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
- Bail 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, accessible, 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: 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))
	100 kHz to 1 MHz	± (5 % of reading + (1 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	10 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

3367232 ESA612 Electrical Safety Analyzer (US), 115 V 20 A
3367259 ESA612 Electrical Safety Analyzer (Europe), 230 V
3367244 ESA612 Electrical Safety Analyzer (France), 230 V
3367267 ESA612 Electrical Safety Analyzer (Israel), 230 V
3367271 ESA612 Electrical Safety Analyzer (Australia), 230 V
3367280 ESA612 Electrical Safety Analyzer (UK), 230 V
3367298 ESA612 Electrical Safety Analyzer (Switzerland), 230 V
3454793 ESA612 Electrical Safety Analyzer (Thailand), 230 V
3461965 ESA612 Electrical Safety Analyzer (Japan), 100 V
3460932 ESA612 Electrical Safety Analyzer (US), 115 V 20 A with test automation
3460959 ESA612 Electrical Safety Analyzer (Europe), 230 V with test automation
3460944 ESA612 Electrical Safety Analyzer (France), 230 V with test automation
3460967 ESA612 Electrical Safety Analyzer (Israel), 230 V with test automation
3460971 ESA612 Electrical Safety Analyzer (Australia), 230 V with test automation
3460980 ESA612 Electrical Safety Analyzer (UK), 230 V with test automation
3460998 ESA612 Electrical Safety Analyzer (Switzerland), 230 V with test automation
3461001 ESA612 Electrical Safety Analyzer (Thailand), 230 V with test automation
3462285 ESA612 Electrical Safety Analyzer (Japan), 100 V with test automation

Standard accessories

3334509 Operator's Manual (multilingual CD)
3334511 Getting-Started Guide (hard copy, multilingual)
2795488 Ansur ESA612 Plug-In, CD with demo version
1626219 Data Transfer Cable
3111008 US Accessory Kit (included for US, Australia, Israel, Thailand, and Japan only):
– Test Lead Set
– TP1 Test Probe Set
– AC285 Alligator Clip Set
3111024 EUR Accessory Kit (included for Europe, France, United Kingdom, and Switzerland only)
– Test Lead Set
– TP74 Test Probe Set
– AC285 Alligator Clip Set
2195732 15 A to 20 A Adapter (US only)
3326842 Null Post Adapter
3359538 5-to-5 Banana Jack to ECG (BJ2ECG) Adapter
2248650 Carry Case

Power Cord, one included, country specific by model number

2238680 US
2238615 Europe
2238596 UK
2238603 Australian
2434122 Israel
2238615 France/Belgium
2238644 Thailand
3379149 Swiss

Optional accessories

1903307 Retractable Test Leads
2242165 Ground Pin Adapter (US receptacle testing ground lug)
3392119 1210 Adapter Box Assembly
3454829 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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