

# SECULIFE | PS100 PATIENT SIMULATOR

3-349-714-03  
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## WARNINGS, CAUTIONS, NOTICES

### WARNING - USE

The SECULIFE | PS100 is intended for testing only and should never be used in diagnostics, treatment or any other capacity where it would come in contact with a patient.

### WARNING - CONNECTIONS

All connections to patients must be removed before connecting the DUT to the SECULIFE | PS100.

A serious hazard may occur if the patient is connected when testing with the SECULIFE | PS100. Do not connect any leads from the patient directly to the SECULIFE | PS100 or DUT.

### CAUTION - SERVICE

The SECULIFE | PS100 is intended to be serviced only by authorized service personnel. Troubleshooting and service procedures should only be performed by qualified technical personnel.

### CAUTION - ENVIRONMENT

Exposure to environmental conditions outside the specifications can adversely affect the performance of the SECULIFE | PS100. Allow the SECULIFE | PS100 to acclimate to specified conditions for at least 30 minutes before attempting to operate it.

### CAUTION - CLEANING

Do not immerse. The SECULIFE | PS100 should be cleaned by wiping gently with a damp, lint-free cloth. A mild detergent can be used if desired.

**CAUTION - INSPECTION**

The SECULIFE | PS100 should be inspected before each use for obvious signs of abuse or wear. The SECULIFE | PS100 should not be used and should be serviced if any parts are in question.

**CAUTION - OPENING / REPAIR**

The equipment may be opened only by authorized service personnel to ensure the safe and correct operation of the equipment and to keep the warranty valid.

Even original spare parts may be installed only by authorized service personnel.

In case the equipment was opened by unauthorized personnel, no warranty regarding personal safety, measurement accuracy, conformity with applicable safety measures or any consequential damage is granted by the manufacturer.

**NOTICE – SYMBOLS****Symbol      Description**

**Caution**  
(Consult Manual for Further Information)



**Center Negative**



Per European Council Directive 2002/95/EC, do not dispose of this product as unsorted municipal waste.

## NOTICE – ABBREVIATIONS

AHA American Heart Association  
ANSI American National Standards Institute  
BPM Beats Per Minute  
C Celsius  
° degree(s)  
ECG Electrocardiogram  
F Fahrenheit  
Hz hertz  
IEC International Electrotechnical Commission  
Lbs pounds  
LED Light Emitting Diode  
mm millimeter(s)  
mV millivolt(s)  
NEDA National Electronic Distributors Association  
Ω ohm(s)  
USA United States of America  
V Volts

## NOTICE – DISCLAIMER

WILL NOT BE RESPONSIBLE FOR ANY INJURIES SUSTAINED DUE TO UNAUTHORIZED EQUIPMENT MODIFICATIONS OR APPLICATION OF EQUIPMENT OUTSIDE OF THE PUBLISHED INTENDED USE AND SPECIFICATIONS

## NOTICE – DISCLAIMER

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## NOTICE – CONTACT INFORMATION

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## DESCRIPTION SECULIFE | PS100 Patient Simulator

The Model SECULIFE | PS100 is a Microprocessor based Patient Simulator. It provides ECG Simulation with four waveforms with constant QRS duration and six machine performance testing waveforms. The following are highlights of some of the main features:

- 10 UNIVERSAL PATIENT LEAD CONNECTORS
- ECG: 30, 60, 120 AND 240 BPM
- SINE: 10, 60 AND 100 Hz
- SQUARE: 0.125 AND 2.000 Hz
- TRIANGLE: 2.000 Hz
- HIGH LEVEL OUTPUT (1 V p-p)
- AMPLITUDE ACCURACY:  $\pm 2\%$
- FREQUENCY ACCURACY:  $\pm 0.5\%$  OF SETTING
- 9 VOLT BATTERY POWER
- LOW BATTERY INDICATOR
- % BATTERY LIFE INDICATOR
- OPTIONAL BATTERY ELIMINATOR
- LEAD TEST FUNCTION
- HIGH IMPACT PLASTIC CASE
- LIGHT TOUCH KEYS

### OPTIONAL ACCESSORIES:

- SOFT-SIDED CARRYING CASE
- BATTERY ELIMINATOR (USA Version)
- BATTERY ELIMINATOR (Euro Version)



