FLUKE®

Biomedical

ESA620

Electrical Safety Analyzer

Technical Data

The ESA620 Electrical Safety Analyzer, featuring smart technology to enhance productivity under any standard, represents the next generation in portable electrical safety testers. With selections of three test loads, two protective earth test currents and two insulation test voltages, this versatile device performs all primary electrical safety tests as well as several additional leakage tests for premium standards compliance worldwide.

A convenient 20 A device receptacle broadens the range of equipment that can be tested using the ESA620. Standard 2-wire and optional 4-wire protective earth measurement capabilities offer first-rate time savings, while new DSP technology offers better accuracy of leakage measurements throughout specified ranges.

Equipped with ten unique safety-enhanced ECG posts, the ESA620 offers simulation of ECG and performance waveforms so both electrical safety and basic tests on patient monitors can be performed with a single connection. When combined with optional Ansur computer-based software, the ESA620 allows for test procedure automation, the capture of results and comparison to standard limits, printed reports, and total digital data management.

Key features

- Superior compliance with multiple standards: IEC60601:2005, EN62353, VDE 751, ANSI/AAMI ES1:1993, NFPA-99, AN/NZS 3551, IEC61010
- Three test loads
- Expanded leakage ranges through 10,000 µA
- Dual-lead resistance, leakage, and voltage tests
- AC only, dc only and true-rms leakage readings
- 100 % and 110 % mains voltage for mains on applied part (lead isolation) test
- 200 mA and 25 A ac PE test current
- DSP filter technology for improved accuracy in leakage measurements
- 20 A equipment current
- More applied parts selections
- ECG and performance waveforms
- Intuitive user interface
- Easy-to-use applied parts (ECG) connections
- Insulation posts on applied parts connections
- Five different insulation tests
- Varying insulation test voltage 500 V dc and 250 V dc
- 2- or (optional) 4-wire ground wire resistance
- Optional Ansur plug-in software
- USB connection
- CE, C-TICK and CSA for USA and Canada
- RoHS compliance
- Designed, tested, and built to incomparable Fluke quality standards

Specifications

Voltage		
Range (mains voltage)	90 V to 132 V ac rms	
	180 V to 264 V ac rms	
Range (accessible voltage)	0 V to 300 V ac rms	
Accuracy	± (2 % of reading +2 LSD)	
Voltage tests	Mains, accessible, and point-to-point	
Earth resistance		
Two-terminal mode test current/range and accuracy	> 200 mA ac	0.0 to 2.0 Ω ± (2 % of reading + 0.015 Ω)
	10 A to 25 A ac	0.0 to 0.2 Ω ± (2 % of reading + 0.015 Ω) 0.2 to 2.0 Ω ± (5 % of reading + 0.015 Ω)
Four-terminal mode test current/range and accuracy	> 200 mA ac	0.0 to 2.0 Ω ± (2 % of reading + 0.005 Ω)
	10 A to 25 A ac	0.0 to 0.2 Ω ± (2 % of reading + 0.005 Ω) 0.2 to 2.0 Ω ± (5 % of reading + 0.005 Ω)
Resistance tests	Earth resistance and point-to-point	
Equipment current		
Mode	AC rms	
Range/accuracy	0 A to 20 A	± 5 % of reading ± (2 counts or .2 A, whichever is greater)
Duty cycle	15 A to 20 A, 5 min on/5 min off 10 A to 15 A, 7 min on/3 min off 0 A to 10 A continuous	
Leakage current		
Modes*	AC + DC (True-rms)	
	AC only	
	DC only	
*** Modes are available in all leakage tests with the exception of MAP leakages that are available only in true-rms**		
Patient load selection (input impedance)	AAMI ES1-1993 Fig.1	
	IEC 60601: Fig 15	
	IEC 61010: Fig. A-1	
Crest factor	≤ 3	
Ranges	0 µA to 199.9 µA	
	200 µA to 1999 µA	
	2 mA to 10 mA	
Frequency response/accuracy	DC to 1 kHz	± (1 % of reading + 1 µA)
	1 kHz to 100 kHz	± (2 % of reading + 1 µA)
	100 kHz to 1 MHz	± (5 % of reading + 1 µA)
Leakage tests	Earth (ground wire)	
	Chassis (enclosure)	
	Patient (lead to ground)	
	Patient auxiliary (lead to lead)	
	Mains on applied part (lead isolation)	
	Direct equipment	
	Direct applied part	
	Alternative equipment	
	Alternative applied part	
	Accessible	
	Point to point	

