Technical data

ESA712 Electrical Safety Analyzer

Our easiest-to-use electrical safety analyzer, ever.

The ESA712 Electrical Safety Analyzer is a game-changer in manual electrical safety testing. This manually operated, portable device delivers unparalleled versatility and precision. Catering to the needs of healthcare technology management professionals, the ESA712 performs from basic troubleshooting to comprehensive analysis on medical equipment, in the field and in facilities. Meeting global electrical safety standards, this innovative device combines the functions of a safety analyzer and patient simulator into one, offering a complete, manual solution for your electrical safety testing needs.

Key features

- 5” Touchscreen with intuitive user interface
- Small, portable, ergonomic design with an integrated handle
- Ten applied parts posts with innovative LED lighting guidance (ECG & Banana)
- Insulation resistance from 50V, 100V, 250V and 500V
- Compliance to key electrical safety standards NFPA 99 / AAMI ES1, AS/NZS 3551, IEC 62353 and parts of EN 50678 / EN 50699, and IEC 60601-1
- ECG waveform tests and dual-lead measurements combine the functionality of a simulator and safety analyzer in a single test tool
- Easy data entry through barcode scanner, external keyboard or on-screen keyboard
- 20 A at 120 V equipment current capability
- Replaceable mains fuses keep your unit in the field and out of the repair shop
- Rigorously tested for rugged field applications with CE and CSA in addition to Fluke-quality ruggedness for long-term reliability
- Enjoy precision, compliance, and total peace of mind through our comprehensive service and coverage program, eliminating unexpected costs with our Protect+ Program
- Global support network delivering prompt service and peace of mind to Fluke Biomedical customers worldwide

General Specifications	
Safety standard compliance	IEC 61010-1: Overvoltage category II, pollution degree 2 IEC 61010-2-034: Measurement CAT II 300 V
Measurement equipment standard compliance	IEC 61557-16:2014, except IP40 for certain equipment outlets
Dimensions (w x d x h)	214 x 207 x 92 mm (8.4 x 8.1 x 3.6 inches)
Weight	1.3 kg (2.7 pounds)
Ingress protection	IP40 per IEC 60529, excluding equipment outlet
Operating temperature	0 to +35 °C (+50 to +95 °F)
Operating humidity	10-90 %, non-condensing
Storage temperature	-20 to +60 °C (-4 to+ 140 °F)
Storage humidity	5-95 %, non-condensing
Battery charging temperature	8 to +28°C (+46 to +82°F)
Altitude	100-127 V ac mains voltage and ≤5 150 V on input jacks: ≤ 5000 m
	200-240 V ac mains voltage and ≤5 300 V on input jacks: ≤ 2000 m
Battery	Built-in rechargeable lithium-ion (<3600 mAh, 3.6 V)
Battery life	Up to 2 h
Connectivity	1 x USB-C for PC communication, 2 x USB-A for peripherals
Display	5-inch touchscreen
Data storage	> 10 000 measurements
Power (region dependent)	90-132 V ac, 20 A MAX, 47-63 Hz
	90-132 V ac & 180-264 Vac, 10 A MAX, 47-63 Hz
	90-132 V ac & 180-264 V ac, 15 A MAX, 47-63 Hz
	90-132 V ac & 180-264 V ac, 16 A MAX, 47-63 Hz
CSA approval	
US version, 90-132 V ac, 20 A MAX, 47-63 Hz	CSA approved
NEMA 6-15 version, 90-132 V ac & 180-264 V ac, 15 A MAX, 47-63 Hz	CSA approved
Electromagnetic Compatibility (EMC)	
See users manual for more information.	




General Specifications (continued)

Measurement Specifications	
Mains voltage	
Range	0-264 V ac rms, limited by power specification
Accuracy	±(2 % + 0.2 V)
Point to point voltage	
Range	0-300 V ac rms, limited by altitude specification
Accuracy	±(2 % + 0.2 V)
Protective earth resistance & Point to point resistance	
Range	0-20 Ω
Accuracy	±(1 % + 0.01 Ω) at ≤ 2 Ω
	±(1 % + 0.1 Ω) at >2 Ω
Test current	Square wave of at least ±200 mA for ≤ 2 Ω
Open circuit voltage	Max ±24 V
Equipment Current	
Range	0-20 A ac rms, limited by power specification
Accuracy	±(5 % + 0.05 A)
Max duty cycle	0-10 A: continuous
	10-15 A: 7 min on/3 min off
	15-20 A: 5 min on/5 min off
Note: Equipment outlet will be turned off if max duty cycle is exceeded.	
Leakage Current	
Modes	ac + dc (true rms), ac only, dc only Mains on applied part leakage test: ac only
Patient load	AAMI ES1:1993 IEC 60601-1:2005 / IEC 62353:2014 See users manual for more information.
Crest factor	≤2
Range	0 µA - 20 mA
Accuracy	dc & 20 Hz - 0.5 kHz: ±(1 % + 1 µA)
	0.5 kHz - 50 kHz: ±(2.5 % + 1 µA)
	50 kHz - 1 MHz: ±(5 % + 1 µA)
Mains on applied part (Applies to: mains on applied part leakage, direct applied part leakage, alternative applied part leakage, alternative equipment leakage)	
Test voltage	Mains voltage ±5 %
Current limit	1 mA ± 25 % at 115 V for AAMI ES1, NFPA 99 3.5 mA ± 25 % at 230 V for IEC 60601-1, IEC 62353 and EN 50678 / EN 50699 7.5 mA ± 25 % at 230 V for AS/NZS 3551
Additional uncertainty	Up to ±2 µA for 120 V, up to ±4 µA for 230 V
Note: For alternative equipment leakage, alternative applied part leakage, direct equipment leakage, and direct applied part leakage tests, the leakage is scaled to nominal mains as per IEC 62353. Specified accuracy is not valid if (unscaled) current limit is exceeded.	

