Texas Department of Health

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September 20, 2000

SOURCE CONTAINMENT AND DEVICES BRANCH
OFFICE OF NUCLEAR MATERIAL SAFETY
AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
ATTN TRACY KIME
DOCUMENT CONTROL DESK P1-37
WASHINGTON, D. C. 20555

Dear Ms. Kime:

Enclosed are the device sheets TX634D172B through TX634D174B for TN Technologies Models 7062B, 7062BP, 7063, 7063B, 7063P, 7063BP, 7100 and 7100B-P fixed gauges. These device sheets have been amended in entirety to describe the specific modification of changing the sealed source specification for these gauges. We would appreciate you distributing copies of this sheet to the other State Programs and NRC Regions, as appropriate.

Thank you for your cooperation and efforts.

Sincerely,

David B. Fogle, Chief
Advanced Technology Licensing Program
Division of Licensing, Registration
and Standards
Bureau of Radiation Control

Enclosure

NMSS/R

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(Amended in its Entirety)

NO.: TX1069D101S DATE: **December 5, 2001** PAGE 1 OF 6

DEVICE TYPE: On-line basis weight gauge

MODEL: Scienta **7210**

MANUFACTURER/DISTRIBUTOR: Scienta Oy Ab
Jarvas Hitech Center
02320 JORVAS Finland

SEALED SOURCE MODEL DESIGNATION: DuPont Model NER-584 (Kr-85)
AEA Technology QSA (Amersham) Models:
KAC.D1 (Kr-85)
PHC.80955 (Pm-147)
IEC.D2 (Fe-55)

ISOTOPE: Kr-85
Pm-147
Fe-55

MAXIMUM ACTIVITY: 300 mCi (11 GBq)
500 mCi (18.5 GBq)
50 mCi (1.9 GBq)

LEAK TEST FREQUENCY: N/A (Kr-85)
36 months (Pm-147)
6 months (Fe-55)

PRINCIPAL USE: (E) Beta Gauge

CUSTOM DEVICE: __X__ YES _____ NO

CUSTOM USERS: Wilsonart International, Inc.
2400 Wilson Place
Temple, Texas 76503-6110

Dynea Overlays, Inc.
2144 Milwaukee Way
Tacoma, WA 98421-2706

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
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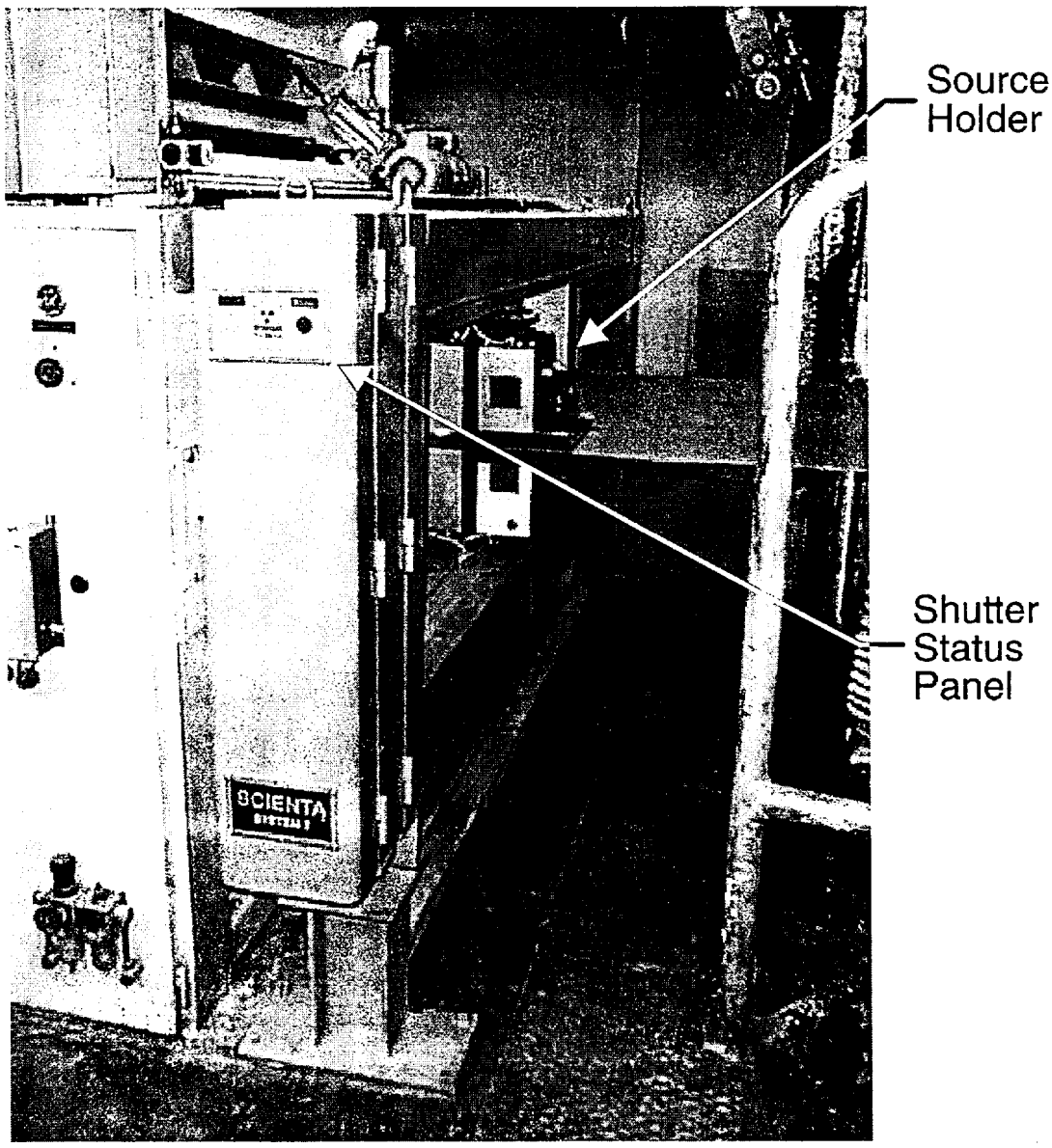
DEVICE TYPE: On-line basis weight gauge

