



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-Limas11 NO		
32470165		
Large combustion plant		
2001/80/EC		
ISOLA 6		
NO		
300	mg/m ³	
300	mg/m ³	
33,5	mg/m ³	

Test value and required quality at that value

Test concentration (Emission Limit Value, ELV)
Equivalent NO₂ concentration
Required measurement quality as 95% confidence interval
Shortest averaging time of measured values
Required response time

204	mg/m ³
313	mg/m ³
20	% of ELV
30	minutes
25	% of shortest averaging time

Field conditions of operation used in the uncertainty assessment

Ambient temperature range
Ambient pressure range
Flow range
Voltage range

Min. value	Max. value	
20	25	°C
970	1030	hPa
30	90	l/h
190	250	V

Internal diameter of sample gas line
Length of sample gas line
Average flow of sample gas

6	mm
40	m
60	l/h

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	0,07	mg/m ³
Selectivity others (largest sum)	1,07	mg/m ³
Lack of fit	0,02	mg/m ³
Drift	1,88	mg/m ³
Pressure dependence	0,00	mg/m ³
Temperature dependence	0,31	mg/m ³
Flow dependence	0,19	mg/m ³
Voltage dependence	0,00	mg/m ³
Repeatability	0,20	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	26	seconds
Origin of data	Report of TÜV suitability test, 02/2001 (Gerät 1)	
Long-term drift of calibration cell	0,35	mg/m ³
Origin of data	Article in UmweltMagazin, 2001	
Uncertainty of SRM	2,63	mg/m ³
Standard Reference Method (SRM), Reference	Ion chromatography, VDI 2456	
Uncertainty of cylinder gas	2,04	mg/m ³
Origin of data	Datasheet of gas supplier	

Determination and assessment of expanded uncertainty

Expanded uncertainty	7,86	mg/m ³
Required measurement quality as 95% confidence interval	40,80	mg/m ³
Confidence interval met	YES	
Total response time	94	seconds
Required response time	450	seconds
Response time met	YES	
Conclusion	The AMS is ACCEPTABLE	

This report confirms that the product
AO2000-Limas11 NO
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.