Radiation Monitors

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EXPERIENCE & EXPERTISE

Contents

Radhound Monitors

Radhound monitors are ideal for use within a large range of sectors, including academia, pharmaceutical research and nuclear medicine/PET. These meters are compatible with a broad range of Geiger-Müller, sodium iodide and plastic scintillator based probes to cover the whole spectrum of contamination and dose rate measurement requirements.

Tracerco Monitors

The Tracerco range is unique, robust and innovative – great for use in the laboratory or by radiation protection professionals out in the field.

Radhound Multi-purpose Digital Radiation Meter

A multi-purpose digital radiation survey meter suitable for all your contamination monitoring and radiation protection requirements, the Radhound is a cost effective, feature packed digital radiation monitor that is simple and easy to use.

Count rate is displayed in large clear numbers and also on a bar scale. Our smart averaging software means a steady display that can be read with confidence, yet provides a fast response.

For source finding, one button push changes the display to a histogram plot. Alpha and Beta/Gamma counts can be displayed separately or on the same screen.

For surveying operations the Radhound also has an integrator mode.

- Clear digital LCD display with backlight.
- GM and scintillation detector options.
- Scaler timer function.
- Ergonomic tilt stand.
- Wall mountable.
- Fully adjustable alarm levels.

Radhound Multi-purpose Digital Radiation Meter with SS315 probe

Radhound Multi-purpose Digital Radiation Meter with SS404 probe

Radhound X/E and X/I

The Radhound X/E is an advanced hand-held general purpose radiation monitor, suitable for a wide range of probes. The X/I is a Radhound with an internal dose rate detector.

This feature-packed instrument boasts some unique features, such as the ability to switch between probes via the menu allowing, for example, a dose rate probe and a contamination probe to be configured for use with one instrument. This flexibility allows any standard probe to be used (operating voltage 300 - 1200 V).

- Clear digital LCD display with backlight.
- GM and scintillation detector options.
- Multiple probe library/configuration.
- Fully adjustable alarm levels.
- Scaler timer function.
- Over range indication.
- Peak mode.

Radhound X/E with SS404 Al probe

Radhound X335 Advanced Hand-held Survey Meter

The Radhound X335 is an advanced hand-held survey meter with an integrated compensated end window Geiger-Müller detector for gamma dose rate monitoring.

- Dose Rate Range H*(10): 0 uSv/h – 1 mSv/h
- Energy response 20 keV - 1.5 MeV
- Clear digital LCD display with backlight.
- Adjustable alarm levels.
- Timed count and timed dose function.
- Peak mode.
- Over range indication.

Radhound Alarm

A low cost digital area monitor available with a range of probe options for all your contamination monitoring and radiation protection requirements.

The Radhound Alarm has a large digital display, the option for mains or battery operation and can be easily wall mounted. The easy to use password protected configuration menu enables a choice of probe and alarm thresholds to be setup.

Alarm output is provided by remotely mounted audio sounder and visual beacon.

- Simple to operate.
- Programmable alarm threshold.
- Audible count rate (with on/off switch).
- Customisation available.

Radhound Mini F Floor Contamination Meter

The Radhound Mini F is an extension of the Mini, providing the same cost-effective and intuitive solution with a pole-mounted detector allowing the instrument to be used as a floor monitor.

The Mini F has the same intuitive operation and functionality as that of the standard model. Users can measure tight and low areas from a standing position, whilst reducing exposure. It is lightweight and well balanced, ensuring that the system can be used comfortably for long periods of time.

Radhound Mini Digital Contamination Meter

A lightweight digital radiation survey meter dedicated to Nuclear Medicine contamination monitoring, the Radhound Mini is a cost-effective and intuitive solution designed ergonomically for ease of use, and providing the sensitive response needed for the monitoring of gamma contamination.

- Clear LCD display with backlighting.
- NaI(Tl) scintillation detector for sensitive contamination monitoring measurements.
- A Micro-USB connection to charge NiMH AA-cell batteries, which can be easily swapped if needed.
- Fully adjustable alarm levels.
- Count rate displayed in large clear numbers and also on a bar scale.
- Optional sounds.
- Integrator function.