DESCRIPTION: The Scienta Model **7210** basis weight gauge is part of an on-line measurement and control system for paper recycling machines. The gauge, attached to an O-frame, scans the paper web measuring the thickness of paper as it is produced.

A Typical Installation



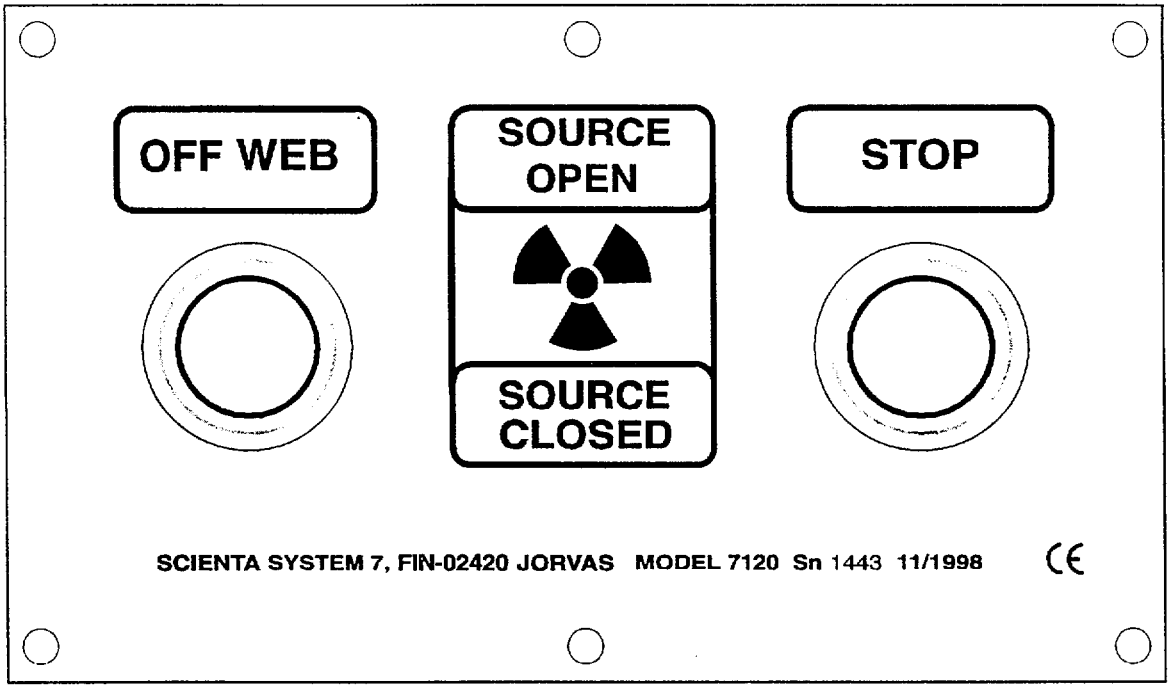
The source holder is made of three major components; a cast aluminum body, a metal alloy source retainer, and a pneumatically operated shutter. These components are enclosed inside a chamber to prevent dust build-up and maintain a constant environment around the source holder and detector head.

