February 27, 2006

United States Nuclear Regulatory Commission Materials Safety and Inspection Branch Division of Industrial and Medical Nuclear Safety Two White Flint North 11545 Rockville Pike North Bethesda, MD 20852

Subject: Request for an amendment to Materials License number 42-23903-01E and registry of radioactive sealed source safety evaluation NR-1199-D-101-E

Drägersafety

Dear Sir / Madam:

Please accept this request for an amendment to our subject Materials License to include the radioactive sealed source module (SSH 0000).

Our original Materials License (42-23903-01B) and Exempt Product Registration (NR-1199-D-101-E) was for the device models 5000, 5100, 5600 and 5700. The device includes a single sealed source module along with the associated electronics and pumps.

Draeger Safety is requesting to apply for licensing and evaluation of the sealed source, rather than the devices, as we are constantly upgrading the electronics, software and hardware for future devices but the sealed source remains the same.

Enclosed are two checks for the application <u>plus</u> registry for the safety evaluation of the scaled source. If this request is approved by the NRC, please advise if it is still necessary for Draeger Safety to continually possess the Materials License and Exempt Product Registration for the devices rather than for just the scaled sources. Or would combining the aforementioned into one registration certificate be more feasible?

Thank you for your assistance and we look forward to your guidance and forth coming reply.

Best regards

Victor Hoang Senior Engineer Alternate Radiation Safety Officer E-mail: Victor.Hoang@Dracger.com

Draeger Safety, Inc. Gas Detection Systems 505 Julie Rivers Roed, Suite #150 Sugar Land, Texas 77478

Tel: (281) 207-1200 Fax: (281) 495-5190

(1-1909)	RE	QUEST FOR DEVICE	A SEALED SOURCI E EVALUATION	EOR
INSTRUCTIONS: Send this Mail Stop O-8 H3. Change to NOTE: Retain a copy of this	request AND a cope License Tracking request with the ap	y of all related letters System milestone to plication and backgro	/applications and drawings to t 19 and assign to reviewer cod and files.	the Chief, Sealed Source Safety Section, OWFN le 1-5.
REQUESTER Drager Safety			REGION/LOCATION:	
TELEPHONE NUMBER	DATE			
			TYPE OF ACTIO	N REQUESTED (Check as appropriate)
Victor Hoang				EW AMENDMENT OF
MAIL CONTROL HUMBER(5)		•		W NUMBER(S)
LETTERAPPLICATION DATE	LICENSE NUMBE	R(8)		EW NR-1199-D-101-E
COMMENTS:	42-	23903-01E		
Sugar Land, IX 7747	s 	FOR 8	SSS USE ONLY	
Nima Ashkel	oussi .	MODEL NUMBERS	0 , 5100, 5700	NUMBER ABBIRD
DATE RECEIVED 03/01/200	6	DATE ABBIGNED	3/01/2006	DATE TO FEE8 03/01/2006
	TYPE	OF ACTION (Inc	licate the number of ea	ch type)
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OTHER (Specify)	TOTAL N REVIEW NUMBER DEFICIEN	UMBER OF HOURS OF ICY LETTERS	MOTES Amendment for NR- 42-23903-01E	1199-D-101-E & E-license
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11997.51 (412) 787.533 (1997) elephone: (412) 787.5383

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DATE: 2003-05-13 - AMENDED IN ITS ENTIRETY 2006-02-27

MANUFACTURER:

Dräger Safety AG & Co. KGaA Velmerstraße 7B 12489-Berlin Dräger Safety AG & Co. KGaA Revalstraße 1 23560 Lübeck Germany Fon: +49 30 6392 2091 Fax: +49 30 6392 2090 Phone: +49 451 882 3613 Fax: +49 451 882 1977

Mail to: Prof. Dr. J. Leonhardt Responsibility Changed to Dr. Stefan Morley

juergen.leonhardt@draøger.com New e-mail: stefan.morley@draeger.com

DISTRIBUTOR:

Draeger Safety, Inc. Gas Detection Systems 505 Julie Rivers, Suite 150 Sugar Land Texas 77478 U.S.A. Phone: 1-281-498-1082 Fax: 1-281-498-5190 Mali to: Victor Hoang victor.hoang@draeger.com

CUSTOM USER OR CUSTOM DEVICE:

No

None

OTHER COMPANIES:

DEVICE NAME/ DEVICE TYPE: Ion Mobility Spectrometer (IMS)

STR 0000 (Spectrometer Type Transmitter) consists of enclosure / electronics and SSH 0000 (Spectrometer Type Sensing Head consists of the Sealed Source module Detector Unit)

Note: We are proposing the sealed source module terminology, in order to make labeling, communication, future amendments etc. simpler. Request for this amendment shall be the SSH 0000, as this module contains the radioactive source. Every transmitter STR 0000 includes one sealed source module SSH 0000. See also MODELS ISSUED IN THE AMENDMENT.