Introducing SiPM detectors

The Radhound Mini features an integrated NaI(Tl) Silicon Photomultiplier (SiPM) detector. SiPMs are solid-state devices making them resistant to shock and vibrations that may occur because of extensive handling by users. They are commonly used in radiation detection and medical imaging systems.

Reduced size

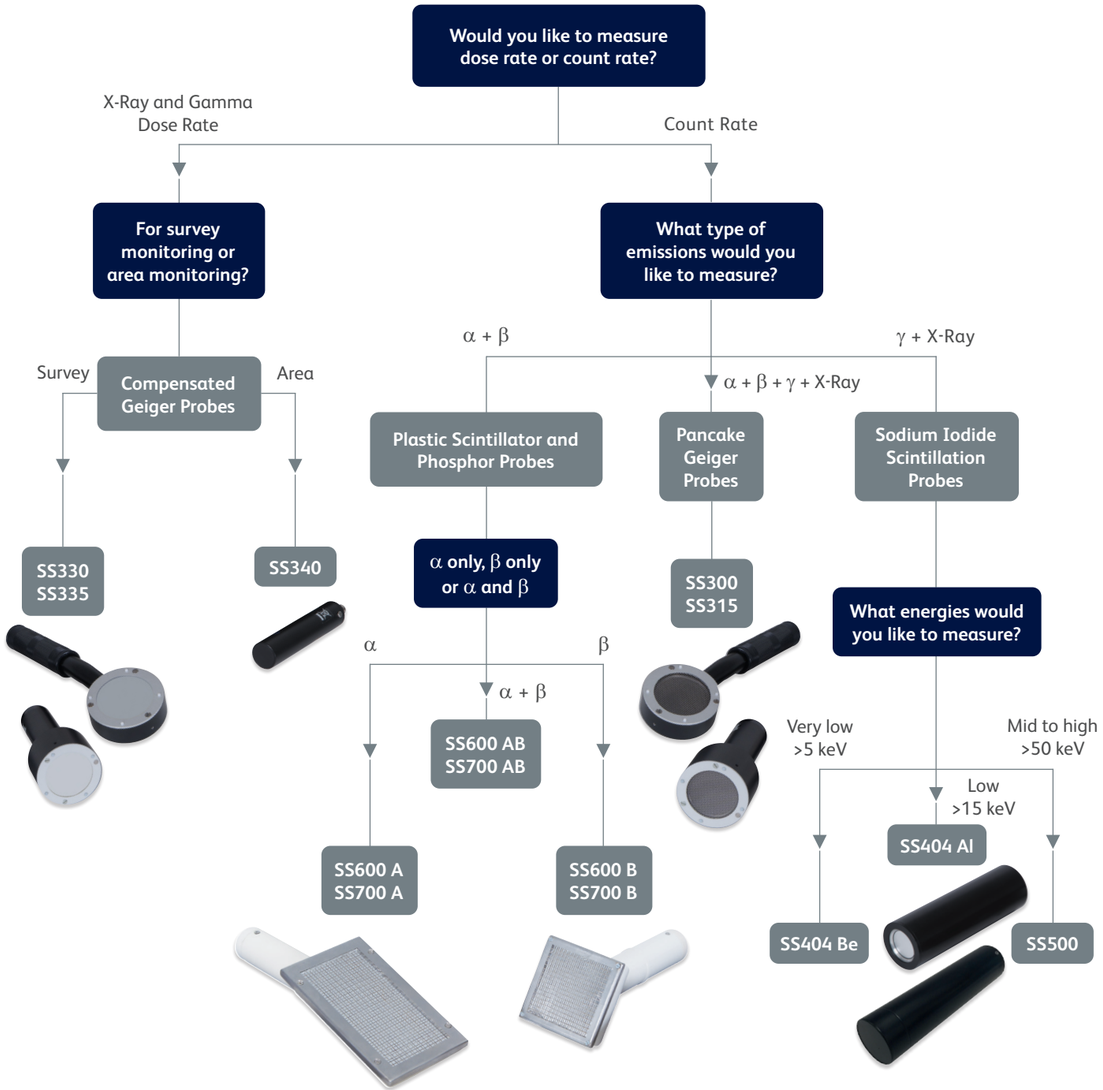
Each detector has thousands of micron-sized avalanche photodiodes (APD) arranged in a bespoke array for optimal optical coupling with the Radhound Mini's scintillation crystal. This reduces the monitor's size and weight while maintaining counting efficiency.

