



July 14, 1999

United States Nuclear Regulatory Commission  
Materials Safety Branch  
Division of Industrial and Medical Nuclear Safety  
Two White Flint North  
11545 Rockville Pike  
North Bethesda, MD 50852

Dear Sir:

This letter is to request a review of several changes planed to the Metorex SIPS probe which is currently covered by Registry NR-0701-D-104-B. These modifications are in the latter stages of design and evaluation but have not yet been formalized. These changes will be implemented in the fall of 1999 and will occur in all probes. Thus, these modified probes will be identified by a serial number greater than a certain number that will be determined at a later date.

Enclosed you will find a document titled "Modifications to SIPS Probe" which describes the modifications planned. Attached to that write-up are several drawings and diagrams which help illustrate the changes. Several of these drawings are preliminary in nature, as the final release of the modifications has not yet been completed.

I have also enclosed a check for \$590.00 which I believe is the fee required for an amendment to a registry.

If you have any questions, please feel free to contact me at the telephone number below or via e-mail at [John.Patterson@MetorexUSA.com](mailto:John.Patterson@MetorexUSA.com)

Sincerely,

John I.H. Patterson, Ph.D.  
President

JHHP/jlr  
Enclosure

*NMSS 02 Purdie*

## **Modifications to SIPS Probe NR-0701-D-104-B**

The configuration of the detector in the SIPS probe has been changed to achieve better analytical performance. In conjunction with this change a few changes have been made to the mechanical parts of the probe.

Attachment 1A (p3) is a drawing of the redesigned probe. Two external modifications have been made to the probe. First, three of the grooves in the body of the probe have been eliminated. This provides a more secure mounting for the screws that hold the radiation warning label. The second change is that a new handle has been designed which better fits the grip and includes a safety strap to minimize the chance of dropping the probe. In addition, the probe cable now enters the probe through a connector rather than being hard wired to the probe.

Attachment 2A (p4) shows the modification of the detector geometry. In this view, the lower shutter is opened and the upper shutter is closed. When compared to Attachment 2 (p5) from the registry, the change in the position of the detector can be seen. The detector is much closer to the front of the probe. In order to shield the detector from the source, the source housing has been modified slightly (p6). Thus, the shutter opening is slightly smaller than in the original probe. Otherwise, no changes have been made to the source holder and/or the shutter mechanism.

Attachment 3A (p7) illustrates the new heat shield and end cover. The heat shield (Attachment 4; p8) is an option for the unit to allow the probe to be used at elevated temperatures. The shield and associated mounting slightly separate the probe from the sample and provide some insulation. The installation of the heat shield slightly extends the length of the probe snout. Thus, with and without the shield, the probe snout will be of different lengths. This has led to the development of a new end cover. In this version, the cover is fixed onto the probe snout with two spring loaded balls in the side of the cover. These balls fit into the small conical recesses in the probe snout. The cover is slightly longer than the old version and shielding mechanism is floating on four (4) springs. Two (2) bars on the side of the cover limit the outward movement. The same cover is used with or without the heat shield. The shielding mechanism is sandwich composed of a lead sheet between a steel and aluminum sheet. A copper reference sample is attached to the front of the sandwich. The steel plate adds to the shielding provided by the cover when compared with the previous cover.

In order to determine the effect of these changes on the radiation profile, measurements were made using the same Cd-109 source in both the current designed probe and the revised probe. Cd-109 was chosen as it has the highest radiation profile in the testing of the original probe. The measurements were made using a Giger counter to monitor the primary beam. A scintillation detector was used to measure the weak radiation in other directions. The following comparative table shows the radiation along the axis illustrated in figure 10 (p9):

### ORIGINAL DESIGN

Distance	A	B	C	D	E
5cm	1000c/s	3000c/s	5000c/s	NA	3000c/s
10cm	500c/s	1000c/s	2500c/s	NA	500c/s
30cm	100c/s	150c/s	500c/s	12.0 mrem/hr.	200c/s

### MODIFIED DESIGN

Distance	A	B	C	D	E
5cm	1000c/s	3000c/s	5000c/s	NA	3000c/s
10cm	500c/s	1000c/s	2200c/s	NA	500c/s
30cm	100c/s	150c/s	500c/s	13.0 mrem/hr.	200c/s

These profiles indicate that there is essentially no difference in the radiation profiles of the two designs.

NRC FORM 567  
(8-93)

U. S. NUCLEAR REGULATORY COMMISSION

## REQUEST FOR A SEALED SOURCE OR DEVICE EVALUATION

**INSTRUCTIONS:** Send this request AND a copy of all related letters/applications and drawings to: The Sealed Source Safety Section, ATTN: Chief, OWFN Mail Stop 6 H3. Change the License Tracking System milestone to 19 and assign to reviewer code I-5.  
**NOTE:** Retain a copy of this request with the application and background files. *sh*

