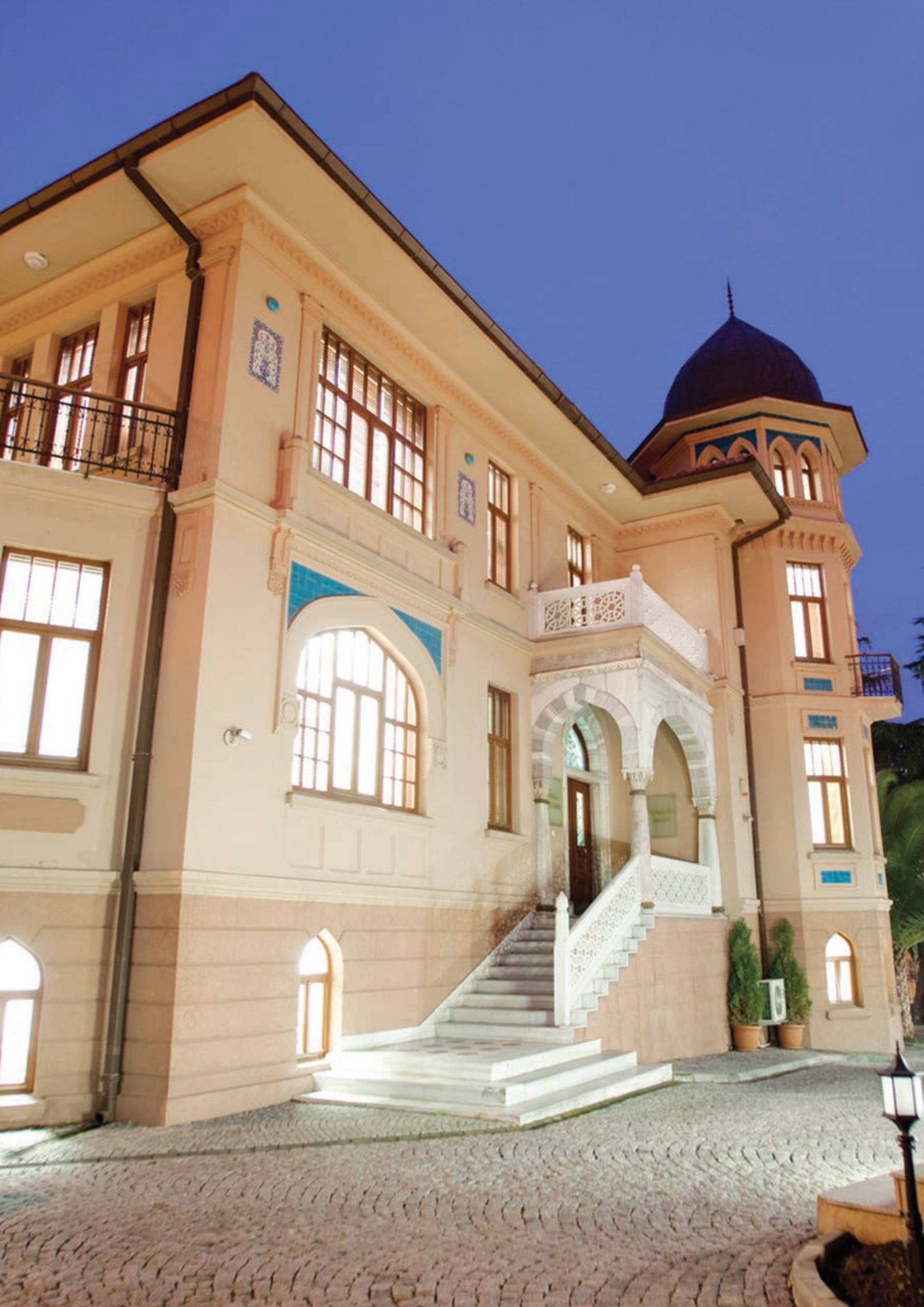
ERS
Epsilon Radioactive Sources

NUCLEAR MEDICINE REFERENCE & CALIBRATION SOURCES

EPSILON RADIOACTIVE SOURCES

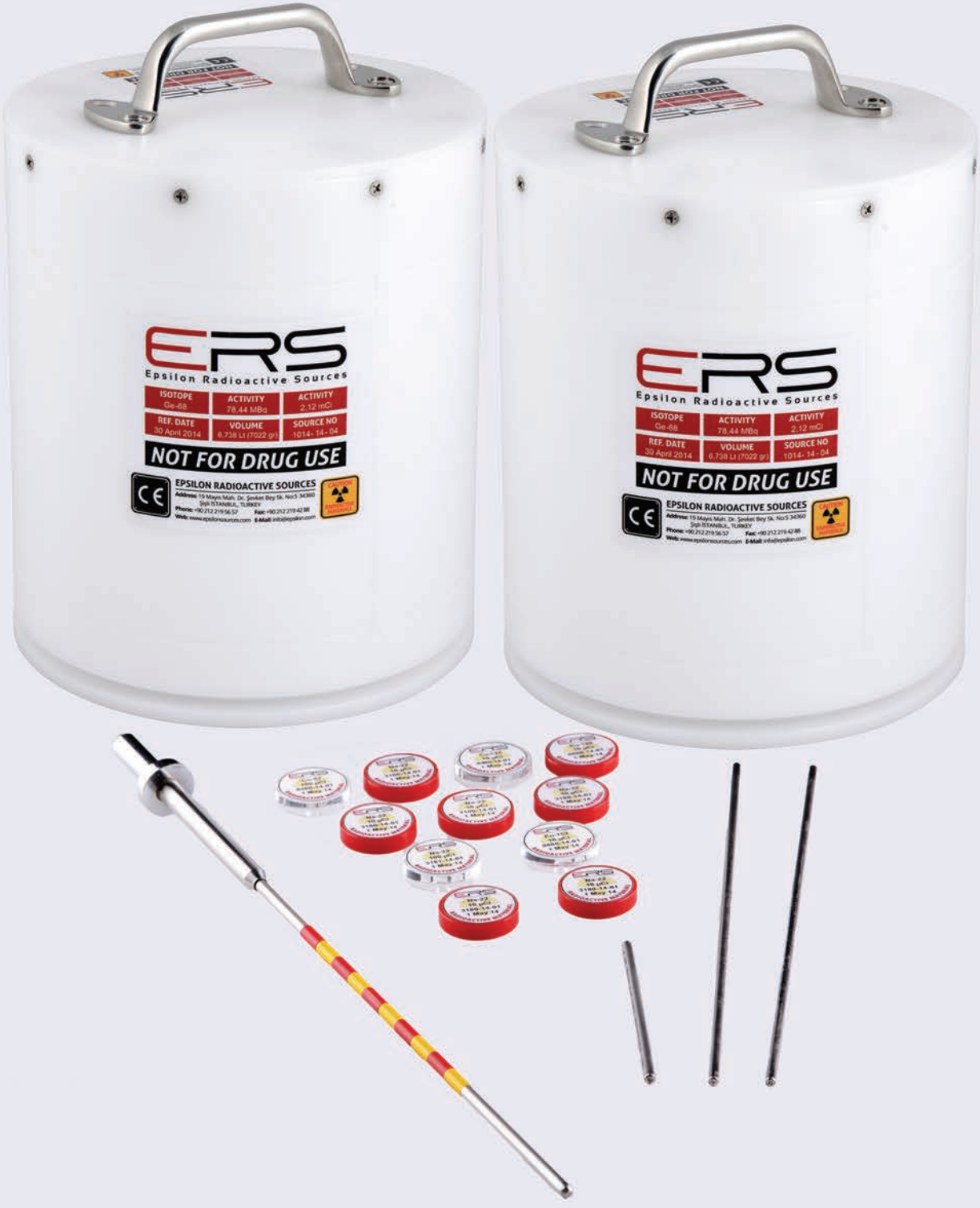
NUCLEAR MEDICINE REFERENCE & CALIBRATION SOURCES

CONTENTS



PET/CT & PET/MR SOURCES

ERS manufactures quality assurance sources that are compatible with the leading PET OEM manufacturers to provide high-quality products and customer satisfaction. For the calibration of PET and PET-CT systems, Ge-68 and Na-22 sources are used in different forms and activities depending on the system model. Customized PET and PET-CT sources in different forms and activities can be offered upon customer request by ERS. Please contact your local distributor or ERS headquarters for product availability and additional information.


ERS
Epsilon Radioactive Sources
ISOTOPE
Ge-68
ACTIVITY
78.44 MBq