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MODELS:

Dräger IMS 5700 Dräger IMS 5600 Dräger IMS 5100 Dräger IMS 5000 STR 0000 transmitter includes the Detector Unit SSH 0000 sealed source module.

PREVIOUS MODELS

The hardware of the models 5600 and 5700 is identical. The models 5000 and 5100 represent a downgrade (minus 3 parts: GC column, one circulation filter, one pump) of the 5600/5700 models. Different chemical compounds can be detected by the models using different kinds of software. The hardware is contained in an aluminium box (for 19" standard rack mounting) with overall dimensions 350 x 480 x 130 cm³ (Fig. 1). It contains the following main components:

- detector unit: IMS cell with radioactive source and current amplifier, circulation filter and internal gas flow loop,
- gas system: gas pumps, inlet system with sampling unit = magnetic valves, flexible tubes, dust filter, GC (Gas chromatographic) column, circulation filter
- electronic boards: microcomputer, display, hy unit, pulse unit, I/O ports



Fig. 1: View of the device; the detector unit is cognizable at the right side, the electronic boards on the left side

MODELS ISSUED IN THE AMMENDMENT:

The STR 0000 contains a detector unit of the SSH 0000 sealed source type module and electronics for signal processing, data transmission, power supply, display and human interface. The STR 0000 does not contain any part of relevance for radiation protection.

Different chemical compounds can be detected by SSH 0000 sealed source module, using different kinds of software. The hardware is contained in an aluminum box (for 19" standard rack mounting) with overall dimensions 390 x 436 x 133 cm³ (Fig. 1a).

APPLICATION FOR RADIOACTIVE SEALED SOURCE AND DEVICE EVALUATION AND REGISTRATION DATE: 2003-05-13 - AMENDED IN ITS ENTIRETY 2006-02-27 (b)(4) Fig. 1b (SSH'0000): Gas flow diagram of sensing head, including optional GC parts 3 und 3/st, 2011 J. The

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PRINCIPAL USE CODE:	(N), Ion Generators, Chromatography
FOR USE BY:	Persons Exempt from Licensing
RADIONUCLIDES USED:	Tritium (Hydrogen-3) of Maximum Activity \leq 1 GBq gettered in a Titanium Layer on a Stainless Steel Disk and covered (sealed) by Layers of Silicon Dioxide (SiO ₂) and Aluminium and/or Gold
SEALED SOURCE MODEL DESIGNATION:	BH 3.21 (Ritverc GmbH, 2-nd Murinsky Ave. 28, 194021 St. Petersburg, Russia)
ISO CLASSIFICATION:	C33131
SEALED SOURCE APPLIED FOR REGISTRATION:	As Part of the Device
LEAK TEST FREQUENCY:	Not required (Tritium Source only)
CONDITIONS OF USE:	 The devices are expected to be used for the detection of gaseous chemical warfare agents in public and official buildings, for selective and very sensitive detection of gases and vapours in industrial facilities (chemical and petrol industry), for extremely sensitive monitoring of molecular contamination in semiconductor plants,

· and in analytical laboratories.

User	Location	Occasions when Persons will be near the Device	Frequency of being near the Device	Component of other Products
Public and Official Buildings	Security Room	Device Check	1 x per week	yes/no
Industrial Facility	Inside/outside	Monitoring	frequently	yes/no
Semiconductor Manufacturing Plant	Production Hall	Device Check	1 x per day	no
Analytical Laboratory	Laboratory	Analytical Measurements	persistently	no

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The devices are designed for the following environmental conditions (normal use):

- Temperature: 0 °C to 50 °C for use; -25 °C to 70 °C for transportation and storage
- Pressure: not effected by pressure
- Humidity: up to 90 % relative humidity (non-condensing)
- Vibration: during transportation the device may experience typical vibration and shock

Unlikely event accident conditions:

In the unlikely event accident conditions that the device does not operate, the source remains sealed.