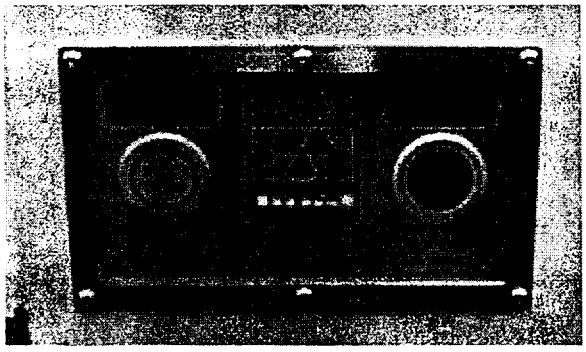
DEVICE TYPE: On-line basis weight gauge

DESCRIPTION (Cont'd.): The cast aluminum body is designed to hold the radioactive source and associated components. The shutter has a lead insert with a plastic cover to reduce 'Bremstrahlung' production. A plastic tube is inserted into a cavity in the body of the source holder which holds the source in place and also assists in reducing 'Bremstrahlung' production.

Attached between the source holder and the detector head are steel "aligner plates" with a plastic cover to aid in the smooth passage of the paper between the source holder and the detector head and to prevent human access to the radiation beam.

The shutter mechanism is pneumatically operated with a spring attached to close the shutter if air pressure is lost or the gauge is turned off. A light panel on the end of the scanner indicates the status of the shutter mechanism. This panel is controlled by a micro-switch on the shutter.





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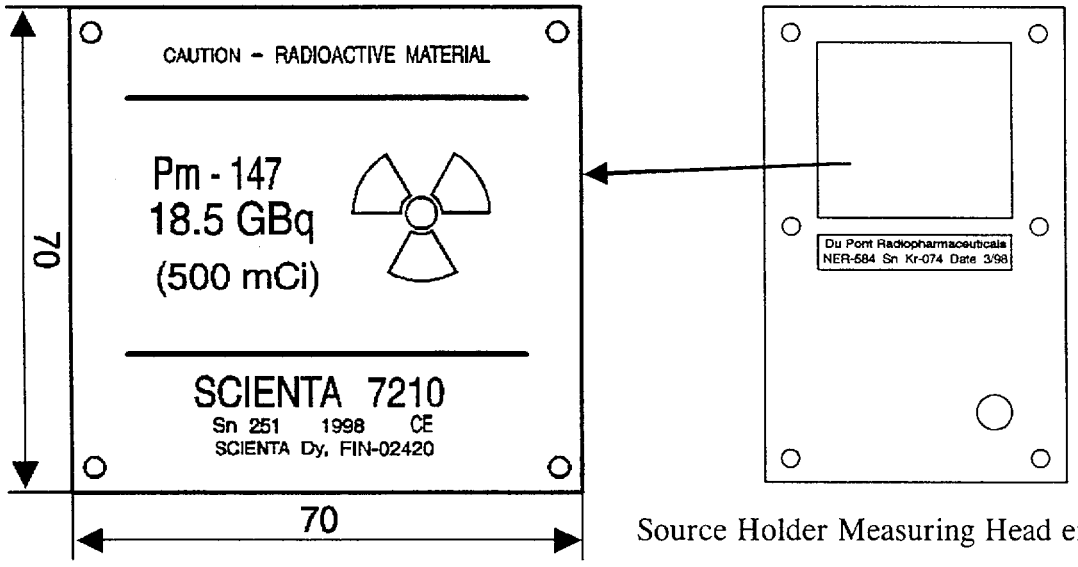
DEVICE TYPE: On-line basis weight gauge

LABELING: The Model **7210** has a label on the side of the measuring head facing the end of the status panel of the O-Frame Scanner. This panel contains the information indicated below.



