

- Electrical Safety Analysers
- Vital Signs Simulators
- Performance Analysers
- Med-eBase Software
- Support & Aftercare



Innovating Together



We share your passion  
for patient safety

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# Extending over four decades, the Rigel Medical brand has become synonymous with bringing innovation and new technologies to biomedical test equipment.

The healthcare market is technology driven and with a global demand for increased patient safety, there has never been a more prudent time to demand more from your test equipment.

International standards for the development and manufacturing of medical devices put greater emphasis on risk assessment and analyses of data. So, there is an increased need for test equipment that allows the user to automate data capture and ensure validity of test results for better management of risk.

Our range of dedicated biomedical test equipment is vital in verifying the safety, accuracy and performance of medical devices, and has become intrinsic to the endeavour to raise the standard of patient safety across the globe.





“I’d definitely recommend Rigel as a supplier. They really were keen to not just sell the product, but also to give us the understanding behind how we could get the most out of it. With Rigel, it’s about building a long term relationship and the after sales service means I’ll feel confident in dealing with them in the future.”

TRUMPF Medical Systems



## Rigel 288+ and 62353+ Electrical Safety Analysers

The Rigel range of battery powered electrical safety testers offers an accurate and fast solution for meeting international and local safety standards.

These uniquely designed testers incorporate an uncompromised list of test features within one compact unit, including automatic leakage, earth bond and insulation testing to international and local standards including IEC 62353, 60601-1 and NFPA-99.

An integrated keyboard enables detailed equipment data to be stored on-board alongside electrical safety test results; providing complete traceability of results.

With a choice from 2 up to 10 individual patient leakage circuits, we have the right solution to test any medical equipment, from beds to multi-parameter monitors in a single test routine.

A combined high and low earth bond test current ensures accurate resistance measurements are made and that poor mechanical connections can be identified.

Automatic warnings of incorrect test setups help to avoid false readings, for example when secondary earth paths are present, providing confidence in results and enabling improved patient safety.

Use the Rigel safety analysers with Med-eBase software to unlock enhanced customisation features, create bespoke test templates and improve traceability and management of test results.

| ▼ Features                 | 288+  | 62353+ |
|----------------------------|-------|--------|
| IEC 60601* leakage         | ■     |        |
| IEC 62353 leakage          | ■     | ■      |
| IEC 61010 leakage          | ■     |        |
| Applied Parts              | 10    | 2      |
| Max earthbond current      | 30A** | 30A**  |
| Point to point measurement | ■     | ■      |
| Insulation test            | ■     | ■      |
| IEC lead test              | ■     | ■      |
| Manual mode                | ■     | ■      |
| Automatic mode             | ■     | ■      |
| Custom test sequencing     | ■     | ■      |
| Battery operation          | ■     | ■      |
| Data storage               | ■     | ■      |
| Data entry                 | ABCD  | ABCD   |
| Barcode scanning           | ■     |        |
| PC download                | ■     | ■      |
| Secondary earth warning    | ■     | ■      |
| Line voltage check         | ■     | ■      |
| Direct print facility      | ■     |        |
| Weight (kg)                | <1.7  | <1.7   |

\* including all local derivatives (AAMI, NFPA, AS/NZ, VDE)

\*\* using high current low energy method



**Product Benefits:**



**Full compliance**

Have peace of mind when it comes to having to comply with (international) standards and recommendations including IEC 62353 and leakage tests in accordance with IEC 60601, NFPA, AAMI and AS/NZ 3551.



**Battery powered**

Save valuable time by using standard AA batteries to keep your tester operational in between tests when moving from one mains socket to the next.



**Automated testing**

Save time and money by automating test procedures, and be assured that test procedures are performed in a consistent manner.



**Electronic data storage**

Reduce the risk of data capture errors or manipulation and speed-up administration with automated data storage.



**Automatic test verification**

Get the correct results first time and avoid time-consuming re-tests with Rigel's unique and automated verification of secondary earth paths and incoming mains configurations.



**Unique earth bond technology**

Rigel's unique high current, low energy earth bond test, gives accurate and precise readings, saving time and unnecessary replacement of good mains cables.



**Smallest and most compact**

Reduce the burden of carrying multiple instruments from site to site by using the most compact electrical safety analyser on the market.



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| Functions available under battery power |   |
|---|---|
| Tests                                   | Earth bond • Insulation   |
| Data transfer                           | Download results<br>Upload sequences, templates and assets  |
| Scanning                                | Barcode   |
| Printing                                | Results • Pass/Fail labels  |
| Setting up                              | Test sequences • Test codes • Asset trace variables – site, location etc<br>Bluetooth • System configuration • Viewing results/data |

A practical guide to IEC 62353

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[www.rigelmedical.com/guides](http://www.rigelmedical.com/guides)



**MED-eBASE**

Unlock greater potential in your safety analyser

**Managing your test results:**

Med-eBase makes easy work of managing your test results.

**Generate test templates:**

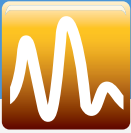
Using Med-eBase test solution software, user definable test templates can be easily generated and uploaded to the analyser.

**Professional test certificates:**

Generate professional PDF test certificates that can be emailed.

**Automatic comparison alert:**

Save time by letting Med-eBase analyse your test results and automatically warn you of changes in test results.



## Rigel Vital Signs Simulators

Rigel Medical's range of portable vital signs simulators verifies the performance of all vital signs on any type of vital signs monitor, ensuring monitors are providing accurate data for the correct treatment, diagnoses and monitoring of patients.

