

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

OPTIFLUX x300 including variants 2300 and 4300

Manufactured by:

KROHNE Altometer

*A production facility of KROHNE AG, Basel
Kerkeplaat 12
3313 LC Dordrecht
The Netherlands*

has been assessed by CSA Group
and for the conditions stated on this certificate complies with:

**Performance Standards and Test Procedures for Continuous Water
Monitoring Equipment, Part 3: Performance standards and test procedures for water
flowmeters, Environment Agency, version 4, March 2020**

The combined performance characteristic (U_c , the expanded uncertainty) is **1.57%** (Class1)

Certification Ranges:

Size range DN25 to DN1200

Project No.: 80096414
Certificate No: Sira MC130221/04
Initial Certification: 27 February 2013
This Certificate issued: 13 May 2022
Renewal Date: 26 February 2023



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Environmental Team Manager

MCERTS is operated on behalf of the Environment Agency by

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Approved Site Application

The product may be used on all MCERTS applications including abstraction, effluent discharge, ultraviolet disinfection and industrial processing.

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.

Basis of Certification

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

Sira Report	16W29039 dated 28 January 2013
NMi Certain B.V Report	R49-1/2003-NL1 – 06.01 dated 17 March 2006
NMi Report	NMi-12200544-01, dated 10 January 2013
NMi Report	NMi-12200544-02, dated 27 March 2013
NMi Report	CPC-608565-1, dated 26 February 2008
NMi Report	CPC-409580-6, dated 21 April 2006

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Product Certified

The OPTIFLUX 2300*/4300* consists of the following parts:

- OPTIFLUX 2000*/4000* electromagnetic flow / water meter
- IFC 300 electromagnetic signal converter (C / compact, F / remote version or W / wall version)

This certificate applies to all instruments fitted with software version 4.0.4. (serial number A10 01 xxxxx onwards).

* the '2300' pairs with the '2000' and the '4300' pairs with the '4000'

Pipe size	Flow rate		Unit
	min	max	
DN25	0.20	10	m ³ /hr
DN32	0.30	17	m ³ /hr
DN40	0.40	27	m ³ /hr
DN50	0.70	42	m ³ /hr
DN65	1.20	72	m ³ /hr
DN80	1.80	110	m ³ /hr
DN100	2.80	170	m ³ /hr
DN125	5.00	265	m ³ /hr
DN150	6.40	380	m ³ /hr
DN200	12.00	700	m ³ /hr
DN250	18.00	1000	m ³ /hr
DN300	26.00	1600	m ³ /hr
DN350	34.00	2000	m ³ /hr
DN400	45.00	2800	m ³ /hr
DN450	60.00	3400	m ³ /hr
DN500	70.00	4200	m ³ /hr
DN800	125.00	12500	m ³ /hr
DN1200	200.00	20000	m ³ /hr

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Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: -25°C to +55°C

The instrument meets MCERTS Class 1 requirements for the combined performance characteristic as specified in Table 6 of the MCERTS performance standard. Details of individual performance characteristics are summarised below:

Results are expressed as error % reading, unless otherwise stated.

Test	Results expressed as error % of reading				Other results	MCERTS specification
	<0.5	<1.0	<1.5	<2.0		
Protection against unauthorised access	A custody transfer seal is present					Clause 3.1.2
Indicating device	The flowmeter incorporates an indicating device, analogue and digital output signal					Clause 3.1.3
Units of measurement	Various units of measurement are available and displayed.					Clause 3.1.6
Bi-directional flow	The flowmeter displays a '+' or '-' flow reading					Clause 3.1.8
Combined performance characteristic				1.57		Clause 6.3.2 ±2.0% Class 1
Mean error						
DN250	-0.14					
DN400			1.07			Clause 6.3.2
DN500	-0.24					±1.5% Class 1
Repeatability						
DN250	0.07					Clause 6.3.2
DN400	0.44					1% Class 1
DN500	0.14					
Supply voltage	<0.02				70 to 250 VAC 10 to 26.4 VDC	Clause 6.3.3 0.5% Class 1
Output impedance	<0.02				50 to 1000Ω	Clause 6.3.4 0.5% Class 1
Fluid Temperature	-0.33				12°C to 50°C	Clause 6.3.5 0.5% Class 1
Ambient air temperature	0.01				-25°C to +55°C	Clause 6.3.6 0.5% Class 1
Relative humidity	0.01				Test conducted at 45% relative humidity	Clause 6.3.6 0.5% Class 1
Stray currents	<0.02					Clause 6.3.9 0.5% Class 1
Bi-directional flow						
Mean error	-0.38					Mean error ±1.5% Class 1
Repeatability					See Note 1	Repeatability 1% Class 1