Source Holder Measuring Head end plate

If Kr-85 **or Fe-55** is used, the appropriate information will replace the Pm-147 information. A source manufacturer label will be attached below this label and will provide the sealed source manufacturer's name, the sealed source model number, serial number of the sealed source and the date of assay. This label is attached with a heat-moisture resistant adhesive and will be replaced with the replacement of the source.

DIAGRAM: See Attachments.

CONDITIONS OF NORMAL USE: The gauge heads are designed to operate in temperatures up to 60°C in a wet dusty environment. The gauge is normally on the web (measuring paper thickness), except for a short period each hour when it returns to its off web position to perform a short calibration. Operational lifetime of the device is about fifteen years. Source replacement is less than three years (approximately one half-life).

PROTOTYPE TESTING: The source holder mechanism design has been in use by Scienta for over 25 years with no incidents or accidents resulting in radiation exposure in Europe.

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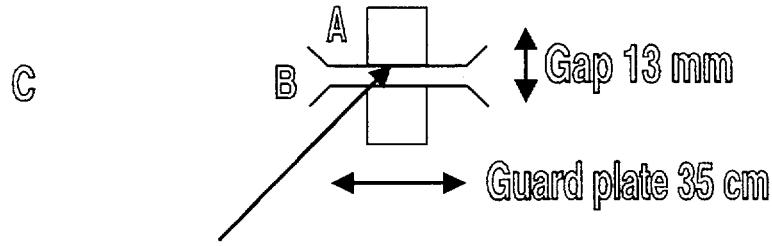
DEVICE TYPE: On-line basis weight gauge

EXTERNAL RADIATION LEVELS: Radiation dose rates from the source holder result primarily from 'Bremstrahlung' production in the walls of the source holder **and low energy x-rays from the Fe-55 source**. Dose rates when each source is in place are provided in the table below:

	A	B	C
RADIONUCLIDE, MAXIMUM ACTIVITY	**At 5 cm from source, SHUTTER CLOSED**	**At 30 cm from source, SHUTTER OPEN**	**At 100 cm from source, SHUTTER OPEN**
Kr-85, 300 mCi (11000 MBq)	< 7.5 mRem/h (< 75 μSv/h)	< 1.5 mRem/h (< 15 μSv/h)	< 0.15 mRem/h (< 1.5 μSv/h)
Pm-147, 500 mCi (18500 MBq)	< 1 mRem/h (< 1 μSv/h)	< 5 mRem/h (< 5 μSv/h)	< 1 mRem/h (< 1 μSv/h)
Fe-55, 50 mCi (1900 MBq)	**< 1 mRem/h (< 1 μSv/h)**	**< 1 mRem/h (< 1 μSv/h)**	**< 1 mRem/h (< 1 μSv/h)**



Source beam aperture is 20 mm.

QUALITY ASSURANCE AND CONTROL: The device is manufactured and assembled to rigid specifications. The custom user is required to check the device against the manufacturer's specifications for final acceptance.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- This device uses either a 300 mCi Kr-85 source, a 500 mCi Pm-147 **or a 50 mCi Fe-55** source. Since the Kr-85 source is a gaseous source, no leak test is required. If the Pm-147 source is used, a leak test interval of three years or at source exchange is required. **A six month leak test interval is required when utilizing the Fe-55 source.**
- Maintainence of the source holder is restricted to the manufacturer.
- Work on the system near the source holder is prohibited when the shutter is in the OPEN position.

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DEVICE TYPE: On-line basis weight gauge

SAFETY ANALYSIS SUMMARY: The Model **7210** source holder is designed to provide the maximum beta radiation while limiting the 'Bremstrahlung' produced to a minimum. **When utilizing the Fe-55 source, a scintillation detector replaces the ion chamber for detection of low energy x-rays.** The shutter is designed to maintain a safe condition if air pressure or electrical power is lost. This system is designed to operate in an environment of high humidity and temperatures up to 60°C.

REFERENCES:

The following supporting documents from Wilsonart International for Oy Scienta Ab are hereby incorporated by reference and are made a part of this registry document.