Specifications		
Detector Energy (Gamma)	Optimised for ^{99m}Tc (140 keV); capable of measuring 50 keV to 1.0 MeV in the Open Window	
Lower and Upper Detection Limits	Upper limit: 20,000 cps (Over range) Alarm level selectable in software	
Default Discrimination Window Settings	**Window (mV)** Low: 80 - 450 Medium: 450 - 1500 High: 1500 - 3000 Open: 80 - 3000	**Equivalent Energy (keV)** Low: 50 - 110 Medium: 110 - 500 High: 500 - 1000 Open: 50 - 1000
Scintillator	NaI(Tl) Crystal	
Detector Operating Voltages	Silicon Photomultiplier (SiPM-based detector – 40 V	
Background Count Rate (30 s Averaged Measurement)	Low Window: 2 cps Med Window: 0.8 cps High Window: 0.1 cps Open Window: 4.5 cps	
^{99m}Tc Counting Efficiency (Open Window, 882 MBq/ml)	1.8%	
Counting Efficiency (Open Window; sealed source 30 mm from end window)	^{57}Co: 3.5% ^{133}Ba: 4.8% ^{22}Na: 1.6% ^{137}Cs: 1.1% ^{60}Co: 0.7%	
Power Requirements	2x AA 1.5 V Batteries (NiMH rechargeable or single-use)	
Mass (Mini F)	460 g	
Optional Rod Lengths* (Mini F)	750, 900 mm	
Standard Rod Length (Mini F)	1000 mm	
Dimensions (Mini F)	170 (H) x 1104 (L) x 75 (W) mm	
Mass (Mini)	610 g	
Dimensions (Mini)	170 (H) x 88 (L) x 72 (W) mm	

Probe Selection Guide

All Radhound monitors are compatible with a range of probes to meet your detection requirements.

Southern Scientific supply a selection of probes with a variety of different detectors. Use the guide below to determine which probe (or probes) is best for you, or call to speak with one of our product specialists.



Geiger-Müller Probes

The SS300 is an uncompensated pancake Geiger-Müller-based probe for alpha beta and gamma contamination measurement.

The SS315 is functionally identical to the SS300, but with a different probe geometry.

SS300

SS315

Specifications	SS300 (Pancake)	SS315 (End On)
Operating Voltage	550 V	550 V
Measurement Range	0 - 5 kcps	0 - 5 kcps
Plateau Length	150 V	150 V
Temperature Range	-10°C to + 50°C	-10°C to + 50°C
Energy Response	20 keV - 2 MeV Gamma, ≥ 40 keV Beta, > 3 MeV Alpha	20 keV - 2 MeV Gamma, ≥ 40 keV Beta, > 3 MeV Alpha
Connector Type	MHV	MHV
Dimensions	∅ 70 x 254 x 64 mm	∅ 70 x 180 mm
Active Area	15.5 cm^2	15.5 cm^2
Mass	280 g	450 g

Efficiencies

(Listed as percentage of 2π emission rate)

Nuclide	Emission	Efficiency
^{241}Am	α	29.1%
^{238}Pu	α	26.6%
Nat U	α	63.5%
$^{90}Sr/^{90}Y$	β	56.7%
^{14}C	β	19.4%
^{147}Pm	β	59.1%
^{238}Pu	β	25.8%
^{60}Co	β	36.2%
^{137}Cs	β	50.6%

Geiger-Müller Dose Rate Probes

The SS330 probe is an excellent general purpose end window compensated pancake Geiger-Müller probe with H*(10) energy compensation, which permits reliable measurements from ambient background up to 1 µSv/hr.

The SS335 probe is functionally identical to the SS330, but with a different probe geometry.

The SS340 is a side-window Geiger-Müller probe for ambient gamma radiation measurement to H*(10). Dose rate range is 0 - 2 mSv/hr and energy range 45 keV - 2 MeV.

