



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	
3-251408-4	
TG501	
Large combustion plant	
2001/80/EC	
Enipower Ravenna	
NO	
75	mg/m ³
75	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

50	mg/m ³
77	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	
5	30	°C
980	1010	hPa
50	90	l/h
190	250	V

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

4	mm
50	m
70	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	0,46	mg/m ³
Pressure dependence	0,00	mg/m ³
Temperature dependence	0,38	mg/m ³
Flow dependence	0,13	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	0,09	mg/m ³
Origin of data	Article in UmweltMagazin, 2001	
Uncertainty of SRM	0,65	mg/m ³
Standard Reference Method (SRM), Reference	Ion chromatography, VDI 2456	
Uncertainty of cylinder gas	0,50	mg/m ³
Origin of data	Datasheet of gas supplier	

Determination and assessment of expanded uncertainty

Expanded uncertainty	2,93	mg/m ³
Required measurement quality as 95% confidence interval	10,00	mg/m ³
Confidence interval met	YES	
Total response time	58	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.