

# Safety Analyzer Series

## Features - SA-2000 Series

- ◆ Small, Lightweight Portable Analyzer
- ◆ Line Voltage Measurement
- ◆ Device Under Test Current Measurement
- ◆ Earth/Ground Lead Resistance/ Leakage Current
- ◆ Point-to-Point Testing (Except SA-2000)
- ◆ Enclosure/Chassis Leakage Current
- ◆ External Resistance
- ◆ External Leakage Current
- ◆ Source Receptacle Wiring Integrity Monitor
- ◆ MAP (Isolation) Function
- ◆ Internal ECG Simulator (SA-2010S Only)
- ◆ True RMS Readings
- ◆ AAMI ES1-1993 or IEC 601 Selectable Test Loads (SA-2000 AAMI Only)
- ◆ 90 to 264 VAC Operation
- ◆ Touch Control Keys - No Knobs
- ◆ LED Status Indicators
- ◆ Audible Feedback
- ◆ Self-Test Points
- ◆ Externally Replaceable Ground Fuse
- ◆ Automatic Delay on Power Polarity Reversal to DUT
- ◆ Soft-Sided Carrying Case
- ◆ International Versions Available

## Optional

- ◆ External Point-to-Point (Red) Cable
- ◆ Kelvin Cable (For four wire resistance testing)
- ◆ RS-232 add “-R” to part number



## SA-2010S

The SA-2000 Series is a Microprocessor-based Electrical Safety Analyzer Family. There are 5 models that provide everything from the most basic testing functions to the most complete set of features of any handheld unit on the market.

The compact size makes the SA-2000 Family easy to hold and operate. All models operate from 90 to 264 Volts @ 50/60 Hz, with Load Currents up to 20 Amps, so there is no need to purchase 2 different analyzers to cover your testing needs. The SA-2010S is the smallest safety analyzer available with a built-in ECG Patient simulator.

The SA-2000 Family of Safety Analyzers allows the user to choose the model that best fits the application. The combination of the best features at the best price makes this Family of products a perfect choice.

All models come with a soft-sided case and a Chassis (Black) cable. An optional External Point-to-Point (Red) cable or a Kelvin cable is also available.

## SPECIFICATIONS



Models:	SA-2000	SA-2001	SA-2005	SA-2010	SA-2010S
Voltage (Rating)	90 to 264 VAC	90 to 264 VAC	90 to 264 VAC	90 to 264 VAC	90 to 264 VAC
Current (Rating)	20 A	20 A	20 A	20 A	20 A
RS-232	On "-R"				
Measures:					
Voltage (VAC)	No	90 to 264 (± 3% R)	90 to 264 (± 3% R)	90 to 264 (± 3% R)	90 to 264 (± 3% R)
Current (A)	No	0 to 19.99 (± 5% R)	0 to 19.99 (± 5% R)	0 to 19.99 (± 5% R)	0 to 19.99 (± 5% R)
Leakage Current ( $\mu$ A)	0 to 1999 DC & 25 to 1 kHz (± 1% R) 1 kHz to 100kHz (± 2.5% R) 100 kHz to 1 MHz (± 5% R)	0 to 1999 DC & 25 to 1 kHz (± 1% R) 1 kHz to 100kHz (± 2.5% R) 100 kHz to 1 MHz (± 5% R)	0 to 1999 DC & 25 to 1 kHz (± 1% R) 1 kHz to 100kHz (± 2.5% R) 100 kHz to 1 MHz (± 5% R)	0 to 1999 DC & 25 to 1 kHz (± 1% R) 1 kHz to 100kHz (± 2.5% R) 100 kHz to 1 MHz (± 5% R)	0 to 1999 DC & 25 to 1 kHz (± 1% R) 1 kHz to 100kHz (± 2.5% R) 100 kHz to 1 MHz (± 5% R)
Resistance ( $\Omega$ )	0 to 1.99 (± 1% R) 2 to 19.99 (± 1% R) 10 mA	0 to 1.99 (± 1% R) 2 to 19.99 (± 1% R) 10 mA	0 to 1.99 (± 1% R) 2 to 19.99 (± 1% R) 10 mA	0 to 1.99 (± 1% R) 2 to 19.99 (± 1% R) 10 mA	0 to 1.99 (± 1% R) 2 to 19.99 (± 1% R) 10 mA
Patient Leads	0	0	5	10	10
MAP (Isolation)	No	No	Yes	Yes	Yes
Built-in ECG Simulator	No	No	No	No	Yes
AAMI & IEC Loads	AAMI Only	Yes	Yes	Yes	Yes
Point-to-Point	No	Yes	Yes	Yes	Yes
Test Points	No	Yes	Yes	Yes	Yes
Test Capability:					
Open Ground	Yes	Yes	Yes	Yes	Yes
Reverse Polarity	Yes	Yes	Yes	Yes	Yes
Open Neutral	Yes	Yes	Yes	Yes	Yes
Open Line	Yes	Yes	Yes	Yes	Yes
Size	8.65 x 5.73 x 1.92 Inches	8.65 x 5.73 x 1.92 Inches	8.65 x 5.73 x 2.40 Inches	8.65 x 5.73 x 2.40 Inches	8.65 x 5.73 x 2.40 Inches
Weight	≤ 2.5 Lbs (1.14kg)	≤ 3.0 Lbs (1.36kg)	≤ 3.0 Lbs (1.36kg)	≤ 3.0 Lbs (1.36kg)	≤ 3.5 Lbs (1.59kg)

