PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

KATflow 150

Manufactured by:

Katronic Technologies Ltd

Earls Court, Warwick Street
Coventry, CV5 6ET
UK

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) are as follows:
KATflow 150 transmitter (AC) is 1.90**% (Class 1)**
KATflow 150 transmitter (DC) is 4.96 **% (Class 2)**

Certification Range:

Velocity:	0.25m/s to 6m/s
Size:	50mm to 300mm

Project No.:	80160507
Certificate No:	CSA MC230373/00
Initial Certification:	01 August 2023
This Certificate issued:	01 August 2023
Renewal Date:	31 July 2028

Andrew Young
Environmental Team Manager

MCERTS is operated on behalf of the Environment Agency by

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Form 3005
Issue 4

Certificate Contents

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.

The field test was carried out between the 16th August 2022 and 19th January 2023 at a sewage treatment plant in Ford, Shropshire, UK.

Basis of Certification

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

WRC test report ref. 'UC15878', dated March 2022.
WRC test report ref. 'UC17183', dated July 2023.
CSA Group report ref. 80160507, incorporating report "Laboratory and Field Test Results", dated 21st July 2023.

Product Certified

The Katronic KATflow 150 flowmeter system consists of the following parts:

- Transmitter (KATflow 150) - IP66 polycarbonate unit with LCD graphic display.
- Transducers - pair of K1L sensors (variant - application specific) with varying length coaxial TPE cabling.

This certificate applies to all instruments fitted with software version 4.22-7565, 4.00 with transmitter serial number 15000350 (AC powered) and 15002956 (DC powered) and K1 sensors serial number 2127, onwards.

Certified Performance

The instrument was evaluated for use under the following conditions:
Ambient Temperature Range: -10°C to +60°C
Instrument IP rating: IP66

The instrument meets **MCERTS Class 2** requirements for the combined performance characteristic as specified in Table 6 of the MCERTS performance standard. Details of individual performance characteristics are summarised below:

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
LABORATORY TESTS ***General requirements/Initial checks*** - Protection against unauthorised access	Password protected unique to the device. Core metrological functions only modified by manufacturer administration password.					Clause 3.1.2
Indicative device and/or analogue or digital output signal	LCD and 4-20mA output incorporated					Clause 3.1.3
Units of measurement	Verified					Clause 3.1.6 & 3.1.7
Comparison of output values	Verified - results comparable					Clause 6.1.4
Warm-up time					30s	Clause 6.1.2 No specification assigned, value(s) obtained to be reported.
Combined performance characteristic(U_c) AC (100 to 240V) DC (9 to 36V)					 ***1.90*** ***4.96***	Clause 6.4 ***Class 1*** ***Class 2***
Loss of Power					All settings retained for 12 parameters	Clause 6.3.1
Mean error AC (100 to 240V) Test point 1 Test point 2 Test point 3 Test point 4 Test point 5 DC (9 to 36V) Test point 1 Test point 2 Test point 3 Test point 4 Test point 5	 -0.31 -0.29 -0.38 	 -0.94 	 1.24 1.07 -1.21 -1.93 	 -3.37 -4.08		Clause 6.3.2 Class 3

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Repeatability						
AC (110 to 220V)						
Test point 1	0.46					
Test point 2	0.28					
Test point 3	0.11					
Test point 4	0.20					
Test point 5	0.18					Clause 6.3.2 Class 1
DC (9 to 32V)						
Test point 1	0.18					
Test point 2	0.14					
Test point 3	0.25					
Test point 4	0.09					
Test point 5	0.35					
Supply voltage (AC 100 to 240V, DC 9 to 36V)						Clause 6.3.3 Class 1
AC (100 to 240V)	0.01					
DC (9 to 36V)	0.37					
Output impedance (10Ω to 550Ω)						Clause 6.3.4 Class 1
AC (100 to 240V)	0.35					
DC (9 to 36V)	0.41					
Fluid temperature (4°C to 29°C)						Clause 6.3.5 Class 2
AC (100 to 240V)		0.83				
Ambient air temperature (-10°C to 60°C)						Clause 6.3.6 Class 2
AC (100 to 240V)	0.36					
DC (9 to 36V)		0.66				
Relative humidity						Clause 6.3.6 Class 1
AC (100 to 240V)	0.20					
DC (9 to 36V)	0.13					

