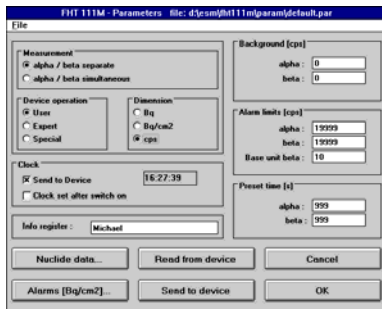


## CONTAMAT(R) FHT 111 M SURFACE CONTAMINATION MONITOR



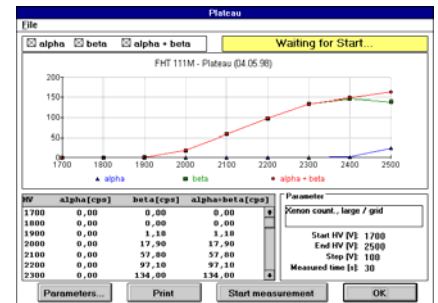
**FHT 111M - Nuclide data**

Nuclide data for detector: Flow count, Ar/CH4, large

Active	Nuclide	a cor. factor	B cor. factor	a cor. factor	B cor. factor
Active >>	14	1,0000	4,3478	1,00	1,00
On	36	1,0000	2,4390	1,00	1,00
On	60	1,0000	3,4483	1,00	1,00
On	90	1,0000	2,1733	1,00	1,00
Off	0	1,0000	16,3420	1,00	1,00
On	125	1,0000	100,0000	1,00	1,00
On	131	1,0000	4,5455	1,00	1,00
On	137	1,0000	2,2727	1,00	1,00
On	204	1,0000	2,5000	1,00	1,00
On	241	4,1657	1,0000	1,00	1,00

Active nuclide:  
 14    36    60    90    0  
 125    131    137    204    241

Buttons: Edit, OK



Ref.no 42 49601

**1. CONTAMAT FHT 111 M**

The basic instrument consists of the indicator, the necessary electronic circuitry with microprocessor, serial data interface, amplifier and high voltage generator and can optionally be operated with one of the counter tubes available.

The basic instrument of the FHT 111 M surface contamination monitor is distinguished by the following performance criteria:

- simultaneous alpha and beta/gamma contamination measurement by means of amplitude discrimination; thus, no operating point changeover is necessary (basic setting)  
or  
alpha or alpha/beta/gamma measurement possible by means of high voltage changeover.
- large, high contrast illuminating digital or analog LCD display
- display in Bq, Bq/cm<sup>2</sup> or s<sup>-1</sup>
- easy detector change by means of new design snap catch; no tools necessary, no cable connections
- ratemeter display according to ADF-algorithm\* :  
fast reaction to changes of the radiation field,  
stable measuring value under constant conditions.
- counter mode with measurement time preset
- 10 selectable radionuclides
- operating time with a fresh set of batteries approx. 150 hours
- parametering and setting facilities simple and clearly laid out

- partial keyboard lockout possible
- robust, lightweight construction; total weight less counter tube approx. 950 g.
- user correctable response defaults
- reference area with physical unit  $\text{Bq/cm}^2$  can be set to  $100 \text{ cm}^2$  (Radiation Protection Regulation) or to the actual detector area

\*) **Advanced Digital Filter**

- facility for display of calibration factors ( $\text{s}^{-1}$  in Bq)
- automatic background correction with display message
- history memory for up to 128 measured values
- serial data interface for connection to a personal computer running on Windows 95/98 or NT for:
  - readout of measured value memory with disk storage facility
  - parametering
  - keyboard lockout
  - automatic plateau recording and storage
  - terminal program (direct command transmission)
- output of stored measured values to printer
- display of "single" statistical error in counter mode

- display of selected nuclide during measurement without additional key operation
- counter tube autoperametering
- abridged operating instructions on instrument
- alarm value setting in  $s^{-1}$  and independently of this, in Bq or  $Bq/cm^2$
- background subtraction learnable or specifiable manually
- automatic high voltage disconnection of removal of counter tube

**Technical Data:**

<b>Dimensions:</b>	216 mm x 138 mm x 111 mm (D x W x H)
<b>Weight:</b>	approx. 950 g less counter tube
<b>Power supply:</b>	5 x AA cells or 5 x NiCd rechargeable cells or 12 V from external power supply
<b>HV generator:</b>	350 V - 3500 V / 50 $\mu$ A
<b>Display:</b>	LCD 80 mm x 33 mm illuminating, with automatic switch-off after 30 sec.
<b>Keyboard:</b>	7 soft keys

