Umwelt Bundes Amt
For our Environment

TÜVRheinland®
Precisely Right.

CERTIFICATE

about Product Conformity (QAL1)

Number of Certificate: 0000025933

Certified AMS:	MT91 for Velocity
Manufacturer:	Fluid Components International 1755 La Costa Meadows Drive San Marcos, CA. 92075 USA
Test Institute:	TÜV Rheinland Immissionsschutz und Energiesysteme GmbH

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

EN 15267-1: 2009, EN 15267-2: 2009, EN 15267-3: 2007 and EN 14181: 2004

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

www.tuv.com TÜVRheinland® ID: 0000025933

- EN 15267-3 tested
- QAL1 certified
- TUV approved
- Annual Inspection

Publication in the German Federal Gazette (BAnz.) of 2010-02-12

The certificate is valid until: 2015-02-11

Umweltbundesamt

Dessau, 2010-03-15

i. A. Dr. Hans-Joachim Hummel

TÜV Rheinland Immissionsschutz und Energiesysteme GmbH

Köln, 2010-03-10

i. V. Dr. Peter Wilbring

www.umwelt-tuv.de / **www.eco-tuv.com** tie@umwelt-tuv.de Tel. +49 - 221 - 806 - 2275	TÜV Rheinland Immissionsschutz und Energiesysteme GmbH Am Grauen Stein 51105 Köln Accreditation according to EN ISO/IEC 17025 and ISO 9001:2000.

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Certificate:
0000025933 / 2010-03-10

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Test report:	936/21210457/A of 2009-10-21
First certification:	2010-02-12
Run of validity until:	2015-02-11
Publication	BAnz. 2010-02-12, no.: 24, page: 554

Approved application:
The suitability of the AMS was assessed on the basis of a laboratory test and a field test on a municipal waste incinerator. The instrument can be used at all kind of plants, as long as the dew point is not under-run. The AMS is approved for the temperature range from -20 °C to +50 °C.

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

Basis of the certification
This certification is based on the test report 936/21210457/A of 2009-10-21 of TÜV Rheinland Immissionsschutz und Energiesysteme GmbH and on the relevant bodies (German Umweltbundesamt) assessment and ongoing surveillance of the product and the manufacturing process and the publication in the German Federal Gazette (BAnz.):

AMS name:
MT91

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

Approval:
For measurements at plants requiring official permission (i. e. 2000-76-EC, waste incineration directive and 2001-80-EC, large combustion plants directive)

Measuring ranges during the suitability test:

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

Software version:
Version 1.28

Restrictions:
The system cannot be used in plants where the dew point is under-run.

Remarks:
The maintenance interval is four weeks.

Test report:
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Köln
Report-No.: 936/21210457/A of 2009-10-21

Certified product
This certificate applies to automated measurement systems confirming to the following description:

The measuring principle is based on convection, due to temperature change. By extraction of thermal energy by the flowing gas molecules on a heated sensor a direct continuous gas flow measurement is possible.

The FCI Sensor consists of two pairs of thermowell. 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 current of a heater from the adjacent well. The reference RTD measures the process temperature. Influences because of temperature variations of the process are considered by this. The second sleeve next to the reference sensor is empty and is used as dynamic balancer, to give this pair of wells the same thermo dynamic characteristic.

The measuring system consists of one or more sensor rods, in which depending on the necessity up to eight sensors can be installed, and the converter unit. In the converter unit the signals of all sensor rods are evaluated.

General notes:
This certificate is based upon the equipment tested. The manufacturer is responsible for ensuring that on-going production complies with the requirements of the DIN 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 certified product is found no longer to comply with the applicable European Standard, TÜV Rheinland Immissionsschutz und Energiesysteme GmbH should be notified at the address shown on page 1.

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

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

The relevant version of this certificate and the validity is also seen at the Internet Address: **qal1.de**.

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Certificate:
0000025933 / 2010-03-10

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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	Velocity
Certificated range	25 m/s

Calculation of the combined standard uncertainty

Test Value		u	u²
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	**U in % of the range 25 m/s**	**3.2**
Requirement of 2000/76/EC and 2001/80/EC	**U in % of the range 25 m/s**	**10.0**
Requirement of EN 15267-3	U in % of the range 25 m/s	7.5

*[1] For this component no requirements in the EC-directives 2001/80/EC und 2000/76/EC are given. The chosen value was recommended by the certification body.