

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

D-FL 100 Flow Monitor

Manufactured by:

DURAG GmbH

*Kollaustraße 105
22453 Hamburg
Germany*

Has been assessed by Sira Certification Service
And for the conditions stated on this certificate complies with:

**MCERTS Performance Standards for Continuous Emission
Monitoring Systems, Version 3.4 dated July 2012
EN15267-3:2007,
& QAL 1 as defined in EN 14181: 2004**

Certification Ranges :

Gas Velocity 3 to 30 m/s
3 to 50 m/s

Project No. : 16A26474
Certificate No : Sira MC060071/02
Initial Certification : 29 September 2006
This Certificate issued : 12 November 2013
Renewal Date : 28 September 2016

R Cooper I Eng MInst MC
Technical Director

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

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Registered Office: Rake Lane, Eccleston, Chester, UK CH4 9JN

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Approved Site Application

Any potential user should ensure, in consultation with the manufacturer, that the monitoring system is suitable for the intended application. For general guidance on monitoring techniques refer to the Environment Agency Monitoring Technical Guidance Notes available at www.mcerts.net

On the basis of the assessment and the ranges required for compliance with EU Directives this instrument is considered suitable for use on waste incineration and large coal-fired combustion plant applications. This CEM has been proven suitable for its measuring task (parameter and composition of the flue gas) by use of the QAL 1 procedure specified in EN14181, for LCPD and WID applications for the ranges specified. The lowest certified range for each determinand shall not be more than 1.5X the daily average emission limit value (ELV) for WID applications, and not more than 2.5X the ELV for LCPD and other types of application.

The measuring system is only fit for use in waste gas which is not saturated with vapour.

Basis of Certification

This certification is based on the following Test Report(s) and on Sira's assessment and ongoing surveillance of the product and the manufacturing process:

TÜV Nord	Report Number: 128CU11650 dated 29 March 1996
Sira Report	Report Number: C1243 September 2006
Sira Report	Report Number: C1241 August 2006
TUV Rheinland	Report Number: 936/21218492/B dated 22 January 2013

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Product Certified

The D-FL 100 flow measuring system consists of the following parts:

- Measuring probe – Flowbar (differential pressure bar). Probe Type I, II, III
- Differential pressure transducer ABB Hartman & Braun Contrans ASA 800 (used to be manufactured by Schoppe & Faser and Elsag Bailey) or ABB 265DS
- Evaluation unit Model D-FL100-10 (optional)

This certificate applies to all instruments fitted with software version 2.0 onwards (serial number 159435502488 onwards)

For instruments certified to EN 15267-3, the D-FL measuring system may be used with both the D-FL 100-10 and D-FL 100-20 evaluation unit. The D-FL 100 flow measuring system consists of the following parts:

- Pitot tube
- Cross-over cock for back flushing pitot tube
- Differential pressure transducer 266MST (ABB)
- Evaluation unit D-FL 100-10 or D-FL 100-20 **
- Software D-ESI 100 (D-FL 100-20)
- Optional: Temperature and pressure sensor

This certificate applies to all D-FL 100-10 instruments fitted with software version 2.0, hardware Rev. 3 onwards (serial number 1225844 onwards);

D-FL 100-20 instruments fitted with software version 01.00R0000 onwards (serial number 1230071 onwards);

D-ISC 100 control unit fitted with software version 01.00R0100 onwards (serial number 1230662 onwards) and;

D-ESI 100 software version 1.0.330 onwards.

** The D-FL 100-20 evaluation unit does not have a display or a control panel. Measured values and parameters are presented using the D-ESI 100 software. There is also an option to connect the system to a universal D-ISC 100 control unit to present measured values and parameters. When used with universal control unit D-ISC 100, the D-FL 100-20 evaluation unit's Modbus interface cannot be used

Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: -20°C to +50°C
Instrument IP rating: IP 65

Results are expressed as % of the certification range 3 to 30 m/s, unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time					Note 1	<200s
Flow						
Repeatability standard deviation at zero point						
Flow	0.14					<2.0%
Repeatability standard deviation at reference point						
Flow			1.2			<2.0%
Lack-of-fit						
Flow (3 to 30 m/s)			1.3			<2.0%
Flow (3 to 50 m/s)	0.46					<2.0%
Influence of ambient temperature zero point						
Flow			1.6			<5.0%
Flow (additional test on D-FL 100-20 with D-ISC 100)	0.20					<5.0%
Influence of ambient temperature reference point						
Flow			1.0			<5.0%
Flow (additional test on D-FL 100-20 with D-ISC 100)	0.30					<5.0%
Influence of voltage variations 196 to 230V						
Flow			1.0			<2.0%
Influence of vibration (10 to 60Hz (±0.3mm), 60 to 160Hz at 1g)						
Flow		0.5				To be reported
Measurement uncertainty					Guidance - at least 25% below max permissible uncertainty	
Flow						
					4.4%	<7.5% (10%)

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Calibration function (field) Flow					>0.99	>0.90
Response time (field) Flow					Note 1	<200s
Lack of fit (field) Flow			1.3			<2.0%
Maintenance interval					3 months	>8 days
Zero and Span drift requirement	<p>The AMS allows for recording zero and span drift and therefore fulfils the requirement of QAL3 according to EN 14181. The AMS doesn't perform any checks or compensation procedures.</p>					<p>Clause 6.13 & 10.13</p> <p>Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.</p>
Change in zero point over maintenance interval Flow			1.8			<3.0%
Change in reference point over maintenance interval Flow			1.3			<3.0%
Availability Flow					99.8%	>95%
Reproducibility Flow			1.0			<3.3%

Note 1: During the lab tests an internal damping time of 10s (moving average) was set (30s during field test).

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Description

The D-FL 100 flow monitor is an in-situ measuring device that determines the flue gas velocity using the differential pressure principle. The measuring system consists of a sensor probe installed inside the duct either over the whole diameter or as a single-sided probe over the half diameter. The probe has two separate chambers, between which a pressure difference caused by the flow in the duct builds up. The differential pressure resulting at the probe is proportional to the square of the gas velocity. The D-FL 100 is not suitable for sites with a flow <3m/s.

An automatic back-flushing unit can be used for keeping the probe clean at high dust concentration applications (typically >30mg/m³). The sensor probe is available in three different sizes depending on the stack diameter. For Stack diameters from 400 to 2000 mm Type I is used (or applications <30mg/m³), for Stack diameters from 2000 to 4000 mm Type II is used (for applications >30mg/m³) and for Stack diameters bigger than 4000 mm Type III is used. The differential pressure transmitter can be placed directly onto the probe or can be connected via flexible hoses or metal pipes to the probe.

The manual back-flushing facility is part of the basic system but was not evaluated. This manual action can be performed automatically as an option. The D-FL 100 is also available in an Ex version.

General Notes

1. This certificate is based upon the equipment tested. The Manufacturer is responsible for ensuring that on-going production complies with the standard(s) and performance criteria defined in this Certificate. 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 system shall be subject to regular surveillance according to 'Regulations Applicable to the Holders of Sira Certificates'. The design of the product certified is defined in the Sira Design Schedule for certificate No. Sira MC060071/01
2. If certified product is found not to comply, Sira Certification Service should be notified immediately at the address shown on this certificate.
3. The Certification Marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of Sira Certificates'.
4. This document remains the property of Sira and shall be returned when requested by the company.

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