## 2. Connectable Counter Tubes

BUTANE flow-type counter tubes for alpha-beta/  
gamma measurement

Ref.no. 4249625

### 2.1 Flow-type counter tube

with window area 166 cm<sup>2</sup>, counting gas: butane,  
integrated gas reservoir, press button for immediate gas flush

Dimensions:	210 mm x 134 mm x 23,5 mm
Weight:	approx. 600 g
Gas reservoir:	approx. 10 cm <sup>3</sup> for 25 purging actions (1 s each), corresponding to 5 days operation
Window area:	166 mm x 100 mm
Window foil:	0,9 mg/cm <sup>2</sup> ; (0,3 mg/cm <sup>2</sup> optional)
Window material:	plastic, aluminium coated
Permeability of grating:	approx. 93%
Prepurge:	3 x 1 second
Background:	approx. 5 - 7 s <sup>-1</sup> at beta operating point approx. 1,4 x 10 <sup>-2</sup> s <sup>-1</sup> at alpha operating point valid for Erlangen laboratory where H = 0,1 µSv/h
Operating range:	10°C < T < 40°C

Response: ( $s^{-1}/Bq$ )

according to DIN 44801, part 1.2.7 (corresp. ratio: Net counter rate/Activity; 100  $cm^2$  calibration source)

Am 241:	0,24*	J 125:	0,0057
Ba 133:	0,004	J 131:	0,24
C 14:	0,13	Mn 54:	0,01
Cl 36:	0,37	Mo 99/Tc <sup>m</sup> 99:	0,48
Co 57:	0,026	Ni 63:	0,033
Co 60:	0,29	Pm 147:	0,32
Cr 51:	0,0073	Se 75:	0,033
Cs 137:	0,44	Sr 90:	0,46
In 111:	0,077	Tc <sup>m</sup> 99:	0,051
J 123:	0,051	Tl 204:	0,40
S 35:	0,203	P 32:	0,473

\* Alpha operating point

Values are valid for window foil 0,9  $mg/cm^2$ .

Note: Scope of supply of the counter tube includes a stainless steel cover plate for protection of the window foil.

Ref.no. 4249627

## 2.2 Flow-type counter tube

window area 166  $cm^2$ , counting gas: butane  
with additional protection grid

The radiological and mechanical data are identical with counter tube 4249630,  
item 2.3;

integrated gas tank and press button for immediate gas flush

2.3 Ref.no. 4249630  
**Flow-type counter tube**

window area 166 cm<sup>2</sup>, counting gas: butane  
additional protective grid and internal support grid  
approved for use by fire brigades integrated gas tank and press button for  
immediate gas flush

Dimensions:	210 mm x 134 mm x 23,5 mm
Weight:	approx. 600 g
Gas reservoir:	approx. 10 cm <sup>3</sup> for 25 purging actions (1 s each), corresponding to 5 days operation
Window area:	166 mm x 100 mm
Window foil:	0,9 mg/cm <sup>2</sup> ; (0.3 mg/cm <sup>2</sup> optional)
Window material:	plastic, aluminium coated
Permeability of grating:	approx. 64%
Prepurge:	3 x 1 second
Background:	approx. 5 - 7 s <sup>-1</sup> at beta operating point approx. 1,4 x 10 <sup>-2</sup> s <sup>-1</sup> at alpha operating point valid for Erlangen laboratory where H = 0,1 μSv/h
Operating range:	10°C < T < 40°C

Response: (s<sup>-1</sup>/Bq)

according to DIN 44801, part 1.2.7 (corresp. ratio: Net counter rate/Activity; 100 cm<sup>2</sup> calibration source)

Am 241:	0,16*	J 125:	0,004
Ba 133:	0,0037	J 131:	0,16
C 14:	0,09	Mn 54:	0,0074
Cl 36:	0,30	Mo 99/Tc <sup>m</sup> 99:	0,30
Co 57:	0,016	Ni 63:	0,024
Co 60:	0,21	Pm 147:	0,23
Cr 51:	0,0037	Se 75:	0,023
Cs 137:	0,28	Sr 90:	0,33
In 111:	0,041	Tc <sup>m</sup> 99:	0,034
J 123:	0,035	Tl 204:	0,27
S 35:	0,132	P 32:	0,36

\* Alpha operating point

Values are valid for window foil 0,9 mg/cm<sup>2</sup>.

