CERTIFICATE

of Product Conformity (QAL1)

Certificate No: 0000040200_05

Certified AMS:	D-FL 220 for waste gas velocity
Manufacturer:	DURAG GmbH Kollaustr. 105 22453 Hamburg Germany
Test Institute:	TÜV Rheinland Energy & Environment 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 (2023), EN 15267-3 (2007), EN ISO 16911-2 (2013) as well as EN 14181 (2014).

Certification is awarded in respect of the conditions stated in this certificate (this certificate contains 10 pages).
The present certificate replaces certificate 0000040200_04 dated 1 July 2020.

Suitability Tested
EN 15267
QAL1 Certified
Regular Surveillance

www.tuv.com
ID 0000040200

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

German Environment Agency

Dessau, 27 June 2025

This certificate will expire on:
30 June 2030

TÜV Rheinland Energy & Environment GmbH
Cologne, 26 June 2025

Dr. Marcel Langner
Head of Section II 4

ppa. Dr. Peter Wilbring

www.umwelt-tuv.eu
qal1-info@tuv.com
Tel. + 49 221 806-5200

TÜV Rheinland Energy & Environment 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.

Test report:	936/21218490/C dated 15 September 2014
Initial certification:	1 April 2014
Expiry date:	30 June 2030
Certificate:	Renewal (of previous certificate 0000040200_04 of 1 July 2020 valid until 30 June 2025)
Publication:	BAnz AT 02.04.2015 B5, chapter II No. 1.1

Approved application

The tested AMS is suitable for use at plants according to Directive 2010/75/EC, chapter III (combustion plants / 13th BImSchV:2013), Directive 2010/75/EC, chapter IV (waste incineration plants / 17th BImSchV:2013), Directive 2015/2193/EC (44th BImSchV:2022), TA Luft:2002, 30th BImSchV:2009 and 27th BImSchV:2013. 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 twelve month field test at a waste incineration.

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 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 flue gas velocity 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 correspond to the current state of legislation during certification. 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 936/21218490/C dated 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 02.04.2015 B5, chapter II No. 1.1, Announcement by UBA dated 25 February 2015:

AMS designation:
D-FL 220 for waste gas velocity

Manufacturer:
DURAG GmbH, Hamburg

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	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 220 measuring system does not have a display or a control panel. The D-ESI 100 software is used to parameterise and visualise measured values. Alternatively, the system may be connected to the D-ISC 100 universal control unit for parameterisation and visualising data.
3. The D-FL measuring system has a digital Modbus interface (EIA-485, serial) in accordance with VDI 4201 parts 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 parts 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 Environment Agency notices of 17 July 2014 (BAnz AT 05.08.2014 B11, chapter II number 1.1).

Test Institute: TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report No.: 936/21218490/C dated 15 September 2014

Publication in the German Federal Gazette: BAnz AT 26.03.2018 B8, Chap. V notification 49, Announcement by UBA dated 21 February 2018:

49 Notification as regards Federal Environment Agency (UBA) notice of 25 February 2015 (BAnz AT 02.04.2015 B5, chapter II number 1.1)

The current software versions of the D-FL 220 measuring system for velocity manufactured by DURAG GmbH are as follows:

D-FL 220:	01.05.R0050
D-ISC 100:	01.04R0007
D-ESI 100:	01.10R0007

Versions of approved intermediate versions are as follows:

D-FL 220:	01.05R0046		
D-ISC 100:	01.04R0001;	01.04R0004;	01.04R0006
D-ESI 100:	1.1.016;	1.1.017;	1.2.003

In addition to the existing XPPower DNR240PS24-I power supply, the Phoenix Contact QUINT4-PS/1AC/24DC/10 power supply may be used for the D-ISC 100.

Statement by TÜV Rheinland Energy GmbH dated 8 December 2017

Publication in the German Federal Gazette: BAnz AT 26.03.2019 B7, Chap. IV notification 7, Announcement by UBA dated 27 February 2019:

7 Notification as regards Federal Environment Agency (UBA) notices of 25 February 2015 (BAnz AT 02.04.2015 B5, chapter II number 1.1) and of 21 February 2018 (BAnz AT 26.03.2018 B8, chapter V notification 49)

The latest software versions of the D-FL 220 measuring system manufactured by DURAG GmbH for velocity are:
D-FL 220: 01.05.R0050
D-ISC 100: 02.02R0066
D-ESI 100: 01.10R0007
Thus, the following software versions have also been approved:
D-ISC 100: 02.00R0048, 02.02R0020

The measuring system may be equipped with a revised version of the D-ISC 100 control unit. It is available in the following model versions:
– D-ISC 100 M (standard)
– D-ISC 100 C (compact housing)
– D-ISC 100 P (c/w purge air blower)
– D-ISC 100 R (housing for 19“ rack mounting)

The D-ISC 100 control unit also provides a digital Modbus interface which complies with VDI standard 4201, parts 1 and 3.Report No. 936/21242380/A dated 14 September 2018 prepared by TÜV Rheinland Energy GmbH presents the test results for the revised D-ISC 100 control unit.

The DC/DC converter, model 4020240 (B1215XT-1WR2), may be used instead of model 1110828(B1215T-1W).

Statement by TÜV Rheinland Energy GmbH dated 14 January 2019

Publication in the German Federal Gazette: BAnz AT 24.03.2020 B7, Chap. IV notification 16, Announcement by UBA dated 24 February 2020:

16 Notification as regards Federal Environment Agency (UBA) notices of 25 February 2015 (BAnz AT 02.04.2015 B5, chapter II number 1.1) and of 27 February 2019 (BAnz AT 26.03.2019 B7, chapter IV notification 7)

The latest software versions of the D-FL 220 measuring system manufactured by DURAG GmbH for velocity are:
D-FL 220: 03.00R0033
D-ISC 100: 02.02R0066
D-ESI 100: 01.11R0018
D-ESI 100 software version 01.11R0017 may also be used.