SS335

SS340

SS330

Specifications	SS330	SS335	SS340
Operating Voltage	550 V	550 V	450 V
Dose Rate Range*	0 µSv/hr - 2 mSv/hr	0.1 µSv/hr - 1 mSv/hr	0 µSv/hr - 2 mSv/hr
Plateau Length	150 V minimum	150 V minimum	200 V minimum
Temperature Range	-10°C to + 50°C	-10°C to + 50°C	-10°C to + 50°C
Gamma Sensitivity	Typically 5 cps/µSv/hr	Typically 5 cps/µSv/hr	Typically 2 cps/µSv/hr
Energy Range	H*(10) for 20 keV - 1.5 MeV	H*(10) for 20 keV - 1.5 MeV	H*(10) for 45 keV - 2 MeV
Connector Type	MHV	MHV	MHV
Dimensions	∅ 70 x 254 x 64 mm	∅ 70 x 180 mm	∅ 25 x 135 mm
Active Area	15.5 cm^2	15.5 cm^2	40 mm tube length
Mass	300 g	470 g	100 g

* Dose rate probes are set up to read in µSv/hr by default. For measurements in rem/hr, please specify at point of order.

SS404 Al Probe and Be Probe

The SS404 Al is a thin-crystal NaI(Tl) end-window scintillation probe designed to be an equivalent to the Mini 44A.

This probe incorporates a ∅ 1.25" x 0.098" (32 x 2.5 mm) thick NaI(Tl) crystal mounted on an aluminium window and is fitted with an internal 3.15 mm lead collimator to reduce background counts.

The SS404 Be is similar to the SS404 Al but is fitted with a beryllium window, which extends the low energy response down to 5 keV, making it suitable for counting ^{55}Fe.

SS500 Probe

The SS500 is a very sensitive end-window gamma scintillation probe.

Equipped with a ∅ 1" x 1" (25.4 x 25.4 mm) NaI(Tl) crystal, it is designed to provide a cost effective gamma monitor for energies of 50 keV upwards.

	SS404 Al	SS404 Be	SS500
Operating Voltage	Typically 650 V	Typically 650 V	Typically 650 V
Detector Crystal	∅ 1.25" x 0.098" NaI (32 x 2.5 mm)	∅ 1.25" x 1" NaI (32 x 2.5 mm)	∅ 1" x 1" NaI (25.4 x 25.4 mm)
Window Density	2.7 mg/cm^3	1.85 mg/cm^3	35 mg/cm^3
Energy Response	15 keV - 250 keV	5 keV - 250 keV	50 keV - 2.0 MeV
Connector Type	MHV	MHV	MHV
Dimensions	∅ 54 x 185 mm	∅ 54 x 185 mm	∅ 44.5 x 205 mm
Mass	820 g	820 g	300 g
Operating Temperature	-10°C to + 50°C	-10°C to + 50°C	-10°C to + 50°C
Operating Humidity	Up to 95% RH non-condensing	Up to 95% RH non-condensing	Up to 95% RH non-condensing

Efficiencies (Listed as percentage of 2π emission rate)

Nuclide	Energy	SS404 Al Efficiency	SS404 Be Efficiency
^{55}Fe	5.9 keV	-	31.4%
^{238}Pu	16.3 keV	98.7%	99.1%
^{129}I	31.5 keV	84.9%	91.5%
^{241}Am	58.8 keV	117.0%	117.3%
^{57}Co	120 keV	82.7%	83.0%
^{137}Cs	662 keV	17.0%	18.3%
^{60}Co	1200 keV	11.4%	12.4%

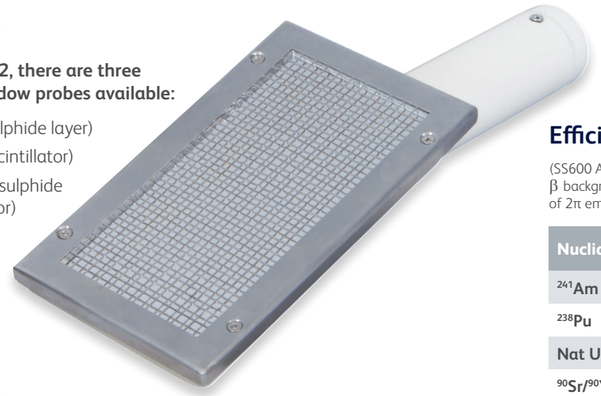
Alpha / Beta Contamination Probes

SS600 Probes

Equivalent to the NE BP6 / AP2, there are three versions of these 100 cm² window probes available:

- SS600 A Alpha only (Zinc sulphide layer)
- SS600 B Beta only (Plastic scintillator)
- SS600 AB Alpha/Beta (Zinc sulphide bonded to a plastic scintillator)

The use of a plastic scintillator avoids the traditional use of anthracene in this application, with a comparable response.



