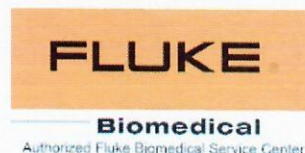




aljeel Medical & Trading Co.
Authorized Service Provider



Certificate of Calibration

ASSET NUMBER: **J000520**
MANUFACTURER: **Fluke Biomedical**
MODEL NUMBER: **ESA 615**
SERIAL NUMBER: **3025021**
DESCRIPTION: **Electrical Safety Analyzer**

CUSTOMER INFORMATION

Royal Clinics
Riyadh
Saudi Arabia

PROCEDURE USED: **ESA615 VER - Exp Unc WW Rev18**
CALIBRATED BY: **Joori Alsanounah**
TEMPERATURE: **23 °C**
HUMIDITY: **40 %rh**

CALIBRATION DATE: **27 Apr 2025**
REQUESTED RECALIBRATION DATE: **27 Apr 2026**

AS-FOUND STATUS: **In Tolerance**
AS-LEFT STATUS: **In Tolerance**

Report Number: 2025000213

The issuing organization certifies that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure unless otherwise noted. It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Physical Laboratory or other national metrology institutes.

Although the item calibrated may meet specification and performance criteria at the time of calibration, due to any number of factors the recommended due date of this item does not imply continuing conformance to specifications during the recommended interval.

This report may contain results of tests for which no traceable calibration standard exists, such as oxygen saturation (SpO2). These tests are conducted using in-house performance standards and accepted test procedures.

Any Test Uncertainty Ratio (TUR) that is less than four-to-one will appear under the "TUR" heading on the data record. If the TUR meets or exceeds four-to-one, the field is left blank. Test status is PASS unless noted otherwise.

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REMARKS:

APPROVED BY:

Technical Manager

STANDARDS USED

ID	Description	Due Date
J35	6-1/2 Digit Precision Multimeter	24 Jul 2025
J49	AC/DC Current Source	22 May 2025
J50	1 K Ohm Decade Resistor	09 May 2025
J52	AC/DC Differential Amplifier	11 Oct 2025
J58	current Shunt	10 May 2025
J59	High Voltage - High Resistance Decade Substi	09 May 2025
J60	Digital Oscilloscope	04 May 2025
J65	Calibrator	09 May 2025
J88	AC+DC Power Source	17 May 2027

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MODEL NUMBER: **ESA 615** SERIAL NUMBER: **3025021**TEST RESULTS: **PENDING**

Test Description	Expected Value	Measured Value	Lower Limit	Upper Limit	Units	Status	TUR
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MODEL NUMBER: **ESA 615** SERIAL NUMBER: **3025021**TEST RESULTS: **PENDING**

Test Description	Expected Value	Measured Value	Lower Limit	Upper Limit	Units	Status	TUR
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MODEL NUMBER: **ESA 615** SERIAL NUMBER: **3025021**TEST RESULTS: **IN TOLERANCE**

Test Description	Expected Value	Measured Value	Lower Limit	Upper Limit	Units	Status	TUR
UUT is ESA615, UI-3.01.03, MTR-3.01.03, VNC-1.09.01, SN-3025021							
As-Found NOMINAL: 230							
Measured line voltage = 231.17 V							
UUT Current Draw: 0 A							
FUNCTIONAL TESTS							
Warning LED ON/OFF Test							
UUT Beeper ON/OFF Test							
UUT Keypad Tests							
UUT USB Host Port Device Connect Test							
UUT USB Host Port Device Disconnect Test							
UUT Detects SD Card Removed							
UUT Detects SD Card Inserted							
EQUIPMENT OUTLET POLARITY TESTS							
Normal Polarity, Closed Neutral, Closed Earth							
Normal Polarity, Closed Neutral, Open Earth							
Normal Polarity, Open Neutral, Closed Earth							
Reversed Polarity, Closed Neutral, Closed Earth							
Reversed Polarity, Open Neutral, Closed Earth							
Reversed Polarity, Closed Neutral, Open Earth							
EQUIPMENT OUTLET GROUND TO NULL JACK RESISTANCE TEST							
EO Ground to NULL Jack Open (>1 GOhm)							
0.000 Ohm	0.000	0.9386	-2.5000	2.5000	Ohm		
MAINS VOLTAGE ACCURACY							
Measure L1-L2	231.14	231.2	226.3	236.0	V		
Measure L1-GND	231.17	231.2	226.4	236.0	V		
GFI VERIFICATION							
5 mA Trip Point							
4.5 mA Test (No Trip)							
5.5 mA Test (Tripped)							
GFI Error Test							
10 mA Trip Point							
9 mA Test (No Trip)							
11 mA Test (Tripped)							
25 mA Trip Point							
22.5 mA Test (No Trip)							
27.5 mA Test (Tripped)							
POINT-TO-POINT VOLTAGE VERIFICATION							
1.000 V	1.0000	1.000	0.780	1.220	V		
8.000 V	8.0000	8.004	7.640	8.360	V		
25.00 V	25.000	25.01	24.30	25.70	V		
80.00 V	80.000	79.98	78.20	81.80	V		
240.0 V	240.00	239.9	235.0	245.0	V		