REQUESTER <i>M. Storex</i>		REGION/LOCATION: <input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> V <input type="checkbox"/> HQ <input type="checkbox"/> LFDCB	
TELEPHONE NUMBER	DATE	<b>TYPE OF ACTION REQUESTED (Check as appropriate)</b>	
APPLICANT'S NAME <i>John Patterson</i>		<input type="checkbox"/> SOURCE REVIEW	<input checked="" type="checkbox"/> AMENDMENT OF REGISTRATION SHEET NUMBER(S)
MAIL CONTROL NUMBER(S)		<input type="checkbox"/> DEVICE REVIEW	
LETTER/APPLICATION DATE <i>7-14-99</i>	LICENSE NUMBER(S)	<input type="checkbox"/> CUSTOM REVIEW	<i>NR-701-D-104-B</i>

COMMENTS:  
*Princeton Crossroads Corporate Center  
250 Phillips Boulevard  
Living, New Jersey 08618*

REVIEWER <i>Opkovich</i>	MODEL NUMBERS <i>SIPS Probe</i>	NUMBER ASSIGNED <i>99-47</i>
DATE RECEIVED <i>7-20-99</i>	DATE ASSIGNED <i>7-20-99</i>	DATE TO FEES <i>7-20-99</i>

TYPE OF ACTION (Indicate the number of each type)			
<input checked="" type="checkbox"/> COMMERCIAL DISTRIBUTION (FORMAL)		<input type="checkbox"/> USE BY A SINGLE APPLICANT (CUSTOM)	
SOURCE (9C)	DEVICE (9A)	SOURCE (9D)	DEVICE (9B)
<input type="checkbox"/> NEW AMENDMENT	<input checked="" type="checkbox"/> NEW AMENDMENT	<input type="checkbox"/> NEW AMENDMENT	<input type="checkbox"/> NEW AMENDMENT
<input type="checkbox"/> NO SAFETY EVALUATION REQUIRED NO FEES REQUIRED		<input type="checkbox"/> LICENSING ACTION REQUIRED IF KNOWN	
		<input type="checkbox"/> YES <input type="checkbox"/> NO	

OTHER (Specify)  
*check next for \$590.00. (Check # 23747)*

	TOTAL NUMBER OF REVIEW HOURS	NOTES <i>Amendment to the Metorex SIPS Probe</i>
	NUMBER OF DEFICIENCY LETTERS	
	NUMBER OF DEFICIENCY CALLS	

FOR BILLING PURPOSES ONLY			
<input type="checkbox"/> NAME CHANGE	<input type="checkbox"/> ADDRESS CHANGE	<input type="checkbox"/> NEW REGISTRATION -- ADD TO BILLING	<input type="checkbox"/> PRODUCT INACTIVE -- REMOVE FROM BILLING

FOR FEE USE ONLY			
TYPE OF FEE <i>AMD</i>	FEE CATEGORY <input type="checkbox"/> 9A <input type="checkbox"/> 9B <input type="checkbox"/> 9C <input type="checkbox"/> 9D		
AMOUNT RECEIVED <i>\$590</i>	CHECK NUMBER <i>23747</i>	<input type="checkbox"/> MATANN UPDATED AS REQUIRED	
DATE OF CHECK <i>7/15/99</i>	LOG <i>Jul 1 99 55 + 2</i>	<input type="checkbox"/> MATSYS UPDATED AS REQUIRED	
APPROVED BY <i>sh</i>	DATE RETURN <i>7/29/99</i>	DATE	

COMMENTS

NRC FORM 567  
(8-93)

U. S. NUCLEAR REGULATORY COMMISSION

### REQUEST FOR A SEALED SOURCE OR DEVICE EVALUATION

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**NOTE:** Retain a copy of this request with the application and background files. *sh*

REQUESTER <i>M. etorex</i>	REGION/LOCATION: <input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> V <input type="checkbox"/> HQ <input type="checkbox"/> LFDCB
TELEPHONE NUMBER	DATE
APPLICANT'S NAME <i>John Patterson</i>	TYPE OF ACTION REQUESTED (Check as appropriate)
MAIL CONTROL NUMBER(S)	<input type="checkbox"/> SOURCE REVIEW <input checked="" type="checkbox"/> AMENDMENT OF REGISTRATION SHEET NUMBER(S)
LETTER/APPLICATION DATE <i>7-14-99</i>	LICENSE NUMBER(S)
	<input type="checkbox"/> DEVICE REVIEW <input type="checkbox"/> CUSTOM REVIEW <i>NR-701-D-104-B</i>

COMMENTS:  
*Princeton Crossroads Corporate Center  
250 Phillips Boulevard  
Livingston, New Jersey 08618*

REVIEWER <i>Jankovich</i>	MODEL NUMBERS <i>SIPS Probe</i>	NUMBER ASSIGNED <i>99-47</i>
DATE RECEIVED <i>7-20-99</i>	DATE ASSIGNED <i>7-20-99</i>	DATE TO FEES <i>7-20-99</i>

