

## **R E P O R T**

**about the Food & Drug Administration Test (FDATest)  
of the Fisher-Rosemount, Rosemount Analytical,  
NGA 2000 series MLT Gas Analyzers in comparison with the  
appropriate DraegerTubes and a certified TUEV gas mixing unit**

**Client : Fisher-Rosemount GmbH & Co.  
Geschäftsbereich Analysentechnik  
Industriestraße 1  
63594 Hasselroth**

**Instruments : NGA 2000 series MLT Gas Analyzers  
for continuous monitoring of Carbon Monoxide**

**Gesellschaft für Umweltschutz TÜV Nord mbH  
Institute for Chemistry and Environmental Protection  
Große Bahnstraße 31  
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**Hamburg, March 26, 1998**

Durch das DAP Deutsches Akkreditierungssystem Prüfwesen akkreditiertes Prüflaboratorium  
Die Akkreditierung gilt für die in der Urkunde aufgeführten Prüfverfahren.



DAP-P-02.750-02-93-00

**Target:**

The test according to the FDA requirements should allow us to compare gas concentrations produced by a gas mixing unit with MLT analyzer and Draeger tube readings. This should be done at minimum three times for each gas concentration (zero gas, midpoint gas and span gas). Each data point should have corresponding data of MLT reading, Draeger tube reading and certified gas mixture values.

**Test procedure:****Gas mixing unit:**

The certified TUEV gas mixing unit consists of Brooks thermal mass flow controllers. For this application a dual channel unit was used.

One channel was used for control of zero gas. The second channel was used for the dosage of the certified Carbon Monoxide span gas.

The exactitude of the gas mixtures is approx. 3 %.

**Test gases:**

zero gas: 100 % Nitrogen, quality 5.0

span gas: 16,3 ppm Carbon Monoxide 1.8 in Nitrogen 5.0,  
manufacturer: Messer Griesheim GmbH,  
bottle no.: 9903 B,  
date: March 3, 1998,  
stability: 12 month,  
deviation: +/- 2 %.

**Draeger tubes:**

Draeger tube 67 28 511, Carbon Monoxide 5/a-P.

**Fisher-Rosemount Analyzer:**

NGA 2000 Type MLT 1.1 CO: 0 - 10 ppm

(MLT 3 consists of the same electrical and physical parts as MLT 1. MLT 3 is including a power supply while MLT 1 is using an external one. MLT 3 can be thermostatically controlled as option.)

**Test arrangement:**

The two MLT analyzers are tubed in series and connected to the outlet of the gas mixing unit. The sample flow was adjusted with a flowmeter and a needle valve to 50 l/h. Residual sample gas mixtures went into a bypass. The reference measurement with the Draeger tubes was done with the sample gas from the bypass.

**Test results:**

The test results are described in the attached table.

**Summary:**

The readings of the MLT analyzers were very close to the certified gas mixture values and absolute in the band width of the Draeger tube readings. The test shows a very good accuracy and reproducibility.

A handwritten signature in black ink, appearing to read 'W. A. Redmann', with a long horizontal flourish extending to the right.

Dr. rer. nat. W. A. Redmann  
Expert of the  
Gesellschaft für Umweltschutz  
TÜV Nord mbH



FDA Test:			Fisher-Rosemount, Rosemount Analytical		
	CO-Analyzer		NGA 2000 MLT-Analyser		
Gesellschaft für Umweltschutz TÜV Nord mbH			Dr. W. A. Redmann		24.03.1998
Analyser 1:		Ser.No. P 60 77 103-1			
Analyser 2:		Ser.No. P 60 77 103-2			
Gas mixing unit:	GfU TÜV Nord GMA-E				
span gas:	16,3 ppm Carbon Monoxide				
zero gas, dilution gas:	Nitrogen 5.0				
comparison test:	Draeger Tube 67 28 511 Carbon Monoxide 5/a-P				
Time	Gas	gas mixing unit CO [ppm]	MLT no. 1 CO [ppm]	MLT no. 2 CO [ppm]	Draeger tube CO [ppm]
1225	zero gas	0	0.00	0.00	
1227	span gas	16.3	16.31	16.30	
1234	gas mixture	9.98	9.92	10.01	7 - 12
1316	gas mixture	9.98	9.97	10.02	8 - 12
1318	gas mixture	4.97	4.99	4.99	4 - 7
1334	gas mixture	4.97	4.93	4.94	4 - 6
1336	zero gas	0	0.06	0.09	0
1342	zero gas	0	0.00	0.00	
1352	gas mixture	9.98	9.95	9.93	7 - 11
1402	gas mixture	9.98	9.99	9.97	7 - 10
1416	gas mixture	4.97	5.00	4.94	4 - 7
1422	gas mixture	4.97	4.99	4.94	4 - 6
1428	zero gas	0	0.01	0.06	0
1436	gas mixture	9.98	9.98	10.06	
1445	gas mixture	9.98	9.93	10.03	6 - 12
1452	gas mixture	4.97	5.06	4.93	3 - 6
1456	gas mixture	4.97	5.03	4.98	
1506	zero gas	0	0.03	0.09	0
1526	zero gas	0		0.00	
1530	span gas	16.3	16.28	16.24	
1540	gas mixture	8.27	8.34	8.33	
1632	gas mixture	9.98	9.90	9.95	7 - 11
1635	gas mixture	4.97	4.96	5.04	3 - 6
1637	zero gas	0	-0.03	0.04	