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Effect of conduit size - range 0.05 - 0.3m						
Mean error						
Small - 0.1m (0.35m/s)				-3.37		
Small - 0.1m (0.70m/s)	-0.31					
Small - 0.1m (0.89m/s)			1.24			
Small - 0.1m (1.78m/s)	-0.29					
Small - 0.1m (3.80m/s)		-0.94				
Medium - 0.15m (0.1m/s)				4.23		
Medium - 0.15m (0.33m/s)			1.37			
Medium - 0.15m (0.69m/s)	0.00					
Medium - 0.15m (0.95m/s)		-0.85				
Medium - 0.15m (1.68m/s)			-1.27			
Medium - 0.15m (3.67m/s)		-0.89				
Medium - 0.15m (4.70m/s)	-0.01					
Large - 0.25m (0.10m/s)			-1.94			
Large - 0.25m (0.35m/s)				-3.04		
Large - 0.25m (0.71m/s)				-2.85		
Large - 0.25m (1.01m/s)				-2.35		
Large - 0.25m (1.77m/s)			-1.61			Clause 6.3.17.1
						No specification assigned, value(s) obtained to be reported
Repeatability						
Small - 0.1m (0.35m/s)	0.46					
Small - 0.1m (0.70m/s)	0.28					
Small - 0.1m (0.89m/s)	0.11					
Small - 0.1m (1.78m/s)	0.20					
Small- 0.1m (3.80m/s)	0.18					
Medium - 0.15m (0.10m/s)				3.37		
Medium - 0.15m (0.33m/s)		0.61				
Medium - 0.15m (0.69m/s)	0.29					
Medium - 0.15m (0.95m/s)	0.46					
Medium - 0.15m (1.68m/s)	0.32					
Medium - 0.15m (3.67m/s)			1.80			
Medium - 0.15m (4.70m/s)		0.76				
Large - 0.25m (0.10m/s)				4.21		
Large - 0.25m (0.35m/s)		0.83				
Large - 0.25m (0.71m/s)		0.89				
Large - 0.25m (1.01m/s)	0.35					
Large - 0.25m (1.77m/s)			1.02			

Bi-directional flow ***Mean error*** Test point 1 - 0.39m/s Test point 2 - 0.73m/s Test point 3 - 4.04m/s ***Repeatability*** Test point 1 - 0.39m/s Test point 2 - 0.73m/s Test point 3 - 4.04m/s	 0.38 0.30 0.29	 	 -1.67 -1.47 	 -5.31 	 	 Clause 6.3.13 No specification assigned, value(s) obtained to be reported
Effect of conduit material ***Mean error*** Carbon Steel - 0.34m/s Carbon Steel - 0.58m/s Carbon Steel - 0.86m/s Carbon Steel - 1.52m/s Carbon Steel - 3.12m/s Lined Ductile Iron - 0.40m/s Lined Ductile Iron - 0.72m/s Lined Ductile Iron - 1.07m/s Lined Ductile Iron - 1.84m/s Lined Ductile Iron - 3.80m/s ***Repeatability*** Carbon Steel - 0.34m/s Carbon Steel - 0.58m/s Carbon Steel - 0.86m/s Carbon Steel - 1.52m/s Carbon Steel - 3.12m/s Lined Ductile Iron - 0.40m/s Lined Ductile Iron - 0.72m/s Lined Ductile Iron - 1.07m/s Lined Ductile Iron - 1.84m/s Lined Ductile Iron - 3.80m/s	 0.23 0.19 0.13 0.28 0.42 0.34 0.08 0.25	 0.82 0.53 0.62 0.79 	 1.91 1.22 -1.18 -1.78 	 2.85 2.82 -3.51 -3.90 	 	 Clause 6.3.16 No specification assigned, value(s) obtained to be reported
Response Time (either increasing or decreasing flow) AC (100 to 240V) DC (9 to 36V)	 	 	 	 	 ≤15s ≤15s	clause 6.3.19 No specification assigned, value(s) obtained to be reported

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
FIELD TESTS						
Error under field conditions	Max error 5.68% Min error -0.03% Mean error -1.01% Proportion of errors ≤2% = 54.2% Proportion of errors ≤5% = 95.8% Proportion of errors ≤8% = 100%					Clause 7.3 Class 2
Up time					100% Note 1	Clause 7.4 ≥95%
Maintenance					None Note 2	Clause 7.5 To be reported

Note 1: Of the total operating time 223,802 minutes, 21,600 minutes, or 360 hours, were attributed to power outages on two separate occasions - this does not constitute device malfunction or repair.

Note 2: The measuring system was installed in a sewage treatment works from 16th August 2022 to the 19th January 2023 with a total scheduled operating time of 223,802 minutes. No maintenance was required during the field test.

Description

Katronic's KATflow 150 is a non-invasive, clamp on ultrasonic flowmeter operating by the transit time principle, which features compact, stainless-steel transducers that are mounted on to a filled pipe by means of straps or clamps.

Advanced measurement algorithms compensate for variations in the flow ensuring accurate measurement within the MCERTS standard. Single and dual channel measurement is possible. KATflow 150 features a large, clear LCD readout in a robust and lockable polycarbonate IP66 enclosure. Katronic's 'Audible Positioning Assistant' is designed to support accurate sensor positioning. The 'Quick Setup' menu helps the user to easily set the unit up.

The Katronic KATflow 150 is configurable to meet the customer's needs in terms of outputs, offering analogue, digital and a full range of telemetry outputs to interface with the site control system where necessary, plus options of data logging up to one million data points.

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. CSA MC230373/00.

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.