

CONFIRMATION

of Product Conformity (QAL1)

Approved AMS: LasIR for HCl und H₂O

Manufacturer: Unisearch Associates
96 Bradwick Drive
L4K 1K8 Concord, Ontario
Canada

Test Institute: TÜV Rheinland Energy GmbH

**This is to certify that the AMS has been tested and certified
according to the standards**


**EN 15267-1 (2009), EN 15267-2 (2009), EN 15267-3 (2007)
and EN 14181 (2014)**

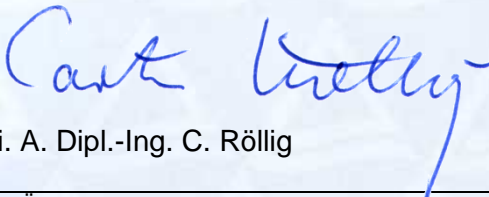
The approval of the measuring equipment subject to the above mentioned conditions
was authorized by the German relevant body.

This confirmation is valid up to the publication of the certificate,
but no longer than 6 months from the date of issue
(this document contains 4 pages).

The confirmation is valid until: 15 July 2017

TÜV Rheinland Energy GmbH
Cologne, 16 January 2017


i. V. Dipl.-Ing. G. Baum


i. A. Dipl.-Ing. C. Röllig

www.umwelt-tuv.eu
tre@umwelt-tuv.eu
Tel. +49 221 806-5200

TÜV Rheinland Energy GmbH
Am Grauen Stein
51105 Köln

Test institute accredited to EN ISO/IEC 17025:2005 by DAkkS (German Accreditation Body).
This accreditation is limited to the accreditation scope defined in the enclosure to the certificate D-PL-11120-02-00.

Confirmation:
16 January 2017

Test report: 936/21226120/A dated 13 October 2016
Expiry date: 15 July 2017

Tested application

The tested AMS is suitable for use at combustion plants according to Directive 2010/75/EU, chapter III (13. BImSchV), at waste incineration plants according to Directive 2010/75/EU, chapter IV (17. BImSchV) 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 six-month field test at a waste incineration plant.

The AMS is approved for an ambient temperature range of +5 °C to +40 °C and the measuring heads are 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 value / Flow oder Oxygen concentration 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 confirmation

This certification is based on:

- Test report 936/21226120/A dated 13 October 2016 of TÜV Rheinland Energy GmbH
- The ongoing surveillance of the product and the manufacturing process
- Expert testing and approved by an independent body

Confirmation:
16 January 2017

AMS designation:

LasIR for HCl and H₂O

Manufacturer:

Unisearch Associates, Concord, Canada

Field of application:

For measurements at plants requiring official approval and plants according to 27. BImSchV

Measuring ranges during the performance test:

Component	Certification range	Supplementary measurement ranges		Unit
HCl	0 - 15*	0 - 90*	-	mg/m ³
H ₂ O	0 - 30*	0 - 40*	0 - 50*	Vol.-%

*related to a path length of 1.0 m

Software version:

4.85

Restrictions:

none

Notes:

1. HCl can be determined with the help of dry test gases from a pressured gas bottle and an unheated measurement cell.
2. The sample gas temperature and pressure need to be available to the measuring system. They can be made available in analogue or digital form.
3. The maintenance interval is three months.

Test report:

TÜV Rheinland Energy GmbH, Cologne
Report No.: 936/21226120/A dated 13 October 2016

Tested product

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

The LasIR measuring system uses the principle of light absorption in the near infrared region of the spectrum by a tunable diode laser. It was designed for in-situ gas measurement of HCl/H₂O. The laser diode is the heart of the LasIR measuring system. It serves as light source in the near infrared spectrum. These diodes emit a light beam in a narrow but tunable wavelength spectrum. Its high spectral sensitivity and the tunable laser diode allow the measuring system to determine the optical absorption of a single rotation/vibration line in the spectrum of the molecule to be measured. This clearly identifies the gas to be measured and makes the measurement robust against interfering gases.

The LaSIR measuring system comprises two main components: The LaSIR control (analyser) unit and the optical heads.

The control/analyser unit

The analyser unit has its own housing. The analyser's laser is selected for and tuned to the absorption wavelength of the gas to be monitored. It is mounted on a thermo-electric cooler which approximates the wavelength via the temperature of the laser. The laser voltage is used for fine tuning.

The laser is coupled to an optical fibre which again is connected to a beam splitter. This beam splitter splits the light beam in two. One output (in the range 2% to 10%) sends the laser beam to a reference channel. Light from the output put for the reference channel crosses a small reference cell filled with high concentrations of the gas to be measured with this laser. The signal from the reference channel serves to tune the wavelength of the laser to the absorption line. The remaining output (90% to 98%) is used for the measurement channels.

The analyser also comes with a control circuit for the temperature and power of the laser, a data logger chip and a control chip as well as an integrated computer for automatic data control and analysis.

Optical heads

A number of different configurations of the emitter/receiver module is available for in-situ emission monitoring. At present, the version emitter/receiver unit with retro reflector (dual pass option) was performance tested.

In the dual-pass version, a light beam is sent to the channel optics via an optical fibre coupled to a specifically designed start/reception element via an APC connector. The laser beam is emitted through the waste gas duct/stack. When it hits the opposite side, the retro reflector reflects it back to the detector. The output voltage of the receiver is transmitted to the LasIR analyser via a coaxial line.