

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000040200

Certified AMS: D-FL 220 for velocity

Manufacturer: DURAG GmbH
Kollastraße 105
22453 Hamburg
Germany

Test Institute: TÜV Rheinland Energie und Umwelt GmbH

**This is to certify that the AMS has been tested
and found to comply with:**

**EN 15267-1: 2009, EN 15267-2: 2009, EN 15267-3: 2007,
EN ISO 16911-2 : 2013 and EN 14181: 2004**

Certification is awarded in respect of the conditions stated in this certificate
(see also the following pages).



Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000040200

Publication in the German Federal Gazette
(BAnz.) of 01 April 2014

German Federal Environment Agency
Dessau, 29 April 2014



i. A. Dr. Marcel Langner

This certificate will expire on:
31 March 2019

TÜV Rheinland Energie und Umwelt GmbH
Cologne, 28 April 2014



ppa. Dr. Peter Wilbring

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Accreditation according to EN ISO/IEC 17025 and certified according to ISO 9001:2008.

Test report:	936/21218490/A of 02 December 2013
Initial certification:	01 April 2014
Expiry date:	31 March 2019
Publication:	BAnz AT 01 April 2014 B12, chapter II, No. 2.3

Approved application

The tested AMS is suitable for use at combustion plants according to Directive 2010/75/EU, chapter III, at waste incineration plants according to Directive 2010/75/EU, chapter IV and other plants requiring official approval. The tested ranges have been chosen with respect to the wide application range of the AMS.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a three-month field test at a waste incinerator.

The AMS is approved for an ambient temperature range of -20 °C to +50 °C.

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

Basis of the certification

This certification is based on:

- test report 936/21218490/A of 02 December 2013 of 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 April 2014 B12, chapter II, No. 2.3, Announcement by UBA from 27 February 2014)

AMS designation:

D-FL 220 for velocity

Manufacturer:

DURAG GmbH, Hamburg

Field of application:

For measurements at plants requiring official approval (Directive 2010/75/EU on industrial emissions, chapter III and IV)

Measuring range during the performance test:

Component	Certification range	Unit
Velocity	0 - 30	m/s

Software version:

D-FL 220: V. 01.05R0042
D-ISC 100: V. 01.01R0000
D-ESI 100: V. 1.1.006

Restrictions:

None

Notes:

1. The maintenance interval is four weeks.
2. The AMS D-FL 220 does not have a display and no control options. The D-ESI 100 software is used for the parameterisation and visualization of measurement values. There is also the option to connect the universal control unit D-ISC 100 for parameterisation of the evaluation unit and visualization of data.
3. The D-FL 220 AMS is fitted with the Modbus (EIA-485, series) digital interface in accordance with VDI 4201 Sheet 1 and 3.
4. When using the D-FL 220 measuring system with the D-ISC 100 universal control unit, the Modbus interface in accordance with VDI 4201 Sheet 1 and 3 cannot be used.
5. The D-ISC 100 universal control unit is fitted with the Modbus digital interface in accordance with VDI 4201 Sheet 1 and 3 (EIA-485, series and TCP/IP, Ethernet).

Test report:

TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report No.: 936/21218490/A of 2 December 2013

Certified product

This certificate applies to automated measurement systems conforming to the following description: The D-FL 220 measuring system follows the principle of ultrasonic time-of-flight measurement for the continuous measurement of exhaust gas velocity.

The measuring system is composed of the following main system components:

- 2 ultrasound probes with ultrasonic transducer
- Connection box for data output (D-TB 101)
- Purge air blower with air filter (D-BL)
- D-ESI 100 software (optional: D-ISC 100 universal connection unit) for parameterisation, visualization of measuring data and performance of AST, QAL2 und QAL3

Two identical measuring heads send and receive ultrasonic impulses and measure their time-of-flight. The system precisely calculates the gas velocity and test gas temperature from the direction-dependent time-of-flight difference of ultrasonic pulses.

The **D-FL 220 measuring system** does not have a display. In addition to the 4 to 20 mA electricity signal output the **connection box of the D-FL 220** provides a Modbus interface (EIA-485, series) as per VDI 4201 Sheet 1 and 3 for the connection of an emission evaluation computer fitted with a digital interface. The measuring heads provide an USB connection (mini-B 5-pole).

The various parameters are entered via the USB connection using a PC and the corresponding software (D-ESI 100).

The **D-ISC 100 universal control unit** can also optionally be used. The display offers an immediate overview of the status of the connected devices and the current measuring values. The measuring values can also be visualized in a bar chart display. Using the D-ISC 100 the connected devices can also be queried, controlled and parameterised. The D-ISC 100 universal control unit is fitted with the Modbus digital interface in accordance with VDI 4201 Sheet 1 and 3 (EIA-485, series and TCP/IP, Ethernet).

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 Energie und Umwelt 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 can be applied to the product or used in publicity material for the certified product.

This document as well as the certification mark remains property of TÜV Rheinland Energie und Umwelt GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energie und Umwelt 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.

Certification of D-FL 220 for velocity 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. 0000040200: 29 April 2014

Expiry date of the certificate: 31 March 2019

Test report: 936/21218490/A of 2 December 2013
TÜV Rheinland Energie und Umwelt GmbH, Cologne

Publication: BAnz AT 01 April 2014 B12, chapter II, No. 2.4
Announcement by UBA from 27 February 2014

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

Measuring system

Manufacturer	Durag GmbH
Name of measuring system	D-FL 220
Serial number of the candidates	1219202 / 1219209
Measuring principle	Ultra sonic

Test report

Test laboratory	21218490A TÜV Rheinland
Date of report	2013-10-08

Measured component

Certification range	Velocity 0 - 30 m/s
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Calculation of the combined standard uncertainty

Tested parameter

			u^2
Standard deviation from paired measurements under field conditions *	u_D	0.224 m/s	0.050 (m/s) ²
Lack of fit	u_{lof}	0.057 m/s	0.003 (m/s) ²
Zero drift from field test	$u_{d,z}$	0.120 m/s	0.014 (m/s) ²
Span drift from field test	$u_{d,s}$	0.130 m/s	0.017 (m/s) ²
Influence of ambient temperature at span	u_t	0.100 m/s	0.010 (m/s) ²
Influence of supply voltage	u_v	0.006 m/s	0.000 (m/s) ²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.121 m/s	0.015 (m/s) ²

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

Combined standard uncertainty (u_c)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.33 m/s
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.65 m/s

Relative total expanded uncertainty

Requirement of 2010/75/EU	U in % of the range 30 m/s	2.2
Requirement of EN 15267-3	U in % of the range 30 m/s	10.0 **
	U in % of the range 30 m/s	7.5

** For this component no requirements in the EC-directives 2010/75/EU are given.
The chosen value is recommended by the certification body.