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24. Oct. 2005

### **DIN EN 14181 and QAL 3 procedure for the S700**

Dear Mr. Deggim,

We have checked your proposal for the QAL 3 – procedure (EN 13181) for the S700 system. The proposal describes in detail the zero- and reference point check.

From our point of view the described procedure fulfils all requirements. It is no problem to use the data for the drift and precision check and the CUSUM card system.

Best regards

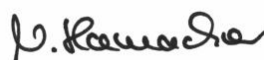
Air pollution control department

i. V.



Dr. rer. nat. Peter Wilbring

i. A.



Nicole Hamacher

**Attachment:** Determination of the zero and reference point data for QAL3

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Geschäftsführung  
Dr.-Ing. Wolfgang Jockel

Amtsgericht Köln HRB 32190

## Modular System S700

**Determination of the zero and reference point data for QAL3 procedure according to DIN EN 14181 for the measuring units in the S700 series with instrument types S710, S711, S715, S720 and S721**

**Procedure to follow when the calibration cuvette option is not included:**

### **Zero point**

The value for the zero point shall be established, when zero gas is admitted to the analyser and the instrument display and/or the corresponding analog signal is ascertained. In practice the same zero gas can be used which is also used for the internal adjustment.

### **Reference point**

The value for the reference point shall be established, when a reference gas with a known concentration is admitted to the analyser and the instrument display and/or the corresponding analog signal is ascertained. In practice the same test gas can be used as reference gas which is also used for the internal adjustment.

**Procedure when the calibration cuvette option is included:**

### **Zero point**

The value for the zero point shall be established, when a zero gas is admitted to the analyser and the instrument display and/or the corresponding analog signal is ascertained. In practice the same zero gas can be used which is also used for the internal adjustment.

### **Reference point**

#### **1. determined with test gas**

The value for the reference point shall be established when a reference gas with a known concentration is admitted to the analyser and the instrument display and/or the corresponding analog output signal is ascertained.

#### **2. determined by using the calibration cuvette, Software Version 1.28 or higher**

The value for the reference point shall be established, the calibration cuvette switched into position with the menu function „Validation“ and the instrument display and/or the corresponding analog output signal is ascertained. The nominal reference corresponds to the nominal value of the calibration cuvette.

The measuring data obtained can be directly entered into the drift and precision calculation according to DIN EN 14181 QAL 3 procedure.

### **Details for the operation of the measuring system according to the regulations**

The internal adjustment of the measuring system is normally done in regular intervals, whereby the service interval as stated in the suitability test report may not be exceeded. The internal adjustment of the measuring system is done by automatic or manual admittance of test gases for zero point and sensitivity. Through automatic adjustment, the time and interval can be selected. Optionally the sensitivity adjustment can be done by switching the calibration cuvette into the optical path and simultaneously admitting zero gas to the measuring system. During adjustment, an automatic self-test will determine if the measuring system is operating within the adjustable range. If the measuring system approaches the limits of its adjustment ability, a service required signal is switched on, if the limits have been reached, then a fault signal is switched on.

### **Details on the suitability tests**

The measuring system of the S700 series are suitability tested according to test report no. 1.6/1190/94-20375784 dated 2.2.2001 and supplementary test no. 1.6/01190/1994-20520010 dated 29.1.2002. The calibration cuvette is tested according to test report no. 3.5.2/0399/94//619850/02 dated 4.8.97, with TÜV-statement: clearance for use of the calibration cuvette in the S 700 series dated 31.05.2002. The software version 1.28 ist tested according to TÜV statement dated 11.01.2005. Here the calibration cuvette was also tested and the validation function is also described.