Note: Scope of supply of the counter tube includes a stainless steel cover plate for protection of the window foil.

Ref.no. 4249650

## 2.4 Flow-type counter tube

with window area 100 cm<sup>2</sup>,  
counting gas: butane from butane reservoir

Dimensions: 134 mm x 134 mm x 23.5 mm

Weight: approx. 440 g

Window area: 100 mm x 100 mm

Window foil: 0,9 mg/cm<sup>2</sup>; (0,3 mg/cm<sup>2</sup> optional)

Window material: plastic, aluminium coated



Permeability of grating: approx. 93%

Prepurge: in combination with butane reservoir by pressing push-button twice for 1 - 3 sec. with 20 sec. interval

Background: approx.  $3 - 5 \text{ s}^{-1}$  at beta operating point  
approx.  $1 \times 10^{-2} \text{ s}^{-1}$  at alpha operating point  
valid for Erlangen laboratory where  $H = 0,1 \text{ } \mu\text{Sv/h}$

Operating range:  $10^\circ\text{C} < T < 40^\circ\text{C}$  butane

Response: ( $\text{s}^{-1}/\text{Bq}$ )

according to DIN 44801, part 1.2.7 (corresp. ratio: Net counter rate/Activity;  $100 \text{ cm}^2$  calibration source)

Am 241*:	0,23
Ba 133:	0,0029
C 14:	0,13
Cl 36:	0,37
Co 57:	0,020
Co 60:	0,27
Cr 51:	0,0033
Cs 137:	0,40
In 111:	0,064
J 123:	0,046
J 125:	0,0038
J 131:	0,21
Mn 54:	0,006
Mo 99/Tc <sup>m</sup> 99:	0,39
Ni 63:	0,033
P 32:	0,47
Pm 147:	0,29
Po 210*:	0,25
S 35:	0,20
Se 75:	0,027
Sr 90:	0,42

Tc<sup>m</sup> 99: 0,053  
Tl 204: 0,36

\* Alpha operating point

Values are valid for window foil 0,9 mg/cm<sup>2</sup>.

Note: This counter tube can only be operated in combination with the counting gas reservoir (Ref.no. 4249645).

The same detector can be used for CH<sub>4</sub> , Ar-CH<sub>4</sub> or Ar-CO<sub>2</sub> operation (see 2.10). In this case the coded label must be changed correspondingly.

Ref.no. 4249645

#### 2.4.1 **Tank for butan**

reservoir with push button for immediate gas flush for screwing onto the basic instrument. The counting gas reservoir is necessary for operation of the 100 cm<sup>2</sup> butane counter tube.

Capacity: 80 ml (cm<sup>3</sup>)  
Dimensions: 23,5 mm x 134 mm x 76 mm (H x W x D)  
Weight: 440 g (incl. fixing bar)

Ref.no. 42496900010

#### 2.5 **Butane gas mixture, special filling**

100 ml ampoule

The use of the above counting gas is very much recommended, as the function of the counter is not guaranteed for other gas mixtures.

Dimensions: dia. 33 mm x 160 mm

**Permanently filled xenon counter tubes for beta/gamma measurement**

Ref.no. 4249635

**2.6 Xenon large area counter tube**

with window area 166 cm<sup>2</sup>

Dimensions:	210 mm x 134 mm x 23.5 mm
Weight:	approx. 600 g
Window foil:	4.5 mg/cm <sup>2</sup>
Window material:	titanium foil
Permeability of grating:	approx. 93%
Service life:	> 2 * 10 <sup>10</sup> pulses
Background:	approx. 10 - 13 s <sup>-1</sup> at beta operating point valid for Erlangen laboratory where H = 0,1 µSv/h
Operating range:	-10°C < T < 45°C
Response:	(s <sup>-1</sup> /Bq)

according to DIN 44801, part 1.2.7 (corresp. ratio: Net counter rate/Activity; 100 cm<sup>2</sup> calibration source)

