

CONFIRMATION

of Product Conformity (QAL1)

Approved AMS: APOA-380 for O₃

Manufacturer: HORIBA Europe GmbH
Hans-Mess-Str. 6
61440 Oberursel
Germany

Test Institute:: TÜV Rheinland Energy & Environment GmbH

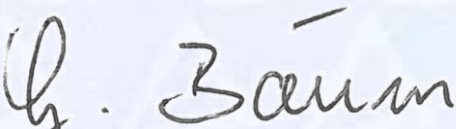
**This is to certify that the AMS has been tested
according to the standards**

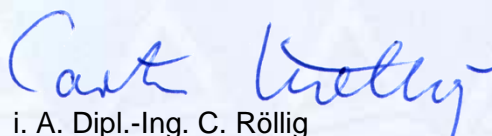
**VDI 4202-1 (2018), EN 14625 (2012), EN 14625 (2024)
as well as EN 15267-1 (2009) and EN 15267-2 (2023).**

The AMS underwent independent expert testing and was accepted.
This confirmation is valid up to the publication of the certificate,
but no longer than 9 months from the date of issue
(this document contains 5 pages).

This confirmation is valid until: 31 December 2026

TÜV Rheinland Energy & Environment GmbH
Cologne, 10 April 2026


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

Confirmation:
10 April 2026

Test Report: EuL/21271880/A dated 30 September 2025
Expiry date: 31 December 2026

Approved application

The tested AMS is suitable for continuous immission measurement of O₃ in stationary use.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a three Monate field test.

The AMS is approved for an ambient temperature range of 0° to 40°C.

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

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the intended purpose.

Note

The legal regulations mentioned do not correspond to the current state of legislation in every case. Each user should, if necessary, in consultation with the competent authority, ensure that this AMS meets the legal requirements for the intended use. In addition, it cannot be ruled out that legal regulations governing the use of a measuring device for emission monitoring may change during the lifetime of the certificate.

Basis of the confirmation

This confirmation is based on:

- Test report EuL/21271880/A dated 30 September 2025 issued by TÜV Rheinland Energy & Environment GmbH
- The ongoing surveillance of the product and the manufacturing process
- Expert testing and approval by an independent body
- Suitability announced by the relevant body.

Confirmation:
10 April 2026

AMS designation:

APOA-380 for ozone

Manufacturer:

Horiba Europe GmbH, Oberursel, Germany

Field of application:

For the continuous determination of ozone concentrations in ambient air in stationary applications

Measuring ranges during performance testing:

Component	Certification range	Unit
Ozone	0 – 500	µg/m ³

Software version:

A7: P2002638D 1.03
M4: P2002642B 1.01
Analyzer: P2002584C 1.03
FPGA: P2002759A 1.01

Restrictions:

none -

Notes:

1. The measuring system also meets the requirements of EN 14625:2024.
2. The test report on the suitability test is available online at www.qal1.de.
3. Supplementary test (qualification of new ozonator, new software version) relating to the announcement by the Federal Environment Agency of 27 August 2025 (BAnz AT 31.10.2025 B5, Chapter III, Section 3.1).

Test Institute: TÜV Rheinland Energy & Environment GmbH, Cologne

Report No.: EuL/21271880/A dated 30 September 2025

Confirmation:
10 April 2026

Tested product

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

The APOA-380 ambient air monitoring system is a continuous ozone analyser. The measuring principle is based on ultraviolet absorption. The device was developed for the continuous measurement of ozone in ambient air.

The measuring principle is based on the determination of light absorption by the gas to be measured in the wavelength range characteristic of the gas, which for the ozone component is in the UV range at a wavelength of 254 nm. The evaluation is carried out by measuring the absorption on the basis of the dependence between the gas concentration and the amount of absorbed light according to Lambert-Beer's law.

Lambert-Beer's law:

$$I = I_0 * e^{-(\alpha L c)} \text{ at standard temperature and pressure (STP)}$$

- I Intensity with absorption.
- I₀ Light intensity without absorption.
- L Path travelled by the light during absorption.
- c Concentration of the absorbing gas, in this case O₃
- α Absorption coefficient (this provides information about the degree of absorption).

To solve this equation for c, it must be rearranged as follows:

$$c = \ln(I_0 / I) * (1 / \alpha L) \text{ at STP}$$

As both the ambient temperature and pressure influence the density of the sampling gas and therefore the number of ozone molecules present in the absorption tube, the amount of absorbed light is changed.

To clarify this effect, the equation was extended by the following addition:

$$c = \ln(I_0 / I) * (1 / \alpha L) * (T/273K * 29,92\text{inHg}/p)$$

T = sample temperature in Kelvin

p = sample pressure in inches of mercury

The APOA-380 ozone analyser determines the concentration of ozone (O₃) in a sample drawn into the instrument. The APOA-380 measures the intensity of ultraviolet light after it has passed through a measuring chamber, where the light is absorbed in proportion to the amount of ozone present. Every four seconds, a switching valve switches between a gas flow containing ozone and a reference gas flow that has been purged of ozone. These measurements are calculated together with the gas pressure and temperature to provide a stable ozone reading.

The photometer in the APOA-380 analyser uses a high-power mercury vapour lamp to generate a UV light beam. This beam passes through a window that is non-reactive with O₃ and transparent to UV radiation at 254 nm, and then enters the absorption tube filled with sample gas. As ozone efficiently absorbs UV radiation, the absorption path is short enough (approx. 42 cm) to cause a measurable drop in UV intensity, so that the light beam only needs to pass through the absorption tube once. The UV light passes through a similar window at the other end of the absorption tube and is detected by a vacuum diode. This diode detects only radiation at or near a wavelength of 254 nm. The detector's accuracy is high enough that no additional optical filter for UV light is required. The detector responds to the UV light and outputs a voltage that is directly proportional to the light intensity. The voltage is digitised and sent to the device's CPU to be used in calculating the O₃ concentration in the absorption tube.

Technical data APOA-380:

Measuring range:	Maximum 0-10 ppm (selectable)
Units:	ppb / ppm / µg/m ³ / mg/m ³
Measured compounds:	ozone
Sample flow:	approx. 0.6 litres/min (during the test)
Outputs:	Ethernet TCP/IP Modbus Serial interface, RS232 0 - 1/5/10 Volt analogue 4 - 20 mA analogue USB INTERFACE
Input voltage:	100 V to 240 V, 50 Hz or 60 Hz
Power:	80 W; maximum 140 W
Dimensions (L x W x H)	568 x 430 x 221 mm
Weight:	approx. 15 kg