Impact: source remains sealed (fall off from 2 m height)

Extreme accident conditions:

•	Corrosion:	not fully resistant under extreme conditions of corrosion
٠	Excessive high temperatures/Fire:	not fully resistant
•	Spontaneous ignition:	low risk
•	Explosion:	not resistant with regard to external explosion
	Flooding:	device does not operate, source remains sealed

Assuming regular service intervals (filter, mechanical pumps, confidence check) the product's estimated working life is 10 years.

CONSTRUCTION OF THE DEVICE:

Components	Parts	Materials	Dimensions
Detector unit	IMS cell Amplitier	Stainless steel, PTFE, PEEK Shielded metallic container	5 cm length, 1 cm diameter
	Circulation filter Flexible tubes	Stainless steel, molecular slove, viton PTFE	
Gas System	Suction and gas flow pumps	Metala, plastic	
	Magnetic valves Flexible tubes	Metals, plastic PTFE	
	Circulation filter GC column	Stainless steel, molecular sieve, viton Quartz, metal, column material	
	SSH 0000: mostly hard- wired	SSH 0000 pneumatic module PEEK	SSH 0000: see drawing SE20447 (attachment to the amendment)
Electronics	Boarda	Epoxy	min 35 x 100 mm ² max 220 x 100 mm ²

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Detector unit

The basic components of the IMS are shown in Fig. 2 and, more schematically, in Fig. 3 (STR000 and SSH000 sealed source module. See attachment to the amendment pages 1 and 2). The detector unit is the core of the device. Its parts are housed in a self-contained plastic box (Polypropylene) with heavy walls of 8 mm thickness (Fig. 4). The radioactive source is tightly mounted at one end of the cylindrical IMS cell (Fig. 6). So it is sealed twofold, by the IMS cell as well as by the plastic housing.

Device operation

A sample flow containing chemical compounds is ionized at the surface of the source (ionization space) by its 8-radiation (fast electrons). The various ions enter the drift region of the IMS cell be means of a shutter grid (electrical pulses of 500 V with microsecond duration). In the drift region an electric field of ±400 V/cm is maintained. Due to their mobility different ions reach the collector electrode at the end of the drift cell at different times. These so called drift times are used for ion identification and concentration measurement. A drift time spectrum represents the ion current (output signal of the amplifier) in dependence on time. Positive and negative ions can be detected by reversing field polarity.

Tritium leakage

Small amounts of desorbed Tritium gas merge into the drift and sample gas flows. They are absorbed in the circulation filter. This filter has to be replaced by the Distributor every 6 month.

Radioactive source

A stainless steel (1.4302, \geq 10,5 % Cr) disc of 10 mm diameter and 2 mm thickness is the basic body of the radioactive source (Fig. 8). A 5 µm Titanium layer is deposited at one side of the disc by vacuum evaporation. This layer is charged with Tritium at a temperature of 400 °C. Hereafter Silicon dioxide is deposited as protective layer. It prevents any abrasion of the Titanium. Finally conducting Aluminium and/or Gold top layers are deposited, preventing static electric charges on the source.

Safety features

The integrity, shielding and normal operation of the radioactive source within the IMS cell can be evaluated at any time by the so called Reaction Ion Peak (RIP). This peak always appears in a measured drift time spectrum. It is caused by positive or negative ions arising directly from air molecules. Fig. 9 shows a typical example of the ion current (output signal) at the collector electrode for positive and negative ions respectively. Now, both the time window and the amplitude of these peaks are watched by software means. In case of no or small RIP, among other reasons, the IMS cell may be out of work. A flushing "alarm" (SSH 0000: "failure") LED located at the front panel of the device and a failure relay for remote control indicate this state. The User Manual demands a service call (on page 21), if straightforward reasons could be excluded.



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STR 0000 transmiter contains no components of relevance for radiation protection (it contains electronics and hardware, e.g. pumps).

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Dräger	Safety AG & Co. KG aA			
	Main bill of m	naterials / 19 "p	olug-ir	n unit
Descri	otion: Ion Mobility Spectrome	ter, -valve inlet system-		
Part N ^a	: 12.000-00-00:00 (St)			
Created 21	1.12.2000, Unger			
pos.	description	drawing-Nº.:	plece	remarks / supplier
1	19" - enclosure	12.000-01-00:00(3)	1	
2	piug-in unit	12.000-02-00:00(3)	1	
3	back panel	12.000-02-00:00(3)	1	
4	add-on board		1	
5	current loop board		1	
6	platter	· · · · ·	1	
7	analogue board		1	
8	HV board		1	
9	computer board		1	
10	spacer 8 x 3		8	PVC
11	slotted screw M 2,5 x 12		8	
12	disk M 2,5		8	
13	countersunk screw		2	
	4 x 12			
14	nut M4		2	
15	nut M4		2	
16	front panel 1	12.000-04-00:00(3)	1	
17	front panel 2	12.000-05-00:00 (3)	1	
18	front panel 3	12.000-06-00:00 (3)	1	
19	T-piece		1	PP, RTC 544,
				Company R. Vetter
20	tubing		1	PTFE, 3/16, 200 lg,
				Company R. Vetter
21	DC-DC-converter		1	

