

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000032298_04

AMS designation: D-FL 100 for velocity

Manufacturer: DURAG GmbH
Kollastraße 105
22453 Hamburg
Germany

Test Laboratory: TÜV Rheinland Energy GmbH

This is to certify that the AMS has been tested and certified
according to the standards

EN 15267-1: 2009, EN 15267-2: 2009, EN 15267-3: 2007,
EN 16911 (2013) and EN 14181 (2004)

Certification is awarded in respect of the conditions stated in this certificate
(this certificate contains 7 pages).



Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000032298

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


This certificate will expire on:
04 March 2023

German Federal Environment Agency
Dessau, 05 March 2018

TÜV Rheinland Energy GmbH
Cologne, 04 March 2018



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Test institute accredited to EN ISO/IEC 17025:2005 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:	936/21218492/C dated 30 September 2013
Initial certification:	05 March 2013
Expiry date:	04 March 2023
Certificate:	Renewal (of previous certificate 0000032298_03 dated 30 April 2015 valid until 04 March 2018)
Publication:	BAnz AT 01.04.2014 B12, chapter II number 2.4

Approved application

The tested AMS is suitable for use at combustion plants according to Directive 2010/75/EU, chapter III (13th BImSchV), at waste incineration plants according to Directive 2010/75/EU, chapter IV (17th BImSchV), the 27th BImSchV, the 30th BImSchV and TA Luft. The measured ranges have been selected so as to cater for 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 °C 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 flow velocities 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 936/21218492/C dated 30 September 2013 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 01.04.2014 B12, chapter II number 2.4
UBA announcement dated 27 February 2014:

AMS designation:

D-FL 100 for Flow 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,
UBA announcement 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

Certified product

This certification 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 in-

terface in accordance with the VDI 4201 parts 1 and 3. The front plate has 5 LEDs and a USB port (Mini-B 5-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).

The current software versions are:	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

The current manual version is: 30.01.2013/2

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.

Certification of the D-FL 100 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. 0000032298: 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, Cologne
Publication: BAnz AT 05.03.2013 B10, chapter II no. 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 Energie und Umwelt GmbH, Cologne
Publication: BAnz AT 23.07.2013 B4, chapter II no. 2.2
UBA announcement dated 3 July 2013

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, Cologne
Publication: BAnz AT 01.04.2014 B12, chapter II no. 2.4
UBA announcement dated 27 February 2014

Notifications in accordance with EN 15267

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 29 September 2014
Publication: BAnz AT 02.04.2015 B5, chapter IV notification 27
UBA announcement dated 25 February 2015
(New software version)

Corrected certificate 0000032298_02 dated 29 April 2014

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

Renewal of the certificate

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

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	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) ²
Lack of fit	u_{lof} 0.230 m/s	0.053	(m/s) ²
Zero drift from field test	$u_{d,z}$ 0.316 m/s	0.100	(m/s) ²
Span drift from field test	$u_{d,s}$ 0.318 m/s	0.101	(m/s) ²
Influence of ambient temperature at span	u_t 0.153 m/s	0.023	(m/s) ²
Influence of supply voltage	u_v 0.180 m/s	0.032	(m/s) ²
Uncertainty of reference material at 70% of certification range	u_{rm} 0.242 m/s	0.059	(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)	$u_c = \sqrt{\sum (u_{max,i})^2}$	0.71 m/s
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	1.39 m/s

Relative total expanded uncertainty

Requirement of 2010/75/EU	U in % of the range 30 m/s	4.6
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.