These handheld and battery powered simulators are available in single- or multi-function versions and are versatile for use in any test environment.

The Rigel Uni-Sim is the world's first all-in-one vital signs simulator combining NiBP, SpO2, ECG, temperature, IBP and respiration simulation. With all vital signs being synchronised, the Uni-Sim provides the closest simulation to a real human being. In automatic mode, fully automatic test protocols reduce the test time and ensure consistent and reliable test procedures.

Also available within the range, the Rigel BP-SiM offers the benefits of a full NIBP simulator in the palm of your hand whilst the SP-SiM in combination with the PULS-R universal SpO2 simulation finger, provides a cost effective way to quickly check the performance of SpO2 monitors.

Use the Rigel vital signs simulators with Med-eBase software to unlock enhanced customisation features, create bespoke test templates and improve traceability and management of test results.

The lightweight design of the Rigel vital signs simulators make them highly portable and practical for multi-site use whilst the long life battery power reduces down time between tests.

| ▼ Features             | UNI-Sim | BP-Sim | SP-Sim | 333 |
|------------------------|---------|--------|--------|-----|
| <b>NIBP Simulation</b> | ■       | ■      |        |     |
| Leak test              | ■       | ■      |        |     |
| Over pressure test     | ■       | ■      |        |     |
| Manometer              | ■       | ■      |        |     |
| <b>SpO2 Simulation</b> | ■       |        | ■      |     |
| Artefacts              | ■       |        | ■      |     |
| Chronometer function   | ■       |        | ■      |     |
| <b>ECG Waveforms</b>   |         |        |        | ■   |
| Arrhythmias            | ■       |        |        | ■   |
| IBP simulation         | ■       |        |        | ■   |
| Temperature simulation | ■       |        |        | ■   |
| Respiration simulation | ■       |        |        | ■   |
| Manual mode            | ■       | ■      | ■      | ■   |
| Automatic mode         | ■       | ■      | ■      |     |
| Custom test sequencing | ■       | ■      | ■      |     |
| Battery operation      | ■       | ■      | ■      | ■   |
| Data storage           | ■       | ■      | ■      |     |
| Data entry             | ABCD    | ABCD   | ABCD   |     |
| Barcode scanning       | ■       | ■      | ■      |     |
| PC download            | ■       | ■      | ■      |     |
| Direct print facility  | ■       | ■      | ■      |     |
| Weight (kg)            | <1.5    | <1.5   | <1     | <1  |



**Product Benefits:**



**Automated testing**

Save time and money by automating test procedures in the most efficient way, and be assured that test procedures are performed in a controlled and consistent manner.



**Electronic data storage**

Reduce the risk of data capture errors or manipulation and speed-up administration with automated data storage.



**Smallest and most compact**

Reduce the burden of carrying multiple instruments from site to site by using the most compact vital signs simulator on the market.



**Physiologically correct and synchronised simulations**

Rest assured that vital signs monitors are checked with physiologically correct and synchronised simulations, the closest to a real human being.

**PULS-R universal SpO2 simulation finger**

The new PULS-R SpO2 simulation accessory combines the benefits of a universal SpO2 simulation method with the ability to identify a reduction in performance of the SpO2 probe LEDs.

With output signals relative to the quality of SpO2 probe, the PULS-R is able to identify aging probes, helping to increase patient safety.

Clear LED indicators ensure correct SpO2 probe placement on the PULS-R, leading to accurate and consistent simulations.

Compatible with the Uni-Sim and SP-Sim, the PULS-R simulates a wide range of technologies and user definable R-curves, making for a truly universal SpO2 simulation finger.

**Technical Specifications**

Accuracy of simulation when used with the corresponding R-curves

| Resolution | Range   | Repeatability* |
|------------|---------|----------------|
| 1% steps   | 30-59%  | ±5%**          |
| 1% steps   | 60-89%  | ±3%            |
| 1% steps   | 90-100% | ±1%            |

\*Based on using the same probe and monitor setup

\*\*Note that some monitor types might not be able to display low range sats

An introduction to measuring and simulating vital signs

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**MED-eBASE**

Unlock greater potential in your safety analyser

**Managing your test results:**

Med-eBase makes easy work of managing your test results.

**Generate test templates:**

Using Med-eBase test solution software, user definable test templates can be easily generated and uploaded to the analyser.

**Professional test certificates:**

Generate professional PDF test certificates that can be emailed.

**Automatic comparison alert:**

Save time by letting Med-eBase analyse your test results and automatically warn you of changes in test results.



# Rigel Uni-Pulse Defibrillator Analyser

Defibrillation is the treatment for life threatening abnormal heart rhythms such as ventricular fibrillation and ventricular tachycardia, it delivers a controlled high energy electric shock causing the heart cells to contract and momentarily stop to enable the SA node to restore normal rhythm.

There are two main types of defibrillators; those that are manually controlled by the operator (energy levels, synch mode, shock delivery) and automatic defibrillators, known as automatic external defibrillators or AEDs.

With output voltages and current capable of causing serious injuries and even death, it is important to both understand the application of defibrillation and maintain a regular testing regime to ensure the highest level of patient and operator safety.

The Uni-Pulse defibrillator analyser has been designed to meet all of the requirements of IEC 60601-2-4. Using its unique and large colour display, the Uni-Pulse can accurately analyse and display the energy pulse of all manual defibrillators and AEDs.

For increased user safety, the Uni-Pulse connects directly to the defibrillator using safe and designated interface leads; eliminating

the risk of the user touching any hazardous metal accessible parts during the delivery of energy.