Fig. 2b (5X00): Specification sheet of IMS components

STR 0000 transmitter contains no components/materials of relevance for radiation protection (it contains electronics and hardware, e.g. pumps).



Fig. 3: Principal scheme of the IMS (1 - dust filter, 2 - inlet system with sampling unit, 3 - sampling loop, 4 - suction pump, 5 - gas flow pump, 6 - circulation filter, 7 - IMS cell, 8 - internal gas flow, 9 - GC column)

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Dräger	Safety AG & Co. KG aA				
	Comj	ponent bill o	f mat	erials	
Descri	ption: plug-in unit				
Drawin	ng-№: 12.000-02-00:00 ((51)			
					•
Created 2	1.12.2000, Unger				
pos.	description	drawing-N ⁴ .	plece	matorial	remarks
1	Beta-drift tube	RID5.50-02:00	1		
2	amplifier	•	1		
3	thermo box	12.000-02-01:00	1		
4	valve system	12.000-02-01:00	1		
6	tube plug		4	PEEK	BESTA
6	tubing	12.000-02-03:00	1	PTFE	
7	side panel	12.000-02-00:02	1	AlMgSI 0.5	
8	distance roll		6	PA	
9	circuit filter	RID.4.12-05:00	1		
10	countersunk screw M3 x 20		6	Steel	
11	crown gear M3		6	Steel	
12	hexagon nut M3		6	Steel	
13	ពីដេកទួ	RID 4.50-04:06	2	1,4301	
14	angle holder	12.000-02-00:03	1	AlMgSI0.5	
15	pumpt		1		ASF Thomas
16	cylinder head screw M3 x 12		4	Steel	
17	pump 2		1		ASF Thomas
18	plug for filter	RID2.11-05:15	1	AlCuMgPb	
19	pump socket	12.000-02-04:00	2		
21	cylinder head screw M4 x 6		4	Steel	
22	crown gear		4	Steel	

Fig. 5 (5X00): Specification sheet of the detector unit

SSH 0000 sealed source module: All relevant parts for radiation protection are either similar to the IMS 5000, 5100, 5600 or 5700 models or have an increased impact protection. The gas paths to connect the filter adapter, the circuit pump module and the pneumatic module are solid material rather than hoses (as in the previous model). The filter adapter and circuit pump module enclosure are aluminum parts, the pneumatic module is PEEK (Poly Ether Ether Ketone).



Fig. 6: IMS cell (4 - radioactive source)

SSH 0000 sealed source module: No changes compared to Beta drift tube of IMS 5000, 5100, 5600, 5700.