TYPE OF ACTION (Indicate the number of each type)			
<input checked="" type="checkbox"/> COMMERCIAL DISTRIBUTION (FORMAL)		<input type="checkbox"/> USE BY A SINGLE APPLICANT (CUSTOM)	
SOURCE (9C)	DEVICE (9A)	SOURCE (9D)	DEVICE (9B)
<input type="checkbox"/> NEW <input type="checkbox"/> AMENDMENT	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> AMENDMENT	<input type="checkbox"/> NEW <input type="checkbox"/> AMENDMENT	<input type="checkbox"/> NEW <input type="checkbox"/> AMENDMENT
<input type="checkbox"/> NO SAFETY EVALUATION REQUIRED <input type="checkbox"/> NO FEES REQUIRED		<input type="checkbox"/> LICENSING ACTION REQUIRED IF KNOWN	
		<input type="checkbox"/> YES <input type="checkbox"/> NO	

OTHER (Specify)  
*check next for \$590.00. (Check # 23747)*

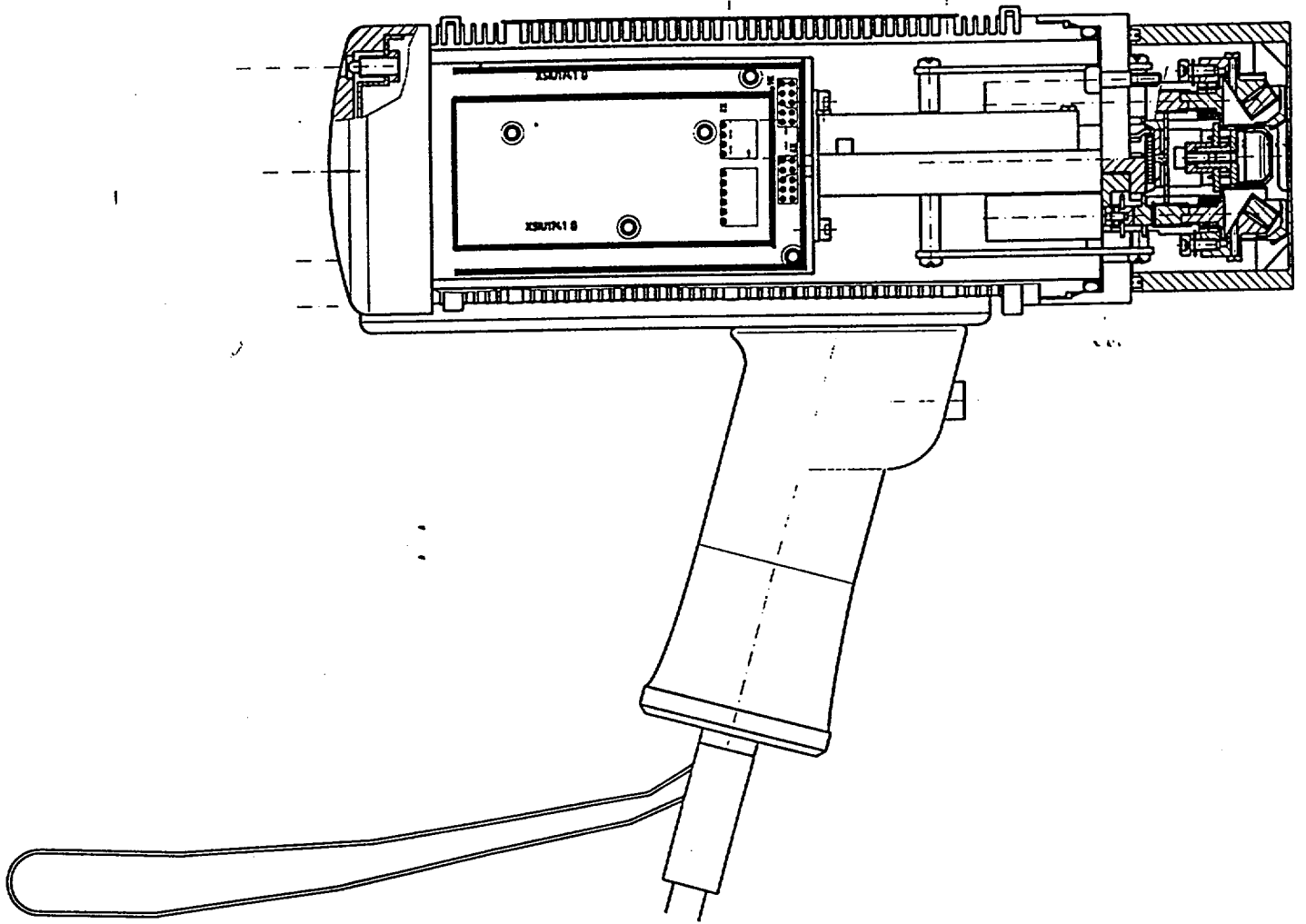
TOTAL NUMBER OF REVIEW HOURS	NOTES <i>Amendment to the Metorex SIPS Probe</i>
NUMBER OF DEFICIENCY LETTERS	
NUMBER OF DEFICIENCY CALLS	

FOR BILLING PURPOSES ONLY			
<input type="checkbox"/> NAME CHANGE	<input type="checkbox"/> ADDRESS CHANGE	<input type="checkbox"/> NEW REGISTRATION -- ADD TO BILLING	<input type="checkbox"/> PRODUCT INACTIVE -- REMOVE FROM BILLING