Am 241:	0,15*	J 125:	0,072
Ba 133:	0,051	J 131:	0,18
C 14:	0,03	Mn 54:	0,011
Cl 36:	0,28	Mo 99/Tc <sup>m</sup> 99:	0,35
Co 57:	0,056	Ni 63:	---
Co 60:	0,15	Pm 147:	0,11
Cr 51:	0,034	Se 75:	0,084
Cs 137:	0,29	Sr 90:	0,34
In 111:	0,1	Tc <sup>m</sup> 99:	0,045
J 123:	0,059	Tl 204:	0,27
S 35:	0,06	P 32:	0,41

\* Alpha + Beta operating point

2.7 Ref.no. 4249640  
**Xenon large area counter tube**

with window area 166 cm<sup>2</sup> and additional protective grating

Dimensions: 210 mm x 134 mm x 23,5 mm

Weight: approx. 600 g

Window area: 166 mm x 100 mm

Window foil: 4,5 mg/cm<sup>2</sup>

Window material: titanium foil

Permeability of grating: approx. 64%

Service life: > 2 \* 10<sup>10</sup> pulses

Background: approx. 10 - 13 s<sup>-1</sup> at beta operating point  
valid for Erlangen laboratory where  
H = 0,1 µSv/h

Operating range: -10°C < T < 45°C

Response: (s<sup>-1</sup>/Bq)

according to DIN 44801, part 1.2.7 (corresp. ratio: Net counter rate/Activity; 100 cm<sup>2</sup> calibration source)

Am 241:	0,096*	J 125:	0,041
Ba 133:	0,038	J 131:	0,17
C 14:	0,02	Mn 54:	0,0074
Cl 36:	0,20	Mo 99/Tc <sup>m</sup> 99:	0,26
Co 57:	0,034	Ni 63:	---
Co 60:	0,10	Pm 147:	0,08
Cr 51:	0,018	Se 75:	0,053
Cs 137:	0,20	Sr 90:	0,26
In 111:	0,065	Tc <sup>m</sup> 99:	0,029
J 123:	0,039	Tl 204:	0,18
S 35:	0,031	P 32:	0,314

\* Alpha + Beta operating point

Note: Scope of supply of the counter tube includes a stainless steel cover plate for protection of the window foil.

**2.8** Ref.no. 4249660  
**Xenon large area counter tube**

with window area 100 cm<sup>2</sup>

Dimensions: 134 mm x 134 mm x 23,5 mm

Weight: approx. 440 g

Window area: 100 mm x 100 mm

Window foil: 4,5 mg/cm<sup>2</sup>

Window material: titanium foil

Permeability of grating: approx. 93%

Service life: > 1 \* 10<sup>10</sup> pulses

Background: approx. 6 - 8 s<sup>-1</sup> at beta operating point  
valid for Erlangen laboratory where  
H = 0.1 μSv/h

Operating range: -10°C < T < 45°C

Response:(s<sup>-1</sup>/Bq)

according to DIN 44801, part 1.2.7 (corresp. ratio: Net counter rate/Activity; 100 cm<sup>2</sup> calibration source)

Am 241:	0,16*	J 125:	0,052
Ba 133:	0,045	J 131:	0,15
C 14:	0,032	Mn 54:	0,0079
Cl 36:	0,28	Mo 99/Tc <sup>m</sup> 99:	0,33
Co 57:	0,041	Ni 63:	-----
Co 60:	0,14	Pm 147:	0,13
Cr 51:	0,025	Se 75:	0,066
Cs 137:	0,28	Sr 90:	0,33
In 111:	0,077	Tc <sup>m</sup> 99:	0,033
J 123:	0,049	Tl 204:	0,26
S 35:	0,06	P 32:	0,41

\* Alpha + Beta operating point

Ref.no. 4249667

### 2.8.1 Counter tube adapter 166 cm<sup>2</sup> - 100 cm<sup>2</sup>

For screwing onto the basic instrument.

The counter tube adapter is necessary for operation of the 100 cm<sup>2</sup> xenon counter tube.

Dimensions: 23,5 mm x 134 mm x 76 mm

Weight: 185 g

### Flow-type counter tubes for CH<sub>4</sub>; Ar/CH<sub>4</sub>/CO<sub>2</sub> operation

Note: The base station is necessary for operation of these counter tubes. Please specify the counting gas used when ordering.

