

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

NivuFlow 750 Echo Profile Flowmeter with POA-R sensor and i-Sensor

Manufactured by:

NIVUS GmbH

Im Täle 2
75031 Eppingen
Germany

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 **7.51% (Class 3)**

Certification Ranges:

Partially Full Pipe Applications

Velocity 0.1 m/s to 3 m/s
Fluid depth 0.075m to 0.8m

Project No.: 80114424
Certificate No: Sira MC170321/02
Initial Certification: 14 February 2017
This Certificate issued: 14 February 2022
Renewal Date: 13 February 2027



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Environmental Team Manager

MCERTS is operated on behalf of the Environment Agency by

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Certificate Contents

Approved Site Application.....	2
Basis of Certification	2
Product Certified.....	2
Certified Performance	3
Description.....	7
General Notes	7

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

The product is suitable for use, where it is appropriate, for regulated applications such as abstraction, effluent discharge, ultraviolet disinfection and industrial processing.

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 - Test report NivuFlow 750 with POA pipe Sensor and air ultrasound level meter, dated 08/12/2016
- Sira Witness Test Report (incorporated with Evaluation Report) dated 08/07/2016

Product Certified

The measuring system consists of the following parts:

- A standard version transmitter NF 750 (NF7-5S1 W0/2 A/D 001)
- A multiple version transmitter NF 750 (NF7-5M3 W0/4 A/D 001)
- A V sensor POA pipe with POA-V200RT010L0, POA-V2D0RT010K0, POA-V200RTE10L0, POA-V2D0RTE10K0)
- An air ultrasonic level meter for open channels i-6 (NMI006XX100000H, NMI006XX100001H)

Each system should be composed of a minimum of one transmitter, one velocity sensor and one level meter

This certificate applies to all instruments fitted with software version V3.5.2 (Transmitters NF750), V4.2 (Sensor POA) and firmware version 16 (i-sensor).

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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 150 mm, 300 mm and 500 mm conduits. Details of individual performance characteristics are summarised below:

Results are expressed as error % of certification range, unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Mean Error				3.43		±4% (Class 2)
Repeatability				3.16		1% (Class 1)
Supply Voltage (93 to 232 VAC, 10 to 35 VDC)	0.16					0.5% (Class 1)
Output Impedance (73 Ω to 478 Ω)	0.02					0.5% (Class 1)
Fluid Temperature (+5°C to +30°C)	0.28					0.5% (Class 1)
Ambient Air Temperature (-20°C to +50°C)	0.20					0.5% (Class 1)
Relative Humidity (95%RH)	0.18					0.5% (Class 1)
Direct Solar Radiation		0.67				1% (Class 1)
Bi-Directional Flow		0.73				1.5% (Class 1)
Effect of conduit size						Clause 6.3.17 ±4% Class 2
DN150 m/s						
0.17			1.31			
0.40		0.74				
0.70	0.23					
1.05		0.92				
1.40			-1.61			
1.90			1.46			
2.20	0.08					
2.50	-0.38					
2.80			-1.20			

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Effect of Conduit Size						
DN300 m/s						Clause 6.3.17 ±4% Class 2
0.1			-1.26			
0.15			-1.54			
0.45		0.87				
0.75	0.27					
1.05			-1.17			
1.55		-0.73				
1.95	-0.25					
2.25	-0.26					
DN500 m/s						Clause 6.3.17 ±1.5% Class 1
0.15	-0.13					
0.45	-0.10					
0.75			-1.06			
Fill Level						Clause 6.3.18 To be reported
DN300						
h (m) v (m/s)			Mean Error			
0.1 0.302			0.86% to 4.29%			
0.1 0.466			1.58% to 5.54%			
0.1 0.710			-0.28% to 2.31%			
0.1 0.100			-0.17% to -1.87%			
0.15 0.134			0.84% to 4.44%			
0.15 0.135			0.14% to -3.88%			
0.15 0.126			0.03% to 2.83%			
0.15 0.158			0.25% to 2.46%			
0.15 0.159			0.05% to 1.17%			
0.15 1.365			2.49% to 3.45%			

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Test	Results expressed as % of the certification range				Other results	MCERTS specification	
	<0.5	<1	<2	<5			
Fill Level						Clause 6.3.18 To be reported	
DN300							
h (m)	v (m/s)	Mean Error					
0.20	1.019	-0.54% to 1.76%					
0.20	1.165	-0.89% to -2.70%					
0.20	1.717	-0.04% to 2.65%					
0.25	1.148	-1.22% to 4.24%					
0.25	1.810	1.71% to 3.40%					
0.25	1.238	0.81% to -3.69%					
0.25	1.973	-0.04% to -1.08%					
0.28	1.318	-1.15% to -2.76%					
DN500							
h (m)	v (m/s)	Mean Error					
0.10	0.203	-0.36% to 1.87%					
0.10	0.481	-0.55% to 2.96%					
0.15	0.844	0.02% to -3.32%					
0.15	0.236	0.25% to 2.51%					
0.15	1.533	-0.05% to -1.72%					
0.23	1.862	-0.25% to 1.79%					
0.26	0.288	-0.05% to -2.40%					
0.30	0.356	0.10% to -3.26%					
0.35	0.512	-1.40% to -3.05%					
0.40	0.643	0.56% to -2.75%					
0.45	0.841	-0.17% to -3.68%					
Response time					29 seconds	<30 seconds	
Combined Performance Characteristic					7.51%	Clause 4.2.1 Class 3 (≤8%)	

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Warm Up Time					39 seconds	Clause 6.1.2 To be reported
Error under field test conditions						
POA-R Sensor	Max error 7.61% Min error -4.23% Mean error 3.40% Proportion of errors $\leq 5\%$ = 79.2% Proportion of errors $\leq 8\%$ = 100%					Clause 7.3.1 >90% Class 3 ($\leq 8\%$)
i-Sensor	Max error 0.91% Min error -6.24% Mean error -2.78% Proportion of errors $\leq 2\%$ = 37.5% Proportion of errors $\leq 5\%$ = 91.67%					Clause 7.3.1 >90% Class 2 ($\leq 5\%$)
Up time					99.2%	>95%
Maintenance					30hrs	To be reported

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Description

The flowmeter type NF750 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 pipe. 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. The level sensor may contain 2 an air-ultrasonic and hydrostatic level measurement. 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. From this velocity profile, hydraulic models are applied (none in the program as newline) to evaluate in each geometry the mean velocity. Associated to the cross section, the discharge is evaluated.

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 V00 for certificate No. Sira MC170321/02.
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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