Mains on applied part test voltage	110 % of mains at 230 V for IEC 60601	
	100 % of mains for AAMI at 115 V per AAMI	
	100 % of mains at 230 V per 62353	
Differential leakage		
Ranges	10 µA to 199 µA	
	200 µA to 1999 µA	
	2 mA to 20 mA	
Accuracy	± 10 % of reading ± (2 counts or 20 µA, whichever is greater)	
Insulation resistance		
Ranges/accuracy	0.5 MΩ to 20 MΩ	± (2 % of reading + 2 counts)
	20 MΩ to 100 MΩ	± (7.5 % of reading + 2 counts)
Source test voltage	500 V dc	
	250 V dc	
Insulation resistance tests	Mains-PE, AP-PE, Mains- PE, Mains-NE (non-earthed accessible conductive part) and AP- NE (non-earthed accessible conductive part)	
Mamimum load capacitance	1 µF	
ECG performance waveforms		
Accuracy	± 2 %	
	± 5 % for amplitude of 2 Hz square wave only, fixed at 1 mV Lead II configuration	
Waveforms	**Rates**	
	ECG complex (BPM)	30, 60, 120, 180, and 240
	Ventricular fibrillation	
	Square wave (50 % duty cycle) (Hz)	0.125 and 2
	Sine wave (Hz)	10, 40, 50, 60, and 100
	Triangle wave (Hz)	2
	Pulse (63 ms pulse width)	30 and 60
Power ratings		
Mains voltage outlet	120 V ac	230 V ac
Mains voltage inlet power range	90 to 132 V ac rms	180 to 264 V ac rms
Maximum current	20 A	16 A
Hz	50 or 60	50 or 60
Physical case		
Dimensions (L x W x H)	31 cm x 23 cm x 10 cm (12.2 in x 9 in x 2.9 in)	
Weight	4.7 kg (10.25 lb)	
Environmental specifications		
Operating temperature	10 °C to 40 °C	
Storage temperature	-20 °C to 60 °C	
Operating humidity	10 % to 90 % non-condensing	
Altitude	To 2,000 meters	
General		
Warranty	Two-year extended warranty*	

*No-cost extended warranty available after first-year calibration at any Fluke Biomedical authorized service center.

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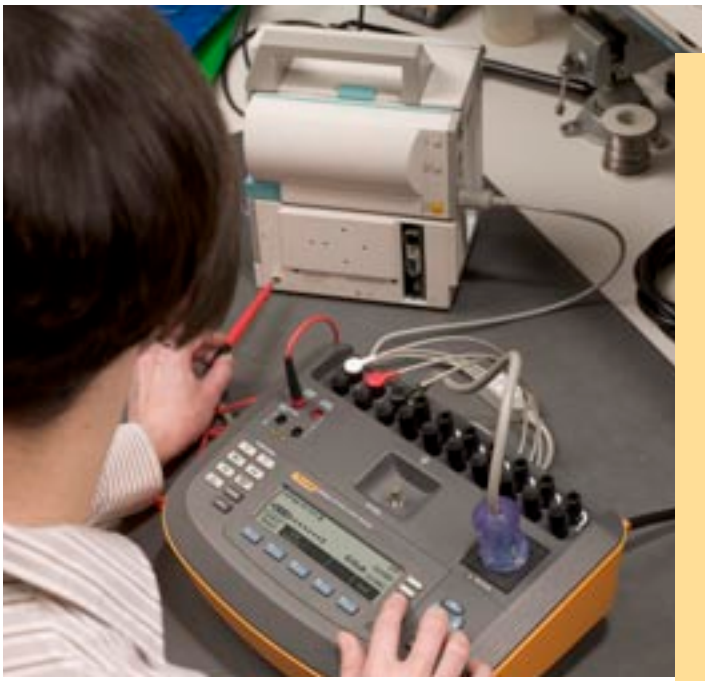

Ordering information

Models

2785725 ESA620 Electrical Safety Analyzer US, 115 V 20 A
3051408 ESA620 Electrical Safety Analyzer EUR, 230 V
3051390 ESA620 Electrical Safety Analyzer FR, 230 V
3051413 ESA620 Electrical Safety Analyzer ISR, 230 V
3051424 ESA620 Electrical Safety Analyzer ITA, 230 V
3051436 ESA620 Electrical Safety Analyzer AUS, 230 V
3051449 ESA620 Electrical Safety Analyzer UK, 230 V
3051451 ESA620 Electrical Safety Analyzer SWI, 230 V

Standard accessories

2814967 Operator's Manual CD
2814971 Multilingual Getting Started Guide
2195732 15 A to 20 A Adapter (USA only)
2814980 Carrying Case
1626219 Data Transfer Cable
Power Cord (country specific)
ESA620 Accessory Kit (country specific)

Optional accessories

3116463 Ansur ESA620 Plug-In
1903307 Retractable Test Leads
2242165 Ground Pin Adapter
2067864 Kelvin Cable Set for 4-Wire Measurement

About Fluke Biomedical

Fluke Biomedical is the world's leading manufacturer of quality biomedical test and simulation products. In addition, Fluke Biomedical provides the latest medical imaging and oncology quality-assurance solutions for regulatory compliance. Highly credentialed and equipped with a NVLAP Lab Code 200566-6 accredited laboratory, Fluke Biomedical also offers the best in quality and customer service for all your equipment calibration needs.

Today, biomedical personnel must meet the increasing regulatory pressures, higher quality standards, and rapid technological growth, while performing their work faster and more efficiently than ever. Fluke Biomedical provides a diverse range of software and hardware tools to meet today's challenges.

Fluke Biomedical Regulatory Commitment

As a medical test device manufacturer, we recognize and follow certain quality standards and certifications when developing our products. We are ISO 9001 certified and our products are:

- CE Certified, where required
- NIST Traceable and Calibrated
- UL, CSA, ETL Certified, where required
- NRC Compliant, where required

Fluke Biomedical.
Better products. More choices. One company.

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