

# 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.

An intuitive interface guides both beginner and experienced users through tests, while the large display with adjustable contrast facilitates quick and clear indication of performed tests, criteria associated with test set up, device-under-test receptacle conditions, and results.

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  $\mu$ A
- 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 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

### Test functions

#### Voltage tests

Mains, accessible, and point-to-point

#### Resistance tests

Earth resistance and point-to-point

#### Equipment current

#### Leakage tests

Earth (ground wire)  
 Enclosure (chassis)  
 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  
 Differential  
 Accessible  
 Point-to-point

#### Insulation resistance tests

Mains-PE  
 AP-PE  
 Mains- PE  
 Mains-NE (non-earthed accessible conductive part)  
 AP- NE (non-earthed accessible conductive part)

#### ECG simulation and performance waveforms

#### Voltage

##### Mains voltage

Range: 90 V ac rms to 132 V ac rms;  
 180 V ac rms to 264 V ac rms

##### Accessible voltage

Range: 0 V ac rms to 300 V ac rms  
 Accuracy:  $\pm$  (2 % of reading +2 LSD)

#### Earth resistance measurements

Test current: >200 mA ac  
 Range: 0  $\Omega$  to 2  $\Omega$   
 Test current: 25 A ac  
 Range: 0  $\Omega$  to 0.2  $\Omega$   
 Accuracy:  $\pm$  (2 % of reading + 0.005  $\Omega$ )

#### Equipment current measurements

Range: 0 A to 20 A  
 Accuracy:  $\pm$  5 % of reading  $\pm$  (2 counts or .2A, whichever is greater)

#### Leakage current measurements

Range: 0  $\mu$ A to 199.9  $\mu$ A  
 Accuracy:  $\pm$  (1 % of reading + 1  $\mu$ A)  
 Frequency response: dc to 1 kHz  
 Range: 200  $\mu$ A to 1999  $\mu$ A  
 Accuracy:  $\pm$  (2 % of reading + 1  $\mu$ A)  
 Frequency response: 1 kHz to 100 kHz  
 Range: 2 mA to 10 mA  
 Accuracy:  $\pm$  (5 % of reading + 1  $\mu$ A)  
 Frequency response: 100 kHz to 1 MHz

#### 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

$\leq$  3

#### Mains on applied part test voltage

Per IEC60601: 110 % of mains, in phase of 180° out of phase with mains voltage  
 Per AAMI ES1 and 62353: 100 % of mains

#### Differential Leakage

Ranges: 10  $\mu$ A to 199  $\mu$ A; 200  $\mu$ A to 1999  $\mu$ A;  
 2 mA to 20 mA  
 Accuracy:  $\pm$  10 % of reading  $\pm$  (2 counts or .2  $\mu$ A, whichever is greater)

#### Insulation resistance measurements

Range: 0.5 M $\Omega$  to 20 M $\Omega$   
 Accuracy:  $\pm$  (2 % of reading + 2 counts)  
 Range: 20 M $\Omega$  to 100 M $\Omega$   
 Accuracy:  $\pm$  (5 % of reading + 2 counts)

#### Source test voltage

500 V dc or 250 V dc

#### ECG performance waveforms

Accuracy:  $\pm$  2 %  
 $\pm$  5 % for amplitude of 2 Hz square wave only, fixed @ 1 mV lead II configuration

#### Waveforms/rates

ECG complex (BPM): 30, 60, 120, 180, and 240

**ECG performance waveforms** (continued)

**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 V ac rms to 132 V ac rms

180 V ac rms to 264 V ac rms

**Maximum current**

20 A @ 120 V ac

16 A @ 230 V ac

**Hz**

47 to 63

**Physical specifications**

**Physical case** (LxWxH)

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 (50 °F to 104° F)

**Storage temperature**

-20 °C to 60 °C (-4 °F to 140 °F)

**Ordering Information**

**Model**

ESA620 Electrical Safety Analyzer  
US, 115 V 20 A (2785725)

ESA620 Electrical Safety Analyzer  
EUR, 230 V (3051408)

ESA620 Electrical Safety Analyzer  
FR, 230 V (3051390)

ESA620 Electrical Safety Analyzer  
SR, 230 V (3051413)

ESA620 Electrical Safety Analyzer  
ITA, 230 V (3051424)

ESA620 Electrical Safety Analyzer  
AUS, 230 V (3051436)

ESA620 Electrical Safety Analyzer  
UK, 230 V (3051449)

ESA620 Electrical Safety Analyzer  
SWI, 230 V (3051451)

**Standard accessories**

Operator's manual CD (2814967)

Multilingual getting started guide  
(2814971)

15 A to 20 A adapter (USA only)  
(2195732)

Carry case (2814980)

Power cord (country specific)

ESA620 accessory kit (country specific)

**Optional accessories**

Ansur ESA620 Plug-In (3116463)

Retractable test leads (1903307)

Ground pin adapter (2242165)

Kelvin cable set for 4-wire  
measurement (2067864)

Data transfer cable (1626219)

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