

# CERTIFICATE

## of Product Conformity (QAL1)

Certificate No: 0000032298\_05

**Certified AMS:** D-FL 100 for waste gas velocity

**Manufacturer:** DURAG GmbH  
Kollastr. 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 the standards  
EN 15267-1 (2009), EN 15267-2 (2009), EN 15267-3 (2007),  
EN ISO 16911-2 (2013) and 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 0000032298\_04 dated 05 March 2018.



Suitability Tested  
EN 15267  
QAL1 Certified  
Regular  
Surveillance

www.tuv.com  
ID 0000032298

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

German Environment Agency  
Dessau, 02 March 2023

This certificate will expire on:  
04 March 2028

TÜV Rheinland Energy GmbH  
Cologne, 01 March 2023

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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>	936/21218492/C dated 30 September 2013
<b>Initial certification:</b>	05 March 2013
<b>Expiry date:</b>	04 March 2028
<b>Certificate:</b>	Renewal (of previous certificate 0000032298_04 of 05 March 2018 valid until 04 March 2023)
<b>Publication:</b>	BAnz AT 01.04.2014 B12, chapter II No. 2.4

### Approved application

The tested AMS is suitable for use at plants according to Directive 2010/75/EC, chapter III (13th BImSchV:2013), chapter IV (17th BImSchV:2013), Directive 2015/2193/EC (44th BImSchV:2021), 30th BImSchV:2009, 27th BImSchV:1997 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 twelve-months field test at a waste incineration plant.

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 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 936/21218492/C dated 30 September 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 01.04.2014 B12, chapter II No. 2.4,  
Announcement by UBA dated 27 February 2014:

**AMS designation**

D-FL 100 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 performance testing:**

Component	Certification range	Supplementary range	Unit
Flow velocity	3 – 30	3 – 50	m/s

**Software versions:**

D-FL 100-10: V. 2.0, Hardw. Rev. 3,

D-FL 100-20: V. 01.00R0003

D-ISC 100: V. 01.01R0000

D-ESI 100: V. 1.1.006

**Restrictions:**

1. The measuring system is only fit for use in waste gas which is not saturated with vapour.
2. The lower limit of measuring the flow velocity is at 3 m/s.

**Notes:**

1. Suitability on the basis of performance testing refers to D-FL 100 measuring systems from serial number 1230000 onwards.
2. The maintenance interval is 6 months.
3. The D-FL 100 measuring system can be used with either the D-FL 100-10 evaluation unit or the D-FL 100-20 evaluation unit.
4. The D-FL 100-20 evaluation unit does not provide a display nor control options. The D-ESI 100 software is used for the parameterisation and visualization of measured 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.
5. The D-FL 100-20 evaluation unit is fitted with a Modbus (EIA-485, series) digital interface in accordance with VDI 4201 parts 1 and 3.
6. The D-ISC 100 universal control unit is fitted with a Modbus digital interface in accordance with VDI 4201 parts 1 and 3 (EIA-485, series and TCP/IP, Ethernet).
7. Supplementary testing (extension of the maintenance interval and supplementary measuring range) as regards Federal Environment Agency (UBA) notice of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter II number 2.5).

**Test Report:**

TÜV Rheinland Energie und Umwelt GmbH, Cologne

Report no.: 936/21218492/C dated 30 September 2013

Publication in the German Federal Gazette: BAnz AT 02.04.2015 B5, chapter IV notification 27, Announcement by UBA dated 25 February 2015:

**27 Notification as regards Federal Environment Agency (UBA) notices of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter II number 2.4)**

The current software versions of the D-FL 100 measuring system for flow velocity manufactured by DURAG GmbH are as follows:

D-FL 100-10: V. 2.0 Hardw. Rev. 3  
D-FL 100-20: V. 01.00R0003  
D-ISC 100: V. 01.03R0001  
D-ESI 100: V. 1.1.015

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 29 September 2014

Publication in the German Federal Gazette: BAnz AT 26.03.2018 B8, chap. V notification 22, Announcement by UBA dated 21 February 2018:

**22 Notification as regards Federal Environment Agency (UBA) notices of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter II number 2.4) and of 25 February 2015 (BAnz AT 02.04.2015 B5, chapter IV 27th notification)**

The current software versions of the D-FL 100 measuring system for flow velocity manufactured by DURAG GmbH are as follows:

D-FL 100-10: 2.0 Hardw. Rev. 3  
D-FL 100-20: 01.01.R0000  
D-ISC 100: 01.04R0007  
D-ESI 100: 01.10R0007

Versions of approved intermediate versions are as follows:

D-FL 100-20: 01.00R0005; 01.00R0007  
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 issued by TÜV Rheinland Energy GmbH dated 8 December 2017

Publication in the German Federal Gazette: BAnz AT 26.03.2019 B7, chap. IV notification 6,  
Announcement by UBA dated 27 February 2019:

**6 Notification as regards Federal Environment Agency notices of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter II number 2.4) and of 21 February 2018 (BAnz AT 26.03.2018 B8, chapter V notification 22)**

The current software versions of the D-FL 100 measuring system for velocity manufactured by DURAG GmbH are:

D-FL 100-10:	2.0 hardw. rev. 3
D-FL 100-20:	01.01.R0000
D-ISC 100:	02.02R0066
D-ESI 100:	01.10R0007

The following software versions have been approved accordingly:

D-ISC 100: 02.00R0048, 02.02R0020

The measuring system may also be equipped with a revised version of the D-ISC 100 control unit.