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	BG 01: Beta-drift tube	tériais P	ims		
· .	N. RID 5.50-02-8t	creat 11.10	ed:).00 Dr. Eckert		
pos.	description	drawing-Nº.:	plece	material	remarks / supplier
1	body	RID5.50-02:01	1	PEEK	1
2	cover pigte I	RID6.50-02	1	AlCuMo1 F39	
3	cover plate il	RID5.50-02:03	1	AlCuMg1 F39	1
4	Tritium source	RID6.50-02:03	1	1.4305]
10	source holder	RID5.50-02:10	1	1,4305	1
21	apace ring	RID2.12-02:06	10	PEEK	<u> </u>
22	ehutter grid	RID5.50-02:20	1		d=0.06/MW0.12
23	aperture grid	RID2.12-02:24	1		1
24	aperture grid ring	RID5.50-02:20	1	1,4305	
25	collector socket	RID2.12-02:24	1	PEEK	·
26	collector	RID2.12-02:26	1	1,4305	1
27	· ·				· · · · · · · · · · · · · · · · · · ·
28	tension spring		11	1,4301	Gute Kunst
29	resistor minimelf 680k		11		RS
30	o-ring 22.0 x 2.0		1	63 FKM 592	BEKU
31	o-ring 2.9 x 1.78		1	63 FKM 692	
32	0-ting 22.0 x 2.0	1	1	83 FKM 692	
33	hexagon nut M3		2	1:4301	t
34	cylinder heed screw M2 x 16	DIN 82-A2	6	1,4301	
35	disk 3,2	DIN 125-A2	10	1.4301	f
36	Smm terminel tag		4	Cu	
37	telion tube 0,62" ID / 1/8"AD		1	Tellon 180 mm	GAT (ZUP1523)
38	banjo screw 1/8"		1	PEEK	GAT (P331)
39	famule complex 1/8"		1	KEL F/1.4301	
40	attenuation ring	RID2.12-02:48	1	Telon	
41	grid insulation ring	RID5.50-0247	1	PEEK	
42	grid contact ring	RID5.50-02:46	1	1.4301	
43	apecer ring	RID5.50-02:45	1	PEEK	
44	drift ring 41	RtD3.60-02:41	1	1.4305	
45	drift ring 40	RID5.60-02:40	8	1.4305	
46	nozzie	Ri05.50-02:49	1	PEEK	
47	drift ring 42	RID5.60-02:42	1	1.4305	
48	capillary	RID5.50-02:50	1	1,4301	
49	source holder	RID5.50-02:07	1	PEEK	
50	contact husk		1		R8
51	needle point contact		1		R\$
62	insulation tube		1		

Fig. 7: Specification sheet of the IMS cell

SSH 0000 sealed source module: No changes compared to Beta drift tube of IMS 5000, 5100, 5600, 5700.

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Fig. 8: Radio	pactive radiation sour	rce		ŀ
SSH 0000 s	ealed source module	: No changes comp	ared to radioactive s	source of
IMS 5000, 5	100, 5600, 5700.			

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Fig. 9: Output signals U in dependence on time: IMS spectra with positive and negative Reaction Ion Peaks

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LABELING (5X00): The IMS is labelled by two labels, one affixed on the sealed source enclosure and one on the outside of the device. A copy of the label text is shown below.

"CAUTION - CONTAINS RADIOACTIVE MATERIAL" TRITIUM (HYDROGEN-3), MAXIMUM ACTIVITY 1GBq DATE OF ASSAY -/-/--DO NOT OPEN DRIFT TUBE ASSEMBLY DRAEGER SAFETY, INC. ION MOBILITY SPECTROMETER 5000,5100,5600,5700 NRC LICENSE 42-23903-01-E

THIS DETECTOR CONTAINS RADIOACTIVE MATERIAL AND HAS BEEN MANUFACTURED IN COMPLIANCE WITH U.S. NRC SAFETY CRITERIA IN 10 CFR 32:27

THE PURCHASER IS EXEMPT FROM ANY REGULATORY REQUIREMENTS.



LABELING (SSH 0000) sealed source module: The IMS is labelled by two labels, one affixed on the sealed source enclosure and one on the outside of the device. A copy of the label text is shown below.

"CAUTION -- CONTAINS RADIOACTIVE MATERIAL" ION MOBILITY SPECTROMETER TRITIUM (HYDROGEN-3), MAXIMUM ACTIVITY 1GBq DO NOT OPEN DRIFT TÜBE ASSEMBLY DATE OF ASSAY --/---DRAEGER SARETY NRC LICENSE

THIS DETECTOR CONTAINS RADIOACTIVE MATERIAL AND HAS BEEN MANUFACTURED IN COMPLIANCE WITH U.S. NRC SAFETY CRITERIA IN 10 CFR 32.27

THE PURCHASER IS EXEMPT FROM ANY REGULATORY REQUIREMENTS.

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PROTOTYPE TESTING:

The above named IMS models, manufactured by Dräger Safety AG & Co. KGeA, Lübeck, Germany, have been extensively field tested in Germany and other countries for 10 years. With over 200 units in use, neither accidents (broken sources) have been known nor problems related to the sealed source integrity have been reported for these devices.

The main parts of the drift tube of SSH 0000 sealed source module is similar to the parts of the 5X00. Many of the hoses have been replaced by a solid PEEK pneumatic module, thus achieving an increased resistance to vibrations and shocks.

Extensive prototype testing with STR 0000 including the SSH 0000 sealed source module have been conducted in regards to temperature, humidity and pressure conditions as specified above. Shock and vibration testing of the STR 0000 including the SSH 0000 sealed source module has been conducted according to a test profile equaliling world wide transport via truck and air freight, operating conditions in facilities with heavy pumps, reactors, such as chemical plants.