ACTIVITY
2.12 mCi
REF. DATE
30 April 2014
VOLUME
6.738 LI (7022 gr)
SOURCE NO
1014- 14 - 04
NOT FOR DRUG USE
EPSILON RADIOACTIVE SOURCES
CE
ERS
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CE

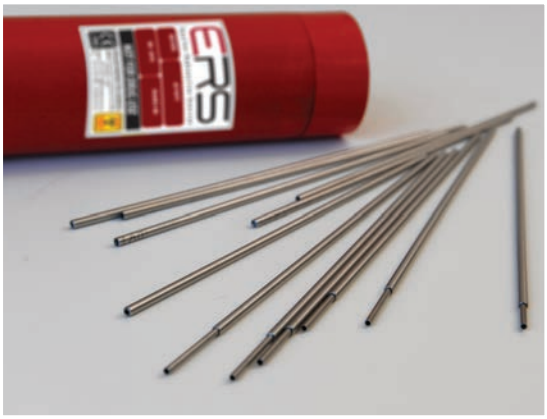
SIEMENS PET/CT & PET/MR

SOURCES

LINE SOURCES

Ge-68 line sources are double layered tubes made of high quality stainless steel. Each line source is sealed on its ends by the process of precise argon welding. Thanks to the argon welding process, the possibility of activity leakage is eliminated, ensuring safe use of line sources.

Source related information including product code, isotope type, activity, serial number and production date is permanently marked with laser for traceability.



Uniformity

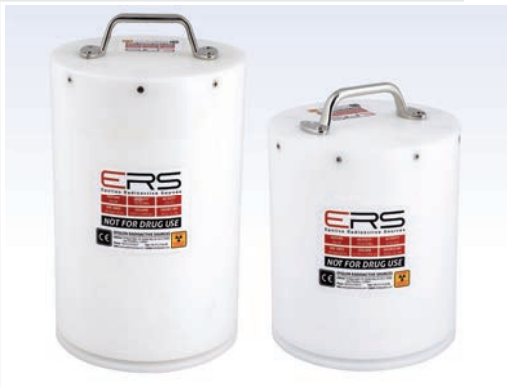
Each line source is tested with 5 mm steps of scannings throughout its length for uniformity.

