

CERTIFICATE

of Product Conformity (QAL1)

Certificate No. : 0000025933_01

Certified AMS: MT91 for velocity

Manufacturer: Fluid Components International
1755 La Costa Meadows Drive
San Marcos, CA. 92075
USA

Test Institute: TÜV Rheinland Energie und Umwelt GmbH

**This is to certify that the AMS has been tested
and found to comply with:**

**EN 15267-1: 2009, EN 15267-2: 2009, EN 15267-3: 2008
and EN 14181: 2004**

Certification is awarded in respect of the conditions stated in this certificate
(see also the following pages).



Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000025933

Publication in the German Federal Gazette
(BAnz.) of 12 February 2010

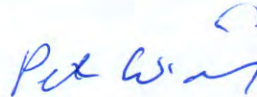
This certificate will expire on:
11 February 2020

German Federal Environment Agency
Dessau, 2 February 2015

TÜV Rheinland Energie und Umwelt GmbH
Cologne, 30 January 2015



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Accreditation according to EN ISO/IEC 17025 and certified according to ISO 9001:2008.

Test report:	936/21210457/A of 21 October 2009
Initial certification:	12 February 2010
Certificate:	renewal (previous certificate 0000025933 of 10 March 2010 valid until 11 February 2015)
Expiry date:	11 February 2020
Publication:	BAnz. 12 February 2010, no. 24, p. 552, chapter II, no. 2.1

Approved application

The tested AMS is suitable for use at large combustion plants according to Directive 2001/80/EC, at waste incineration plants according to Directive 2000/76/EC, and plants according to the German Technical Instruction on Air Quality Control as well as other plants requiring official approval.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a field test at a waste incineration plant.

The AMS is approved for an ambient temperature range of -20 °C to +50 °C.

The notification of suitability of the AMS, performance testing, and the uncertainty calculation have been effected on the basis of the regulations valid at the time of performance testing. As changes in legal regulations are possible, any potential user should ensure that this AMS is suitable for monitoring the limit values relevant to the application.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the installation at which it will be installed.

Basis of the certification

This certification is based on:

- test report 936/21210457/A dated 21 October 2009 of TÜV Rheinland Immissionsschutz und Energiesysteme GmbH
- suitability announced by the German Federal Environment Agency (UBA) as the relevant body
- the ongoing surveillance of the product and the manufacturing process
- publication in the German Federal Gazette (BAnz. 12 February 2010, no. 24, p. 552, chapter II, no. 2.1, UBA announcement of 25 January 2010)

AMS designation:

MT91

Manufacturer:

Fluid Components International, La Costa Meadows Drive San Marcos, USA

Field of application:

For measurements at plants requiring official approval (e.g. Directive 2001/80/EC regarding large combustions plants, Directive 2000/76/EC regarding waste incineration plants)

Measuring range during the performance test:

Component	Certification-range	Unit
Velocity	0 - 25	m/s

Software version:

Version 1.28

Restriction:

The measuring system shall only be employed if a fall below the dew point can be excluded.

Notes:

The maintenance interval is four weeks.

Test report:

TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne
Report no.: 936/21210457/A of 21 October 2009

Certified product

This certificate applies to automated measurement systems conforming to the following description:

The measuring principle is based on convection due to changes in temperature. Thermal energy is extracted by gas molecules passing a heated sensor, which makes direct and continuous gas flow measurement possible.

The FCI sensor consists of four protective sleeves (thermowells) which are paired by welding. Each of the two thermowell pairs holds a temperature sensor (RTD) made of platinum. One thermowell pair contains a heater and an active Resistance Temperature Detector (RTD). The second pair contains the reference RTD and a thermal mass equalizer. The active RTD is heated with a constant heater current from a heater placed in the adjacent thermowell. The reference RTD measures the process temperature. Influences due to temperature variations of the process are thus being considered. The sleeve next to the reference sensor is empty and is used as dynamic balancer in order to provide this pair of thermowells with the same thermo-dynamic characteristics.

The flow monitor consists of one or more sensor rods, in which – depending on the necessity – up to eight sensors can be installed, and the converter unit. The converter unit evaluates the signals of all sensor rods.

General notes

This certificate is based upon the equipment tested. The manufacturer is responsible for ensuring that ongoing production complies with the requirements of the EN 15267. 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 systems shall be subject to regular surveillance.

If a product of the current production does not conform to the certified product, TÜV Rheinland Energie und Umwelt GmbH must be notified at the address given on page 1.

A certification mark with an ID-Number that is specific to the certified product is presented on page 1 of this certificate. This can be applied to the product or used in publicity material for the certified product.

This document as well as the certification mark remains property of TÜV Rheinland Energie und Umwelt GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energie und Umwelt GmbH this document shall be returned and the certificate mark must not be employed anymore.

The relevant version of this certificate and its expiration is also accessible on the internet: qal1.de.

Certification of MT91 for velocity is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Initial certification according to EN 15267

Certificate No. 0000025933: 10 March 2010
Expiry date of the certificate: 11 February 2015
Test report: 936/21210457/A of 21 October 2009
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne
Publication: BAnz. 12 February 2010, no. 24, p. 552, chapter II, no. 2.1
UBA announcement of 25 January 2010

Renewal of the certificate

Certificate No. 0000025933_01 2 February 2015
Expiry date of the certificate: 11 February 2020

Calculation of overall uncertainty for QAL1 in EN 14181 and EN 15267-3

Manufacturer data

Manufacturer	Fluid Components International LLC
Name of measuring system	MT91
Serial Number	299905 / 299906
Measuring Principle	Convection

TÜV Data

Approval Report	936/21210457/A 09-10-21
Editor	Steinhagen
Date	2009-10-05

Measurement Component

Certificated range	Velocity 25 m/s
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Calculation of the combined standard uncertainty

Test Value

	u	u ²
Standard deviation from paired measurements under field conditions *	u _D 0.082 m/s	0.007 (m/s) ²
Lack of fit	u _{lof} -0.318 m/s	0.101 (m/s) ²
Zero drift from field test	u _{d,z} -0.034 m/s	0.001 (m/s) ²
Span drift from field test	u _{d,s} -0.069 m/s	0.005 (m/s) ²
Influence of ambient temperature at span	u _t 0.000 m/s	0.000 (m/s) ²
Influence of supply voltage	u _v 0.001 m/s	0.000 (m/s) ²
Influence of sample pressure	u _p 0.086 m/s	0.007 (m/s) ²
Uncertainty of reference material at 70% of certification range	u _{rm} 0.202 m/s	0.041 (m/s) ²

* The bigger value of: "Repeatability standard deviation at span" or "Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u _c)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.40 m/s
Total expanded uncertainty	$U = u_c * k = u_c * 1,96$	0.79 m/s

Relative total expanded uncertainty

Requirement of 2000/76/EC and 2001/80/EC

Requirement of EN 15267-3

U in % of the range 25 m/s	3.2
U in % of the range 25 m/s	10.0 **
U in % of the range 25 m/s	7.5

** For this component no requirements in the EC-directives 2001/80/EC and 2000/76/EC are given.
A value of 10 % was used for this.