

CERTIFICATE

on Product Conformity (QAL1)

Certificate No.: 0000038505

Certified AMS: LasIR for HF

Manufacturer: Unisearch Associates Inc.
96 Bradwick Drive
Concord On L4K 1K8
Canada

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: 2007
and EN 14181: 2004**

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



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

Publication in the German Federal Gazette
(BAnz.) of 05 March 2013

This certificate will expire on:
04 March 2018

German Federal Environment Agency
Dessau, 22 March 2013

TÜV Rheinland Energie und Umwelt GmbH
Cologne, 21 March 2013

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Am Grauen Stein
51105 Cologne

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

Test report:	936/21216746/A of 06 October 2012
Initial certification:	05 March 2013
Expiry date:	04 March 2018
Publication:	BAnz AT 05 March 2013 B10, chapter I, No. 3.2

Approved application

The tested AMS is suitable for use at combustion plants according to EC Directive 2001/80/EC and at waste incineration plants according to EC Directive 2000/76/EC and other plants requiring official approval. The measured ranges have been selected considering the wide application range of the AMS.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a threemonth field test at an aluminium smelter plant.

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

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 936/21216746/A of 06 October 2012 of TÜV Rheinland Energie und Umwelt 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 AT 05 March 2013 B10, chapter I, No. 3.2

AMS designation:

LasIR for HF

Manufacturer:

Unisearch Associates, Concord, Kanada

Field of application:

Measurement at plants requiring official approval as well as plants within the scope of 2000/76/EC (waste incineration directive) and 2001/80/EC (large combustion plants directive)

Measuring ranges during the suitability test:

Component	Certification range	Supplementary range	Unit
HF	0 - 5*	0 - 10*	mg/m ³

*related to a measurement path of 1.0 m

Software version:

4.76

Restrictions:

None

Remarks:

1. HF can be determined with the help of dry test gases from a pressured gas bottle and an unheated measurement cell.
2. The maintenance interval is four weeks.

Test report:

TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report No.: 936/21216746/A dated 6 October 2012

Certified product

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

The measuring device LasIR is a tunable infrared spectrometric diode laser system, which is made for the contactless in-situ measurement of stack emissions.

The measuring device LasIR consists of:

- LasIR control / analysis unit
- transmitter unit with purge unit
- receiver unit with purge unit
- optical cable (between analysis unit and transmitter unit)
- data cable (between the receiver unit and analysis unit)
- unheated sample gas cell

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 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 LasIR for HF 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. 0000038505: 22 March 2013

Expiry date of the certificate: 04 March 2018

Test report: 936/21216746/A dated 06 October 2012
TÜV Rheinland Energie und Umwelt GmbH, Cologne

Publication: BAnz AT 05 March 2013 B10, chapter I, No. 3.2
Announcement by UBA from 12 February 2013

Calculation of overall uncertainty according to EN 14181 and EN 15267-3

Measuring system

Manufacturer	Unisearch Associates
Name of measuring system	LasIR
Serial number of the candidates	LAS1002 / LAS1003
Measuring principle	IR Laser

Test report

Test laboratory	936/21216746/A TÜV Rheinland
Date of report	2012-10-06

Measured component

Certification range	HF 0 - 5 mg/m ³
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Evaluation of the cross sensitivity (CS)

(system with largest CS)

Sum of positive CS at zero point	0,00 mg/m ³
Sum of negative CS at zero point	0,00 mg/m ³
Sum of positive CS at reference point	0,00 mg/m ³
Sum of negative CS at reference point	0,00 mg/m ³
Maximum sum of cross sensitivities	0,00 mg/m ³
Uncertainty of cross sensitivity	0,000 mg/m ³

Calculation of the combined standard uncertainty

Tested parameter

			u ²	
Standard deviation from paired measurements under field conditions *	u _D	0,024 mg/m ³	0,001	(mg/m ³) ²
Lack of fit	u _{lof}	-0,035 mg/m ³	0,001	(mg/m ³) ²
Zero drift from field test	u _{d,z}	0,006 mg/m ³	0,000	(mg/m ³) ²
Span drift from field test	u _{d,s}	0,026 mg/m ³	0,001	(mg/m ³) ²
Influence of ambient temperature at span	u _t	0,017 mg/m ³	0,000	(mg/m ³) ²
Influence of supply voltage	u _v	0,006 mg/m ³	0,000	(mg/m ³) ²
Cross sensitivity (interference)	u _i	0,000 mg/m ³	0,000	(mg/m ³) ²
Influence of sample pressure	u _n	0,012 mg/m ³	0,000	(mg/m ³) ²
Uncertainty of reference material at 70% of certification range	u _{rm}	0,040 mg/m ³	0,002	(mg/m ³) ²
Excursion of measurement beam	u _{mb}	0,022 mg/m ³	0,000	(mg/m ³) ²

* The larger value is used :

"Repeatability standard deviation at span" or

"Standard deviation from paired measurements under field conditions"

$$u_c = \sqrt{\sum (u_{\max, j})^2}$$

Combined standard uncertainty (u _c)		0,07 mg/m ³
Total expanded uncertainty	U = u _c * k = u _c * 1.96	0,14 mg/m ³

Relative total expanded uncertainty

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

Requirement of EN 15267-3

U in % of the ELV 1 mg/m³	14,0
U in % of the ELV 1 mg/m³	40,0
U in % of the ELV 1 mg/m³	30,0