The uniformity of the line sources is within +/- 5% limits.

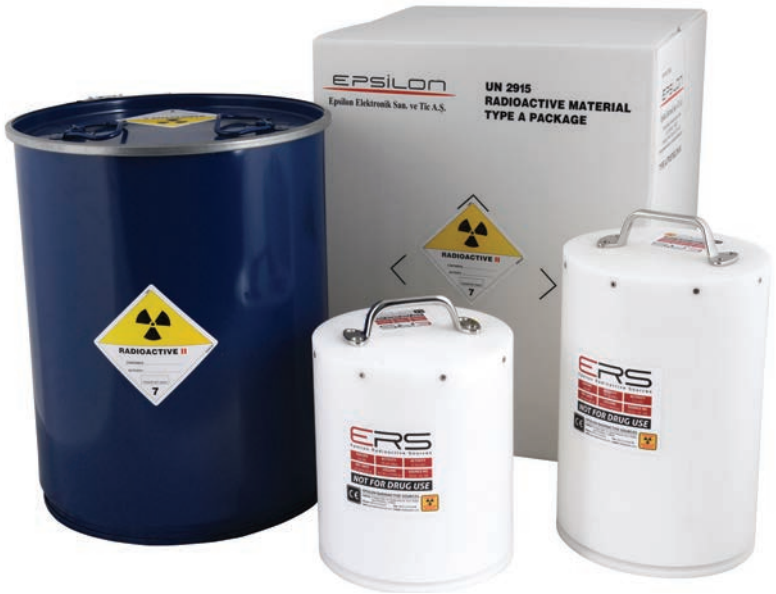
GE-68 CYLINDIRICAL PHANTOM

Ge-68 Cylindirical phantoms are used for 2D and 3D normalization and in test images of PET and PET-CT systems. Radioactive element is uniformly filled in the cylindrical cast. Each cylindrical phantom manufactured is checked with a PET-CT scanner to ensure high quality.

The results of quality control image files are available upon request.



SIEMENS HEALTHINEERS SYSTEM MODEL	PRODUCT CODE	PRODUCT TYPE	ISOTOPE	ACTIVITY		QUANTITY	REPLACEMENT PERIOD*
				SI	NON SI		
BIOGRAPH							
Initial Set-up & Annual Replacement	FNT1010	Phantom	Ge-68	44 MBq	1.19 mCi	1	1 Year
	CBK1020	Line Source	Ge-68	37 MBq	1 mCi	2	1 Year
	TST1030	Test Tube	Ge-68	5.5 kBq	0.15 uCi	1	1 Year
BIOGRAPH PICO							
Initial Set-up & Annual Replacement	FNT1014	Phantom	Ge-68	74 MBq	2 mCi	1	1 Year
	CBK1020	Line Source	Ge-68	37 MBq	1 mCi	2	1 Year
	TST1031	Test Tube	Ge-68	15 kBq	0.41 uCi	1	1 Year
BIOGRAPH TRUE V & BIOGRAPH mCT & HORIZON							
Initial Set-up & Annual Replacement	FNT1012 -FNT1013	Long Phantom	Ge-68	74-92.5 MBq	2-2.50 mCi	1	1 Year
	CBK1020	Line Source	Ge-68	37-46.25 MBq	1-1.25 mCi	2	1 Year
	TST1031	Test Tube	Ge-68	15 kBq	0.41 uCi	1	1 Year
BIOGRAPH mMR							
Initial Set-up & Annual Replacement	FNT1015	Long Phantom	Ge-68	111 MBq	3mCi	1	1 Year
	CBK1025	Line Source	Ge-68	55 MBq	1.48 mCi	4	1 Year
	TST1031	Test Tube	Ge-68	15 kBq	0.41 uCi	1	1 Year



* Recommended

GE PET/CT

SOURCES

LINE SOURCES

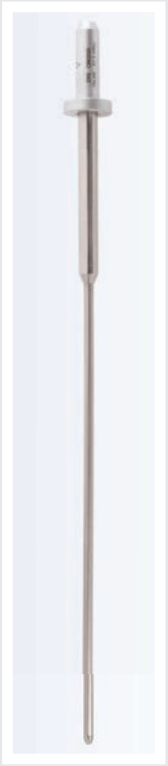
Ge-68 line sources are triple layered tubes and made of high quality stainless steel. Each line source is sealed on its ends by the process of precise argon welding. Thanks to the argon welding process, the possibility of activity leakage is eliminated, ensuring safe use of line sources.

Source related information including product code, isotope type, activity, serial number and production date is permanently marked with laser for source traceability.