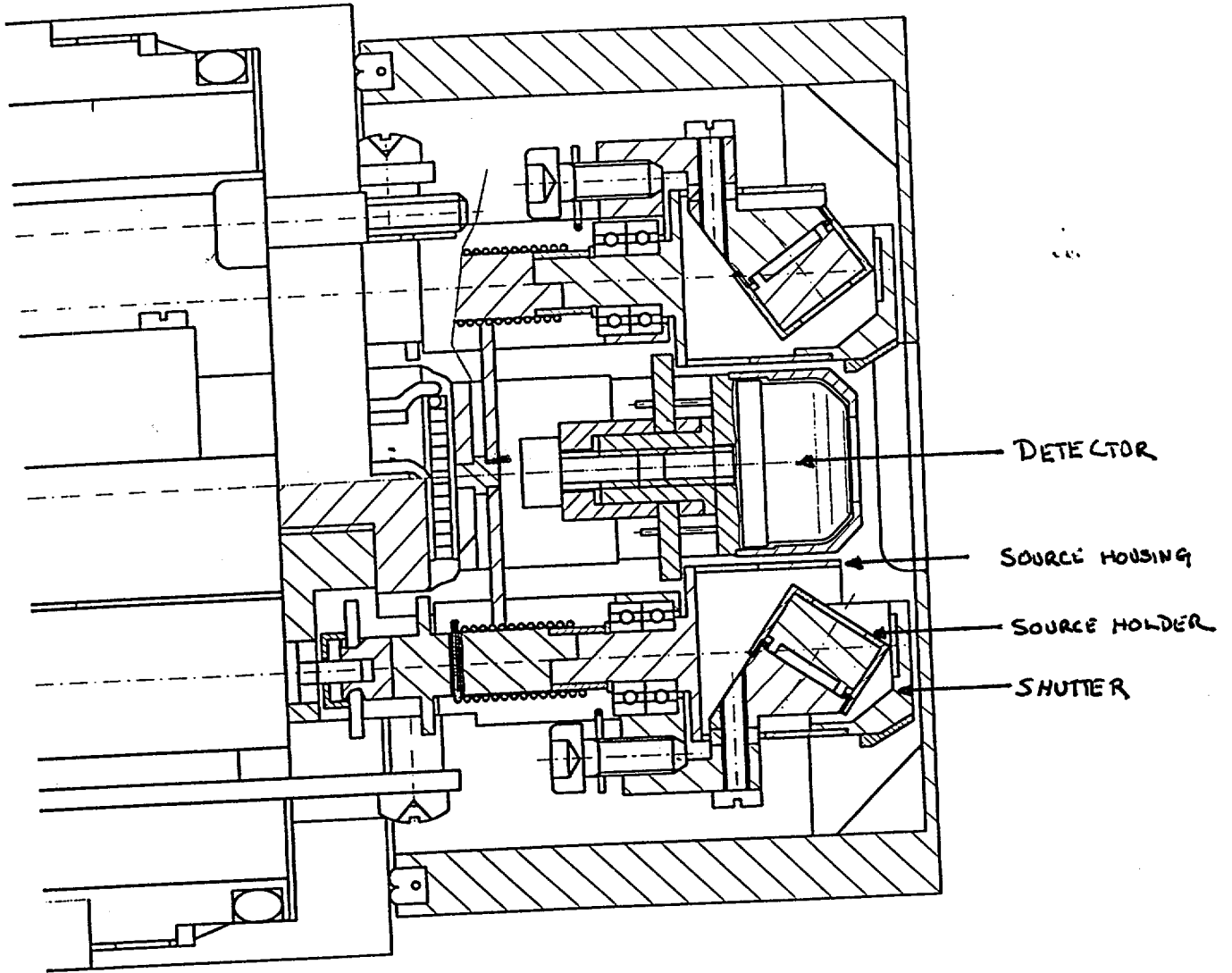
FOR FEE USE ONLY			
TYPE OF FEE <i>AMD</i>	FEE CATEGORY <input type="checkbox"/> 9A <input type="checkbox"/> 9B <input type="checkbox"/> 9C <input type="checkbox"/> 9D		
AMOUNT RECEIVED <i>18590</i>	CHECK NUMBER <i>23747</i>	<input type="checkbox"/> MATANN UPDATED AS REQUIRED	
DATE OF CHECK <i>7/15/99</i>	LOG <i>Jul 1 99 5542</i>	<input type="checkbox"/> MATSYS UPDATED AS REQUIRED	
APPROVED BY <i>sh</i>	DATE RETURN <i>7/29/99</i>	DATE	