An optional paddle adaptor box allows testing with delivery paddles, and an optional variable load box simulates a range of patient types to meet the test requirements of IEC 60601-2-4

For full traceability of your tests and to reduce the risk of data capture errors, the Uni-Pulse features a large internal memory capable of storing test results alongside high resolution wave form captures.

Detailed navigation screens make it easy to select all features of the Uni-Pulse which include manual and automatic defibrillator programs, cardio synch and charge time measurements as well as an integral full 12-lead arrhythmia and function wave simulator.

Powered by rechargeable batteries, the Uni-Pulse is capable of testing mono and biphasic manual and automatic defibrillators without the need for carrying additional test tools such as an oscilloscope, making it a cost effective solution ideal for both bench and field applications.





## Product Benefits:



### Full compliance

Have peace of mind when it comes to managing risk of litigation by fully complying with (international) test standards and manufacturer recommendations including IEC 60601-2-4.



### Waveform capture

Make it easy to spot hard to detect faults such as insulation damage and breakdown by analysing the waveform directly on the Uni-Pulse.



### Electronic data storage

Speed-up your administration and reduce the risk of data capture errors or manipulation by automating data storage.



### Compact all-in-one

Reduce the burden of carrying multiple test tools from site to site by using the compact defibrillator analyser from Rigel Medical.



### Manage your budget

Save money on additional test tools by using the built-in high-resolution waveform analyser.

## Variable Load box

To simulate varying patient types, an optional variable load box is available to meet the requirements of testing to IEC 6060-2-4 which describes that performance of defibrillators must be tested and documented during the design phase on varying chest impedances between 25Ω and 200Ω.

Large paddle areas meet the safety requirements and reduce the risk of paddle electrodes being exposed, which can lead to hazardous testing conditions.

The light weight and portable variable load box is easy to operate and can be used whilst testing with paddles or connected with the supplied leads. To minimise user error, the Uni-Pulse can automatically detect the resistance setting on the variable load box.



Scan QR code to find out more

## MED-eBASE

## Unlock greater potential in your safety analyser

### Managing your test results:

Med-eBase makes easy work of managing your test results.

### Generate test templates:

Using Med-eBase test solution software, user definable test templates can be easily generated and uploaded to the analyser.

### Professional test certificates:

Generate professional PDF test certificates that can be emailed.

### Automatic comparison alert:

Save time by letting Med-eBase analyse your test results and automatically warn you of changes in test results.

### Analyse high resolution defibrillator waveforms

Defibrillator output waveforms can be analysed, saved and printed in high resolution, reducing the need for expensive scopes.



# Rigel Multi-Flo Infusion Pump Analyser

Although the vast majority of infusions are delivered safely, the MHRA investigated over 1000 incidents in the UK between 2005 and 2010 [1,2], and 700 deaths in the USA over the same period of time, all thought to be linked to problems with the infusion devices.[3]

When using infusion devices, there are many dangers which need to be minimised for patient safety and therefore most infusion devices incorporate warnings and alarm systems. In addition, infusion pumps can administer fluids at flow rates of 0.1 ml/hr, provide medication at predetermined intervals, provide repeated boluses requested by the patient and administer fluids where volumes vary by the time of day and also for extended durations.

The Multi-Flo infusion device analyser has been designed to work with the widest possible flow range and all types of infusion devices to allow performance verification with an accuracy of 1% from flow rates starting as low as 0.1ml/hr. Its unique flow sensor technology leads to virtually instant and accurate flow measurements, thus reducing the test time, especially when testing low flow infusion devices such as those used in pain management and paediatric care facilities.

The Multi-Flo's ability to measure extremely low flow makes it ideal for accurate PCA / Bolus verifications.

Internal simulation and regulation of varying line pressures ensures that no further tools are required to meet manufacturer requirements to verify performance at a range of back pressures.

Save time by choosing to use the Multi-Flo in fully manual or in automatic mode to benefit from customisable test protocols for each type of infusion device, reducing test time and providing a high standard of quality when it comes to test procedures.

Use the Rigel Multi-Flo in combination with Med-eBase test solution software to unlock its full potential in automation and customisation. Remote control the Multi-Flo from the comfort of your PC or create bespoke test templates for each type of infusion device to allow fast re-testing of assets and reduce the risk of human error by fixing the templates to each Rigel Multi-Flo.

[1] MHRA. (2010). Infusion Systems Device Bulletin. *Safeguarding public health*.

[2] Paul Scott. (2013). *What Is a Dial Gauge?* Last accessed 25th August 2013. Available: [www.wisegeek.com/what-is-a-dial-gauge.htm](http://www.wisegeek.com/what-is-a-dial-gauge.htm)

[3] Meier, B. (2010). *F.D.A. Steps Up Oversight of Infusion Pumps*. Available: [www.nytimes.com/2010/04/24/business/24pump.html?\\_r=2&](http://www.nytimes.com/2010/04/24/business/24pump.html?_r=2&)



## Product Benefits:



### Full compliance

Have peace of mind when it comes to managing risk of litigation by fully complying with (international) test standards and manufacturer recommendations including IEC 60601-2-24.



### Automated testing

Save time and money by automating test procedures in the most efficient way, and be assured that test procedures are performed in a controlled and consistent manner.



### Electronic data storage

Speed-up your administration and reduce the risk of data capture errors or manipulation by automating data storage.



### Compact all-in-one

Reduce the burden of carrying multiple test tools from site to site by using the compact infusion pump analyser from Rigel Medical.