The 5X00 devices are manufactured in accordance with the registration certificates (attachments I and II)

B – 04/98 (including supplement 1, 03/00) Senatsverwaltung für Gesundheit und Soziales Berlin

and

Nr. 6.52 – R 244

Physikalisch-Technische Bundesanstalt Braunschweig und Berlin.

For the **SSH0000** sealed source module devices, Dräger Safety has recently filed an approval application for a type approval issued by the Bundesamt für Strahlenschutz (BfS).

The active part of the incorporated sources are subject to quality control according to ISO.9978:1992 (E). The sources are certified by the Ministry for Atomic Energy of Russian Federation. Tests are carried out in accordance with ISO.2919/1980(E) on prototypes (attachments III and IV).

The device (5X00) has been evaluated under sinusoidal vibrations according to IEC 68, part 2-6 (frequency range 10-150 Hz, excitation acceleration 1 g, 2 g, 3 g, 5 cycles for every axis). The device remained ready for measurement actions (attachment V).

The device (5X00) has been evaluated under free fall conditions according to IEC 68, part 2-32 (free fall from a height of 10 cm on concrete in normal operating position). The device remained ready for measurement actions. A derogation of the device integrity could not be observed (attachment V).

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SSH 0000 sealed source module: No changes compared to Beta drift tube of IMS 5000, 5100, 5600, 5700. Therefore the impact resistance of the tube and its including source is similar to the previous model.

EXTERNAL RADIATION LEVELS:

Due to the low energy beta radiation associated with Hydrogen-3 (Tritium) and the amount of shielding provided by the drift tube assembly and other device components, for a Tritium source of 4,4 GBq activity the radiation level in a distance of 10 cm from the touchable surface of the device is lower than 10 μ Sv/h (certification Nr. 6.52 – R 244, attachment II).

Nuclide	Activity	5 cm	10 cm	100 cm	
H-3	4,4 GBq	40 µSv/h	<10 µSv/h	0,1 µSv/h	
H-3	1 GBq	9,1 µSv/h	2,3 µSv/h	0,023 µSv/h	

QUALITY CONTROL AND QUALITY ASSURANCE:

The registration certificate B - 04/98demands a detailed quality control with respect to radiation safety for each IMS before being delivered. It states that the results of radiation level and surface contamination measurements have to be collected in a database.

Quality control is supervised by the Institut für Strahlenschutz und Qualitätssicherung GmbH (ISQ), Kylimannstr. 12b, 12203 Berlin, Germany.

Moreover, manufacturing is based on the Dräger Quality Management System (QMS) in accordance with the rules of the DIN EN ISO 9001 : 2000 standard (certification no. 07 100 284/0, attachment VI). The QMS ensures that

- the materials of construction and the final assembly meet the design specifications,
- the 19° container is completely closed (EMC shielding)
- every final device is leak tested (5X00: the IMS spectrum shows no changes when the device is exposed to a high external concentration of Acetone.
 - SSH 0000 sealed source module: the pressure in the detector cell is reduced below ambient pressure, each SSH 0000 sealed source module is tested for a maximum pressure increase during a specified time)
- a radiation measurement is performed (including radiation level and surface contamination), a test certificate is supplied with each device
- a test is performed verifying that the device and especially the drift cell assembly, that is critical to safety, operates as intended, including all safety

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functions (abnormal device operation leads to a wrong RIP spectrum, flashing of the "alarm" (STR 0000: "failure") LED and to the operation of the failure relay),

IMS spectra for positive / negative ions are measured and stored in a database.

INSTALLATION, SERVICING, AND INSTRUCTIONS TO USERS:

The use of the IMS requires full understanding and strict observation of the "User Manual", especially the safety regulations contained:

- The IMS should be mounted at a location with little vibration and ambient conditions as follows:
 - o Temperature: 0 50 °C
 - o Relative Humidity: 0 90 %
- For air monitoring the device must be installed at a location with free air circulation.
- Attention has to be paid if special air flow conditions are present. The IMS should be located in an area, where a gas leak is most likely to occur.
- In case of integration the IMS into a consisting tube systems an appropriate gas inlet flow has to be ensured.
- The operation in explosive areas requires an additional EXPROOF package.
- The device has to be operated at a place with minimal risk of mechanical destruction.
- According to the manual, maintenance and service of the IMS is allowed for authorized persons subject to all regulations, e.g. Draeger Service, only.
- The circulation filter has to be replaced every 6 months by the Draeger authorised Service.

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