2.9 Ref.no. 4249620  
**Flow-type counter tube**

with window area 166 cm<sup>2</sup> for CH<sub>4</sub>, Ar/CH<sub>4</sub>, Ar/CO<sub>2</sub> operation

Dimensions:	210 mm x 134 mm x 23,5 mm
Weight:	approx. 600 g
Window area:	166 mm x 100 mm
Window foil:	0.9 mg/cm <sup>2</sup> ; (0.3 mg/cm <sup>2</sup> optional)
Window material:	plastic, aluminium coated
Permeability of grating:	approx. 93%
Prepurge time:	minimum 2 min.
Gas flow:	min. 0,2 l/h in operation with base station
Supply pressure:	approx. 8 mbar from base station
Background:	approx. 6 - 8 s <sup>-1</sup> at beta operating point approx. 1.3*10 <sup>-2</sup> s <sup>-1</sup> at alpha operating point valid for Erlangen laboratory where H = 0,1 μSv/h
Operating range:	10°C < T < 50°C
Response:	(s <sup>-1</sup> /Bq)

according to DIN 44801, part 1.2.7 (corresp. ratio: Net counter rate/Activity; 100 cm<sup>2</sup> calibration source)

Am 241* :	0,24
Ba 133:	0,0032 (CH <sub>4</sub> ) 0,0088 (Ar/CH <sub>4</sub> , Ar-CO <sub>2</sub> )
C 14:	0,13
Cl 36:	0,41

---

Co 57:	0,02 (CH <sub>4</sub> ) 0,1 (Ar/CH <sub>4</sub> , Ar/CO <sub>2</sub> )
Co 60:	0,29
Cr 51:	0,0023 (CH <sub>4</sub> ) 0,048 (Ar/CH <sub>4</sub> , Ar/CO <sub>2</sub> )
Cs 137:	0,44
In 111:	0,073 (CH <sub>4</sub> ) 0,087 (Ar/CH <sub>4</sub> , Ar/CO <sub>2</sub> )
J 123:	0,059 (Ar/CH <sub>4</sub> , Ar/CO <sub>2</sub> ) 0,05 (CH <sub>4</sub> )
J 125:	0,026 (Ar/CH <sub>4</sub> , Ar/CO <sub>2</sub> ) 0,0034 (CH <sub>4</sub> )
J 131:	0,23
Mn 54:	0,054 (Ar/CH <sub>4</sub> , Ar/CO <sub>2</sub> ) 0,0055 (CH <sub>4</sub> )
Mo 99/Tc <sup>m</sup> 99:	0,46
Ni 63:	0,03
P 32:	0,47
Pm 147:	0,31
Po 210*:	0,26
S 35:	0,19
Se 75:	0,031 (CH <sub>4</sub> ) 0,062 (Ar/CH <sub>4</sub> , Ar/CO <sub>2</sub> )
Sr 90:	0,45
Tc <sup>m</sup> 99:	0,057 (Ar/CH <sub>4</sub> , Ar/CO <sub>2</sub> )
Tl 204:	0,39

\* Alpha operating point

Values are valid for window foil 0,9 mg/cm<sup>2</sup>



**2.10** Ref.no. 4249650  
**Flow-type counter tube**

with window area 100 cm<sup>2</sup> for CH<sub>4</sub>, Ar/CH<sub>4</sub>, Ar/CO<sub>2</sub>  
operation

Dimensions: 134 mm x 134 mm x 23,5 mm

Weight: approx. 440 g

Window area: 100 mm x 100 mm

Window foil: 0,9 mg/cm<sup>2</sup>; (0,3 mg/cm<sup>2</sup> optional)

Window material: plastic, aluminium coated

Permeability of grating: approx. 93%

Gas flow: min. 0,2 l/h in operation with base  
station

Supply pressure: approx. 8 mbar from base station

Background: approx. 3 - 5 s<sup>-1</sup> at beta operating point  
approx. 1 \* 10<sup>-2</sup> s<sup>-1</sup> at alpha operating  
point  
valid for Erlangen laboratory where  
H = 0,1 μSv/h

Operating range: 10°C < T < 50°C

Response: (s<sup>-1</sup>/Bq)

according to DIN 44801, part 1.2.7 (corresp. ratio: Net counter rate/Activity; 100 cm<sup>2</sup> calibration  
source)