### Manage your budget

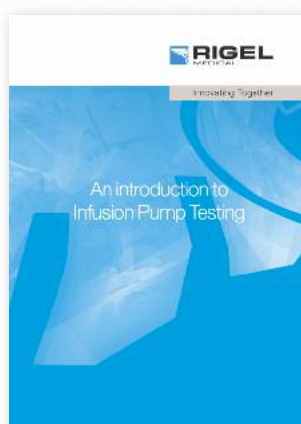
Benefit from a cost effective solution by upgrading your single or dual channel Multi-Flo with additional channels as and when your budget allows.

An introduction to infusion pump testing

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## MED-eBASE

Unlock greater potential  
in your safety analyser

### Remote control:

Use Med-eBase test solution software to control one or more Multi-Flo's from the comfort of your PC.

### Managing your test results:

Med-eBase makes easy work of managing your test results.

### Generate test templates:

Using Med-eBase test solution software, user definable test templates can be easily generated and uploaded to the analyser.

### Professional test certificates:

Generate professional PDF test certificates that can be emailed.



## Rigel Uni-Therm Electrosurgical Analyser

Electrosurgical generator units (ESUs) are a crucial piece of equipment in the majority of operative settings and are the most useful and common instruments used by surgeons today. Electrosurgery is based on the transformation of a high frequency electrical current into heat, with the resulting effect of cutting and coagulating tissue at the point of current application.

In electrosurgery, the patient is a fundamental part of the electrical circuit as the current must flow through the body, which acts as a conductor. Therefore, to ensure the highest level of patient safety, it is critical that performance of surgical generators is verified on a regular basis.

Rigel's Uni-Therm has been designed to meet all the requirements in accordance with IEC 60601-2-2. Using its unique and industry leading load bank to simulate human tissue behaviour, the Uni-Therm can accurately analyse the performance of surgical generators across a wide range of impedances.

The Uni-Therm uses a bespoke current measurement technology which makes it ideal for testing even high current application generators.

Detailed help screens and customisable user instructions are displayed on the large colour screen, making it easy to follow even the most comprehensive test procedures.

The Uni-Therm provides a true all-in-one solution for testing modern CQM systems by accurately simulating patient plate resistance.

Save time by choosing to use the Uni-Therm in automatic mode to benefit from customisable test protocols and power distribution curves for each type of surgical generator, reducing test time and providing a high standard of quality when it comes to test procedures.

The Med-eBase test solutions software helps to unlock the Uni-Therm's full potential in automation and customisation. Create bespoke test templates for each type of electrosurgical generator for fast re-testing of assets and reduced risk of human error.

The Rigel Uni-Therm is packed with all of the features you need to test electrosurgical generators without the need for carrying further test tools, making it ideal for both bench as well as field applications.



**Product Benefits:**



**Full compliance**

Have peace of mind when it comes to managing risk of litigation by fully complying with (international) test standards and manufacturer recommendations including IEC 60601-2-4.



**Low inductance loadbank**

Rest assured that you accurately calibrate and verify performance, with load resistors with the lowest inductance available on the market today. At a typical 400kHz signal, most other conventional load banks will see an increase in inductance which can directly impact on the validity of your measurements.



**Automated testing**

Save time and money by automating test procedures in the most efficient way, and be assured that test procedures are performed in a controlled and consistent manner.



**Electronic data storage**

Speed-up your administration and reduce the risk of data capture errors or manipulation by automating data storage.



**Compact all-in-one**

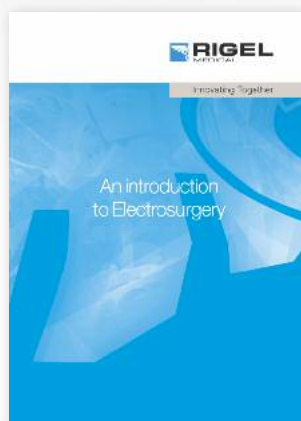
Reduce the burden of carrying multiple test tools from site to site by using the compact electro-surgical analyser from Rigel Medical.



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An introduction to electrosurgery

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**Generate test templates:**

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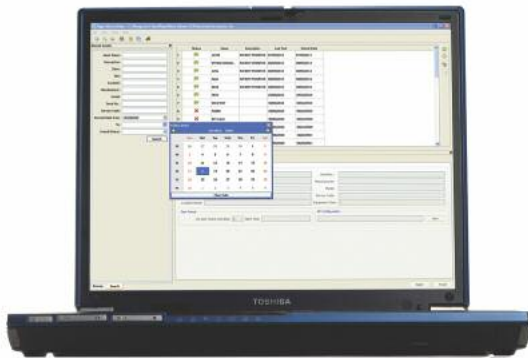
**Professional test certificates:**

Generate professional PDF test certificates that can be emailed.

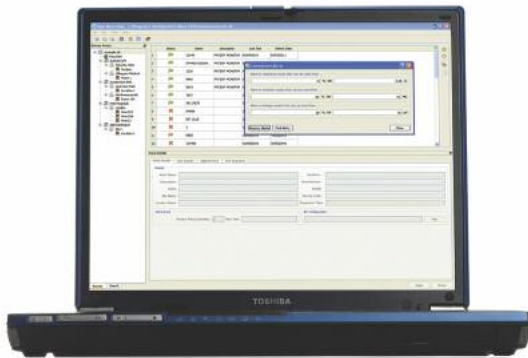
# Med-eBase Asset Management Software

Med-eBase is a test solution software program designed to bring out the full potential of your Rigel test equipment.

