



PULSE OXIMETRY SIMULATOR



SPO-2000 SYSTEM

USER MANUAL

<p>BC BIOMEDICAL SPO-2000 SYSTEM TABLE OF CONTENTS</p>

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WARNING - USERS

The SPO-2000 System is for use by skilled technical personnel only.

WARNING - USE

The SPO-2000 System 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 - MODIFICATIONS

The SPO-2000 System is intended for use within the published specifications. Any application beyond these specifications or any unauthorized user modifications may result in hazards or improper operation.

WARNING – LIQUIDS

Do not submerge or spill liquids on the SPO-2000 System. Do not operate the SPO-2000 System if internal components not intended for use with fluids may have been exposed to fluid, as the internal leakage may have caused corrosion and be a potential hazard.

CAUTION - CLEANING

Do not immerse. The SPO-2000 System should be cleaned by wiping gently with a damp, lint-free cloth. A mild detergent can be used if desired.

CAUTION - SERVICE

The SPO-2000 System 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 SPO-2000 System. If the SPO-2000 System is outside of Operating specifications, allow it to acclimate to specified conditions for at least 30 minutes before attempting to operate it.

CAUTION - INSPECTION

The SPO-2000 System should be inspected before each use for wear and should be serviced if any parts are in question.

NOTICE – SYMBOLS

<u>Symbol</u>	<u>Description</u>
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	Center Negative
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NOTICE – ABBREVIATIONS

BPM	Beats Per Minute
C	Celsius
°	Degree(s)
DUT	Device Under Test
F	Fahrenheit
kg	kilogram(s)
LED	Light Emitting Diode
mA	milliampere(s)
mm	millimeter(s)
Lbs	pounds
USA	United States of America
VDC	Volts Direct Current

NOTICE – DISCLAIMER

BC GROUP INTERNATIONAL, INC. 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

BC BIOMEDICAL
BC GROUP INTERNATIONAL, INC.
3081 ELM POINT INDUSTRIAL DRIVE
ST. CHARLES, MO 63301
USA

1-800-242-8428
1-314-638-3800

www.bcgrouptl.com
sales@bcgrouptl.com

<p style="text-align: center;">BC BIOMEDICAL SPO-2000 SYSTEM PULSE OXIMETRY SIMULATOR SYSTEM</p>

The SPO-2000 System is used to verify the operation of Pulse Oximeters. The SPO-2000 System is comprised of the SPO-2000 Base Unit and a FingerSim™ simulated finger, available in three different SpO₂ saturation levels. The FingerSim™ is inserted into the SPO-2000 Base Unit, which then adds calibrated pulse rates to the functionality of the FingerSim™.

The following are highlights of some of the main features.

SPO-2000 SYSTEM (BASIC FEATURES):

- SIX CALIBRATED SIMULATOR PULSE RATES: 30, 60, 90, 120, 150, and 180 BPM
- LED INDICATION OF SELECTED PULSE RATE
- STANDBY MODE

AVAILABLE MODELS:

The SPO-2000 Base Unit plus one or more FingerSims™ are required in order to verify the operation of Pulse Oximeters.

- | | |
|------------------|--|
| • SPO-2000 | SIMULATOR BASE UNIT |
| • FingerSim™ KIT | COMPLETE STARTER KIT (INCLUDES 80%, 90% AND 97% FingerSims™, FingerSim™ HOLDER, AND CARRYING CASE) |
| • FingerSim™ SET | REPLACEMENT KIT (80%, 90% AND 97% FingerSims™ ONLY) |

STANDARD ACCESSORIES:

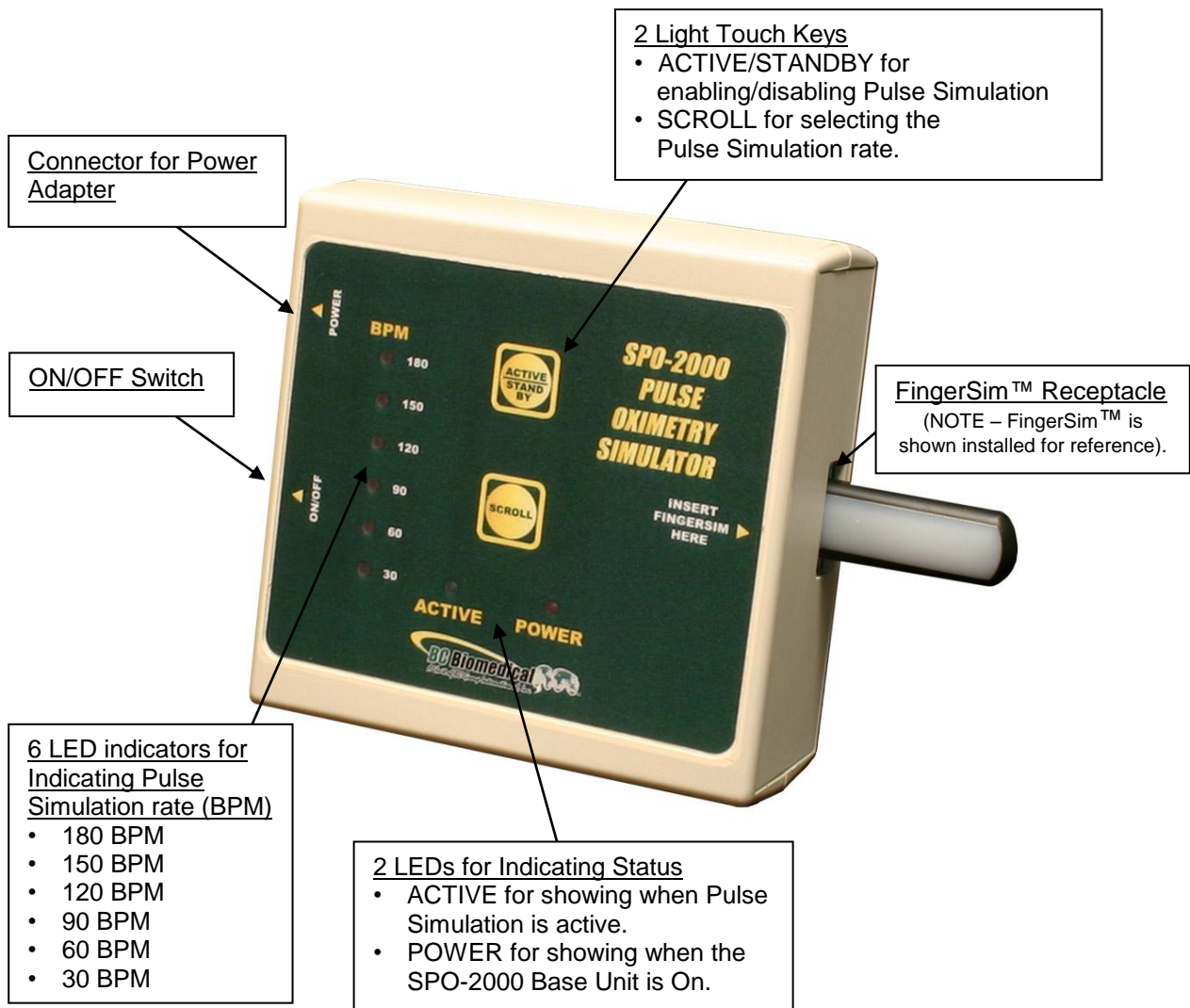
- | | |
|--------------|------------------------------|
| • BC20-00431 | 110V AC POWER ADAPTER (US) |
| (OR) | |
| • BC20-40614 | 220V AC POWER ADAPTER (EURO) |

OPTIONAL ACCESSORIES:

- | | |
|--------------|---|
| • BC20-40110 | CARRYING CASE FOR SPO-2000 BASE UNIT, FingerSims™ & ACCESSORIES |
|--------------|---|

LAYOUT

This section looks at the layout of the SPO-2000 Base Unit and gives descriptions of the elements that are present.