Measurement Specifications (continued)

Insulation Resistance		
Test voltage 250 V dc and 500 V dc	Range	0.1-100 MΩ
	Accuracy	±(2 % + 0.2 MΩ) at ≤ 10 MΩ ±(7.5 % + 0.2 MΩ) at >10 MΩ
	Test voltage accuracy	+20 % / -0 %
Test voltage 50 V dc and 100 V dc	Range	0.1-20 MΩ
	Accuracy	±(10 % + 0.2 MΩ)
	Test voltage accuracy	+30 % / -0 %
Short-circuit current	2 mA ± 0.25 mA	
Maximum load capacitance	2 µF	

ECG simulation		
Frequency accuracy	±2 %	
Amplitude accuracy	±5 %, for 2 Hz square wave	
Waveforms	ECG complex	30, 60, 120, 180 and 240 BPM
	Square wave	0.125 and 2 Hz, 50 % duty cycle
	Triangle wave	2 Hz
	Pulse, 63 ms	30 and 60 BPM
	Ventricular fibrillation	
Respiration simulation		
Rate	Apnea (0 BrPM) and 10-100 BrPM in 10 BrPM steps	
Waveforms	Normal	
Inspiration : expiration ratio	1:1	
Impedance baseline	1000 Ω ± 5 % between leads	
Impedance variation	1 ± 0.15 Ω	
Respiration lead	LL or LA, user selectable	

Ordering information

Models/descriptions

6046003	ESA712 Electrical Safety Analyzer-US, 120 V
6046042	ESA712 Electrical Safety Analyzer-01-France, 230 V
6045879	ESA712 Electrical Safety Analyzer-02-Europe, 230 V
6046035	ESA712 Electrical Safety Analyzer-03-Isreal, 230 V
6046019	ESA712 Electrical Safety Analyzer-04-Denmark, 230 V
6045867	ESA712 Electrical Safety Analyzer-05-Australia, 230 V
6045898	ESA712 Electrical Safety Analyzer-06-UK, 230 V
6045908	ESA712 Electrical Safety Analyzer-07-Swiss, 230 V
6046026	ESA712 Electrical Safety Analyzer-08-Thailand, 230 V
6046192	ESA712 Electrical Safety Analyzer-09-Japan, 100 V
6046163	ESA712 Electrical Safety Analyzer-10-North America, 220 V
6046205	ESA712 Electrical Safety Analyzer-11-Brazil, 230 V
6046057	ESA712 Electrical Safety Analyzer-12-India, 230 V
6045996	ESA712 Electrical Safety Analyzer-13-South Africa, 230 V
6046171	ESA712 Electrical Safety Analyzer-14-NEMA615

Standard accessories

5517611	Getting started guide
5517610	OneQA quick guide
5579600	USB C to USB A cable
2427138	Probe test banana jack 4MM tip black w/cap 175-290-001 EVZFTP74SW00 (USA/AUS/ISR/THAI/JAPAN)
2099044	Probe test banana jack 4MM tip red w/cap 175-290-003 EVZFTP74RT00 (USA/AUS/ISR/THAI/JAPAN)
4151242	USA/NEMA outlet to NBR14136 socket (BRAZIL)
3326842	Null post adapter
2248650	Carrying case
LINE CORD	Country-specific power cord

Accessory kits (country specific)

3111008	USA/AUS/ISR Accessory Kit: test lead set, TP1 test probe set, AC285 alligator clip set (ESA T/L kit, USA)
3111024	EUR Accessory Kit: test lead set, TP74 test probe set, AC285 alligator clip set (ESA T/L kit, EUR)

Optional accessories

6078258	Barcode scanner
6078184	USB Wi-Fi dongle

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.

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