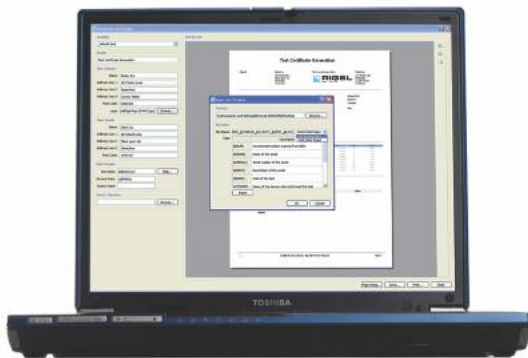
For faster, more efficient testing and to unlock advanced features within each tester, this easy-to-use Windows based program provides enhanced database management, test scheduling, data analysis, customised test certificates and user-defined test templates amongst other product-specific features.



Manage your test results with ease



Save time with automatic test comparisons



Generate professional, customised test certificates

## Manage your test results:

Med-eBase makes easy work of managing your test results and building a complete test history by asset record. Data entered and captured by a Rigel tester can be stored in Med-eBase, removing the need to manually record test results.

## Generate test templates

User definable test templates can be easily generated and uploaded from Med-eBase to a Rigel analyser or tester for quick retesting of medical devices, reducing the risk of incorrect setup and speeding up the time it takes to carry out a full inspection.

## Professional test certificates:

Generate professional and customisable PDF test certificates that can be emailed, stored electronically or exported to most third party databases.

## Automatic comparison alert:

When test results are uploaded to Med-eBase they're automatically compared with previous test results and analysed for any variation. If the results fall outside of the user-specified limits then Med-eBase alerts you to this, saving the time required to analyse results manually.

## Other Features:

### Analyse high resolution defibrillator waveforms:

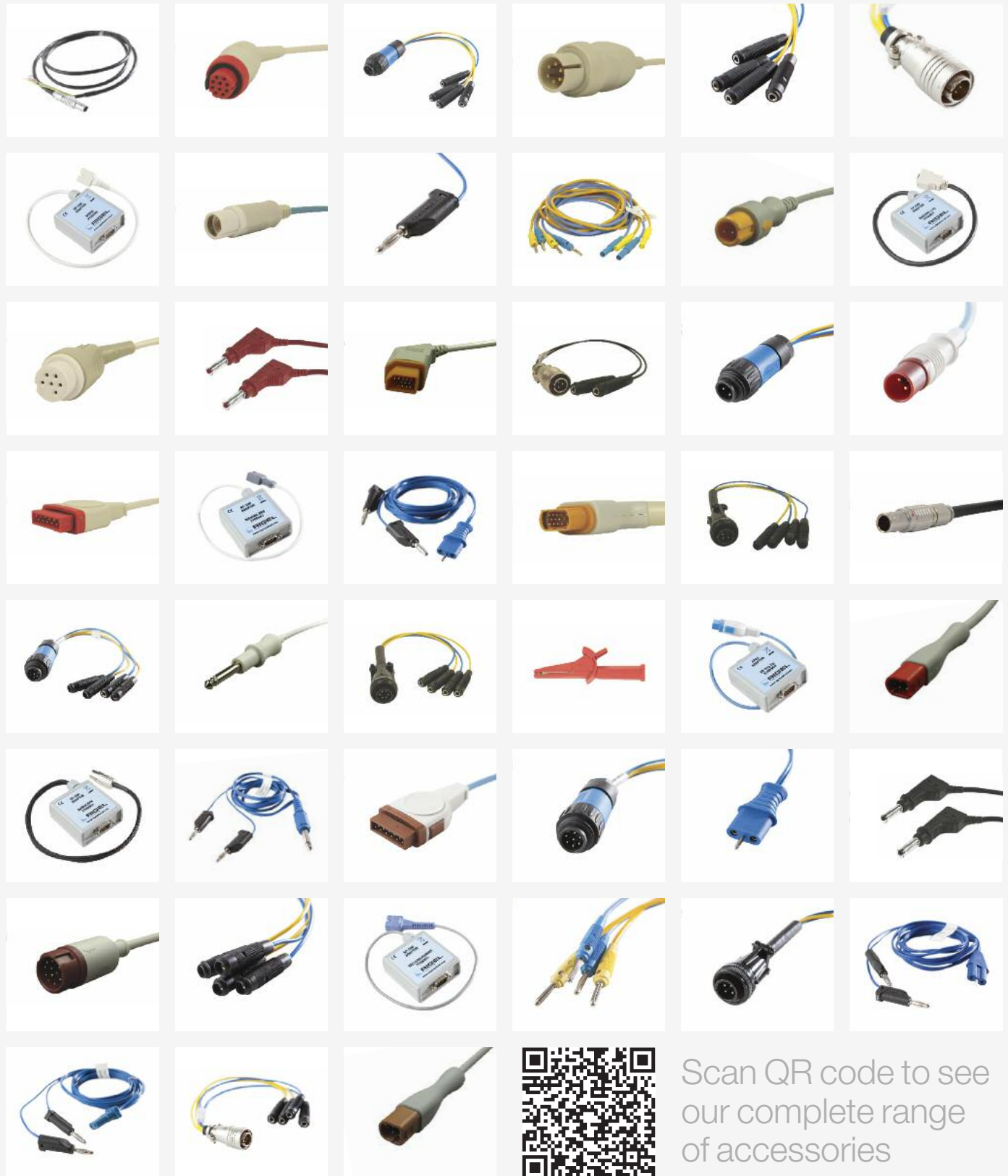
When using Med-eBase with the Uni-Pulse defibrillator analyser, output waveforms can be analysed in high resolution, allowing possible degradation in insulation or delivery of energy to be detected. This feature reduces the need for using expensive scopes whilst waveform shapes and data can be saved and printed automatically with every test record.

