



Industrie Service

# Certificate

TÜV Süd Industrie Service GmbH

Laboratory for Environmental Services  
(Laboratorium Umwelt Service)

accredited according DIN EN ISO/IEC 17025 DAP-PL-2885.99

## FID 1230 Modul

Gas Analyser for TOC

Report Nr. 1529455 (August 1992), 24014741 (February 1996)

Manufacturer:  
Testa GmbH, Germany

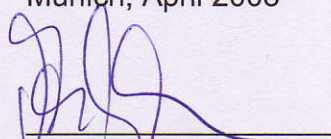
TÜV Süd Industrie Service GmbH is herewith certifying that the analyser FID 1230 Modul is in accordance with DIN EN ISO 14956, Jan. 2003 and fulfils QAL1 of EN 14181 for the following ranges of measurement or for higher ranges:

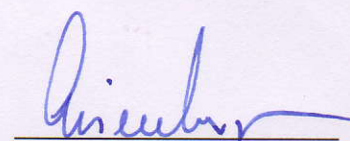
Component	C <sub>test</sub> (Daily average value)	Range of measurement	Expanded Uncertainty mg/ m <sup>3</sup>	In line with DIN EN ISO 14956
TOC	10 mg/m <sup>3</sup>	0-15 mg/m <sup>3</sup>	2,00	Yes

The response time was with maximum 10 s below the required value of 200 s.

The calculation according DIN EN ISO 14956 was performed on the basis of the results of the investigations for report Nr. 1529455 (August 1992) and 24014741 (February 1996) for the German suitability test. The following performance characteristics were regarded: Response time; non-linearity, instability/ drift; selectivity/ interfering components; dependence of ambient temperature, ambient pressure and voltage; gas flow; sample losses; uncertainty of calibration gas, responsefactors, repeatability of zero point and span.

Munich, April 2008

  
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## Results of the Calculation of the Uncertainty of a Measurement System (QAL 1 of EN 14181)

<b>Manufacturer</b>	Testa GmbH		
<b>Name</b>	FID 1230 Modul		
<b>Certified range</b>	0-15 mg/m <sup>3</sup> TOC		
<b>Performance Characteristic</b>			<b>Value of uncertainty</b>
Repeatability at zero point			0,03 mg/ m3
Lack of fit			0,02 mg/ m3
Zero drift			0,12 mg/ m3
Span drift			0,31 mg/ m3
Repeatability/ reproducibility			0,09 mg/ m3
Influence of flow			0,01 mg/ m3
Influence of atmospheric pressure			0,03 mg/ m3
Temperature dependent drift of span			0,16 mg/ m3
Influence of voltage			0,20 mg/ m3
Uncertainty of span gas			0,12 mg/ m3
<b>Other influences</b>			
Losses in sampling system			0,00 mg/ m3
Converter efficiency	not relevant		0,00 mg/ m3
Responsefactors (TOC-analysers)			0,82 mg/ m3
Misalignment of light beam	not relevant		0,00 mg/ m3
Contamination of optical surfaces	not relevant		0,00 mg/ m3
Long time drift of calibration standard	not relevant		0,00 mg/ m3
<b>Interferences (Interf.)</b>	<b>Concentration of interfering component</b>		
Sum positive Interf.>Sum negative Interf.	<b>component</b>		
	O2	20,8 Vol.-%	0,25 mg/ m3
	CO	12492 mg/m3	0,00 mg/ m3
	CO2	15 Vol.-%	0,00 mg/ m3
	CH4	not relevant mg/m3	0,00 mg/ m3
	N2O general	not relevant mg/m3	0,00 mg/ m3
	N2O fluidized bed	not relevant mg/m3	0,00 mg/ m3
	NO	272 mg/m3	0,01 mg/ m3
	NO2	45 mg/m3	0,01 mg/ m3
	NH3	229 mg/m3	0,00 mg/ m3
	SO2 general	not relevant mg/m3	0,00 mg/ m3
	SO2 coal without desulfurization	1216 mg/m3	0,00 mg/ m3
	HCl general	80 mg/m3	0,00 mg/ m3
	HCl coal fired plant	not relevant mg/m3	0,00 mg/ m3
	H2O (hot or inSitu)	16,6 Vol.-%	0,33 mg/ m3
	H2O (gas over cooler)	not relevant Vol.-%	0,00 mg/ m3
<b>Square sum</b>			<b>1,04</b>
<b>Combined uncertainty u<sub>c</sub></b>			<b>1,02 mg/ m3</b>
<b>Expanded uncertainty U=1,96 x u<sub>c</sub></b>			<b>2,00 mg/ m3</b>
<b>Demanded uncertainty</b>			<b>3,00 mg/ m3</b>
<b>Requirement concerning uncertainty fulfilled</b>			<b>yes</b>
<b>Response time</b>			<b>10 s</b>
<b>Requirement concerning response time fulfilled</b>			<b>yes</b>