COMMENTS

Attachment 1A



# Attachment 2A

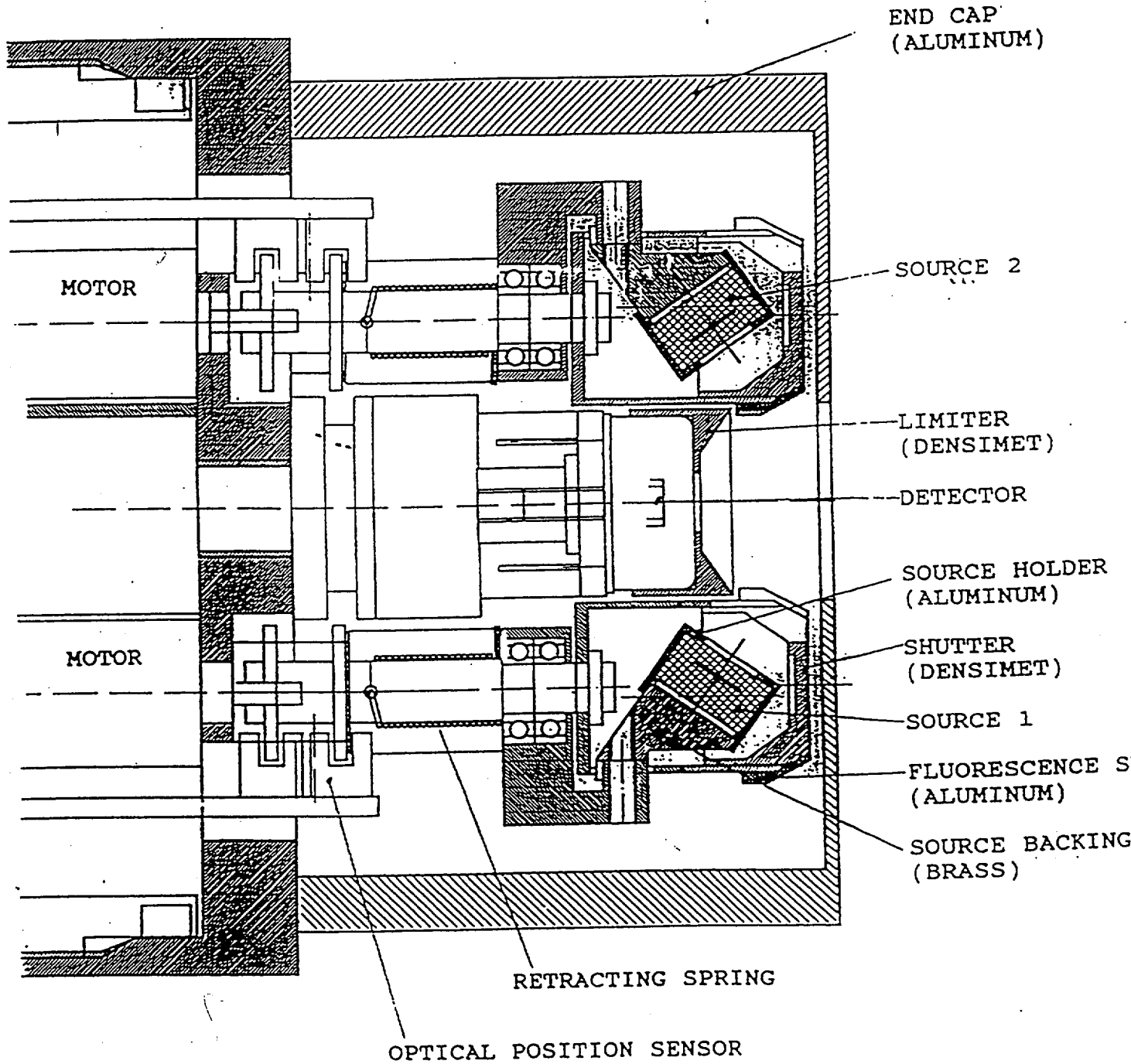


REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES  
SAFETY EVALUATION OF DEVICE  
(AMENDED IN ITS ENTIRETY)