### Remote control:

Use Med-eBase test solution software to remotely control the Multi-Fló infusion pump analyser from the comfort of a PC. Multiple channels and Multi-Fló's can be controlled, viewed and managed from a single PC screen, making it easy to manage high volume test environments.

# Accessories

A vast range of accessories ensures that you're covered for any eventuality. With pre-packed and ready-to-go lead sets and adaptors for safer working practice, and efficiency boosting accessories such as the Test n Tag label printer, Rigel supplies a wide range of accessory types, a full list is available from [www.rigelmedical.com/accessories](http://www.rigelmedical.com/accessories) or if you have any specific requirements please contact us.



Scan QR code to see our complete range of accessories



# Support & Aftercare

At Rigel we take pride in giving you all of the tools to help make your life easier.

Our website is full of useful and free resources including:

## Videos

We're always adding to our videos, offering you visual help and guidance when using our products.

[www.rigelmedical.com/videos](http://www.rigelmedical.com/videos)

## How-to guides

Our how-to guides are free to download and cover a multitude of topics related to medical device testing.

[www.rigelmedical.com/guides](http://www.rigelmedical.com/guides)

## Datasheets

Our datasheets include a full product specification helping you to decide which product is right for you.

[www.rigelmedical.com/datasheets](http://www.rigelmedical.com/datasheets)

## Software trials

Get your free trial of Med-eBase test solution software.

[www.rigelmedical.com/med-ebase](http://www.rigelmedical.com/med-ebase)

## Firmware updates

We update our website with any new firmware updates to ensure our customers' products are up-to-date.

[www.rigelmedical.com/firmware](http://www.rigelmedical.com/firmware)

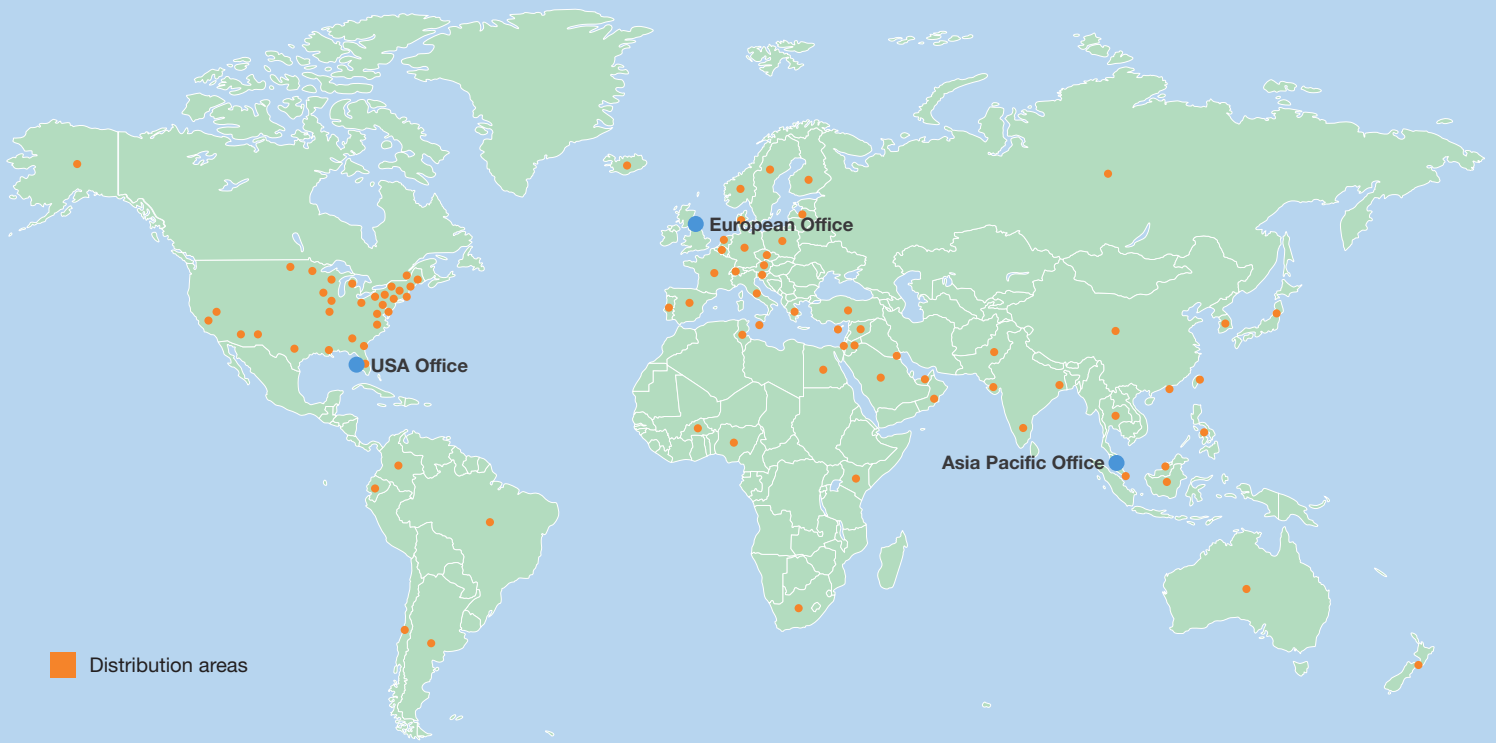
## Accessory Lists

See our extensive range of accessories on the accessory lists available for download.