KEYS

2 soft touch keys are provided for Base Unit operation:



– This key is used to turn the SPO-2000 Base Unit Pulse Simulation ON and OFF.



– This key is used to select the desired Pulse Simulation rate.

LED INDICATORS

There are eight LEDs to indicate the status of the Base Unit. They are marked POWER, ACTIVE, 30, 60, 90, 120, 150, AND 180.

POWER – This LED indicates that the Base Unit power switch is turned ON and the onboard power supply is functioning properly.

ACTIVE – This LED indicates that the Base Unit is in the ACTIVE mode, meaning Pulse Simulation is activated. STANDBY mode is indicated by an active POWER LED and inactive ACTIVE LED.

30 – This LED indicates that the currently selected Pulse Simulation rate is 30 BPM.
NOTE: This is the default Pulse Simulation rate when the Base Unit is first powered.

60 – This LED indicates that the currently selected Pulse Simulation rate is 60 BPM.

90 – This LED indicates that the currently selected Pulse Simulation rate is 90 BPM.

120 – This LED indicates that the currently selected Pulse Simulation rate is 120 BPM.

150 – This LED indicates that the currently selected Pulse Simulation rate is 150 BPM.



180 – This LED indicates that the currently selected Pulse Simulation rate is 180 BPM.


OPERATIONS

The SPO-2000 Base Unit will start up in the STANDBY mode with a selected Pulse Simulation rate of 30 BPM by default.


Insert the desired FingerSim™ into the rectangular SPO-2000 FingerSim™ receptacle.

NOTE: It is recommended that the FingerSim™ be inserted with the printed side down to minimize wear on the printing by the mechanism inside the SPO-2000 Base Unit.

Use the  key to select the desired Pulse Simulation rate. Pulse Simulation is enabled by depressing the  key. The ACTIVE LED will turn on and the FingerSim™ will pulse at the desired rate.

The Pulse Simulation rate can be changed by depressing the  key, in either the ACTIVE or STANDBY mode.

Connect the finger probe of the DUT being tested to the FingerSim™. For tidiness, route the probe's cable underneath the SPO-2000 Base Unit.

Pulse Simulation is disabled by depressing the  key, which sets the Base Unit to STANDBY mode.

NOTE: The accuracy of the simulated SpO₂ saturation is a function of the FingerSim™, not the SPO-2000 Base Unit. The SPO-2000 Base Unit only affects the Pulse Simulation rate. See the FingerSim™ Specifications for accuracy and related data.

MANUAL REVISIONS

<u>Revision #</u>	<u>Revisions Made</u>
Rev 01	Origination
Rev 02	Format Updated
Rev 03	Misc. Edits
Rev 04	Misc. Edits, Format Updated, Specifications Updated

LIMITED WARRANTY

WARRANTY: BC GROUP INTERNATIONAL, INC. 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.

BC GROUP INTERNATIONAL, INC. 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 **BC GROUP INTERNATIONAL, INC.**, THE REFUND OF THE PURCHASE PRICE.

SPECIFICATIONS

SPO-2000 BASE UNIT

PULSE SIMULATION	
RATE	30, 60, 90, 120, 150, 180 BPM
ACCURACY	$\pm 1\%$

PHYSICAL, ENVIRONMENTAL, AND ELECTRICAL		
SIZE	5.20 x 5.20 x 2.50 Inches (132.1 x 132.1 x 63.5 mm)	
WEIGHT	≤ 1 Lbs (0.45 kg)	
CONSTRUCTION	ENCLOSURE	ABS Plastic
	FACE PLATE	Lexan, Back printed
OPERATING RANGE	15° to 40° C (59° to 104° F)	
STORAGE RANGE	-20° to 65° C (-4° to 149° F)	
POWER	12 VDC, 500 mA 	

NOTES



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