Uniformity

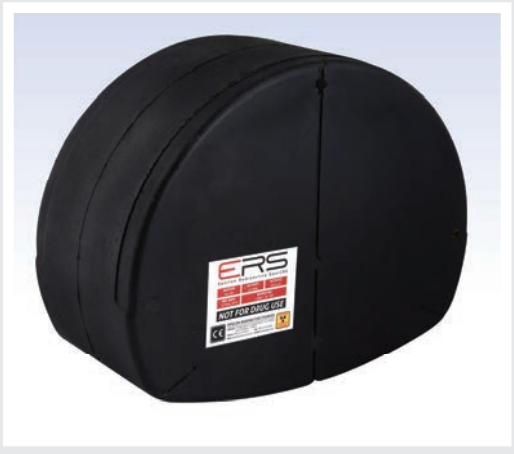
Each line source is tested with 5 mm steps of scannings throughout its length for uniformity.

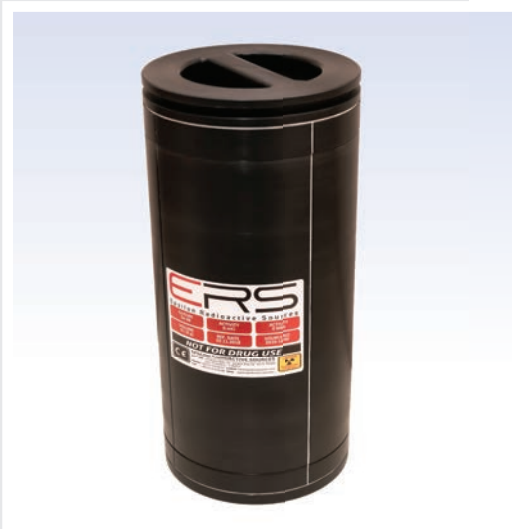
The uniformity of the line sources is within +/- 5% limits.



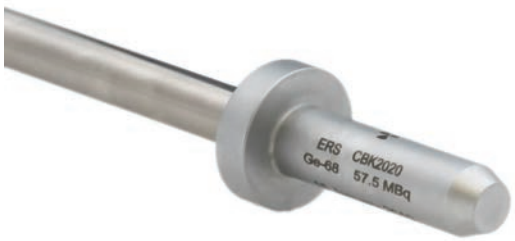
ANNULUS &VQC PHANTOM

Each Annulus & VQC phantom manufactured is scanned by a PET scanner to perform uniformity quality control test.





GE HEALTHCARE SYSTEM MODEL	PRODUCT CODE	PRODUCT TYPE	ISOTOPE	ACTIVITY		QUANTITY	REPLACEMENT PERIOD*
				SI	NON SI		
DISCOVERY ST							
	CBK2020	Line Source	Ge-68	55 MBq	1.49 mCi	1	1 Year
DISCOVERY 600							
	FNT2090	VQC Phantom	Ge-68	3.5 MBq	0.095 mCi	1	1 Year
	CBK2022	Line Source	Ge-68	10 MBq	0.27 mCi	1	1 Year
DISCOVERY 690 & 690 ELITE							
	FNT2090	VQC Phantom	Ge-68	3.5 MBq	0.095 mCi	1	1 Year
	CBK2021	Line Source	Ge-68	18.5 MBq	0.5 mCi	1	1 Year
DISCOVERY 710 & 710 ELITE							
	FNT2090	VQC Phantom	Ge-68	3.5 MBq	0.095 mCi	1	1 Year
	CBK2021	Line Source	Ge-68	18.5 MBq	0.5 mCi	1	1 Year
DISCOVERY LS							
	CBK2023	Line Source	Ge-68	60 MBq	1.62 mCi	1	2 Years
	CBK2024	Line Source	Ge-68	400 MBq	10.81 mCi	2	6-9 Months
DISCOVERY IQ							
	FNT2010	Annulus Phantom	Ge-68	55 MBq	1.5 mCi	1	1 Year
	FNT2090	VQC Phantom	Ge-68	3.5 MBq	0.095 mCi	1	1 Year



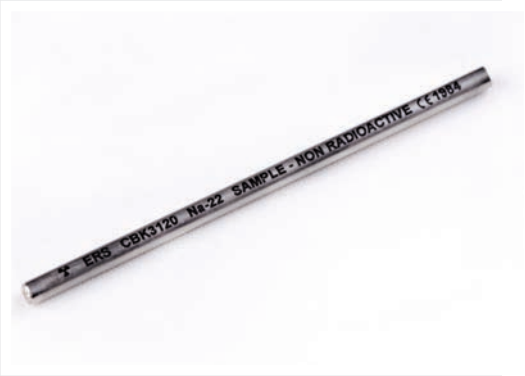
* Recommended

PHILIPS PET-CT

SOURCES

LINE SOURCES

Na-22 line sources are double layered tubes made of high quality stainless steel. Each line source is sealed on its ends by the process of precise argon welding. Thanks to the argon welding process, the possibility of activity leakage is eliminated, ensuring safe use of line sources.



Uniformity

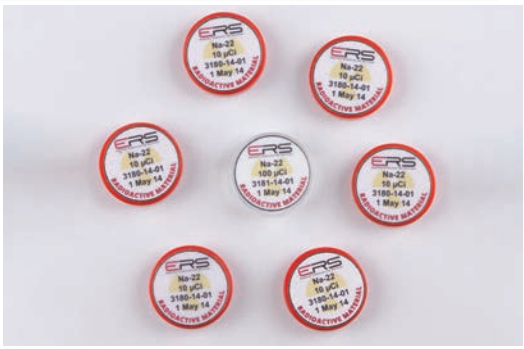
Each line source is tested with 5 mm steps of scannings throughout its length for uniformity.