Am 241:	0,23*
Ba 133:	0,0029 (CH <sub>4</sub> ) 0,0074 (Ar/CH <sub>4</sub> , Ar-CO <sub>2</sub> )
C 14:	0,13
Cl 36:	0,37
Co 57:	0,02 (CH <sub>4</sub> ) 0,086 (Ar/CH <sub>4</sub> , Ar-CO <sub>2</sub> )
Co 60:	0,27

Cr 51:	0,0033 (CH <sub>4</sub> )
	0,044 (Ar/CH <sub>4</sub> , Ar-CO <sub>2</sub> )
	Cs 137: 0,40
In 111:	0,064 (CH <sub>4</sub> )
	0,077 (Ar/CH <sub>4</sub> , Ar-CO <sub>2</sub> )
J 123:	0,046 (CH <sub>4</sub> )
	0,053 (Ar/CH <sub>4</sub> , Ar-CO <sub>2</sub> )
J 125:	0,0038 (CH <sub>4</sub> )
	0,022 (Ar/CH <sub>4</sub> , Ar-CO <sub>2</sub> )
J 131:	0,21
Mn 54:	0,006 (CH <sub>4</sub> )
	0,046 (Ar/CH <sub>4</sub> , Ar-CO <sub>2</sub> )
Mo 99/Tc <sup>m</sup> 99:	0,39
Ni 63:	0,033
Pm 147:	0,29
Po 210:	0,25*
Se 75:	0,027 (CH <sub>4</sub> )
	0,052 (Ar/CH <sub>4</sub> , Ar-CO <sub>2</sub> )
Sr 90:	0,42
Tc <sup>m</sup> 99:	0,053
Tl 204:	0,36
S 35:	0,19 (Ar-CO <sub>2</sub> , Ar/CH <sub>4</sub> )
	0,20 (CH <sub>4</sub> )
P 32:	0,47

\* Alpha operating point

The same detector can be used for butane operation (see 2.4).  
In this case the coded label must be changed correspondingly.  
For butane operation the gas reservoir Ref.no. 4249645 is required.

Ref.no. 4249667  
**2.10.1 Counter tube adapter 166 cm<sup>2</sup> - 100 cm<sup>2</sup>**

For screwing onto the basic instrument.

The counter tube adapter is necessary for operation of the CH<sub>4</sub>, Ar/CH<sub>4</sub>, Ar/CO<sub>2</sub> flow-type counter tube with 100 cm<sup>2</sup> window.

Dimensions: 23,5 mm x 134 mm x 76 mm

Weight: 185 g

Ref.no. 4249670  
**2.11 Base station**

The base station is used for purging flow-type counter tubes with counting gas CH<sub>4</sub>, Ar/CH<sub>4</sub>, Ar/CO<sub>2</sub>

For charging the NiCd rechargeable cells used in the basic instrument a power pack plug is needed.

The FHT 111 M basic instrument with adapted counter tube can be inserted in the base station by means of a metal guide.

Butane flow-type counter tubes are not suitable for use in the base station.

Dimensions: 340 mm x 165 mm x 140 mm  
(D x W x H)

Weight: approx. 2 kg

Permissible ambient temperature: -5°C to +50°C

Gas consumption: approx. 0.2 ltr/h (continuous purging)

**2.12** Ref.no. 4249680  
**Tritium counter tube**

Dimensions:	210 mm x 134 mm x 45 mm
Weight:	approx. 1600 g
Window area:	75 mm x 9.5 mm
Hole diameter of cathode grating:	0,3 mm
Permeability of cathode grating:	approx. 36%
Reservoir capacity:	approx. 160 cm <sup>3</sup>
Prepurge time:	approx. 2 min
Operating time:	with full reservoir, window; 75% full, measurement time > 1 h
Background:	approx.0.4-0.6 s <sup>-1</sup> at beta operating point
Operating range:	10°C < T < 40°C not condensing
Response *:	≥ 75 %

\* referred to the source surface emission rate by source supplier, source no. D 285.

**2.12.1** Ref.no. 4249600010  
**Butane gas mixture, special filling**

100 ml ampoule

The use of the above counting gas is very much recommended, as the efficiency of the counter tube is not guaranteed for other gas mixtures.

