Luft and 13th BImSchV and plants according to the 27th BImSchV

**Measuring ranges during the performance test:**

Component	Certification range	Supplementary measurement ranges		Unit
Dust	0 - 1,000	0 - 10,000	0 - 100,000	pA

The 0 - 1,000 pA measuring range roughly corresponds to 0 - 15 mg/m<sup>3</sup> in the field test.

**Software version:**

u-1.2

**Restrictions:**

1. The instrument can only be used at plants with a constant flow velocity. At a velocity of 10 m/s the permissible deviation is  $\pm 10\%$ . Any other velocities require an initial estimation of the uncertainty contribution to the total uncertainty.
2. The measuring system may not be used downstream of an electronic precipitator.
3. The instrument is only fit for purpose in waste gas which is not saturated with water vapour.

**Notes:**

1. The maintenance interval is six months.
2. The dust concentration is determined in wet flue gas under operational conditions.
3. The requirement for the determination coefficient  $R^2$  of the calibration function in accordance with EN 15267-3 was not satisfied.
4. When determining the total uncertainty as part of performance testing, the uncertainty contributions of the interference sources velocity and waste gas moisture were not taken into account. These must be determined on installation of the instrument.
5. Supplementary testing (extension of the maintenance interval) as regards Federal Environment Agency (UBA) notice of 21 February 2018 (BAnz AT 26.03.2018 B8, chapter I number 1.1).

**Test report:**

TÜV Rheinland Energy GmbH, Cologne  
Report No.: 936/21232911/D dated 28 February 2018

Publication in the German Federal Gazette: BAnz AT 26.03.2019 B7, chapter IV notification 1, Announcement by UBA dated 27 February 2019:

**1 Notification as regards Federal Environment Agency (UBA) notices of 13 July 2017 (BAnz AT 31.07.2017 B12, chapter I number 1.1) and of 3 July 2018 (BAnz AT 17.07.2018 B9, chapter I number 1.1)**

The U3600-QAL1 measuring system manufactured by Auburn Systems may now be operated with a 24 V power supply.

Statement issued by TÜV Rheinland Energy GmbH dated 28 September 2018

Publication in the German Federal Gazette: BAnz AT 24.03.2020 B7, chapter IV notification 10, Announcement by UBA dated 24 February 2020:

**10 Notification as regards Federal Environment Agency (UBA) notices of 13 July 2017 (BAnz AT 31.07.2017 B12, chapter I number 1.1) and of 27 February 2019 (BAnz AT 26.03.2019 B7, chapter IV number 1)**

The latest software version of the U3600-QAL1 measuring system for dust manufactured by Auburn Systems is:  
V 1.4

The following version may also be used: V1.3

Statement issued by TÜV Rheinland Energy GmbH dated 2 October 2019

**Certified product**

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

The U3600-QAL1 measuring system manufactured by Auburn Systems uses what is called the TRIBO.dsp technology. The TRIBO.dsp measurement technology processes not only the DC signal which is generated by a particle in contact with and transferring a charge to a probe, but also the AC signal generated by a particle closely passing by the probe. By combining both technologies for signal processing and using high-quality electronics, this measuring system also meets the tough requirements on quantitative dust emission monitoring technology. The measurement principle combines the two measurement principles DC (direct charge transfer, triboelectric) and AC induction of electrostatic signals (electrodynamic) for improved accuracy, reliability and repeatability. It is characterised by a high degree of sensitivity and flexibility.



The certified U3600-QAL1 measuring system comprises the following components:

- an electronic control unit using u-1.2 software;
- a probe rod;
- a cable connecting the probe with the electronics;

Moreover, the following equipment is required for performing annual surveillance tests (AST):

- a model 2902 “field test unit” including a zero pipe for testing the measuring system;

During performance testing, two different measuring probes were used. One version had an active probe length of approximately 18.5 cm, the second version for the field test was ~45 cm long.

By means of different types of flanges, the probes can be installed at different measurement ports in the field.

The U3600-QAL1 measuring system performs automated zero and span point checks once a day. If the average of values over the period of testing exceeds the permissible limits, the system produces a status signal.

