



PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

OCM Pro CF (incorporating POA Sensor) Echo Profile Flowmeter

manufactured by:

NIVUS GmbH

Im Täle
75031 Eppingen
Germany

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

**MCERTS Performance Standards for Water Monitoring
Equipment Part 3, Version 2.1 dated March 2008**

Certification Ranges :

Velocity :	0 to 2 m/s
Depth :	0.1 to 1 m

Project No:	16W22558
Certificate No:	Sira MC110189/02
Initial Certification:	24 June 2011
This Certificate Issued	26 May 2015
Renewal Date:	23 June 2016

Technical Director

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

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Approved Site Application

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

The flowmeter is able to follow normal changes of open channel flows; it may not be suitable for use on applications where rapid changes in flow occur, due to a long response time.

Any potential user should ensure, in consultation with the manufacturer, that the flowmeter is suitable for the process on which it will be installed.

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:

- NIVUS GmbH Test Report – Documentation of the M-Cert lab and field tests dated 14 April 2011
- Sira Witness Test Report (incorporated with Evaluation Report) dated 21 June 2011

Product Certified

The OCM Pro CF measuring system consists of the following parts:

- OCP – S3W0 – IN – A3 – 0 Standard version transmitter or;
- OCP – M3W0 – IN – A3 – 0 Multifunction version transmitter.
- POA – V1U1 – KT – 0 Sensor

This certificate applies to all instruments fitted with firmware version V5.04 (OCM Pro CF) and V1.83 (POA Correlation Sensor) onwards.

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Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: -20°C to +50 °C

The instrument meets MCERTS Class 3 requirements for the combined performance characteristic as specified in Table 6 of the MCERTS performance standard and for the tests carried out on 300 mm and 500 mm semi-circular conduits and 340 mm and 600 mm rectangular conduits. Details of individual performance characteristics are summarised below:

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

Test	Results expressed as error % reading				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Protection against unauthorised access					Password required	Clause 3.1.2
Indicating device					The flowmeter displays totalised volume and/or flow-rate	Clause 3.1.3
Units of measurement					The flowmeter records in metric or imperial units	Clause 3.1.6
Combined performance characteristic					5.4% Note 1	Clause 4.2.1 Annex D Class 3 ±8%
Mean error <i>Configuration</i> Rectangular 0.34m 1 sensor (m/s) 0.1 0.25 0.5 1 2 2.5 Rectangular 0.34m 3 sensors (m/s) 0.1 0.25 0.5 1 2 2.5		0.8 -0.8 -0.6 -0.6 0.0		4.1 -3.4 -2.0 -2.0	Note 2	Clause 6.3.2 Class 3 ±6.5% lower zone ±10% upper zone Note 2

Certificate No: Sira MC110189/02

This Certificate Issued: 26 May 2015

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Test	Results expressed as error % reading				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Repeatability <i>Configuration</i> Rectangular 0.34m 1 sensor (m/s) 0.1 0.25 0.5 1 2 2.5 Rectangular 0.34m 3 sensors (m/s) 0.1 0.25 0.5 1 2 2.5	0.2		1.3		Note 3 Note 3 Note 3 Note 3 Note 3 Note 3 Note 3 Note 3	Clause 6.3.2 Class1 ±5% lower zone ±2% upper zone Note 2
Supply voltage AC DC	<0.01 <0.01					Clause 6.3.3.1 Clause 6.3.3.2 Class 1 ±0.5%
Output impedance	<0.01					Class 6.3.4 Class 1 ±0.5%
Fluid temperature	0.18					Clause 6.3.5 Class 1 ±0.5%
Ambient temperature -20 to +50	<0.1					Clause 6.3.6 Class 1 ±0.5%
Relative humidity	<0.1					Clause 6.3.6 Class 1 ±0.5%

Certificate No: Sira MC110189/02
 This Certificate Issued: 26 May 2015

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Test	Results expressed as error % reading				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Effect of conduit size						Clause 6.3.17
300mm semi-circular 1 sensor					Note 6	
l/s h (mm) v (m/s)						
1 20 122 0.744		0.6				
2 30 155 0.836				2.2		
3 40 167 1.003			1.8			
4 50 187 1.081		0.6				
5 60 207 1.139		-0.7				
6 70 225 1.213		-1.0				
500mm semi-circular 1 sensor						
1 20 115 0.591				7.6		
2 30 136 0.703				3.2		
3 40 153 0.804				5.5		
4 50 170 0.849				4.2		
5 60 183 0.915				2.2		
6 70 191 1.005				5.9		
500mm semi-circular 3 sensors						
1 20 115 0.591			1.7			
2 30 136 0.703			1.7			
3 40 153 0.804				2.3		
4 50 170 0.849	-0.4					
5 60 183 0.915			-1.2			
6 70 191 1.005		-0.6				