The uniformity of the line sources is within +/- 5% limits.

SPOT SOURCES

Na-22 point sources are in two different forms; glass filled teflon capsule and acrylic disc.

Epoxy marked active area is located in the center of the point source with the dimension of 1 mm x 1 mm (0.39”x 0.39”) Overall dimensions for glass filled teflon capsule and acrylic disc type point sources are 25.4 mm x 6.35 mm (1” x 0.25”) and 25.4 mm x 5 mm (1”x 0.20”) respectively.



PHILIPS HEALTHCARE SYSTEM MODEL	PRODUCT CODE	PRODUCT TYPE	ISOTOPE	ACTIVITY		QUANTITY	REPLACEMENT PERIOD*
				SI	NON SI		
GEMINI GXL							
	SPT3181	Spot Marker	Na-22	3.7 MBq	0.1 mCi	1	2 Years
	SPT3180	Spot Marker	Na-22	0.37 MBq	0.01 mCi	6	2 Years
GEMINI TF							
	CBK3120	Line Source	Na-22	3.7 MBq	0.1 mCi	1	2 Years
	SPT3180	Spot Marker	Na-22	0.37 MBq	0.01 mCi	6	2 Years
CPET & ALLEGRO							
	SPT3181	Spot Marker	Na-22	3.7 MBq	0.1 mCi	1	2 Years
VEREOS							
	CBK3121	Line Source	Na-22	14.8 MB	0.4mCi	1	2 Years
	SPT3180	Spot Marker	Na-22	0.37 MBq	0.01 mCi	6	2 Years

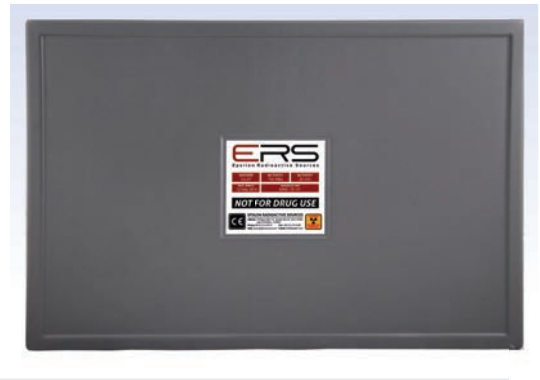
* Recommended

FLOOD SOURCES

FLOOD

SOURCES

Co-57 flood sources are intented to produce uniform radiation field across the camera's usable field of view with the method's of NEMA NU-1-2007 to evaluate the gama camera uniformity.



Uniformity

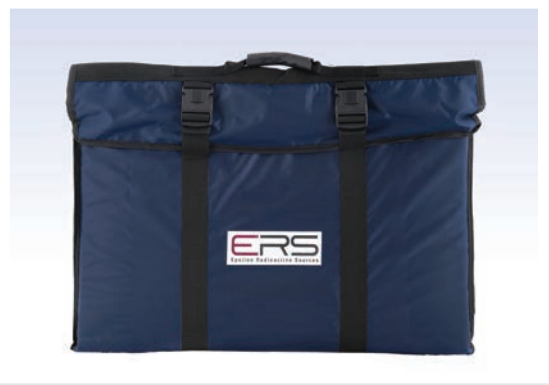
ERS flood sources are manufactured according to following specifications in accordance with ANSI 42.27.

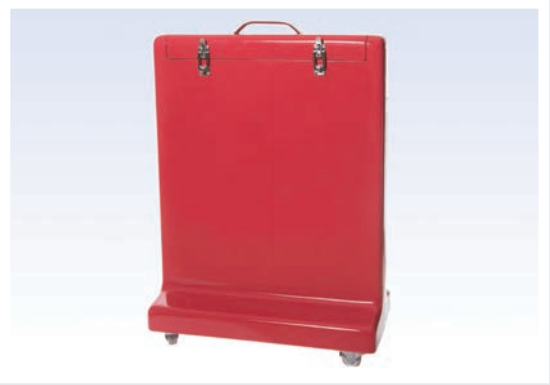
CV ≤ 0,9% INU ≤ 3,6 %

LEAD SHIELDING AND CARRYING CASE

ERS offers lead shielding and carrying case accessories to provide high-level radiation protection during Co-57 flood source transportation.

Unless otherwise indicated, flood source orders come with the lead shielded carrying case as a standart accessory.





PRODUCT CODE	PRODUCT TYPE	ISOTOPE	ACTIVITY	
			SI	NON SI
DZM6260-5M	Rectangular	Co-57	185 MBq	5 mCi
DZM6260-10M	Rectangular	Co-57	370 MBq	10 mCi
DZM6260-15M	Rectangular	Co-57	555 MBq	15 mCi
DZM6260-20M	Rectangular	Co-57	740 MBq	20 mCi
DZM6262-5M**	Rectangular	Co-57	185 MBq	15 mCi
DZM6262-10M**	Rectangular	Co-57	370 MBq	10 mCi
DZM6262-15M**	Rectangular	Co-57	555 MBq	15 mCi
DZM6262-20M **	Rectangular	Co-57	740 MBq	20 mCi
DZM6261-20M	Square	Co-57	740 MBq	20 mCi