## Safety Analyzer Series

### Features - SA-2000-INTL Series

- ◆ Five Models Available: SA-2000-INTL, SA-2001-INTL, SA-2005-INTL, SA-2010-INTL & SA-2010S-INTL
- ◆ All of the Same Features Available as the Domestic Counterpart
- ◆ Universal Power Receptacle Accepts Almost Any International Power Plug Configuration
- ◆ Detachable Power Cord allows for use in Any Country
- ◆ Multiple International Configuration Power Cords Available
- ◆ AAMI ES1-1993 or IEC 601 Selectable Test Loads
- ◆ 90 to 264 VAC Operation
- ◆ Soft-sided Carrying Case & Chassis Cable Included

### Features - CS-2000 Series

- ◆ Two Models Available: CS-2000-U (US Version with US Plug & Socket) and CS-2000-E (European Version with European "Schuko" Plug & Socket)
- ◆ Facilitates Testing to IEC 601 Requirements
- ◆ Interfaces Directly to BC Biomedical SA-2000 & SA-2000-INTL Series of Safety Analyzers
- ◆ Interfaces with Dale Technology® LT544D, LT544D Lite, 601 & 601E Safety Analyzers
- ◆ Universal Power Supply (90 to 264 VAC, 50/60 Hz)
- ◆ 1 Amp Current Source for Resistance Measurements
- ◆ No Protruding Push Buttons
- ◆ Light Touch Key Used to Operate
- ◆ Small Size



Universal Power Receptacle with BC20-20221 Installed for Schuko use

### SA-2001-INTL

The SA-2000-INTL Series is ideal for international customers or for those that simply need a power cord configuration that is different from the standard NEMA 5-15P configuration that is standard on our SA-2000 Series. Interchangeable power cords make power input switching extremely easy and the universal configuration power receptacle is compatible with almost all countries around the world.



CS-2000

The CS-2000 Series is a one Amp current source for testing the ground continuity in equipment. This device facilitates testing to IEC 601 requirements, where a one Amp source current is required. This device interfaces directly with the BC Biomedical SA-2000 Series of Safety Analyzers as well as the Dale Technology® LT544D, LT544D Lite & 601/601E. This Series comes in two models, US and European plug and socket configurations.