[www.rigelmedical.com/accessory-lists](http://www.rigelmedical.com/accessory-lists)







# Global distributor network

At Rigel Medical, we strive to provide our customers with fast and accurate local support, and with an ever growing network of dedicated and knowledgeable partners, there is every chance you will find a Rigel representative in your area.

Visit our website [www.rigelmedical.com/contact-us](http://www.rigelmedical.com/contact-us) for our partners' contact details.

To find a representative in your area, or for any other queries, please contact us on;

**+44 (0) 191 587 8730** or [info@rigelmedical.com](mailto:info@rigelmedical.com)

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**Tel:** +1 (813) 886 2775

**Fax:** +1 (813) 886 2754

**Email:** [sales@seaward-groupusa.com](mailto:sales@seaward-groupusa.com)

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**Tel:** +60 (019) 386 8649

**Email:** [sales@seaward.co.uk](mailto:sales@seaward.co.uk)



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# Specifications

The following pages provide basic specifications for our product range. For more in-depth product details and for feedback on our current range, please visit [rigelmedical.com](http://rigelmedical.com)



## Electrical Safety Analysers

### Rigel 288 Electrical Safety Analyser

|                         |  |
|-------------------------|--|
| Earth Continuity        | Method 2 wire technique  |
| Test Current            | >+200mA -200mA DC into 2ohms   |
| Measuring Range         | 0.001 – 19.9Ω  |
| Insulation Test Voltage | 250V DC & 500V DC @1mA   |
| Range (low range)       | 0.01MΩ - 100MΩ   |
| Range (high range)      | 20MΩ - 100MΩ   |
| Direct Leakage Current  | 4μA to 9999μA  |
| Measuring Device        | IEC 60601 / 62353  |
| Number of Applied Parts | 10   |
| Measurement Type        | Direct, Differential and Alternative                                 |
| PC Connections          | Bluetooth + RS232  |
| Memory                  | Appr. 5,000 records  |
| Mains Power             | 230V AC ±10%, 50Hz +/- 1Hz<br>(USA model) 120V AC ±10%, 60Hz +/- 1Hz |
| Battery                 | 6 x 1.5V Alkaline AA   |
| Weight                  | 1.6 kg including batteries   |
| Dimensions              | 270mm x 110mm x 75mm   |
| Operating Conditions    | 10°C - 40°C, 0-90% RH - NC   |
| Storage Environment     | -15°C to +60°C   |

### Rigel 62353 Electrical Safety Analyser

|                         |  |
|-------------------------|--|
| Earth Continuity        | Method 2 wire technique  |
| Test Current            | >+200mA -200mA DC into 2Ω  |
| Measuring Range         | 0.001 – 19.9Ω  |
| Insulation Test Voltage | 250V DC & 500V DC @1mA   |
| Range (low range)       | 0.01MΩ - 100MΩ   |
| Leakage Current         | 4μA to 9999μA  |
| Measuring Device        | IEC 60601 / 62353  |
| Number of Applied Parts | 2  |
| Measurement Type        | Direct, Differential and Alternative                                 |
| PC Connections          | RS232  |
| Memory                  | Appr. 5,000 records  |
| Mains Power             | 230V AC ±10%, 50Hz +/- 1Hz<br>(USA model) 120V AC ±10%, 60Hz +/- 1Hz |
| Battery                 | 6 x 1.5V Alkaline AA   |
| Weight                  | 1.6kg including batteries  |
| Dimensions              | 270mm x 110mm x 75mm   |
| Operating Conditions    | 10°C - 40°C, 0-90% RH - NC   |
| Storage Environment     | -15°C to +60°C   |



## Vital Signs Simulators

### Rigel UNI-SIM Vital Signs Simulator

|                          |  |
|--------------------------|--|
| NIBP Simulation Waveform | Oscillometric  |
| Integrated Pump          | 0 to 350mmHg user configurable                                   |
| Leak Test                | User configurable between 0-350mmHg                              |
| Digital Manometer        | 0 - 410mmHg  |
| SpO2 Simulation          | Opto-electronic method   |
| SpO2 Range               | 30 to 100% (with PULS-R)   |
| ECG                      | Full 12 lead simulation including high level output              |
| Waveforms                | NSR, Atrial, Atrial Conduction, Ventricular and Pacer wave forms |
| Rate                     | 20 – 300BPM  |
| Performance Waveforms    | Sine, Square, Triangle and Pulse                                 |
| Temperature Simulation   | 25, 33, 37 and 41°C (YSI400/700)                                 |
| Respiration              | Apnoea, 5, 10, 15, 30, 60, 120, 180BPM                           |
| Invasive Blood Pressure  | 2 channels, 0 - 300mmHg  |
| PC Connections           | Bluetooth  |
| Memory                   | Appr. 5,000 records  |
| Dimensions               | 270mm x 110mm x 75mm   |
| Weight                   | <1.5kg   |
| Operating Temperature    | 10-30°C, 0-90% RH - NC   |
| Storage Temperature      | 10°C-40°C  |
| Mains Power              | 115 / 230V AC; 48Hz to 66Hz                                      |
| Operation                | Battery cell, insitu charge                                      |