SS700 Probes

A series of three ergonomically balanced probes with a square window of 50 cm² and a 64° angled handle.

Equivalent to the NE BP7, there are three versions available:

- SS700 A Alpha only (Zinc sulphide layer)
- SS700 B Beta only (Plastic scintillator)
- SS700 AB Alpha/Beta (Zinc sulphide bonded to a plastic scintillator)

The use of a plastic scintillator avoids the traditional use of anthracene in this application, with a comparable response.

Alpha

	SS600 A	SS700 A
Window Area	100 cm²	50 cm²
Typical Alpha Efficiency ^{241}Am % of surface emission (2π)	30	30
Background Response	Less than 1 cps	Less than 1 cps
Mass	500 g	500 g

Beta

	SS600 B	SS700 B
Window Area	100 cm²	50 cm²
Beta Efficiency ^{14}C % of surface emission (2π)	8	40
Beta Efficiency ^{90}Sr/Y % of surface emission (2π)	8	40
Background Response	Less than 20 cps	Less than 10 cps
Mass	500 g	500 g

Efficiencies

(SS600 Alpha/Beta, α background 1.9 cps, β background 7.5 cps. Listed as percentage of 2π emission rate)

Nuclide	Emission	Efficiency
^{241}Am	α	39.3%
^{238}Pu	α	42.0%
Nat U	α	43.1%
^{90}Sr/^{90}Y	β	38.4%
^{14}C	β	1.5%
^{36}Cl	β	36.9%
^{238}Pu	β	4.7%
^{60}Co	β	14.0%
^{137}Cs	β	28.8%

Efficiencies

(SS700 Alpha/Beta, α background 0.7 cps, β background 3.4 cps. Listed as percentage of 2π emission rate)

Nuclide	Emission	Efficiency
^{241}Am	α	33.0%
^{238}Pu	α	32.1%
Nat U	α	34.8%
^{90}Sr/^{90}Y	β	33.9%
^{36}Cl	β	30.6%
^{60}Co	β	13.2%
^{137}Cs	β	23.1%

Alpha / Beta

	SS600 AB	SS700 AB
Window Area	100 cm²	50 cm²
Typical Efficiency ^{241}Am % of surface emission (2π)	30	30
Typical Efficiency ^{60}Co % of surface emission (2π)	15	15
Typical Efficiency ^{90}Sr/Y % of surface emission (2π)	30	30
Background Response	Less than 20 cps	Less than 10 cps
^{137}Cs Response cps/µSv/hr	50	25
Mass	500 g	500 g

Handhound Voice Activated Monitor

The Handhound has been designed mainly for use in 'wet chemistry' radio-isotope handling situations where hands could be contaminated. It has been designed to help with safety compliance, by keeping a record of hand contamination measurements taken.

Radhound radiation monitoring electronics are incorporated into a stainless steel enclosure with a high sensitivity collimated detector, so that any contamination can be detected on hands.

The background is updated while the unit is not in use. A proximity sensor ensures the user's hands are underneath the detector, the user then speaks his/her name and says 'Continue'. The system will begin counting for a predetermined period, set by the supervisor.

A touchscreen interface is also incorporated, to allow configuration and manual triggering if needed.

The Handhound is mains-operated and will find application in 'wet' lab using gamma isotopes, in corridors, work areas and laboratories.

- Entirely voice operated to avoid instrument contamination.
- Sensitive scintillation counter for gamma emitters.
- Alternative detector options to cover PET radionuclides.
- Stainless steel housing for ease of cleaning and decontamination.
- Automatic record keeping against user names, to aid with safety compliance.
- Touch-screen compatibility included as an alternative to voice operation.
- Data can be downloaded onto USB.
- Automatic background updates.
- Fixed or dynamic alarm thresholds.

Contamination Monitor (T401)

Designed to meet the challenge of combining operational reliability with excellent sensitivity the T401 offers a range of features including direct surface, peak and background readings. It can be used one-handed, or detach the probe for two-handed operation.