NO.: NR-0701-D-104-B

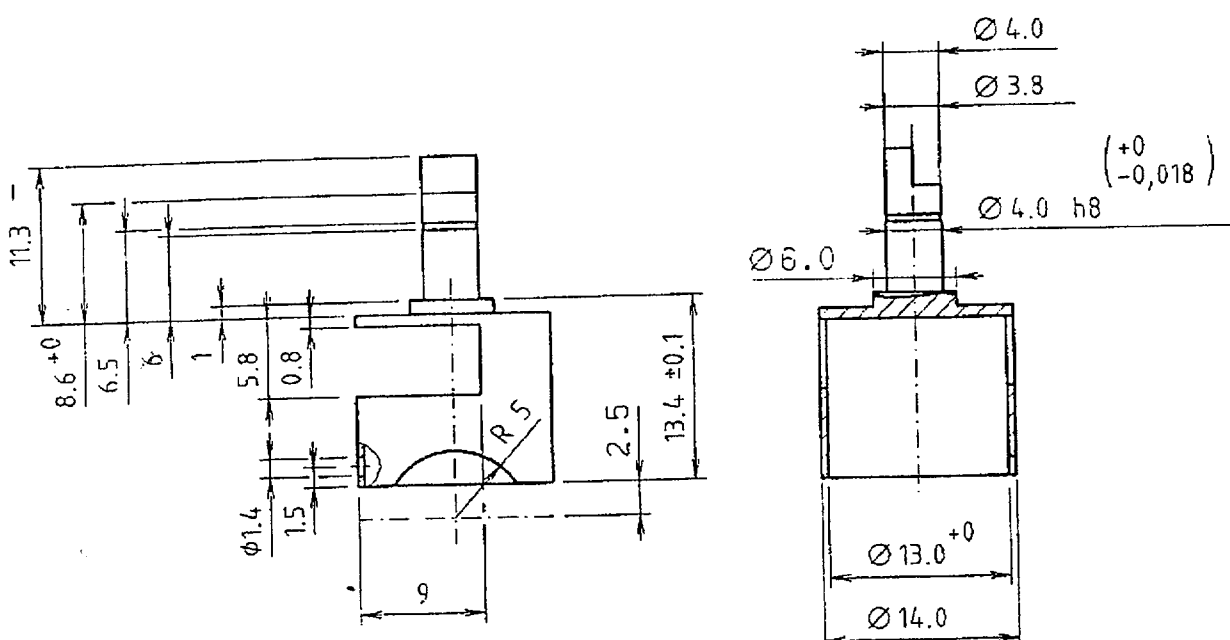
DATE: NOV 12 1998

ATTACHMENT 2





REV.	MUUTOKSET / REVISIONS	PVM DATE	PART. DRAWN	HYV. APPR.
A	Lisätty toleranssi h8 (+0,-0,018)	9810	RM	RAK
B	Poist. mitta 12.4, lis. mitta 13.4	9901	RM	RAK



This machining is left away from the new SIPS.