The printed board’s jumper which had been used to assign the A/B sample head was replaced by a software switch.

Statement by TÜV Rheinland Energy GmbH dated 16 December 2019

Publication in the German Federal Gazette: BAnz AT 28.07.2022 B4, Chap. III notification 3, Announcement by UBA dated 28 June 2022:

3 Notification as regards Federal Environment Agency (UBA) notices of 25 February 2015 (BAnz AT 02.04.2015 B5, chapter II number 1.1) and of 24 February 2020 (BAnz AT 24.03.2020 B7, chapter IV notification 16)

The current software versions of the measuring device D-FL 220
for the measurement of the exhaust gas velocity of the company DURAG GmbH are:
D-FL 220: 03.00R0033
D-ISC 100: 02.02R0073
D-ESI 100: 01.11R0018
The D-ESI 100 software version 01.11R0017 can also be used.

Statement by TÜV Rheinland Energy GmbH dated 13 April 2022

Publication in the German Federal Gazette: BAnz AT 20.03.2023 B6, Chap. IV notification 13, Announcement by UBA dated 21 February 2023:

13 Notification as regards Federal Environment Agency (UBA) notices of 25 February 2015 (BAnz AT 02.04.2015 B5, chapter II number 1.1) and of 28 June 2022 (BAnz AT 28.07.2022 B4, chapter III notification 3)

The current software versions of the D-FL 220 measuring system
for the determination of waste gas velocity from DURAG GmbH are:
D-FL 220: 03.01R0001,
D-ISC 100: 02.02R0073,
D-ESI 100: 01.11R0018

Statement by TÜV Rheinland Energy GmbH dated 3 September 2022

Publication in the German Federal Gazette: BAnz AT 10.05.2024 B7, Chap. V notification 6, Announcement by UBA dated 19 March 2024:

6 Notification as regards Federal Environment Agency (UBA) notices of 25 February 2015 (BAnz AT 02.04.2015 B5, chapter II number 1.1) and of 21 February 2023 (BAnz AT 20.03.2023 B6, chapter IV notification 13)

The current software versions for the D-FL 220 measuring system for determining waste gas velocity from DURAG GmbH are as follows:
D-FL 220: 03.01R0002
D-ISC 100: 02.02R0073
D-ESI 100: 01.11R0018

Statement by TÜV Rheinland Energy GmbH dated 23 September 2023

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 parts 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 universal D-ISC 100 control unit is fitted with the Modbus digital interface in accordance with VDI 4201 parts 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 & Environment 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 as well as the certification mark remains property of TÜV Rheinland Energy & Environment 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 & Environment 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 D-FL 220 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_00: 29 April 2014
Expiry date of the certificate: 31 March 2019
Test report: 936/21218490/A dated 2 December 2013
TÜV Rheinland Energie und Umwelt GmbH
Publication: BAnz AT 01.04.2014 B12, chapter II number 2.3
UBA announcement dated 27 February 2014

Supplementary testing according to EN 15267
Certificate No. 0000040200_01: 9 September 2014
Expiry date of the certificate: 31 March 2019
Test report: 936/21218490/B dated 28 March 2014
TÜV Rheinland Energie und Umwelt GmbH
Publication: BAnz AT 05.08.2014 B11, chapter II number 1.1
UBA announcement dated 17 July 2014

Supplementary testing according to EN 15267
Certificate No. 0000040200_02: 30 April 2015
Expiry date of the certificate: 31 March 2019
Test report: 936/21218490/C dated 15 September 2014
TÜV Rheinland Energie und Umwelt GmbH
Publication: BAnz AT 02.04.2015 B5, chapter II number 1.1
UBA announcement dated 25 February 2015

Notifications
Statement issued by TÜV Rheinland Energy GmbH dated 8 December 2017
Publication: BAnz AT 26.03.2018 B8, chapter V notification 49
UBA announcement dated 21 February 2018
(Software changes)

Renewal of certificates
Certificate No. 0000040200_03: 1 April 2019
Expiry date of the certificate: 30 June 2020

Notifications
Statement issued by TÜV Rheinland Energy GmbH dated 14 January 2019
Test report: 936/21242380/A dated 14 September 2018
Publication: BAnz AT 26.03.2019 B7, chapter IV notification 7
UBA announcement dated 27 February 2019
(Hard and software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 16 December 2019
Publication: BAnz AT 24.03.2020 B7, chapter IV notification 16
UBA announcement dated 24 February 2020
(Soft- and hardware changes)

Renewal of certificates
Certificate No. 0000040200_04: 1 July 2020
Expiry date of the certificate: 30 June 2025

Notifications
Statement issued by TÜV Rheinland Energy GmbH dated 13 April 2022
Publication: BAnz AT 28.07.2022 B4, chapter III notification 3
UBA announcement dated 28 June 2022
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 3 September 2022
Publication: BAnz AT 20.03.2023 B6, chapter IV notification 13
UBA announcement dated 21 February 2023
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 23 September 2023
Publication: BAnz AT 10.05.2024 B7, chapter V notification 6
UBA announcement dated 19 March 2024
(Software changes)

Renewal of certificates
Certificate No. 0000040200_05: 27 June 2025
Expiry date of the certificate: 30 June 2030

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				u²	
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.