



# Uni-Pulse

## Defibrillator Analyser



The Rigel Uni-Pulse is a portable and battery operated defibrillator analyser, designed to safely test the performance of all mono- and bi-phasic, standard and pulsating waveforms and AED applications. Control of the Rigel Uni-Pulse is through a menu driven colour GUI.

The Rigel Uni-Pulse is able to measure and display the following parameters;

1. Energy (peak voltage, peak current, pulse duration)
2. Cardiac Synchronisation Time
3. Charge Time
4. Display the curve

In addition, the Rigel Uni-Pulse, can simulate a variety of ECG signals to help establish the analytical function of AED's and the performance of the waveform detection circuits.

The Rigel Uni-Pulse has internal memory to enable asset management data to be collected including but not limited to:

- Test Sequences
- Asset Details (Site / Location / Make / Model)
- Test results
- Discharge waveform

Computer communication is via Bluetooth and USB. This communication facility can be used to:

- Download test results
- Upload of Asset ID's and model numbers
- Future upgrades

### Tests on Defibrillators

- Energy Discharge (including peak voltage, peak current and pulse duration)
- Cardiac Synchronisation Time
- Charge Time

### Energy Discharge

This test measures the Energy output of the defibrillator. In doing so the Peak Voltage (upto 6000V) and peak Current (up to 100A) is recorded.

Energy is displayed in Joules. A typical discharge lasts for up to 10mSec and is the result of a discharge of a large capacitor. The discharge time is similar to the RC time (R= 50Ω load)

### Cardiac Synchronisation

A defibrillator is required to discharge at the correct moment of the QRS complex in order to avoid the vulnerable period (T-Wave). When using the Uni-Pulse in Cardiac Synch mode, the Uni-Pulse will output an NSR waveform. The defibrillator will synchronise on the R wave in the QRS complex. The Uni-Pulse will measure the time between this point and the actual discharge. Time is displayed in mSec. Typical between 10 – 50mSec.

### Key Features

- Compatible with mono-, bi-phasic and pulsed waveforms
- Reliable and non-inductive test load of 50Ω
- Variable load option as part of paddle adaptor box (25-200Ω)
- 12-lead patient simulator with ECG hi output
- Portable and rugged enclosure
- Colour graphic user interface
- Display of defib pulse
- Intuitive user interface
- Battery operation
- Future upgrade ready
- Data Upload / Download

### Interfaces

- **Navigation**  
via dedicated fast keys and up / down navigation keys
- **Display**  
Full graphic Colour LCD, white backlit, 1/4 VGA resolution
- **External**  
2 x 4 mm  
(Sternum / Apex – Paddle Adaptor Box )  
1 x 2 mm sensing lead  
10 x 4 mm patient simulator output  
Mains Charger inlet  
USB outlet  
ECG high level output

### Power Source

- Universal power supply (230 / 110V +/-10%, 50/60Hz)
- Internal battery pack 12v/2400mAh Nickel Metal Hydride

### Charge time

This test records the recovery time of battery operated defibrillators and is a requirement from IEC 60601-2-4. The standard requires the defib to be able to perform 10 full tests at maximum energy and measure the charge time at the 10th charge cycle. The battery should be such that its capability is the charge to maximum power within the set limit.

### Product Features

#### Compatible with ALL defib output waveforms

The Uni-Pulse is able to accurately test all defib wave forms from older mono-phasic to more recent Bi-phasic wave forms and in particular the pulsating and modulating waveforms.

#### Reliable and non-inductive test load of 50Ω

The Rigel Uni-Pulse utilises non-inductive load resistors which are rated to dissipate up to 10 x 360 Joules discharges within a 10 minute period. This test can be used in conjunction with the charge test, a requirement from IEC 60601-2-4.

#### External variable load box (optional accessory)

An external paddle adaptor box including variable load is available. A sense line determines the switch position / load to ensure that the recorded values match the set resistor settings. This reduces potential user errors of selecting the incorrect load (load to be displayed on screen and recorded with test results). The selectable loads are from 25-200Ω in 25Ω steps.

#### Portable and rugged enclosure

The Rigel Uni-Pulse is in a elegant, ergonomic and portable enclosure. This provides the user with a highly portable and rugged design.