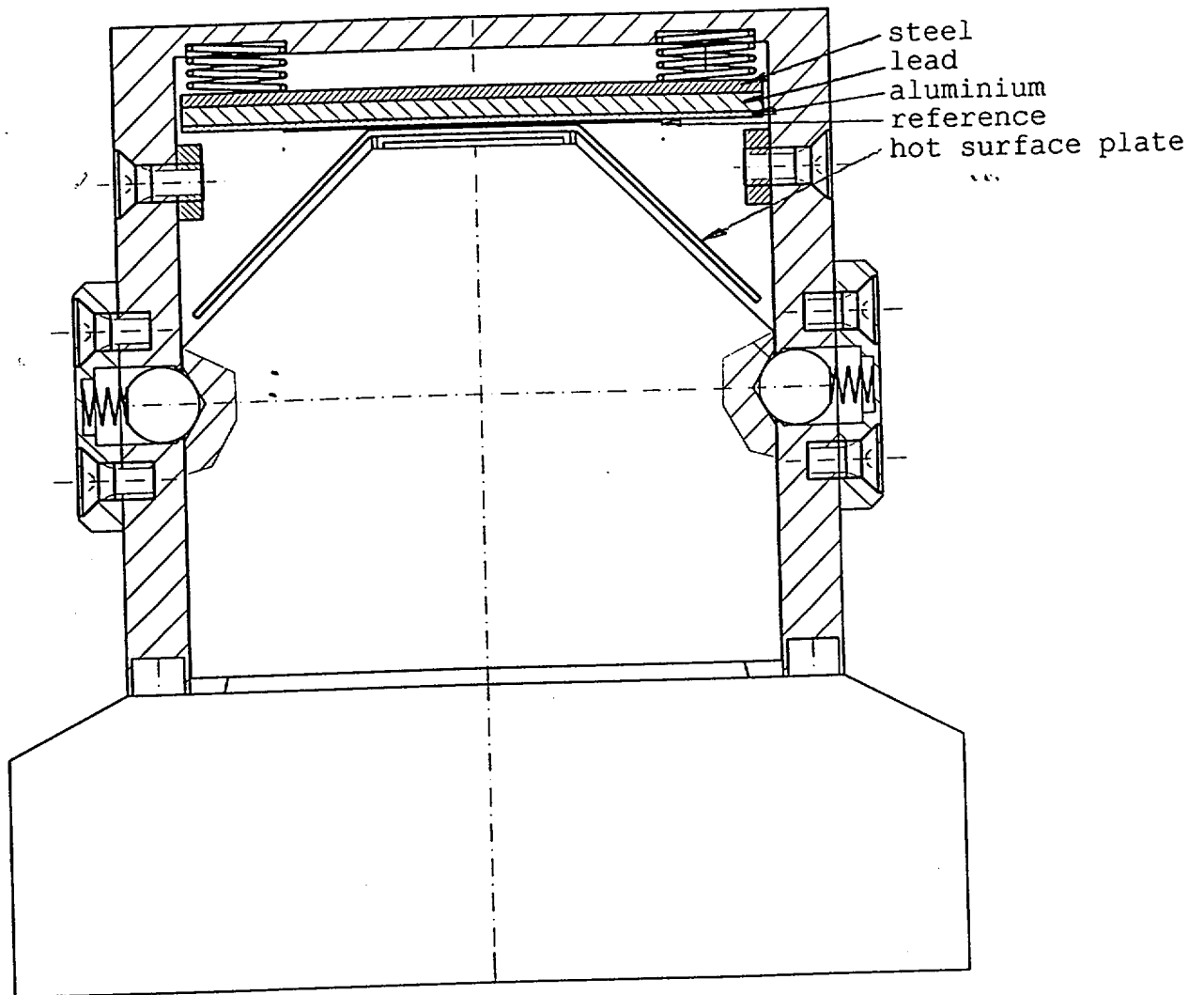
3.2/

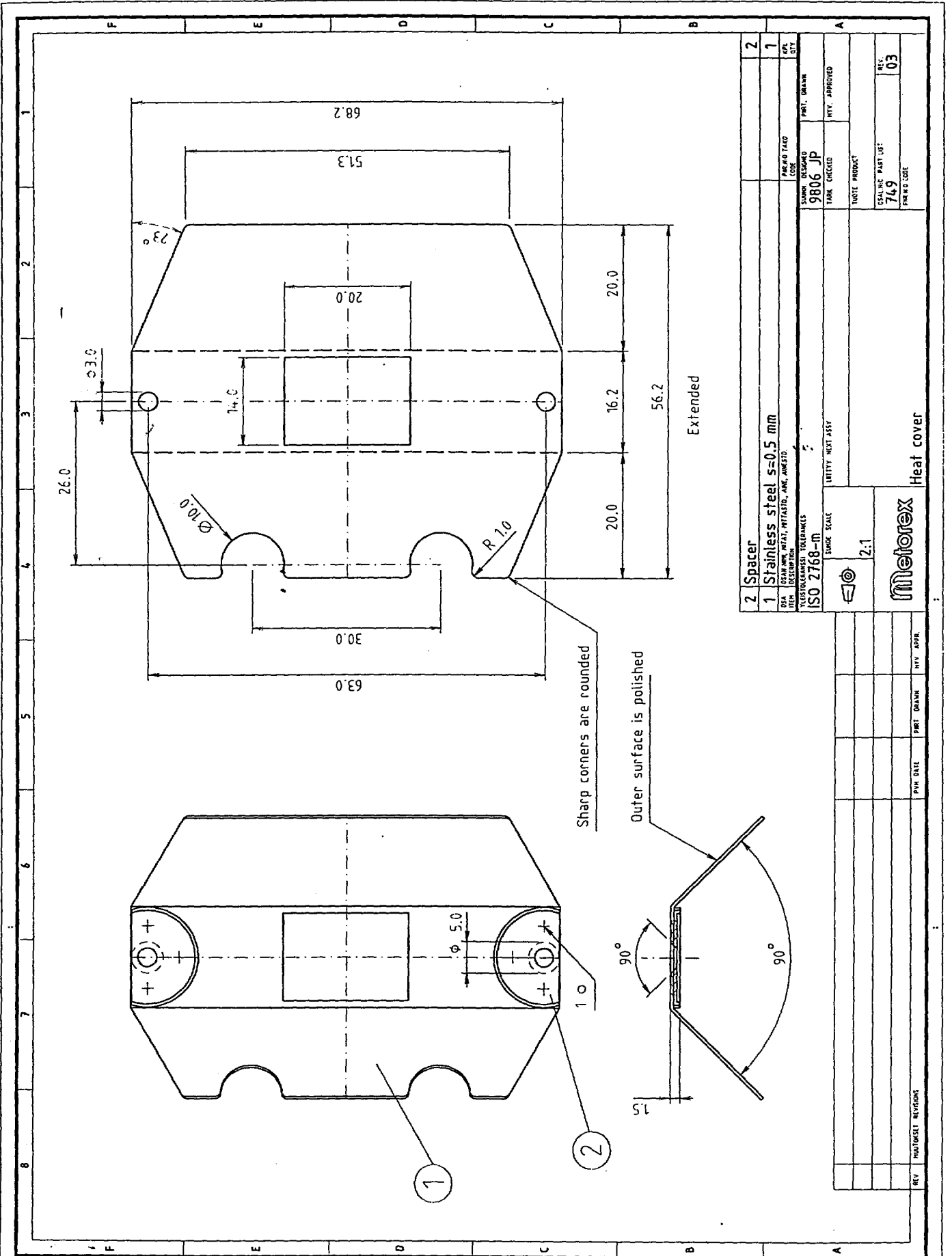
W-tanko 16x250mm Densiment		3060 177	
OSA ITEM	OSAN NIMI, MITAT, MITTASTO, AINE, AINESTO. DESCRIPTION	PIIR.N:O TAKO CODE	KPL CTY
YLEISTOLERANSSI / TOLERANCES ISO 2768-mk		SUUNN. DESIGNED 9603 SV	PART. DRAWN 9603 RM
SUOJE SCALE 2:1		TARK. CHECKED 9806 SV	HYV. APPROVED 9806 RAK
LITTYY NEXT ASSY SIPS 2480		TUOTE PRODUCT X-MET	
		OSAL.N:O PART LIST 4101 297-40	REV. B
		PIIR.N:O CODE 4100 618-4M	

