FLUKE®

Biomedical

ESA612

Electrical Safety Analyzer

Technical Data

The ESA612 Electrical Safety Analyzer represents the next generation in testers for biomedical professionals that perform field service on medical equipment throughout their facilities, in clinics, and anywhere onsite service is required. Portable, lightweight, and designed for operation in tight spaces, the ESA612 offers the functionality of a simulator, multimeter and electrical-safety analyzer in a single test tool.

With selection of two test loads, this versatile product can be used worldwide to test to preventative maintenance electrical safety standards of choice: ANSI/AAMI ES1:1993 (NFPA-99), IEC62353 (VDE 751), and AN/NZS 3551.

The versatility of the multifaceted ESA612 is further expanded with optional automation software, which speeds and simplifies testing and provides high-end-analyzer productivity at software-level investment. Ansur-automated ESA612 standardizes test procedures, compares results to standards limits, and generates and stores reports for total digital data management.

Key features

- Portable, ergonomic, lightweight and easy to use
- Large, easy-to-read display with adjustable contrast
- Human-factors-designed user interface
- Tilt stand design for stand-up testing in field environments
- Five applied parts jacks and easy ECG snap connection with optional expander box
- ECG waveform tests and dual-lead measurements combine the functionality of a simulator, multimeter and electrical-safety analyzer in a single test tool
- Replaceable mains fuses keep the device in the field and out of the repair shop
- Internal memory for 100 test records
- 20 A at 120 V current capability
- USB connection for use with Ansur and Data Viewer software (for memory download to PC)
- Two-year extended warranty (no-cost, available after first-year calibration at the Fluke Biomedical Cleveland Service Center)
- Optional Ansur automation software standardizes test procedures, compares results to standards limits, generates/stores reports and provides total digital data management
- Rigorously tested for rugged field applications, with CE and CSA in addition to the Fluke-quality-design stamp of approval

Specifications

Voltage		
Range (mains voltage)	90 V ac to 132 V ac rms	
	180 V ac to 264 V ac rms	
Range (accessible voltage)	0 V ac to 300 V ac rms	
Accuracy	± (2 % of reading + 0.2 V)	
Voltage tests	Mains and point-to-point	
Earth resistance		
Mode	Two terminal	
Test current	> 200 mA ac	
Range	0 Ω to 2 Ω	
Accuracy	± (2 % of reading + 0.015 Ω)	
Resistance tests	Earth resistance and point-to-point	
Equipment current		
Mode	AC rms	
Range	0 A to 20 A	
Accuracy	± 5 % of reading + (2 counts or 0.2 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 60601-1: Fig 15	
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 or 1 LSD, whichever is greater))
	1 kHz to 100 kHz	± (2 % of reading + (1 µA or 1 LSD, whichever is greater))
	1 kHz to 5 kHz (current > 1.6 mA)	± (4 % of reading + (1 µA or 1 LSD, whichever is greater))
	100 kHz to 1 MHz	± (5 % of reading + (1 µA or 1 LSD, whichever is greater))
Note: Accuracy for Isolation, MAP, Direct AP, Alternative AP, and Alternative Equipment leakage tests all ranges are + (2.5 µA or 1 LSD, whichever is greater)		
Leakage tests	Ground wire (earth)	
	Chassis (enclosure)	
	Lead to ground (patient)	
	Lead to lead (patient auxiliary)	
	Lead isolation (mains on applied part)	
	Direct equipment	
	Direct applied part	
	Alternative equipment	
	Alternative applied part	
	Point to point	

Mains on applied part test voltage	100 % of mains	
Differential leakage		
Ranges	75 µA to 199 µA	
	200 µA to 2000 µA	
	2 mA to 20 mA	
Accuracy	± 10 % of reading + (2 counts or 20 µA, whichever is greater)	
Insulation resistance		
Ranges	0.5 MΩ to 20 MΩ	
	20 MΩ to 100 MΩ	
Accuracy	± (2 % of reading + 0.2 MΩ)	
	± (7.5 % of reading + 0.2 MΩ)	
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)	
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 BPM and 60 BPM
Power ratings		
Mains voltage outlet	120 V ac or 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)	17.63 cm x 8.38 cm x 28.45 cm (6.94 in x 3.30 in x 11.20 in)	
Weight	1.6 kg (3.5 lb)	
Environmental specifications		
Operating temperature	10 °C to 40 °C (50 °F to 104 °F)	
Storage temperature	-20 °C to 60 °C (-4 °F to 140 °F)	
Operating humidity	10 % to 90 % non-condensing	
Altitude	120 V ac mains supply voltage up to 5,000 m	
	230 V ac mains supply voltage up to 2,000 m	
General		
Warranty	Two-year extended warranty (no-cost, available after first-year calibration at the Fluke Biomedical Cleveland Service Center, otherwise standard one-year warranty applies)	

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Ordering information

Item numbers/Descriptions
ESA612 Electrical Safety Analyzer
ESA612 ESA612 United States, 115 V, 20 A
ESA612-01 ESA612 France, 230 V
ESA612-02 ESA612 Europe, 230 V
ESA612-03 ESA612 Israel, 230 V
ESA612-05 ESA612 Australia, 230 V
ESA612-06 ESA612 United Kingdom, 230 V
ESA612-07 ESA612 Switzerland, 230 V
ESA612-08 ESA612 Thailand, 230 V
ESA612-09 ESA612 Japan, 100 V
ESA612-10 ESA612 North America, 220 V
TA-ESA612-USA ESA612 United States, 115 V, 20 A with test automation
TA-ESA612-EUR ESA612 Europe, 230 V with test automation
TA-ESA612-FR ESA612 France, 230 V with test automation
TA-ESA612-ISR ESA612 Israel, 230 V with test automation
TA-ESA612-AUS ESA612 Australia, 230 V with test automation
TA-ESA612-UK ESA612 United Kingdom, 230 V with test automation
TA-ESA612-SWI ESA612 Switzerland, 230 V with test automation
TA-ESA612-THAI ESA612 Thailand, 230 V with test automation
TA-ESA612-JAPAN ESA612 Japan, 100 V with test automation
TA-ESA612-NA220V ESA612 North America, 220 V with test automation

Standard accessories
CD-ROM Operator's Manual (multilingual CD)
MANUAL Getting-Started Guide (hard copy, multilingual)
CD-ROM Ansur ESA612 Plug-In, CD with demo version
CABLE ASSEMBLY Data Transfer Cable
ESA T/L KIT USA US Accessory Kit (included for US, Australia, Israel, Thailand, and Japan versions only):
- Test Lead Set
- TP1 Test Probe Set
- AC285 Alligator Clip Set

ESA T/L KIT EUR EUR Accessory Kit (included for Europe, France, United Kingdom, and Switzerland versions only)
- Test Lead Set
- TP74 Test Probe Set
- AC285 Alligator Clip Set

2719-0154 15 A to 20 A Adapter (US only)
ESA620-NPA Null Post Adapter
ESA612-2016 5-to-5 Banana Jack to ECG (BJ2ECG) Adapter
9530-0075 Carry Case
Power Cord, one included, country specific by model number
LINE CORD US
75026 Europe
75024 UK
75025 Australia
LINE CORD Israel
75026 France/Belgium
75033 Thailand
75058 Japan
FBC-ESA620-4420 Switzerland

Optional accessories
6358 Retractable Test Leads
9503-0004 Ground Pin Adapter (US receptacle testing ground lug)
1210 ECG 1210 Adapter Box Assembly
ANSUR ESA612 Ansur ESA612 Plug-In License Key

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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