Dimensions: dia. 33 mm x 160 mm

2.12.2      Ref.no. SM 149476106  
**Large area test source**  
for tritium contamination  
TRRB 1951, active area: 75 x 10 mm

2.13              Ref.no. 4249675  
**Scintillation probe**  
  
2" x 2" NaI(Tl)-detector in a plastic housing  
according to specification ZT-022E

2.13.1          Best.-Nr. 4249677  
**Telescopic adapter**  
according to specification ZT-022E

2.13.2          **Multi-Channel Analyzer FHT 1150**  
according to specification ZT-022E  
For acquisition, display and storage of pulse height spectra incl. PC software (only  
in connection with Contamat basic instrument and scintillation probe. A PC is  
required for operation).

### 3.              **Zubehör**

#### **contamination monitor**

3.1              Ref.no. 42510421010  
**Power pack plug**

Operating voltage:              220 V/50 Hz

Operating temperature:              0°C - 40°C

Output voltage:                      12 V =/200 mA

Dimensions:                          86 mm x 50 mm x 62 mm (DxWxH)

Cord length for  
connecting plug:                      2 m

\* referring to surface emission rate > 80 %

3.1.1 Ref.no. KT164600080  
**Rechargeable cell IEC KR15/51**

5 pieces are required

3.2 Ref.no. KT149142230  
**Plastic carrying case**

incl. foamed insert for transport box for taking up 5 batteries and 1 gas cartridge

Dimensions: 235 mm x 175 mm x 210 mm (D x W x H)

Weight: approx. 800 g

3.3 Ref.no. 424960105  
**Case for taking up the Contamat, lockable**

with hard foam insert for:

- 1 CONTAMAT FHT 111 M basic instrument with counter tube
- 1 tritium counter tube
- 2 counter tubes 166 cm<sup>2</sup> or 100 cm<sup>2</sup>
- 4 gas ampoules
- 1 set of spare batteries
- 1 lockout plug
- 1 set of spare foil frames
- 1 Operating Instructions
- 1 screwdriver

Dimensions: 380 mm x 470 mm x 170 mm (D x W x H)

Weight: approx. 2900 g

Ref.no. 99903-1

### 3.4 **PC program for CONTAMAT FHT 111 M**

for Windows 3.11, WIN 95 or Windows NT; 3,5" disk

The program allows to easily set the following parameters on-screen:

- alpha- and beta measurement time for counter operation
- background setting for alpha- and beta measurement operation
- keyboard lock
- switching in of software clock
- switching of operating modes
- loading and storage of parameter files on disk or hard disk
- read parameters from the FHT 111 M
- transfer new parameter set to Contamat
- select display unit
- select or change calibration factors
- select or reset radioisotopes or reduce them to any given subquantity
- set alarm limits for every radioisotope
- set correction factors

Automatic acquisition of the counter tube identification line as a function of the high voltage. Preset of a measurement protocol head for entry of the unit type, the checker, the radioactive source, counter tube number and the HV-initial readings and upper range values, measurement time pre-selection included. A graphic representation of the identification line on-screen and via a printer is possible, date and time included. Plateau storage into a measured value data file.

Program to read out a measured value memory (128 measured values)

Program to enter a unit identification which is to remain in the battery-backed RAM.

Ref.no. 424960130  
**3.5 Data cable FHT 111 M - PC**

(incl. connector 25/9 )

For data and command transmission to and from a PC.  
If the serial interface of the PC is a 9 pin male connector, the connection adapter (25pin - 9pin) will be necessary (connection adapter not in scope of delivery).

Ref.no. 4249668  
**3.6 Holding Device (light metal) for Contamat FHT 111 M**

Location facility for the CONTAMAT FHT 111 M.  
The instrument can be operated both as wall station and charged there at the same time, or it is possible to operate the CONTAMAT FHT 111 M in stationary form as bench-top station ready for measurement.

Ref.no.42 4962005  
**3.7 Stainless steel cover plate**

For protection of the delicate foil window of the counter tube.

Ref.no. 4245007  
**3.8 Holding device for CONTAMAT FHT 111 M**

To extend the capability of the CONTAMAT FHT 111 M for use as floor monitor device.

Dimensions:	255 mm x 175 mm x 120 mm (D x W x H*)
Handle length:	1000 mm
Weight:	approx. 3000 g

\* with CONTAMAT FHT 111 M inserted

Ref.no. 424969013  
**3.9 Set of spare foil frames (5 x)**

As replacement foils for butane, CH<sub>4</sub>, Ar/CH<sub>4</sub> and Ar/CO<sub>2</sub> counter tubes. The foils are pre tensioned, thus considerably facilitating fitting.



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