

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000040200_04

AMS designation: D-FL 220 for velocity

Manufacturer: DURAG GmbH
Kollaustraße 105
22453 Hamburg
Germany

Test Laboratory: 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)
16911 (2013) and EN 14181 (2014).**

Certification is awarded in respect of the conditions stated in this certificate
(this certificate contains 9 pages).
The present certificate replaces certificate 0000040200_03 of 01 April 2019.



Suitability Tested
EN 15267
QAL1 Certified
Regular Surveillance

www.tuv.com
ID 0000040200

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

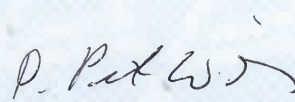
This certificate will expire on:
30 June 2025

German Federal Environment Agency
Dessau, 01 July 2020

TÜV Rheinland Energy GmbH
Cologne, 30 June 2020



Dr. Marcel Langner
Head of Section II 4.1



ppa. Dr. Peter Wilbring

www.umwelt-tuv.eu
tre@umwelt-tuv.eu
Phone: + 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 certificate D-PL-11120-02-00.

Test Report:	936/21218490/C dated 15 September 2014
Initial certification:	01 April 2014
Expiry date:	30 June 2025
Certificate:	Renewal (of previous certificate 0000040200_03 dated 01 April 2019 valid until 30 June 2020)
Publication:	BAnz AT 01.04.2014 B12, chapter II number 2.3

Approved application

The tested AMS is suitable for use at combustion plants according to Directive 2010/75/EU, chapter III (13th BImSchV), chapter IV (17th BImSchV), 30th BImSchV, plants in compliance with TA Luft and plants according to the 27th BImSchV. 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-months 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 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 velocities relevant to the application.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the intended purpose.

Basis of the certification

This certification is based on:

- Test report no. 936/21218490/C dated 15 September 2014 issued by 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 number 1.1,
UBA announcement dated 25 February 2015:

AMS designation:

D-FL 220 for velocity

Manufacturer:

DURAG GmbH, Hamburg

Field of application:

For plants requiring official approval and for plants according to the 27th BImSchV

Measuring range during performance testing:

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 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 Report:

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

Publication in the German Federal Gazette: BAnz AT 26.03.2019 B7, chapter IV notification 7, UBA announcement 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 49th notification)

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 issued by TÜV Rheinland Energy GmbH dated 14 January 2019

Publication in the German Federal Gazette: BAnz AT 24.03.2020 B7, chapter IV notification 16
UBA announcement 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 7th notification)**

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 issued by TÜV Rheinland Energy GmbH dated 16 December 2019

Certified product

This certification 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 remarks

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 manufacturing process for 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 document as well as the certification mark remains property of TÜV Rheinland Energy GmbH. Upon revocation of the publication the certificate loses its validity. After the expiration of the certificate and on request of TÜV Rheinland Energy GmbH this document shall be returned and the certificate mark must no longer be used.

The relevant version of this certificate and its expiration date are also accessible on the internet at qal1.de.

Document history

Certification of the D-FL 220 measuring system is based on the documents listed below and the regular, continuous surveillance of the manufacturer's quality management system:

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 dated 2 December 2013
TÜV Rheinland Energie und Umwelt GmbH, Cologne
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: 09 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, Cologne
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, Cologne
Publication: BAnz AT 02.04.2015 B5, chapter II number 1.1
UBA announcement dated 25 February 2015

Renewal of the certificate

Certificate no. 0000040201_03: 01 April 2019
Expiry date of the certificate: 30 June 2020

Notifications in accordance with EN 15267

Statement issued by TÜV Rheinland Energy GmbH dated 14 January 2019
Publication: BAnz AT 26.03.2019 B7, chapter IV notification 7
UBA announcement dated 27 February 2019
(New software version)

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
(New software version)

Renewal of the certificate

Certificate no. 0000040200_04: 01 July 2020
Expiry date of the certificate: 30 June 2025

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	936/21218490/C
Date of report	TÜV Rheinland
	2014-09-15

Measured component

Certification range	Velocity
	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_{dz}	0.162 m/s	0.026 (m/s) ²
Span drift from field test	u_{ds}	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

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.

A value of 10 % was used for this.