The T401 can be supplied with an extension pole kit to securely deploy the detector probe during monitoring operations.

- Dual bar graph meter display 0 - 1000 cps.
- Digital numeric display with automatic direct translation to Bq/cm^2 for 14+ pre-programmed nuclides (natural and man-made) including ^{14}C, ^{32}P, ^{137}Cs.
- Optional extension arm.
- Detachable probe.
- Background reading and storage.
- Audible response with adjustable alarm thresholds.

Dose Rate and X-ray Monitors (T402, T406)

The T402 and T406 are lightweight, yet robust and comfortable to use over extended periods.

- T402 detects gamma and X-rays from 60 keV - 1.33 MeV.
- T406 detects gamma and X-rays from 17 keV - 1.33 MeV.
- T402HR – extended range for high dose rates.
- Digital bar graph display: 0.1 - 1000 µSv/h.
- Digital dose rate indication: 0 - 10,000 µSv/h.
- Peak dose rate memory – allows maximum exposure levels to be recorded.
- Accumulated dose rate memory – for risk assessment and total exposure.
- Audible response with adjustable alarm thresholds.
- Water-resistant so easy to clean and decontaminate.
- Shock and drop tested so highly durable.

Personal Electronic Dosimeter (PED)

Ideal for users who are not specially trained to measure radiation exposure, the PED family have been specially designed to be easy to use and understand. Encased in weather, shock and drop-proof housings each PED features a smooth clean design and simple to use DoseVision™ software.

- Detects X-rays and gamma rays from 48 keV - 3 MeV.
- One button operation.
- Easy to read large Amoled display screen displaying dose rate, accumulated dose and animated silhouette indicating dose received.
- Multiple languages.
- Multiple users.
- Waterproof up to 1 m.

PED2-IS

PED2-IS

Built on over a decade of user experience with the original model, PED2-IS is a rugged, lightweight and easy-to-use personal electronic dosimeter that effectively monitors, measures and manages radiation exposure. It is an intrinsically safe certified device for use in potentially explosive environments, such as the oil and gas industries. A new Graphical User Interface (GUI) features intuitive visual elements, simple menus, and a single-button navigation for effortless operation.

PED-Blue

This is the non-intrinsically safe version of the PED-IS. Lighter, it retains the same high quality design and features a direct micro USB connection.

This entry level model is perfect for use within the medical sector.

PED+

An advanced version of the PED-Blue, it can be used as both a PED and a hand-held dose rate survey meter. The PED+ has a number of added features, such as Bluetooth, GPS and pop-up message alarms.

PED+ / PED-ER+

PED-Blue / PED-ER

PED-ER

The PED-ER's extended dose rate range of 1 Sv/h (100 R/h) provides perfect radiation dosimetry for nuclear medicine environments.

PED ER+

Featuring an extended dose rate range of 1 Sv/h (100 R/h), the PED-ER+ allows the user to measure radioisotopes which could not have been measured previously. Lightweight, waterproof and compact, the PED-ER+ provides the perfect radiation monitoring solution for those working in challenging environments.

NORM Monitor-IS

The ultimate tool for obtaining accurate NORM measurements in hazardous areas, the NORM Monitor-IS is ATEX approved with dual probe capabilities; Geiger-Müller and scintillator.

- Large, easy to read LCD screen with bar graph and back light.
- One-touch integrate function that allows detection of very low activities for increased measurement accuracy.
- Live background subtraction and several measurement modes.
- Adjustable alarm thresholds for improved safety.
- Easy to clean and decontaminate.

Service and Support

Users of our systems can benefit from our comprehensive, fully inclusive service and support.

We can give reassurance that if things go wrong or you need expert advice, help is only an e-mail or phone call away.

Validation Services

Our Validation Service enables you to implement and get maximum value from your investments as soon as possible.

We work as a partner with your Quality Manager, System Manager and users to provide a tailored Validation Plan, suited to your needs. Our Validation Specialists who have many years' of experience in GLP system validation, detailed knowledge of our systems, together with other industry standard systems to help you meet company and regulatory requirements.

Training

LabLogic can provide a variety of training courses and workshops to help you get the most out of your instrument and software.

All training is performed by our expert Product and Support Specialists who have many years experience in the development and use of the instruments and software.

Certificates can be provided to complement your internal GLP training records.

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