Umwelt Bundesamt

TÜVRheinland®
Precisely Right.

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000040200_03

Certified AMS:	D-FL 220 for velocity
Manufacturer:	DURAG GmbH Kollaustraße 105 22453 Hamburg Germany
Test Institute:	TÜV Rheinland Energy 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).
The present certificate replaces Certificate No. 0000040200_02 of 30 April 2015

TÜVRheinland® CERTIFIED

Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000040200

Publication in the German Federal Gazette (BAnz.) of 2 April 2015

This certificate will expire on:
30 June 2020

German Federal Environment Agency
Dessau, 1 April 2019

Dr. Marcel Langner
Head of Section II 4.1

TÜV Rheinland Energy GmbH
Cologne, 31 March 2019

ppa. Dr. Peter Wilbring

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TÜV Rheinland Energy GmbH
Am Grauen Stein
51105 Cologne

Accreditation according to EN ISO/IEC 17025:2018 and certified according to ISO 9001:2015.

10/221 2.08

Test report:	936/21218490/C of 15 September 2014
Initial certification:	1 April 2014
Expiry date:	30 June 2020
Publication:	BAnz AT 2 April 2015 B5, chapter II number 1.1

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 twelve-month field test at a waste incinerator.

The AMS is approved for an ambient temperature range of -40 °C to +60 °C.

The notification of suitability of the AMS, performance testing and the uncertainty calculation have been effected on the basis of the regulations valid at the time of performance testing. As changes in legal regulations are possible, any potential user should ensure that this AMS is suitable for monitoring the flows 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.

Basis of the certification
This certification is based on:

- test report 936/21218490/C of 15 September 2014 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 2 April 2015 B5, chapter II number 1.1
  UBA announcement of 25 February 2015

AMS designation:
D-FL 220 for velocity

Manufacturer:
DURAG GmbH, Hamburg

Field of application:
For measurements at plants requiring official approval (e.g. Directive 2010/75/EU on industrial emissions, chapters III and IV)

Measuring ranges during the performance test:

Component	Certification range	Unit
velocity	0 - 30	m/s

Software versions:
D-FL 220: V. 01.05R0044
D-ISC 100: V. 01.03R0001
D-ESI 100: V. 1.1.015

Restrictions:
None

Notes:
1. The maintenance interval is six months.
2. The D-FL measuring system does not have a display or a control panel. The D-ESI 100 software is used in order to parameterise and visualise measured values. Optionally, the system may be connected to the D-ISC 100 universal control unit for parameterisation and visualizing data.
3. The D-FL measuring system has a digital Modbus interface (EIA-485, serial) in accordance with VDI 4201 Sheets 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 cannot be used.
5. The universal D-ISC 100 control unit is fitted with the Modbus digital interface in accordance with VDI 4201 Sheets 1 and 3 (EIA-485, serial and TCP/IP, Ethernet).
6. Supplementary testing (extension of the maintenance interval and extension of the ambient temperature range to -40 °C to +60 °C) as regards Federal Environmental Agency notices of 17 July 2014 (BAnz AT 5 August 2014 B11, chapter II, number 1.1).

Test report:
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report no.: 936/21218490/C of 15 September 2014

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, visualisation of measurement data and for performing AST, QAL2 und QAL3

Two identical measuring heads send and receive ultrasonic pulses 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 the ultrasonic pulses.

The **D-FL 220 measuring system** does not have a display. In addition to the 4 to 20 mA current signal output the **connection box of the D-FL 220** provides a Modbus interface (EIA-485, serial) in accordance with VDI 4201 Sheets 1 and 3 for connecting an emissions calculator fitted with a digital interface. The measuring heads provide an USB connection (mini-B 5-pin).

The various parameters are entered using a PC with the corresponding software (D-ESI 100) and transmitted by way of USB connection.

The **D-ISC 100 universal control unit** may also be used optionally. The display offers an immediate overview of the status of the connected devices and current measured values. The measured values can also be displayed as a bar chart. By means of the D-ISC 100 the connected devices can also be accessed, controlled and parameterised. The D-ISC 100 universal control unit is fitted with the Modbus digital interface in accordance with VDI 4201 Sheets 1 and 3 (EIA-485, serial 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 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 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 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**.

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. 0000040201: 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 1 April 2014 B12, chapter II, no. 2.3
UBA announcement of 27 February 2014

Supplementary testing according to EN 15267

Certificate no. 0000040201_01: 9 September 2014
Expiry date of the certificate: 31 March 2019

Test report: 936/21218490/B vom 28 March 2014
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Publication: BAnz AT 5 August 2014 B11, chapter II, no. 1.1
UBA announcement of 17 July 2014

Supplementary testing according to EN 15267

Certificate no. 0000040201_02: 30 April 2015
Expiry date of the certificate: 31 March 2019

Test report: 936/21218490/C of 15 September 2014
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Publication: BAnz AT 2 April 2015 B5, chapter II number 1.1
UBA announcement of 25 February 2015

Renewal of the certificate according to EN 15267

Certificate no. 0000040201_03: 1 April 2019
Expiry date of the certificate: 30 June 2020

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			936/21218490/C		
Test laboratory			TÜV Rheinland		
Date of report			2014-09-15		
Measured component			Velocity		
Certification range			0 - 30 m/s		

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.136	m/s	0.018	$(m/s)^2$
Lack of fit	u_{lof}	0.057	m/s	0.003	$(m/s)^2$
Zero drift from field test	$u_{d,z}$	0.162	m/s	0.026	$(m/s)^2$
Span drift from field test	$u_{d,s}$	0.206	m/s	0.042	$(m/s)^2$
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)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.34	m/s
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.67	m/s

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

** For this component no requirements in the EC-directives 2010/75/EU are given.
A value of 10 % was used for this.