The latter is available in the following versions:

- D-ISC 100 M (standard)
- D-ISC 100 C (compact housing)
- D-ISC 100 P (with purge air blower)
- D-ISC 100 R (housing for installation in a 19" rack)

Furthermore, the D-ISC 100 control unit provides a Modbus interface in accordance with VDI guideline 4201 parts 1 and 3.

Report no. 936/21242380/A issued by TÜV Rheinland Energy GmbH of 14 September 2018 presents the results on testing the revised D-ISC 100 control unit.

Statement issued by TÜV Rheinland Energy GmbH dated 14 January 2019

Publication in the German Federal Gazette: BAnz AT 24.03.2020 B7, chap. IV notification 15,  
Announcement by UBA dated 24 February 2020:

**15 Notification as regards Federal Environment Agency (UBA) notices of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter II number 2.4) and of 27 February 2019 (BAnz AT 26.03.2019 B7, chapter IV notification 6)**

The latest software versions of the D-FL 100 measuring system manufactured by DURAG GmbH for velocity are:

D-FL 100-10:	2.0 Hardw. Rev. 3
D-FL 100-20:	01.01.R0000
D-ISC 100:	02.02R0066
D-ESI 100:	01.11R0018

D-ESI 100 software version 01.11R0017 may also be used.

Statement issued by TÜV Rheinland Energy GmbH dated 1 October 2019

Publication in the German Federal Gazette: BAnz AT 05.08.2021 B5, chap. IV notification 28,  
Announcement by UBA dated 29 June 2021:

**28 Notification as regards Federal Environment Agency (UBA) notices of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter II number 2.4) and of 24 February 2020 (BAnz AT 24.03.2020 B7, chapter IV notification 15)**

The latest software versions of the measuring system D-FL 100 for the determination of waste gas velocity manufactured by the company DURAG GmbH are:

D-FL 100-10: 2.0 Hardw. Rev. 3,  
D-FL 100-20: 01.01R0009,  
D-ISC 100: 02.02R0066,  
D-ESI 100: 01.11R0018

Statement issued by TÜV Rheinland Energy GmbH dated 29 April 2021

Publication in the German Federal Gazette: BAnz AT 28.07.2022 B4, chap. III notification 2,  
Announcement by UBA dated 28 June 2022:

**2 Notification as regards Federal Environment Agency (UBA) notices of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter II number 2.4) and of 29 June 2021 (BAnz AT 05.08.2021 B5, chapter IV notification 28)**

The current software versions of the measuring device D-FL 100 for the measurement of the exhaust gas velocity of the company DURAG GmbH are:

D-FL 100-10: 2.0 Hardw. Rev. 3  
D-FL 100-20: 01.01R0009  
D-ISC 100: 02.02R0073  
D-ESI 100: 01.11R0018

The D-ESI 100 software version 01.11R0017 can also be used.

Statement issued by TÜV Rheinland Energy GmbH dated 13 April 2022

### Certified product

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

In essence, the measuring system consists of the following components:

- Pitot tube
- Switchover device for manual zero and span checks and for back purging of the pitot tube
- Differential pressure transmitter 266MST (ABB)
- optional: Temperature and pressure sensor for calculating waste gas density
- D-FL 100-10 or D-FL 100-20 evaluation unit for data evaluation and output
- D-ESI 100 software for adjusting parameters, presenting data and conducting AST, QAL2 and QAL3 for the D-FL 100-20

Version	Description
D-FL 100 with D-FL 100-10	With display, mA output and option to adjust parameters
D-FL 100 with D-FL 100-20	no display, with mA- and digital Modbus output (EIA-485, serial) as specified in VDI 4201. The D-ESI 100 software is part of the shipment for the adjustment of parameters and the presentation of measurement data.
D-FL 100 with D-FL 100-20 and universal D-ISC 100 control unit	display, mA output and option to adjust parameters

The D-FL 100-10 evaluation unit evaluates measured signals from the differential pressure transducer and presents them on a display. Signals are output via a 4 – 20 mA signal outputs.

The D-FL 100-20 evaluation unit does not have a display. In addition to the 4 – 20 mA signal output, it provides a Modbus interface for connecting an evaluation system with a digital interface in accordance with the VDI 4201 parts 1 and 3. The front plate has 5 LEDs and a USB port (Mini-B5–pins). The LEDs serve to signal the current status/operating mode of the system.

