

# MIC TYPE EC-912

## Smoke measuring equipment

### GENERAL

The second generation of the well-proven MIC smoke measuring equipment is now in production and for sale. The MIC has been developed specifically for reference measurements of smoke density by Cerberus Ltd. of Switzerland. DELTA Electronics Testing has been granted an exclusive license to manufacture and sell the equipment to customers worldwide. The MIC instrument is based on the ionisation principle and is a supplement to the MIREX instrument type EC-910 based on the light extinction principle.

The MIC is suitable for smoke measurements e.g. in connection with testing of smoke detectors. The instrument complies with the European Standards EN54-7 and EN54-9, issued by the European Committee for Standardisation (CEN). In addition the instrument will be suitable for the UL smoke box and other applications where accurate and reproducible smoke measurements are required.

### APPLICATIONS

Reference measurements of smoke density by smoke detector testing:

- In smoke tunnel measurements according to EN54-7.
- In fire sensitivity testing according to EN54-7/9.
- In the UL smoke box measurements according to UL 217 and UL 268.
- In other applications where accurate smoke measurements are required.



The second generation of the MIC smoke measuring equipment.

## TECHNICAL SPECIFICATIONS

The MIC smoke measuring system type EC-912 consists of the following parts:

- A MIC smoke measuring head.
- A multicable, 10 m (other lengths on request).
- A MIC control unit with power supply.
- A flow control unit with filter.
- A vacuum pump.
- Accessories, instruction manual, etc.

The smoke measuring head is installed at the measuring site and connected to the control unit via the multicable. The control unit, flow control unit and power supply are housed in a cabinet which can be placed in an operator room. The vacuum pump can be placed in a convenient location.

## SYSTEM SPECIFICATIONS

### Calibration:

Manual calibration from front of control unit. With calculator unit (optional) automatic calibration can be locally or remotely controlled.

### Mains supply:

100-240 VAC, 50-60 Hz without switch-over.

### Cabinet:

19 inch bench top/rack cabinet with power supply for MIC, MIREX (optional) and calculator unit (optional). The cabinet can accommodate the following typical system configurations:

- a) one MIC
- b) one MIC and one MIREX
- c) one MIREX, one MIC and calculator

## MEASURING HEAD

### Chamber quiescent current:

100 pA (nominal)

### Chamber impedance:

$1.9 \times 10^{-11} \Omega \pm 5\%$

### Radioactive source:

Am241

### Activity:

129.5 kBq ( $3.5 \mu\text{Ci}$ )  $\pm 5\%$

### Average $\alpha$ - energy:

4.5 MeV  $\pm 5\%$

### Time delay:

$\leq 10$  sec. at 30 l/min. flow rate

### Smoke sensitivity:

The measuring head is calibrated against DELTA's reference MIC to within  $\pm 3\%$  smoke sensitivity. Calibration certificate enclosed with each measuring head.

## CONTROL UNIT

### Readout:

3.5 digit LCD display. Chamber voltage or smoke density X can be selected. With calculator unit (optional) smoke density Y and  $Y_{20}$  can also be displayed.

### Analog outputs:

X (0.0 - 10.0 VDC), chamber voltage  $U_c$  (14-25 VDC approx.), Y and  $Y_{20}$  (0.0 - 11.0 VDC). The Y and  $Y_{20}$  outputs are not active without the calculator unit. Load impedance  $\geq 100 \text{ k}\Omega$ .

## FLOW CONTROL UNIT

### Flow rate:

Adjustable between 0 - 50 l/min.

### Filter:

Replaceable filter element.

## VACUUM PUMP

### Mains requirements:

100 VAC  $\pm 10\%$ , 50 Hz or  
115 VAC  $\pm 10\%$ , 60 Hz or  
230 VAC  $\pm 10\%$ , 50-60 Hz

### Motor rating:

Approx. 0.15 kW

### Capacity:

Approx. 60 l/min.

### Option

- Calculator unit type EC-913-20.

## INFORMATION

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NB: Specification may be subject to changes for improvement without prior notice.

**Wipe test of radioactive sources for MIC smoke measuring equipment**

**1. Test specimens**

Type of sources: Americium-241 alpha foils manufactured by Amersham International plc, UK. The Am-241 is incorporated in the form of a relatively insoluble compound in a gold matrix which is covered on the alpha emitting face by gold-palladium alloy. The backing is silver with a thin gold interface. Activity: 3,5 µCi (130 kBq) ±5%. Type: disc AMMV577. Sealing: The disc is mounted in metal holder, open edges are sealed.

**2. Test specification, procedure and instruments**

Specification: The tests are carried out according to the recommendations and methods described in ISO TR 4826 (1979), clause 2.1.1.: Wipe (smear) test.

Procedure: The procedure described in DELTA procedure DQP-228323, issue 1 is followed.

Instrument: The instrument used for the tests is a Series 900 Mini Monitor, EC no. 41052 with AP5AD scintillation probe, EC no. 41053. The instrument has a detection limit of 1 Bq for alpha particles. The measurements concern Am-241 alpha particles.

**3. Results**

Source type AMMV577, serial no.	Test results (activity), Bq
20000201	< 1
20000202	< 1
20000203	< 1
20000204	< 1
20000205	< 1
20000206	< 1
20000207	< 1
20000208	< 1
20000209	< 1
20000210	< 1

The results are below the prescribed limit of 185 Bq

Approved by: Morten Avlund

Sign:



Date: 2000-05-17

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Electronics Testing  
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Divisions:  
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# National Board of Health

National Institute of Radiation Hygiene

Date 14 October 1996

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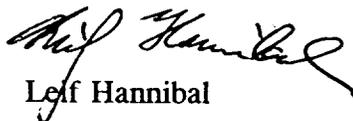
DELTA Dansk Elektronik, Lys & Akustik		
Til:	15 OKT. 1996	
<i>MFA</i>		
C.C.: <i>SPP, AR</i>		

The National Institute of Radiation Hygiene, being the Danish competent authority on matters concerning radiation sources, hereby confirms that

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has obtained licence to produce and service smoke-detection equipment containing radioactive sources.

Best regards

  
Lef Hannibal