#### **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: [gal1.de](http://gal1.de).

### **History of documents**

Certification of U 3600-QAL1 is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

#### **Initial certification according to EN 15267**

Certificate No. 0000053816\_00: 08 September 2017  
Expiry date of the certificate: 30 July 2022  
Test report 936/21232911/A dated 6 March 2017  
TÜV Rheinland Energy GmbH  
Publication BAnz AT 31.07.2017 B12, chapter I number 1.1  
UBA announcement dated 13 July 2017

#### **Supplementary testing according to EN 15267**

Certificate No. 0000053816\_01: 13 April 2018  
Expiry date of the certificate: 30 July 2022  
Test report 936/21232911/C dated 5 September 2017  
TÜV Rheinland Energy GmbH  
Publication BAnz AT 26.03.2018 B8, chapter I number 1.1  
UBA announcement dated 21 February 2018

#### **Supplementary testing according to EN 15267**

Certificate No. 0000053816\_02: 04 September 2018  
Expiry date of the certificate: 30 July 2022  
Test report 936/21232911/D dated 28 February 2018  
TÜV Rheinland Energy GmbH  
Publication BAnz AT 17.07.2018 B9, chapter I number 1.1  
UBA announcement dated 3 July 2018

#### **Notifications**

Statement issued by TÜV Rheinland Energy GmbH dated 28 September 2018  
Publication BAnz AT 26.03.2019 B7, chapter IV notification 1  
UBA announcement dated 27 February 2019  
(Hardware changes)

Statement issued by TÜV Rheinland Energy GmbH dated 2 October 2019  
Publication BAnz AT 24.03.2020 B7, chapter IV notification 10  
UBA announcement dated 24 February 2020  
(Software changes)

#### **Renewal of certificate**

Certificate No. 0000053816\_03: 31 July 2022  
Expiry date of the certificate: 30 July 2027



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

**Measuring system**

Manufacturer	Auburn Systems
AMS designation	U3600-QAL1
Serial number of units under test	160175-A / 160175-B
Measuring principle	triboelectric

**Test report**

Test laboratory	936/21232911/D
Date of report	TÜV Rheinland
	2018-02-28

**Measured component**

Certification range	Dust	0 - 15 mg/m <sup>3</sup>
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**Calculation of the combined standard uncertainty**

**Tested parameter**

			$u^2$
Standard deviation from paired measurements under field conditions *	$u_D$	0.102 mg/m <sup>3</sup>	0.010 (mg/m <sup>3</sup> ) <sup>2</sup>
Lack of fit	$u_{lof}$	0.009 mg/m <sup>3</sup>	0.000 (mg/m <sup>3</sup> ) <sup>2</sup>
Zero drift from field test	$u_{d,z}$	0.043 mg/m <sup>3</sup>	0.002 (mg/m <sup>3</sup> ) <sup>2</sup>
Span drift from field test	$u_{d,s}$	-0.078 mg/m <sup>3</sup>	0.006 (mg/m <sup>3</sup> ) <sup>2</sup>
Influence of ambient temperature at span	$u_t$	0.049 mg/m <sup>3</sup>	0.002 (mg/m <sup>3</sup> ) <sup>2</sup>
Influence of supply voltage	$u_v$	0.007 mg/m <sup>3</sup>	0.000 (mg/m <sup>3</sup> ) <sup>2</sup>
Uncertainty of reference material at 70% of certification range	$u_{rm}$	0.121 mg/m <sup>3</sup>	0.015 (mg/m <sup>3</sup> ) <sup>2</sup>

\* The larger value is used :

"Repeatability standard deviation at set point" or

"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty ( $u_c$ )

$$u_c = \sqrt{\sum (u_{max, j})^2} \quad 0.19 \text{ mg/m}^3$$

Total expanded uncertainty

$$U = u_c * k = u_c * 1.96 \quad 0.37 \text{ mg/m}^3$$

**Relative total expanded uncertainty**

**U in % of the ELV 10 mg/m<sup>3</sup> 3.7**

**Requirement of 2010/75/EU**

**U in % of the ELV 10 mg/m<sup>3</sup> 30.0**

**Requirement of EN 15267-3**

**U in % of the ELV 10 mg/m<sup>3</sup> 22.5**