#### Graphic user interface.

The User-Interface of the Rigel Uni-Pulse consists of a full graphic, colour LCD display.

An intuitive GUI provides instant and clear overview of measurement data and navigate through the various screens. This ensures that

the operation of the Uni-Pulse is easy to follow, reduces the requirement for training and aids the customer's ownership.

#### Intuitive User Interface

The operation of the Rigel Uni-Pulse requires the minimum of key presses to aid the reduction of test times and complexity.

Dedicated fast keys for immediate tests / simulations as well as download and view data are also included.

The colour GUI makes use of clear icons to help the user to navigate and operate the different functions.

Multi-lingual firmware is available to meet local requirements.

#### Rechargeable Battery operation

The Rigel Uni-Pulse is fitted with a rechargeable battery pack allowing the Uni-Pulse to operate without mains required during tests.

#### Download/Upload data

The Rigel Uni-Pulse is able to communicate to an external bluetooth printer and a PC / Laptop via Bluetooth and USB.

Download contains all stored test data including waveform, measured values. [energy, peak voltage / current, cardiac synch time, charge time].

Asset ID's can be scanned by barcode scanner or uploaded from Med-eBase prior to the tests. Customers can create and upload a list of Asset Trace Variables (ATV) which can be selected using the navigation keys.

It is possible to store any uploaded test programs in the tester for future reference. These are instructions on the energy output of the defib and require manual interaction from the user. The Uni-Pulse displays the required energy levels of the defibrillator.

### Supplied Accessories

- AC power supply (110/230 VAC)
- ECG Snap Adapters (set of 10)
- Instruction Manual
- Utility disc
- Carry case
- Bluetooth dongle

### Optional Accessories

- Paddle adaptor box (Apex / Sternum)
- Paddle Adaptor box, including variable load 25-200 Ω
- AED Paddle Adapters
- Med-eBase
- Barcode scanner with embedded Blue Tooth
- Printer (BT)

### Variations

- The unit is available with a universal power supply including connectors for UK / Europe and USA. Firmware allows for multi lingual menu's.

### Languages

- English (Default)
- French (Default)
- German (Default)
- Spanish (Default)
- Italian (Default)
- Chinese (Default)
- The Rigel Uni-Pulse is field upgradeable to any other additional language.

## SPECIFICATIONS

## Serviceability

Warranty:	2 Years (when calibrated at Seaward)
Calibration interval:	1 Years

## Environmental

Operating	0° - 40°C
Storage environment	-15° - +60°C
Environmental Protection	IP 40

## Safety

Electrical:	BS EN61010-1:2010.
Manufacturer's Certification	CE
EMC:	BS EN61326-2006.

## Test Specification

## Energy Measurement

Load Resistance:	50 Ohms $\pm$ 1% non inductive
Range (Low):	0 – 199.9 Joules.
Resolution:	0.1 Joules.
Accuracy:	$\pm$ 1% of Reading $\pm$ 0.1 Joule.
Range (High):	200- 600 Joules.
Accuracy:	$\pm$ 1% of the Reading $\pm$ 1 Joules.
Voltage:	0-6000 volts
Maximum Current:	0-120 Amp,
Sampling rate	100kHz sample frequency

## Cardio version (Sync.) Time

Measurement:	From peak of the simulated ECG R-wave to the peak of the defibrillator output pulse.
Range:	-250 to +250 ms.
Accuracy:	1% of Full Scale $\pm$ 1 ms.

## Discharge Waveform Output

Stored:	Waveform is captured on screen and stored in memory for download / print. Including peak voltage / peak current pulse duration.
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## Charge Time

Measurement is initiated by pressing the function key and simultaneously charging the defibrillator. Charge time recorded after the defibrillator has discharged across the 50 $\Omega$  resistor.