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Test	Results expressed as error % of reading				Other results	MCERTS specification
	<0.5	<1.0	<1.5	<2.0		
Loss of Power for electronic flowmeters	No changes in pre set data					Clause 6.3.1 to be reported
Response time					<10s	Clause 6.3.19 30 seconds
Warm up time					<1s	Clause 6.1.2 to be reported
Vibration					Note 2	Clause 6.3.20 to be reported

Note 1: Repeatability for bi-directional flow could not be calculated as only 2 data points were taken at each flow rate

Note 2: Test not conducted

Note 3: The following tests are not applicable to the flowmeter:

- | | | | |
|--------|--|--------|----------------------------|
| 6.3.4 | Output Impedance | 6.3.14 | Flow reversal |
| 6.3.7 | Incident light | 6.3.15 | Ancillary devices |
| 6.3.8 | Sensor location | 6.3.16 | Effect of conduit material |
| 6.3.10 | Sonic velocity compensation & response | 6.3.17 | Effect of conduit size |
| 6.3.11 | Accuracy of computation | 6.3.18 | Fill level |
| 6.3.12 | User defined stage-discharge equation | | |

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Field Test Results

The field test was conducted on a OPTIFLUX 2300 in series with an electromagnetic flowmeter for 3 months measuring leachate at a landfill site

Test	Results expressed as error % of reading				Other results	MCERTS specification
	<0.5	<1.0	<1.5	<2.0		
Error under field test conditions	Error range 0.00% to 4.88%					Clause 7.3 2% Class 1 5% Class 2 8% Class 3
Up time					100%	Clause 7.4 >95%
Maintenance					none	Clause 7.5 to be reported

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Description

The OPTIFLUX 2300/4300 is a mains powered water meter based on the electromagnetic flow principle. It is dedicated for applications in the water and wastewater industry. It consists of a OPTIFLUX 2000/4000 sensor and a mains powered IFC 300 converter. The converter can be mounted directly on the sensor (compact version) or separately (field version).

OPTIFLUX 2300/4300 is designed for custody transfer applications. It meets the requirements of the OIML R49 and can be verified according to MI-001. For potable water applications it is certified with DVGW, ACS, KTW. Krohne Altometer meets the applicable requirements of MID module D for the conformity assessment of water meters. The accuracy of the OPTIFLUX 2300 is 0.2 % of the measured value plus 1 mm/s and every flow meter leaving the factory is calibrated. The variants of the Optiflux x300 are dependant on the liner material. The '2300' variant contains hard rubber liners. The '4300' contains PFA, PTFE, ETFE, PU, hard rubber and soft rubber liners.

The principle of the electromagnetic flow metering is based on Faraday's law of induction: passing an electrically conductive body through a magnetic field, a voltage is induced. This voltage is proportional to velocity and picked up by electrodes.

Grounding is possible with grounding rings, grounding electrode or with virtual reference. Virtual reference is an optional on the IFC 300 converter and with this option grounding rings or grounding electrodes are not required.

The IFC 300 converter is mains powered. It can display positive and negative counter, sum counter and flow rate. It can further provide diagnostic information for self-checking, counter overrun, flow direction and empty pipe detection. It has two pulse outputs and two status outputs.

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 CSA Certificates'.
2. The design of the product certified is defined in the CSA design schedule for certificate No. Sira MC130221/04.
3. If the certified product is found not to comply, CSA Group should be notified immediately at the address shown on this certificate.
4. The certification marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of CSA Certificates'.
5. This document remains the property of CSA Group and shall be returned when requested by CSA Group.

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