SOURCE HOUSING

Suliinkansi 11. -1- 2009 06

# Attachment 3A



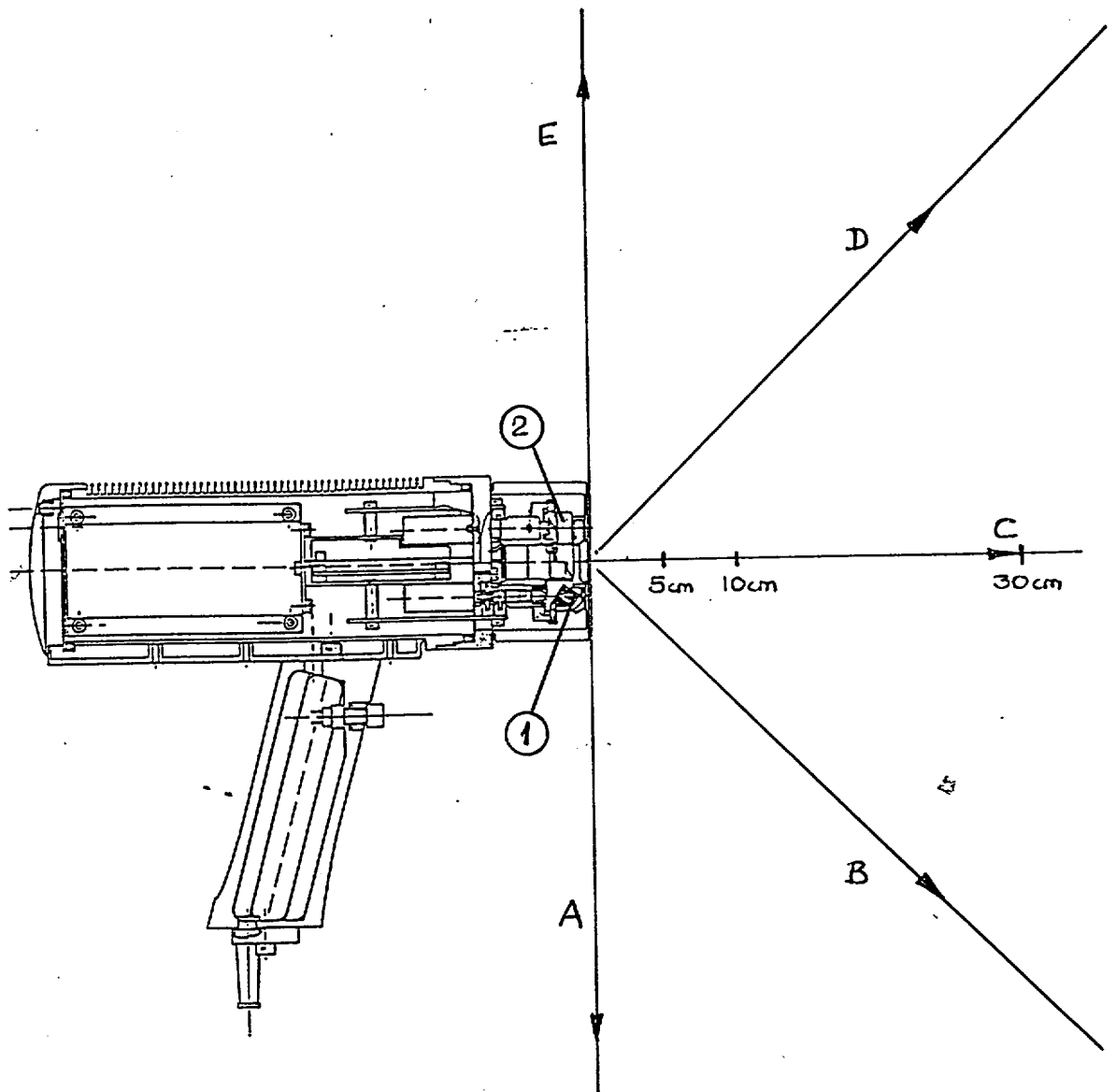


2	Spacer	SPACER	PART. DRAWN	REV. 03
1	Stainless steel s=0.5 mm	DESIGNED	INTY. APPROVED	
		9806 JP		
		TASK CHECKED		
		TASTE PRODUCT		
		PLANNING PART USE		
		749		
		PART CODE		

ISO 2768-m	ISO 2768-m
SURFACE FINISH	SURFACE FINISH
SURFACE SCALE	SURFACE SCALE
2:1	2:1
INTY. NEXT ASSY	INTY. NEXT ASSY
INTY. APPROVED	INTY. APPROVED

Metorex Heat cover

REV	DESCRIPTION	PWR DATE	PRT DRAWN	INTY APPR.



① → Cd-109 or Am-241

② → Fe-55

FIGURE 1b. LOCATION OF DOSE RATE MEASUREMENT POINTS

23747

**METOREX INC.**  
PRINCETON CROSSROADS CORPORATE CENTER  
250 PHILLIPS BLVD.  
EWING, NJ 08618  
(609) 406-9000

FIRST UNION NATIONAL BANK  
3-50-310

Five Hundred Ninety Dollars And 00 Cents

DATE

AMOUNT

7/15/99

\$590.00

PAY  
TO THE  
ORDER  
OF

NUCLEAR REGULATORY COMMISSION  
MATERIALS SAFETY BRANCH  
DIV IND & MED NUC SAFETY  
WASHINGTON DC 20555-0001



MP

⑈00023747⑈ ⑆031000503⑆ 2000070113721⑈

Security features included. Details on back.