

Technical data

# ESA612

## Electrical Safety Analyzer

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, 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, 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 DataView 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 rms to 132 V ac rms	
	180 V ac rms to 264 V ac rms	
Range (accessible voltage)	0 V ac rms 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	
<b>Differential leakage</b>		
Ranges	75 $\mu$ A to 199 $\mu$ A	
	200 $\mu$ A to 1999 $\mu$ A	
	2 mA to 20 mA	
Accuracy	$\pm$ (10 % of reading + (2 counts or 20 $\mu$ A, whichever is greater))	
<b>Insulation resistance</b>		
Ranges	0.5 M $\Omega$ to 20 M $\Omega$	
	20 M $\Omega$ to 100 M $\Omega$	
Accuracy	$\pm$ (2 % of reading + 0.2 M $\Omega$ )	
	$\pm$ (7.5 % of reading + 0.2 M $\Omega$ )	
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)	
<b>ECG performance waveforms</b>		
Accuracy	$\pm$ 2 %	
	$\pm$ 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) (Hz)	30 BPM and 60 BPM
<b>Power ratings</b>		
Mains voltage outlet	120 V ac or 230 V ac	
Mains voltage inlet power range	90 V ac rms 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 (WxDxH)	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	
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 5000 meters 230 V ac mains supply voltage up to 2000 meters
General	
Warranty	Two-year extended warranty (no-cost, available after first-year calibration at any authorized Fluke Biomedical Service Center, otherwise standard one year warranty applies)



## 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

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): <ul style="list-style-type: none"> <li>• Test Lead Set</li> <li>• TP1 Test Probe Set</li> <li>• AC285 Alligator Clip Set</li> </ul>

ESA T/L KIT EUR	EUR Accessory Kit (included for Europe, France, United Kingdom, and Switzerland versions only) <ul style="list-style-type: none"> <li>• Test Lead Set</li> <li>• TP74 Test Probe Set</li> <li>• AC285 Alligator Clip Set</li> </ul>
-----------------	---

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 200566-0 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 and ISO 13485 medical device 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

*We empower our everyday heroes to focus only on protecting lives.*

**Fluke Biomedical**  
6920 Seaway Boulevard  
Everett, WA 98203

**For more information, contact us at:**  
(800) 850-4608 or Fax (440) 349-2307  
sales@flukebiomedical.com  
flukebiomedical.com

©2009-2024 Fluke Biomedical.  
Specifications subject to change without notice.  
7/2024 3456744e-en

Modification of this document is not permitted without written permission from Fluke Corporation.