# SA-2000-INTL SERIES INFORMATION

## Typical Power Cord Options Available for the SA-2000-INTL Series



**BC20-20400**  
North America  
Hospital Grade



**BC20-20401**  
Japan



**BC20-20402**  
United Kingdom



**BC20-20403**  
Schuko-Continental  
Europe



**BC20-20409**  
India/South Africa



**BC20-20410**  
Switzerland

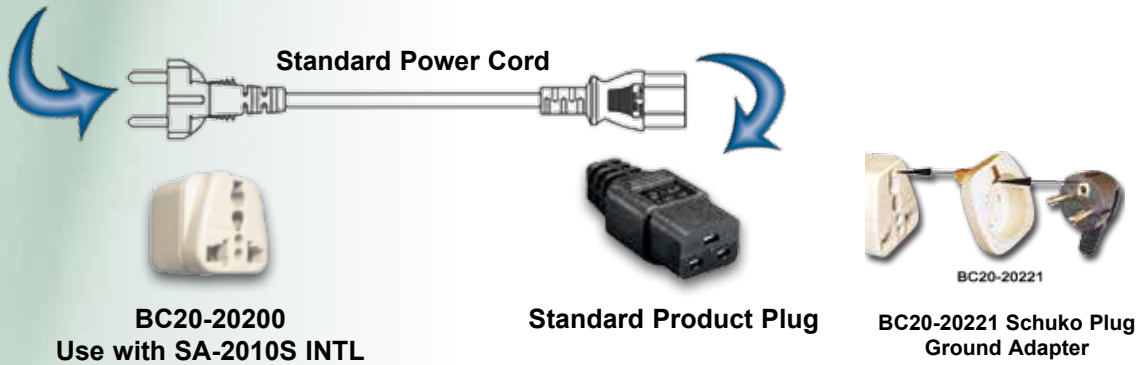


**BC20-20412**  
Italy



**BC20-20416**  
Australia

Pick Your Country's Connector from Above to Connect to the SA-2000-INTL series



### CS-2000 SPECIFICATIONS

Electrical	
CURRENT SOURCE	1.00 to 1.02 A DC
OPERATING LINE VOLTAGE	90-264 VAC, 50/60 Hz
POWER CONSUMPTION	12 VA (12 W)
LOAD CURRENT	This device is an accessory to a Safety Analyzer, refer to applicable Safety Analyzer User Manual for this Rating
LINE PLUG	CS-2000-U NEMA 5-15P
	CS-2000-E European CEE 7/7 "Schuko"
DUT RECEPTACLE	CS-2000-U Hospital Grade NEMA 5-15R
	CS-2000-E European CEE 7/7 "Schuko"
CONNECTIONS	<p>LINE PLUG 3 Pin Locking Plug for Safety Analyzer Chassis Cable Connection (See Description section for Compatible Safety Analyzers)</p> <p>Detachable Kelvin Cable (BC20-20114) for DUT Ground Connection</p>
Physical	
SIZE	7.09 x 3.94 x 1.56 Inches (180 x 100 x 40 mm)
ENCLOSURE	ABS Plastic Back-printed Lexan Overlay
WEIGHT	< 1 Lbs (0.45 kg)
OPERATING RANGE	0 to 50 °C (32 to 122 °F) 10 to 90% RH, Non-Condensing
STORAGE RANGE	-40 to 60 °C (-40 to 140 °F)

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# Safety Analyzer Series

## Features - SA-2500

- ◆ Full PC Automation with Procedures and Reports
- ◆ Small & Lightweight Portable Analyzer
- ◆ Line Voltage Measurement
- ◆ Device Under Test Current Measurement
- ◆ Earth/Ground Lead Resistance/Leakage Current
- ◆ Point-to-Point Testing
- ◆ Enclosure/Chassis Leakage Current
- ◆ External Resistance
- ◆ External Leakage Current
- ◆ Source Receptacle Wiring Integrity Monitor
- ◆ MAP (Isolation) Function
- ◆ True RMS Readings
- ◆ 90 to 240 VAC Operation
- ◆ Touch Control Keys - No Knobs
- ◆ Audible Feedback
- ◆ Automatic Delay on Power Polarity Reversal to DUT
- ◆ Soft-Sided Carrying Case
- ◆ International Versions Available

## Optional

- ◆ BC20-20150 – Chassis Cable (Kelvin), one comes with the unit (SA-2500 Only)



## SA-2500

The SA-2500 is an Electrical Safety Analyzer with Full PC Automation.

There are two modes of operation, Manual and Remote. The Manual Mode allows most of the basic testing functions to be stepped through one at a time. With the Remote Mode, measurements are controlled via a PC. The user has the possibility to integrate all measurements into the individual operator interface at the PC and to define test sequences.



PC Interface  
(Included)

Sample  
Report  
(Included)

BC Group		Report no. 201501110101		Test report	
Customer No.	None	Order No.	201501110101		
Name		BC Group (International) Inc.	2000 Old Transportation Drive	St Charles, MO 63041	
Phone				63 360 44 55 99	
Manufacturer		Manufacturer	Model		
Part number		Part number	Version		
Accessories					
Test					
Beginning of test	00:00:00	End of test	00:00:00		
Procedure or measurement		Reason for testing	Planned test		
Global measurement	BC 2500 Safety Analyzer				
<p>✓ All test results from the unit are being sent to the test report by the test device.</p> <p>✓ All test results from the unit are being sent to the test report by the test device.</p> <p>✓ All test results from the unit are being sent to the test report by the test device.</p> <p>✓ All test results from the unit are being sent to the test report by the test device.</p> <p>✓ All test results from the unit are being sent to the test report by the test device.</p> <p>✓ All test results from the unit are being sent to the test report by the test device.</p>					
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Item	Unit	Description	Measurement	Test Pass	Test Result
1	V	Line Voltage	112 V	Pass	Yes
2	mA	Device Under Test Current	<1 μA	Pass	Yes
3	Ω	Earth/Ground Lead Resistance	112 Ω	Pass	Yes
4	Ω	External Resistance	112 Ω	Pass	Yes

## SPECIFICATIONS

Electrical	
Voltage (Rating)	90-240 VAC
Current (Rating)	16A
Remote Control	USB
Measurements	
Voltage (VAC)	90 - 240 (+/-5%)
Current (A)	0 to 16.00 (+/- 5%)
Leakage Current	10 to 300 uA(+/- 5%)300 uA to 30 mA (+/- 5%)
Resistance (Ohms)	0.01 to 30.00 (+/- 10%)
Patient Leads	10
MAP (Isolation)	Yes
Built-In ECG Simulator	No
Test Load	IEC
Point to Point	Yes
Test Points	No
Test Capability	
Open Ground	Yes
Reverse Polarity	Yes
Open Neutral	Yes
Open Line	Yes
Size	12.8 x 9.8 x 3.5 Inches
Weight	< 4.4 Lbs (2 kg)

### Measuring Leakage Current

Frequency response is taken into consideration in accordance with the diagram to the right when leakage current is measured.