- letter dated November 24, 1998 with associated documents and drawings,
- drawing received January 6, 1999,
- information dated January 19, 1999 from Scienta, and
- **letter dated November 27, 2001.**

ISSUING AGENCY: Texas Department of Health
Bureau of Radiation Control

Date: December 5, 2001 Reviewer: _____
David B. Fogle

Date: December 5, 2001 Concurrence: _____
Peter H. Myers

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
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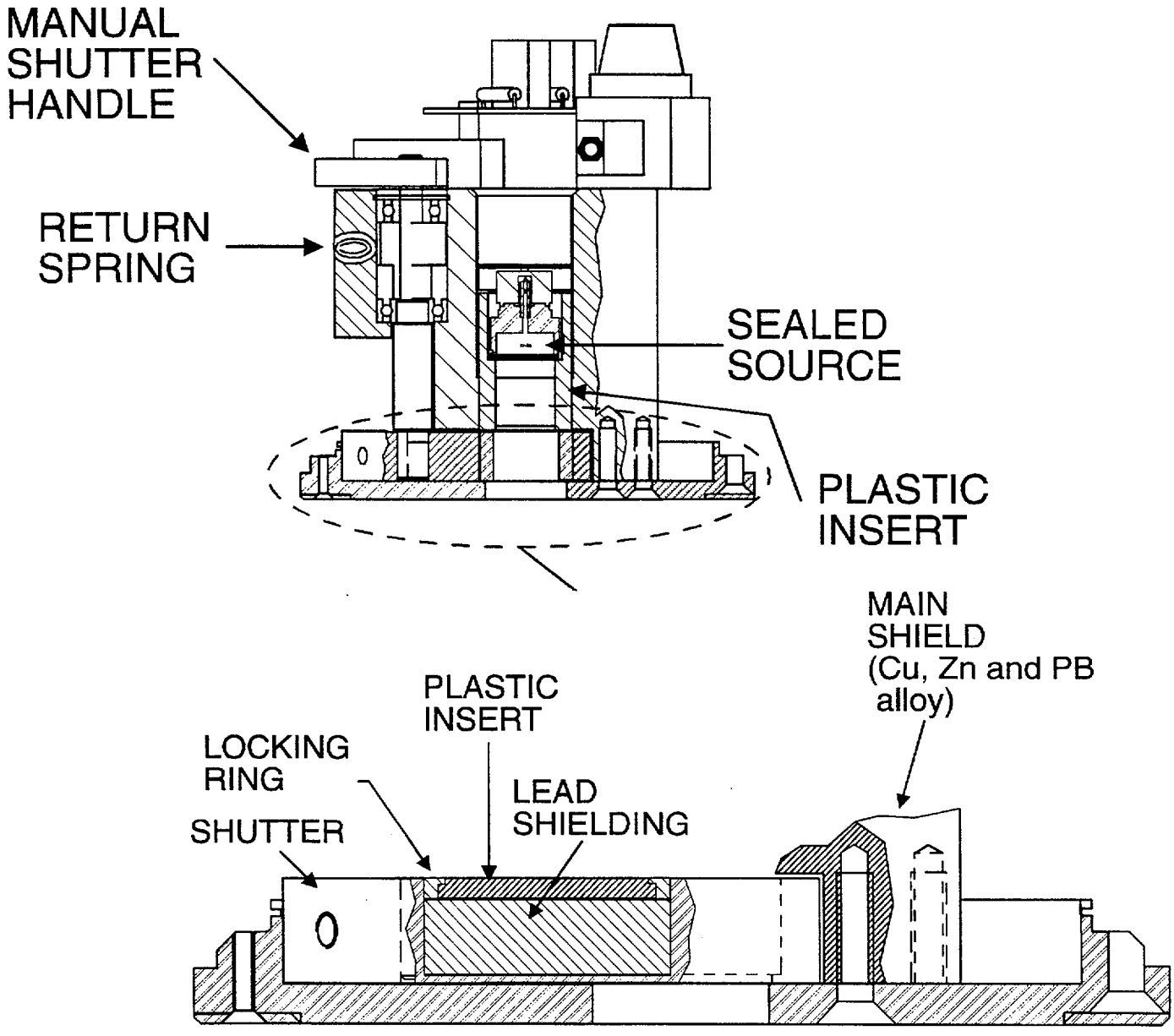
Amended in Entirety