Different parameters such as standard density, substitute values for pressure and temperature in the waste gas duct, k-factor and measuring ranges are entered directly for the D-FL 100-10 and via a PC and accompanying software (D-ESI 100) for the D-FL 100-20.

Alternatively, the D-ISC 100 control unit may be used in conjunction with the D-FL 100-20. The display provides instant information on the status of connected instruments as well as values currently being measured. In addition, measured values can be presented as bar charts. The D-ISC 100 also allows retrieval of information, control and adjustment of parameters for connected instruments. The D-ISC 100 universal control unit is fitted with a Modbus digital interface in accordance with VDI 4201 parts 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 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 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](http://qal1.de).

### History of documents

Certification of D-FL 100 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

Initial certification according to EN 15267  
Certificate No. 0000032298\_00: 22 March 2013  
Expiry date of the certificate: 04 March 2018  
Test report 936/21218492/A dated 11 October 2012  
TÜV Rheinland Energie und Umwelt GmbH  
Publication BAnz AT 05.03.2013 B10, chapter II number 2.5  
UBA announcement dated 12 February 2013

#### Supplementary testing according to EN 15267

Certificate No. 0000032298\_01: 20 August 2013  
Expiry date of the certificate: 04 March 2018  
Test report 936/21218492/B dated 22 January 2013  
TÜV Rheinland Energy GmbH  
Publication BAnz AT 23.07.2013 B4, chapter II number 2.2  
UBA announcement dated 3 July 2013

#### Supplementary testing according to EN 15267

Certificate No. 0000032298\_02: 29 April 2014  
Expiry date of the certificate: 04 March 2018  
Test report 936/21218492/C dated 30 September 2013  
TÜV Rheinland Energie und Umwelt GmbH  
Publication BAnz AT 01.04.2014 B12, chapter II number 2.4  
UBA announcement dated 27 February 2014



**Notifications**

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 29 September 2014  
Test report 936/21218492/C dated 30 September 2013  
Publication BAnz AT 02.04.2015 B5, chapter IV number 27  
UBA announcement dated 25 February 2015  
(New software version)

**Corrected certificate for 0000032298\_02**

Certificate No. 0000032298\_03: 30 April 2015  
Expiry date of the certificate: 04 March 2018  
(Correction of the device description)

**Renewal of certificate**

Certificate No. 0000032298\_04: 05 March 2018  
Expiry date of the certificate: 04 March 2023

**Notifications**

Statement issued by TÜV Rheinland Energy GmbH dated 8 December 2017  
Publication BAnz AT 26.03.2018 B8, chapter V notification 22  
UBA announcement dated 21 February 2018  
(Soft- and hardware changes)

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 6  
UBA announcement dated 27 February 2019  
(Hard and software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 1 October 2019  
Publication BAnz AT 24.03.2020 B7, chapter IV notification 15  
UBA announcement dated 24 February 2020  
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 29 April 2021  
Publication BAnz AT 05.08.2021 B5, chapter IV notification 28  
UBA announcement dated 29 June 2021  
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 13 April 2022  
Publication BAnz AT 28.07.2022 B4, chapter III notification 2  
UBA announcement dated 28 June 2022  
(Software changes)

**Renewal of certificate**

Certificate No. 0000032298\_05: 02 March 2023  
Expiry date of the certificate: 04 March 2028

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

**Measuring system**

Manufacturer	Durag GmbH
Name of measuring system	D-FL 100
Serial number of the candidates	1226520 / 1227484
Measuring principle	dynamic / differential pressure

**Test report**

Test laboratory	936/21218492/C TÜV Rheinland
Date of report	2013-09-30

**Measured component**

Certification range	Velocity 3 - 30 m/s
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**Calculation of the combined standard uncertainty**

**Tested parameter**

		$u^2$	
Repeatability standard deviation at set point *	$u_r$ 0.364 m/s	0.132	(m/s) <sup>2</sup>
Lack of fit	$u_{lof}$ 0.230 m/s	0.053	(m/s) <sup>2</sup>
Zero drift from field test	$u_{d,z}$ 0.316 m/s	0.100	(m/s) <sup>2</sup>
Span drift from field test	$u_{d,s}$ 0.318 m/s	0.101	(m/s) <sup>2</sup>
Influence of ambient temperature at span	$u_t$ 0.153 m/s	0.023	(m/s) <sup>2</sup>
Influence of supply voltage	$u_v$ 0.180 m/s	0.032	(m/s) <sup>2</sup>
Uncertainty of reference material at 70% of certification range	$u_{rm}$ 0.242 m/s	0.059	(m/s) <sup>2</sup>

\* The larger value is used :

"Repeatability standard deviation at span" or

"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty ( $u_c$ )

$$u_c = \sqrt{\sum (u_{max,i})^2} \quad 0.71 \text{ m/s}$$

Total expanded uncertainty

$$U = u_c * k = u_c * 1.96 \quad 1.39 \text{ m/s}$$

**Relative total expanded uncertainty**

**U in % of the range 30 m/s** **4.6**

**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.