EG - KONFORMITÄTSERKLÄRUNG  
DECLARATION OF CONFORMITY



Dokument-Nr./ Document.No.: 833 / 11-022  
 Hersteller/ Manufacturer: GMC-I GOSSEN-METRAWATT GMBH  
 Anschrift / Address: Südwestpark 15  
 D - 90449 Nürnberg  
 Produktbezeichnung/ Product name: Patient Simulator  
 Patientensimulator  
 Typ / Type: SECULIFE PS100 /PS200 /PS300  
 Bestell-Nr / Order No: M695L /M /N

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinien überein, nachgewiesen durch die vollständige Einhaltung folgender Normen:

The above mentioned product has been manufactured according to the regulations of the following European directives proven through complete compliance with the following standards:

Nr. / No.	Richtlinie	Directive
2006/95/EG 2006/95/EC	Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen - Niederspannungsrichtlinie - Anbringung der CE-Kennzeichnung : 2013	Electrical equipment for use within certain voltage limits - Low Voltage Directive - Attachment of CE mark : 2013

EN/Norm/Standard	IEC/Deutsche Norm	VDE-Klassifikation/Classification
EN 61010-1 : 2010	IEC 61010-1 : 2010	VDE 0411-1 : 2011

Nr. / No.	Richtlinie	Directive
2004/108/EG 2004/108/EC	Elektromagnetische Verträglichkeit - EMV Richtlinie -	Electromagnetic compatibility - EMC directive -

Produktfamilienorm / Product family standard

EN 61326-1 : 2006

Nürnberg, den 25.03.2013

Ort, Datum / Place, date:

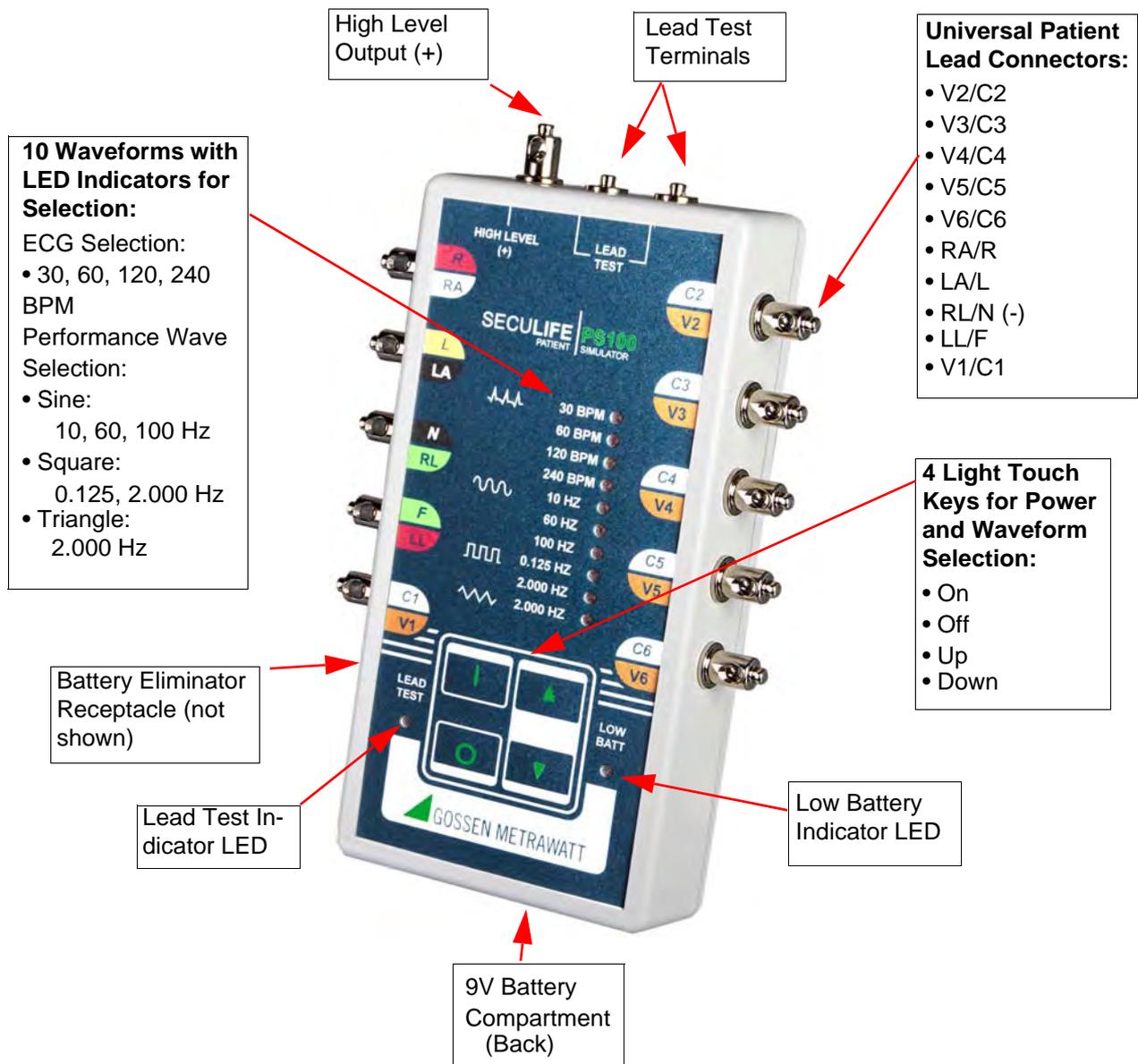
Geschäftsführung / managing director

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, beinhaltet jedoch keine Zusicherung von Eigenschaften. Die Sicherheitshinweise der mitgelieferten Produktdokumentationen sind zu beachten.

This declaration certifies compliance with the above mentioned directives but does not include a property assurance. The safety notes given in the product documentations, which are part of the supply, must be observed.

## LAYOUT

This section looks at the layout of a SECULIFE | PS100 and gives descriptions of the elements that are present.



The unit is controlled by 4 light touch keys. They allow the user to select waveforms and control the power for the unit. There is an audio click when a key is depressed.

There are 10 LEDs to provide the user with information about waveforms that are generated; 1 LED for Lead Test confirmation and 1 LED for Low Battery Indication.

## Universal Patient Lead Connectors

The 10 Universal Patient Lead Connectors allow for 12 lead ECG simulation with independent outputs. AHA and IEC color-coded labels are located on the face of the unit to aid in connecting the corresponding AHA and IEC Patient Leads.

AHA Label	IEC Label	Description
RA	R	Right Arm
LA	L	Left Arm
RL	N	Right Leg (reference or ground)
LL	F	Left Leg
V1 V2 V3 V4 V5 V6	C1 C2 C3 C4 C5 C6	V Leads (V1-V6) (U.S. and Canada) also referred to as pericardial, precordial or unipolar chest leads Chest Leads (C1-C6) (International)

## High Level Output (+)

An additional Universal Patient Lead Connector is located on the top of the unit for connecting the high level ECG output signal (1 Volt p-p). The connection is between the High Level (+) and RL/N (-) Patient Lead Connectors.

## Waveform Selection

There are two keys and 10 LEDs in the Waveform Selection Control Section. The LEDs indicate which

waveform is generated. The   keys sequentially select each waveform. The microprocessor sends the stored waveform information of the selected waveform to a Digital to Analog converter that generates an accurate analog representation. This waveform is then sent through a resistor network, developing the appropriate signals on the output terminals.

## Lead Test Terminals

There are two test terminals on the top of the unit that allow for a quick test of the continuity of the lead cables. Connecting one end of the cable to one terminal and the other end to the other terminal will test the cable. If the cable is OK (less than 1000 ohms), the LEAD TEST LED in the lower left of the face will light.

## Power Keys

The   keys control the power for the unit.

## Auto Power Off

The unit will automatically turn off after 10 minutes of no key activity to conserve the battery.

To override this feature and keep the unit on continuously, depress the  key twice after the unit is on. This will keep the unit on until it is manually turned off. The “Low Batt” LED will illuminate for 3 sec to indicate that the Auto Power Off feature has been turned off.

## Percent of Battery Life Indicator

The unit provides an indication of the Percent of battery life left on the 9 Volt Alkaline Battery. An analog to digital converter monitors the battery voltage. Continuously holding down the  key will change the 10 waveform LEDs into a Percent of Battery Life display, with each LED representing 10 % intervals.

The indicator will strobe up to the present level and flash. This sequence will continue while the  key is depressed.