### Rigel BP-SIM NIBP Simulator

|                          |                                     |
|--------------------------|-------------------------------------|
| NIBP Simulation Waveform | Oscillometric                       |
| Integrated Pump          | 0 to 350mmHg user configurable      |
| Leak Test                | User configurable between 0-350mmHg |
| Digital Manometer        | 0 - 410mmHg                         |
| Rate                     | 20 – 300BPM                         |
| PC Connections           | Bluetooth                           |
| Memory                   | Appr. 5,000 records                 |
| Dimensions               | 270mm x 110mm x 75mm                |
| Weight                   | <1.5kg                              |
| Operating Temperature    | 10-40°C, 0-90% RH - NC              |
| Storage Temperature      | 0°C to 50°C                         |
| Mains Power              | 115 / 230V AC; 48Hz to 66Hz         |
| Operation                | Battery cell, insitu charge         |

### Rigel SP-SIM SpO2 Simulator

|                       |                             |
|-----------------------|-----------------------------|
| SpO2 Simulation       | Opto-electronic and optical |
| SpO2 Range            | 30 to 100%                  |
| Rate                  | 20 – 300BPM                 |
| PC Connections        | Bluetooth                   |
| Memory                | Appr. 5,000 records         |
| Dimensions            | 270mm x 110mm x 55mm        |
| Weight                | <1.0kg                      |
| Operating Temperature | 10-40°C, 0-90% RH - NC      |
| Storage Temperature   | 0°C to 50°C                 |
| Mains Power           | 115 / 230V AC; 48Hz to 66Hz |
| Operation             | Battery cell, insitu charge |

### Rigel 333 Patient Simulator

|                         |  |
|-------------------------|--|
| ECG                     | Full 12 lead simulation including high level output              |
| Waveforms               | NSR, Atrial, Atrial Conduction, Ventricular and Pacer Wave forms |
| Rate                    | 20 – 350BPM  |
| Performance Waveforms   | Sine, Square, Triangle and Pulse                                 |
| Temperature Simulation  | 25 and 37°C (YSI400/700)   |
| Respiration             | Apnoea, 15, 30, 60, 120BPM                                       |
| Invasive Blood Pressure | 2 channels, 0 - 300mmHg  |
| Dimensions              | 140mm x 90mm x 38mm  |
| Weight                  | 0.3kg  |
| Operating Temperature   | 10-40°C, 0-90% RH - NC   |
| Storage Temperature     | 0°C to 50°C  |
| Operation               | Battery cell, 9V   |

### Rigel Multi-Flo Infusion Pump Analyser

|                       |                                    |
|-----------------------|------------------------------------|
| Channels              | 1, 2 or 4                          |
| Flow Rates            | 0.010 - 1500mL / hr                |
| Update Rate           | 1Hz                                |
| Back Pressure         | -200 to 600mmHg                    |
| Occlusion Pressure    | 0 - 1500mmHg                       |
| PCA Bolus             | 0.10 - 100mL                       |
| Basal Flow Rate       | 1 - 30mL                           |
| External Connections  | Flow in and out                    |
| PC Connections        | Bluetooth + USB                    |
| Memory                | Up to 24 hours real time recording |
| Dimensions            | 300m x 204mm x 220mm               |
| Weight                | 5 - 8kg (1-4 ch)                   |
| Operating Temperature | 10°C to 40°C                       |
| Storage Temperature   | 15°C to 40°C                       |
| Mains Power           | 115 / 230V AC; 48Hz to 66Hz        |



## Performance Analysers

### Rigel Uni-Pulse Defibrillator Analyser

|                         |  |
|-------------------------|--|
| Energy Range            | 0-600 Joules   |
| Internal Load           | 50Ω ±1% non inductive  |
| External Loads*         | 25 - 200Ω  |
| Voltage                 | 0 - 6000V  |
| Maximum Current         | 0 - 120A   |
| Cardiac Synchronisation | -250 to +250ms   |
| ECG                     | Full 12 lead simulation including high level output              |
| Waveforms               | NSR, Atrial, Atrial Conduction, Ventricular and Pacer wave forms |
| Rate                    | 20 – 300BPM  |
| Performance Waveforms   | Sine, Square, Triangle and Pulse                                 |
| External Connections    | External paddle and load box                                     |
| PC Connections          | Bluetooth + USB  |
| Memory                  | Appr. 5,000 records  |
| Dimensions              | 220mm x 150mm x 90mm   |
| Weight                  | <2kg   |
| Operating Temperature   | 10°C to 40°C   |
| Storage Temperature     | -15°C to 60°C  |
| Mains Power             | 115 / 230V AC; 48Hz to 66Hz                                      |
| Operation               | Battery pack, insitu charged                                     |

### Rigel Uni-Therm Electrosurgical Analyser

|                       |  |
|-----------------------|--|
| Power rating          | 0 - 500W (RMS)   |
| Duty cycle            | 100% up to 60 seconds                                      |
| Load bank             | 0 - 5115Ω @ 5Ω resolution                                  |
| Voltage (peak)        | 0 - 10kV (Peak) closed loop only                           |
| Voltage               | 0 - 700V (RMS)   |
| Current               | 0 - 6000mA with load bank<br>0 - 8000mA external load test |
| Crest factor          | 1.4 - 20 (Vpeak / V RMS)                                   |
| REM test              | 1- 475Ω, steps @ 1Ω steps                                  |
| External connections  | footswitch control, oscilloscope, USB (keyboard)           |
| PC connection         | Bluetooth + USB  |
| Memory                | Appr. 5000 records   |
| Dimensions            | 370 mm x 300 mm x 204 mm                                   |
| Weight                | 10kg   |
| Operating temperature | 0°C to 40°C  |
| Storage temperature   | 0°C to 50°C  |
| Mains power           | 115 / 230V AC; 48 – 66Hz                                   |

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