** Lighter flood source

PRODUCT CODE	OVERALL DIMENSIONS		ACTIVE AREA DIMENSIONS	
	cm	inches	cm	inches
DZM6260	66 cm x 46 cm	25.98"x 18.11"	61.7 cm x 42.3 cm	24.29" x 16.65"
DZM6261	27 cm x 29 cm	11.1"x11.1"	25.4 cmx 25.4cm	10" x 10"
DZM6262	62.4 cmx 43 cm	24.56"x 16.92"	61.7 cm x 42.3 cm	24.29" x 16.65"

DOSE CALIBRATOR SOURCES
SPOT MARKERS

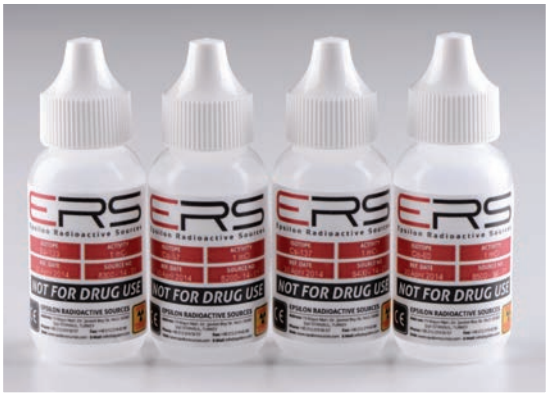
DOSE CALIBRATOR SOURCES
SPOT MARKERS

DOSE CALIBRATOR

SOURCES

ERS dose calibrator reference sources are calibrated by direct comparison of standardized solutions traceable to the National Institute of Standards and Technology (NIST), in an identical geometry, using a pressurized ion chamber with ±%5 accuracy. Dose Calibrator sources are manufactured by adding 20 ml activity of epoxy composition in 30 ml volumed of polyethelen vial. Each dose calibrator source has its own colored-coded epoxy.

Cobalt-57, Cobalt-60, Cesium-137, Barium-133 dose calibrator reference sources can be supplied in set or individually in accordance with customer request.



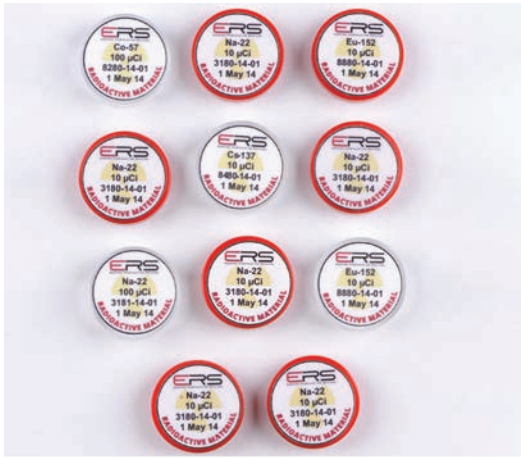
PRODUCT CODE	PRODUCT TYPE	ISOTOPE	ACTIVITY	
			SI	NON SI
RKK8200-5M	Reference Source	Co-57	185 MBq	5 mCi
RKK8200-10M	Reference Source	Co-57	370 MBq	10 mCİ
RKK8400-250u	Reference Source	Cs-137	9.25 MBq	0.25 mCİ
RKK8400-200u	Reference Source	Cs-137	7.4 MBq	0.20 mCi
RKK8300	Reference Source	Ba-133	9.25 MBq	0.25 mCi
RKK8500	Reference Source	Co-60	1.85 MBq	0.05 mCi
RKKSET1	Reference Source	Co-57	185 MBq	5 mCi
	Reference Source	Cs-137	7.4 MBq	0.20 mCi
	Reference Source	Ba-133	9.25 MBq	0.25 mCi
RKKSET2	Reference Source	Co-57	185 MBq	5 mCi
	Reference Source	Co-60	1.85 MBq	0.05 mCi
	Reference Source	Cs-137	7.4 MBq	0.20 mCi
RKKSET3	Reference Source	Co-57	185 MBq	5 mCi
	Reference Source	Co-60	1.85 MBq	0.05 mCi
	Reference Source	Cs-137	7.4 MBq	0.20 mCi
	Reference Source	Ba-133	9.25 MBq	0.25 mCi

SPOT
MARKERS

ERS spot markers are used for a range of purposes including patient orientation during a camera study, gamma camera calibration and quality control, gamma probe and NaI detectors calibration and performance check.

Epoxy marked active area is located in the center of the spot marker with a spherical diameter of 1.8 mm (0.71”).

Overall dimensions of ERS spot markers are 25.4 mm x 6.35 mm (1” x 0.25”).



