



QAL1 Report

Description of evaluated measurement procedure

Automated Measuring System (AMS) based on
Analyzer module serial number (optional)
Quotation or order number
Intended for monitoring of
Applicable EU directive
Name of plant
Gas to be measured
Smallest range of AMS
Largest range of AMS (optional)
Smallest certified range for AMS

AO2000-Uras14 CO	
3-251407-4	
TG501	
Large combustion plant	
2001/80/EC	
Enipower Ravenna	
CO	
75	mg/m ³
75	mg/m ³
75	mg/m ³

Test value and required quality at that value

Test concentration (Emission Limit Value, ELV)

30	mg/m ³
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Required measurement quality as 95% confidence interval

10	% of ELV
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Shortest averaging time of measured values

30	minutes
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Required response time

25	% of shortest averaging time
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Field conditions of operation used in the uncertainty assessment

Ambient temperature range

Min. value	Max. value	
5	30	°C
980	1010	hPa
50	90	l/h
190	250	V

Ambient pressure range

Flow range

Voltage range

Internal diameter of sample gas line

4	mm
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Length of sample gas line

50	m
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Average flow of sample gas

70	l/h
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Time between (automatic) span calibration

7	days
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Ranges of chemical interferents for

Combustion process

Component

O₂
H₂O
CO
CO₂
CH₄
N₂O
NO
NO₂
NH₃
HCl
SO₂

Min. value	Max. value	
3	21	Vol. %
1	30	Vol. %
0	300	mg/m ³
0	15	Vol. %
0	50	mg/m ³
0	20	mg/m ³
0	300	mg/m ³
0	30	mg/m ³
0	20	mg/m ³
0	50	mg/m ³
0	200	mg/m ³



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(continued)

Contributing partial standard uncertainties and reference to their origins

Selectivity H ₂ O	0,04	mg/m ³
Selectivity others (largest sum)	0,68	mg/m ³
Lack of fit	0,09	mg/m ³
Drift	0,42	mg/m ³
Pressure dependence	0,00	mg/m ³
Temperature dependence	0,15	mg/m ³
Flow dependence	0,06	mg/m ³
Voltage dependence	0,00	mg/m ³
Repeatability	0,06	mg/m ³
Uncertainty of response factors	0,00	mg/m ³
Uncertainty of converter efficiency (SCC-K NO _x converter)	0,00	mg/m ³
Response time	61	seconds
Origin of data	<i>Report of TÜV suitability test, 08/1997 (Gerät 1)</i>	
Long-term drift of calibration cell	0,05	mg/m ³
Origin of data	<i>Article in UmweltMagazin, 2001</i>	
Uncertainty of SRM	0,19	mg/m ³
Standard Reference Method (SRM), Reference	<i>NDIR, VDI 2459 Bl.6</i>	
Uncertainty of cylinder gas	0,30	mg/m ³
Origin of data	<i>Datasheet of gas supplier</i>	

Determination and assessment of expanded uncertainty

Expanded uncertainty	1,76	mg/m ³
Required measurement quality as 95% confidence interval	3,00	mg/m ³
Confidence interval met	YES	
Total response time	93	seconds
Required response time	450	seconds
Response time met	YES	
Conclusion	The AMS is ACCEPTABLE	

This report confirms that the product
AO2000-Uras14 CO
operating with system components as described in §3 of the TÜV suitability test report
complies with the requirements of EN 14181:2004 QAL1
according to the International Standard ISO 14956:2002
for the above specified operating conditions.