## Battery

The unit utilizes a 9 Volt Alkaline Battery in the rear battery compartment. When the unit detects a LOW BATTERY, the LED in the lower right of the face will light, indicating the need to change the battery.

**Battery Eliminator Input** – A 2.1 mm receptacle is provided for the optional 9 VDC Battery Eliminator power supply that may be used for continuous run applications. It bypasses the internal battery when plugged in.

**NOTE:** The unit is shipped with a Red Battery Lock-Out plug installed into the line power connector as shown below. Its purpose is to prevent the unit from accidentally being turned on during handling and transport, subsequently depleting the battery. This plug must be removed before any use.



## LIMITED WARRANTY

**WARRANTY:** GMC-I MESSTECHNIK GMBH WARRANTS ITS NEW PRODUCTS TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP UNDER THE SERVICE FOR WHICH THEY ARE INTENDED. THIS WARRANTY IS EFFECTIVE FOR TWELVE MONTHS FROM THE DATE OF SHIPMENT.

**EXCLUSIONS:** THIS WARRANTY IS **IN LIEU OF** ANY OTHER WARRANTY EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF **MERCHANTABILITY** OR FITNESS FOR A PARTICULAR PURPOSE.

GMC-I MESSTECHNIK GMBH IS NOT LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

NO PERSON OTHER THAN AN OFFICER IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR ASSUME ANY LIABILITY.

**REMEDIES:** THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY SHALL BE: (1) THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS OR PRODUCTS, WITHOUT CHARGE. (2) AT THE OPTION OF GMC-I MESSTECHNIK GMBH, THE REFUND OF THE PURCHASE PRICE.

## SPECIFICATIONS

PATIENT SIMULATION			
RATE	NORMAL SINUS RHYTHM	30, 60, 120, 240 BPM	
	PERFORMANCE WAVEFORMS	SINE	10, 60, 100 Hz
		SQUARE	0.125, 2.0 Hz
		TRIANGLE	2.0 Hz
	ACCURACY	$\pm 0.5\%$	
AMPLITUDE	LEAD 1	1.75 mV	
	LEAD 2	2.75 mV	
	LEAD 3	1.00 mV	
	ACCURACY	$\pm 2\%$ Lead II	
IMPEDANCE	LEAD TO LEAD	1000 $\Omega$	
	LEAD TEST	$< 1000 \Omega$	

PHYSICAL & ENVIRONMENTAL		
CONSTRUCTION	ENCLOSURE	ABS Plastic
	FACEPLATE	Lexan, Back printed
SIZE	7.26 x 4.46 x 1.51 Inches (184.4 x 113.3 x 38.4 mm)	
WEIGHT	$\leq 1$ Lbs (0.45 kg)	
OPERATING RANGE	15 to 40 °C (59 to 104 °F)	
STORAGE RANGE	-20 to 65 °C (-4 to 149 °F)	

ELECTRICAL	
BATTERY	9 V Alkaline Battery (ANSI/NEDA 1604A or equivalent)
BATTERY ELIMINATOR (Optional)	9 VDC, 50 mA 

<b>NOTES</b>
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## **Repair and Replacement Parts Service Calibration Center\* and Rental Instrument Service**

If required please contact:

GMC-I Service GmbH  
Service-Center  
Thomas-Mann-Strasse 16-20  
90471 Nürnberg • Germany  
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Fax: +49 911 817718-253  
E-mail [service@gossenmetrawatt.com](mailto:service@gossenmetrawatt.com)  
[www.gmci-service.com](http://www.gmci-service.com)

This address is only valid in Germany. Please contact our representatives or subsidiaries for service in other countries.

\* **DAkkS Calibration Laboratory for Electrical Quantities**  
**D-K-15080-01-01 accredited per DIN EN ISO/IEC 17025:2005**

Accredited quantities: direct voltage, direct current value, direct current resistance, alternating voltage, alternating current value, AC active power, AC apparent power, DC power, capacitance, frequency and temperature

## **Product Support**

If required please contact:

GMC-I Messtechnik GmbH  
**Product Support Hotline**  
Phone: +49-911-8602-0  
Fax: +49 911 8602-709  
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Edited in Germany • Subject to change without notice • A PDF version is available on the Internet

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