NO.: TX1069D101S DATE: January 29, 1999 ATTACHMENT 1

DIAGRAM:



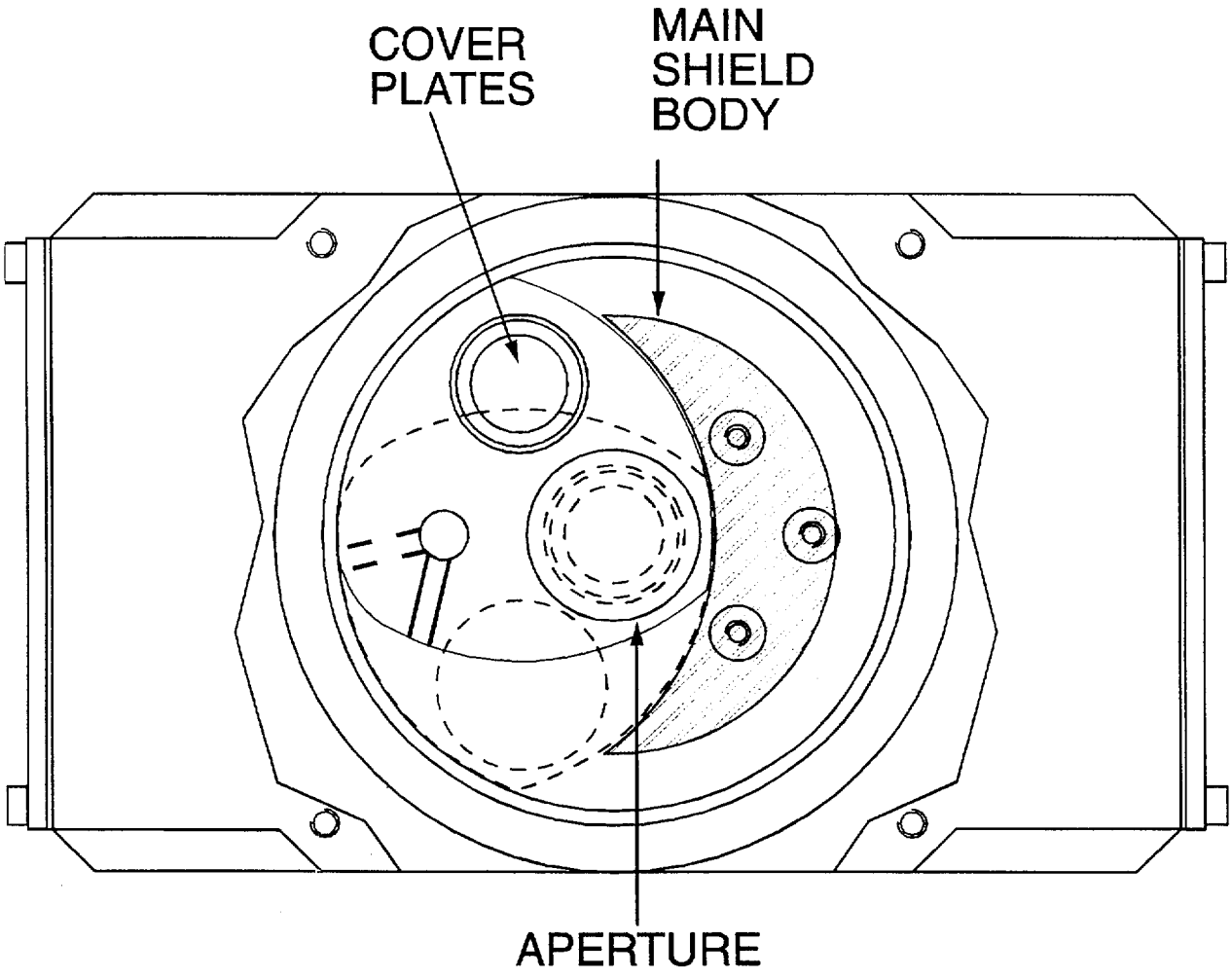
Side View of Source Holder

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

Amended in Entirety

NO.: TX1069D101S DATE: January 29, 1999 ATTACHMENT 2

DAIGRAM:



Bottom View of Source Holder Inside Environmental Housing
(- - - = CLOSED position and —— = OPEN position)