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Test	Results expressed as error % reading				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Fill level Rectangular 0.60m 1 sensor - by height h (mm) v (m/s) 100 0.2-1.6 200 0.1 300 0.2-0.4 400 0.1-0.4 600 0.1-0.2 800 0.2 Rectangular 0.60m 1 sensor - by velocity h (mm) v (m/s) 200-600 0.1 100-800 0.2 100-400 0.4 100 0.6 100 1.2 100 1.6 Rectangular 0.60m 3 sensors - by height h (mm) v (m/s) 100 0.2-1.6 200 0.1 300 0.2-0.4 400 0.1-0.4 600 0.1-0.2 800 0.2 Rectangular 0.60m 3 sensors - by velocity h (mm) v (m/s) 200-600 0.1 100-800 0.2 100-400 0.4 100 0.6 100 1.2 100 1.6	Error range %					Clause 6.3.18
	-0.63 to 4.87	-6.67	-4.08 to -4.48	1.63 to 3.03		
	-2.82 to -3.26	-0.75				
	-2.82 to -6.67	-0.75 to 4.87	1.63 to -4.08	-0.63		
	-1.46	-0.63				
	-1.72					
	-1.30 to 7.49	1.45	-1.98 to -4.33	-0.53 to -2.94		
	0.21 to -2.13	-1.72				
	1.45 to -2.94	0.21 to 7.49	-0.53 to 4.17	1.58		
	-1.30	-2.65				

Certificate No: Sira MC110189/02

This Certificate Issued: 26 May 2015

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Test	Results expressed as error % reading				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time 0.5 m/s to 1 m/s to 0.5 m/s					<120 sec Note 4	Clause 6.3.19 < 30 secs
Error under field test conditions						Clause 7.3.1 >90% ≤5%
Up time					100%	Clause 7.4.1 >98%
Maintenance					Note 5	Clause 7.5 To be reported

- Note 1 The combined performance characteristic reported is the root-sum-square addition of the maximum errors recorded in the following tests: mean error, repeatability, supply voltage, output impedance, ambient temperature, and fluid temperature.
- Note 2 Results were obtained using the ultrasonic sensor. Pressure sensor readings were also provided for the tests reported on this certificate. There was good agreement between the ultrasonic sensor and the pressure sensor.
- Note 3 Only one determination of error was made at these test points. Therefore, it is not possible to calculate repeatability.
- Note 4 Test conducted with a 50% step change rather than the 20% step change specified in the standard.
- Note 5 No scheduled or unscheduled maintenance was required on the flowmeter during the field test period.
- Note 6 Flow given in l/s is reference value.

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Description

The flowmeter type OCM Pro CF including the Correlation Sensor supplied by NIVUS is intended to be used for continuous flow measurement in slight to heavy polluted media with various compositions. The flowmeter can be operated in partly filled and full channels and pipes with various shapes and dimensions. It is a stationary measurement system for flow measurement and storage of the measurement data. The flowmeter simultaneously determines the velocity and level at a common measurement point. Depending on the selected sensor type, the water-ultrasonic combi-sensor may contain 2 different built-in level measurements, a water-ultrasonic and hydrostatic level measurement. To ensure accurate level measurement, the fluid temperature is constantly monitored and fluctuations in atmospheric pressure are compensated for. A piezo crystal with a certain installation angle towards the flow direction operates as a flow velocity sensor. All the particles in the measurement path (air, dirt, suspended solids) reflect a part of the emitted ultrasonic signal pulse. This echo is received by the piezo crystal again and converted to electric signals. After a certain period the echoes of a second pulse are measured too. By correlation these echo the velocity and a velocity profile can be determined. Using hydraulic laws the complete 2-dimensional velocity profile is reconstructed resulting in an accurate flow rate measurement.

The flowmeter has level, velocity, flow rate and temperature as standard outputs. Up to 4 external measurement values can be stored. Wall mounted enclosure units can be accessed remotely using the TCP/IP protocol via Internet.

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 MC 110189/01
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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