PRODUCT CODE	PRODUCT TYPE	ISOTOPE	ACTIVITY	
			SI	NON SI
SPT8280-25u	Spot Marker	Co-57	0.925 MBq	0.025 mCi
SPT8280-50u	Spot Marker	Co-57	1.85 MBq	0.05 mCi
SPT8280-100u	Spot Marker	Co-57	3.7 MBq	0.1 mCi
SPT8280-200u	Spot Marker	Co-57	7.4 MBq	0.2 mCi
SPT8280-1M	Spot Marker	Co-57	37 MBq	1 mCi
SPT8280-2M	Spot Marker	Co-57	74 MBq	2 mCi
SPT8480-5u	Spot Marker	Cs-137	0.185 MBq	0.005 mCi
SPT8480-10u	Spot Marker	Cs-137	0.37 MBq	0.01 mCi
SPT8080-100u	Spot Marker	Ge-68	3.7 MBq	0.1 mCi
SPT8080-500u	Spot Marker	Ge-68	18.5 MBq	0.5 mCi
SPT8180-100u	Spot Marker	Na-22	3.7 MBq	0.1 mCi
SPT8180-500u	Spot Marker	Na-22	18.5 MBq	0.5 mCi

PEN POINT MARKERS
ROD SOURCES

PEN POINT MARKERS
ROD SOURCES

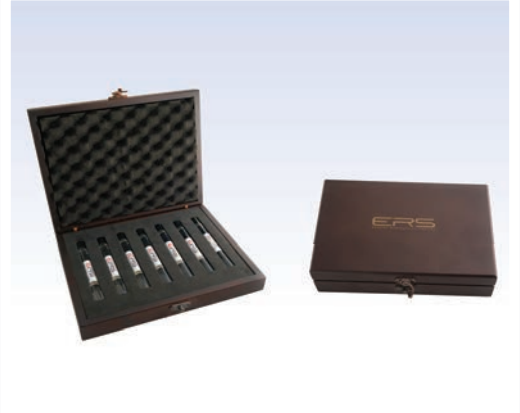
ROD

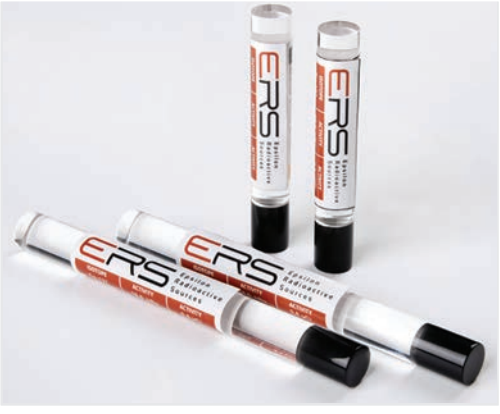
SOURCES

ERS rod sources and Pen Point Markers are calibrated by direct comparison of standardized solutions traceable to the National Institute of Standards and Technology (NIST), in an identical geometry, using a pressurized ion chamber with ±%5 accuracy.

ERS rod sources can be supplied in set or invidually in accordance with customer request

Rod Source dimensions are 12.7 mmx127 mm (0.5”x5”) / 12.7 mmx74.9mm (0.5”x2.95”).



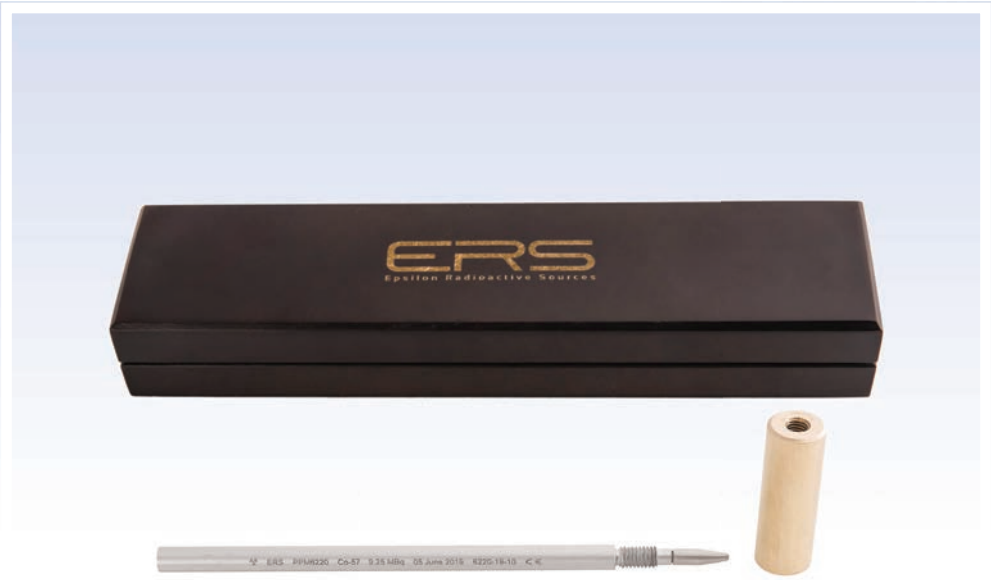


ERS offers a wide range of rod sources that are used for calibrating well counters and thyroid uptake systems. Rod sources are constructed of acrylic material and have a flat base which allows easy positioning in the vertical position required for consistent accuracy of the calibration process.