## ECG Arrhythmia Simulator

ECG full 12 lead simulation including high level output  
Wave forms Normal Sinus Rhythm (NSR), ST Elevation, ST Depression, Myocardial Infarction, Tall T  
Rate 20 – 300 BPM ( 1 BPM resolution)

## Also available



288

## Electrical Safety Analyser

## Features include:

- Light, hand-held, battery operation
- Conform IEC 62353 / 60601/ VDE 0751 / NFPA-99 / AS-NZS 3551
- Memory for up to 10,000 devices
- Bluetooth communication
- Full, semi automatic & manual tests



UNI-Sim

## Vital Signs Simulator

## Features include:

- Light, hand-held, battery operation
- Combined NIBP, SpO2 and Patient Simulator in one unit
- User configurable simulations
- Full synchronised functionality
- Memory for up to 10,000 devices





**Performance waveforms**

Sine, Square, Triangle, and Pulse  
Pacer Waveforms Synchronous Atrial, Asynchronous Atrial  
Pacer Only Pacer Pulse rate 60 BPM, Ventricular Pacer rate 70 BPM, Atrial  
& Ventricular Pacer Heart rate 70 BPM, R Wave Detection

**Arrhythmia Waveforms****Atrial**

Sinus Arrhythmia (SA), Missing beat, Atrial Flutter (AFLT),  
Atrial Fibrillation (AFB), Paroxysmal Atrial Tachycardia (PAT),  
Junctional Premature Contraction

**Atrial Conduction**

First Degree AV Block, Second Degree AV Block - Mobitz I,  
Second Degree AV Block - Mobitz II, Third Degree AV Block,  
Right Bundle Branch Block (RBB), Left Bundle Branch Block  
(LBB), Left Anterior Hemiblock

**Ventricular**

Premature Ventricular Contraction - Intermittent Premature  
Ventricular Contraction – Continuous, Bigeminy, Trigeminy,  
Ventricular Flutter (VFLT), Ventricular Fibrillation (VFB), Ventricular  
Tachycardia (VTC), Right Focal PVC.

**Waveform Output:**

Low Level	12 Lead ECG and on Paddles
Hi Level	Output Jack

**Accuracy:**

Rate	± 1 %
Amplitude	± 2% (LA-LL), ± 10% (Paddles)

**Blue Tooth / USB Output**

A computer interface is available to print test results or to save them on a PC. The test results can be saved directly to a PC software (Med-eBase). The dataformat shall be in SSS format. A document describing this format is available upon request

All displayed values including wave form are stored in the internal memory (4MB or more)

**Power Requirements**

12v/2400mAh Nickel Metal Hydride battery pack.  
110/230 VAC; 48 to 66 Hz, 35 VA power supply.







**Also available****Uni-Therm  
Electrosurgical Analyser****Features include:**

- IEC 60601-2-2 compliant
- Power distribution from 10-5100Ω
- HF leakage test
- Return plate security test (Rem)
- Onboard data storage

**Multi-Flo  
Infusion Pump Analyser****Features include:**

- IEC 60601-2-24 compliant
- Instant flow and pressure
- Compatible with all infusion devices
- On-screen trumpet curve
- Onboard data storage

**Product Features Key**

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|--|--|
|  Bluetooth compatible |  Battery powered      |
|  Mains powered        |  Med-eBase compatible |
|  Barcode scanner      |  Med-ekit compatible  |

## Innovating Together

### Storage and Recall

Memory	Internal minim of 4MB or at least 1000 tests plus graphs
Output	CSV and SSS format

### Temperature

Operating	15 °C to 40 °C
Storage	0°C to 50 °C

### Display

LCD	colour graphic display 1/4" VGA
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### Dimensions

225 mm x 145 mm x 95 mm (L x W x H)

### Weight

1.5 Kg

### Available accessories



#### Barcode Scanners

Speed up your testing procedures and reduce data entry errors with a dedicated range of barcode scanners. Simply "scan and test" with Rigel's range of barcode scanners. Compatible with all conventional barcode systems, the scanners are available in Bluetooth & battery operation or RS232 variants.



#### Test 'n' Tag Elite

Rigel Medical offer a unique range of printers to increase traceability onsite. From dedicated barcode label and results printers to the popular Test 'n' Tag Elite printer which encompasses all. Available with durable and tamper-proof labels; you can choose from mains or battery and bluetooth operated printers. There is always a solution to meet your requirements.



#### Med-eBase Software

Rigel's Med-eBase is a universal software package that not only allows you to download and manage test results, it also allows for easy scheduling of work-orders, configuration of test equipment, comparing of data, trend analyses and creation of customised test certificates to give you flexibility in the way you want to manage your assets.

**For orders or enquiries call**  
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