PRODUCT CODE	PRODUCT TYPE	ISOTOPE	ACTIVITY		DIMENSIONS (Diameter x Length)	
			SI	NON SI	mm	inches
KSR8230-0,1u	Rod Source	Co-57	3.7 kBq	0.1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8230-1u	Rod Source	Co-57	37 kBq	1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8430-0,1u	Rod Source	Cs-137	3.7 kBq	0.1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8430-0,5u	Rod Source	Cs-137	18.5 kBq	0.5 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8430-1u	Rod Source	Cs-137	37 kBq	1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8330-0,1u	Rod Source	Ba-133	3.7 kBq	0.1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8330-1u	Rod Source	Ba-133	37 kBq	1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8530-0,1u	Rod Source	Co-60	3.7 kBq	0.1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8530-1u	Rod Source	Co-60	37 kBq	1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8630-0,1u	Rod Source	Mn-54	3.7 kBq	0.1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8630-1u	Rod Source	Mn-54	37 kBq	1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8130-0,1u	Rod Source	Na-22	3.7 kBq	0.1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8130-1u	Rod Source	Na-22	37 kBq	1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8730-0,1u	Rod Source	Cd-109	3.7 kBq	0.1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8730-1u	Rod Source	Cd-109	37 kBq	1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8830-0,1u	Rod Source	Eu-152	3.7 kBq	0.1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8830-0,5u	Rod Source	Eu-152	18.5 kBq	0.5 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8830-1u	Rod Source	Eu-152	37 kBq	1 uCi	12.7mm x 127 mm	0.5" x 5"
KSR8240-0,1u	Rod Source	Co-57	3.7 kBq	0.1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8240-1u	Rod Source	Co-57	37 kBq	1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8440-0,1u	Rod Source	Cs-137	3.7 kBq	0.1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8440-1u	Rod Source	Cs-137	37 kBq	1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8340-0,1u	Rod Source	Ba-133	3.7 kBq	0.1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8340-1u	Rod Source	Ba-133	37 kBq	1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8540-0,1u	Rod Source	Co-60	3.7 kBq	0.1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8540-1u	Rod Source	Co-60	37 kBq	1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8640-0,1u	Rod Source	Mn-54	3.7 kBq	0.1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8640-1u	Rod Source	Mn-54	37 kBq	1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8140-0,1u	Rod Source	Na-22	3,7 kBq	0.1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8140-1u	Rod Source	Na-22	37 kBq	1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8740-0,1u	Rod Source	Cd-109	3.7 kBq	0.1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8740-1u	Rod Source	Cd-109	37 kBq	1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8840-0,1u	Rod Source	Eu-152	3.7 kBq	0.1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"
KSR8840-1u	Rod Source	Eu-152	37 kBq	1 uCi	12.7mm x 74.9 mm	0.5" x 2.95"

PEN POINT MARKERS

PRODUCT CODE	PRODUCT TYPE	ISOTOPE	ACTIVITY	
			SI	NON SI
PPM6220-100u	Pen Point Marker	Co-57	3.7 MBq	100 uCi
PPM6220-200u	Pen Point Marker	Co-57	7.4 MBq	200 uCi
PPM6220-250u	Pen Point Marker	Co-57	9.25 MBq	250 uCi



AREA MONITOR

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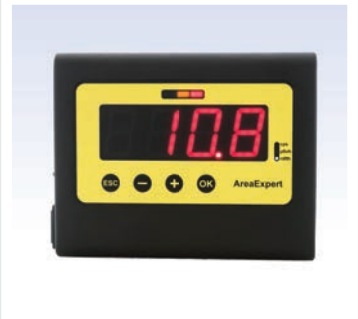
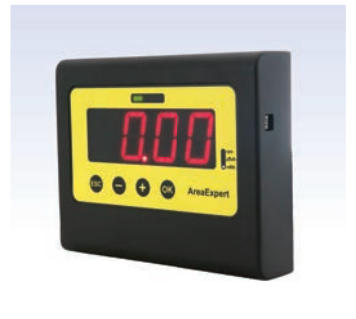
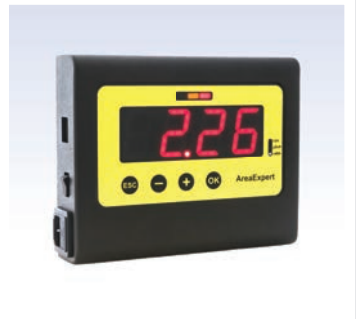
Detector Type	Energy Compansated GM
Display Type	7-Segment + BarGraph
Units	uSv/hr, mR/hr, cps
Sensitivity	Depends on internal detector 18cps/mR/hr for Co-60 with LND71210 1.5cps/mR/hr for Co-60 with LND71412
Measuring Range	0-1000 mR/hr, 0-4000 mR/hr
Response Tim	3s for the 90% of the actual value
Alarm Levels	2 programmable alarm levels indicating 3 states. Safe Area Low Alarm Level, High Alarm Level
Run On Battery	10 hours (min) in no alarm conditions
Battery Indicator	Battery indicator on blinking Green LED
Battery Type	3000mAh Li-Po battery
Calibration	Calibration via membrane keypad or remote application
Monitoring	WEB based or mobile application monitoring interface
Data Output	Ethernet (only AreaExpert +)
Detector Bias Voltage	50 VDC within %1
Power Line	85-265 VAC 50-60Hz, PoE and Battery backup line
External Device	ON/OFF dry contact giving ability to control external device on alarm condition
Operating Environment	0-50C, 0 to 90%RH
Mounting Type	Wall mount adapter
Enclosure	Low attenuation material (Aluminum 6061)







PRODUCT CODE	PRODUCT NAME
AE-01	AreaExpert
AE-02	AreaExpert + (w/network option)

ERS
Epsilon Radioactive Sources

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