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MODEL NUMBER: **ESA 615** SERIAL NUMBER: **3025021**TEST RESULTS: **IN TOLERANCE**

Test Description	Expected Value	Measured Value	Lower Limit	Upper Limit	Units	Status	TUR
POINT-TO-POINT RESISTANCE VERIFICATION							
Red/Black Jack Input							
0.000 Ohm	0.0000	0.001	-0.015	0.015	Ohm		
0.200 Ohm	0.2000	0.198	0.181	0.219	Ohm		
1.800 Ohm	1.8000	1.801	1.749	1.851	Ohm		
Red Jack/EO Ground Terminal							
0.000 Ohm	0.0000	0.001	-0.015	0.015	Ohm		
1.800 Ohm	1.8000	1.798	1.749	1.851	Ohm		
INSULATION RESISTANCE VERIFICATION							
250 V Source	250.0	264.70	250.00	300.00	V		
500 V Source	500.0	528.01	500.00	600.00	V		
2 mA Current Limit	2.000	1.9365	1.7500	2.2500	mA		
Mains-PE (500V)	10.0000	10.022	9.600	10.400	MOhm		
AP-PE (500V)	10.0000	10.017	9.600	10.400	MOhm		
AP-NE (500V)	10.0000	10.019	9.600	10.400	MOhm		
Mains-NE (500V)	10.0000	10.021	9.600	10.400	MOhm		
Mains-AP (RA) (500V)	10.0000	10.021	9.600	10.400	MOhm		
Mains-AP (LL) (500V)	10.0000	10.025	9.600	10.400	MOhm		
Mains-AP (LA) (500V)	10.0000	10.020	9.600	10.400	MOhm		
Mains-AP (RL) (500V)	10.0000	10.013	9.600	10.400	MOhm		
Mains-AP (V1) (500V)	10.0000	10.021	9.600	10.400	MOhm		
INSULATION RESISTANCE RANGE VERIFICATION							
Mains-AP (V1) (250V)	0.70000	0.7110	0.4860	0.9140	MOhm		
Mains-AP (V1) (500V)	1.00000	1.0010	0.7800	1.2200	MOhm		
Mains-AP (V1) (250V)	6.50000	6.5133	6.1700	6.8300	MOhm		
Mains-AP (V1) (500V)	18.0000	18.012	17.440	18.560	MOhm		
Mains-AP (V1) (250V)	22.0000	22.017	20.150	23.850	MOhm		
Mains-AP (V1) (500V)	60.0000	59.956	55.300	64.700	MOhm		
Mains-AP (V1) (250V)	100.000	99.76	92.30	107.70	MOhm		
DC LEAKAGE VERIFICATION							
AAMI Load Resistance Test							
1.000 kOhm	1.000	1.0012	0.9800	1.0200	kOhm		
DC Leakage Current Tests							
10.0 µA	10.00	10.0	8.9	11.1	µA		
50.0 µA	50.00	50.0	48.5	51.5	µA		
100.0 µA	100.00	100.0	98.0	102.0	µA		
500 µA	500.0	500	494	506	µA		
1600 µA	1600.0	1601	1583	1617	µA		
7.000 mA	7.000	7.00	6.92	7.08	mA		
AC LEAKAGE FILTER FREQUENCY RESPONSE (AAMI Load)							
1000 uA, 60 Hz	998.00	1000.3	987.0	1009.0	µA		
1000 uA, 1 kHz	691.00	698.0	683.1	698.9	µA		
1000 uA, 10 kHz	95.60	97.3	92.7	98.5	µA		2.2
1000 uA, 30 kHz	33.10	33.7	31.4	34.8	µA		2.3

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MODEL NUMBER: **ESA 615** SERIAL NUMBER: **3025021**TEST RESULTS: **IN TOLERANCE**

Test Description	Expected Value	Measured Value	Lower Limit	Upper Limit	Units	Status	TUR
DIFFERENTIAL LEAKAGE VERIFICATION - NORMAL POLARITY							
(75 to 199)uA Range							
76 uA @ 50 Hz	86.3	79	58	115	uA		
160 uA @ 50 Hz	166.4	163	130	203	uA		
(200 to 1999)uA Range							
500 uA @ 50 Hz	504.7	508	434	575	uA		
1600 uA @ 50 Hz	1609.0	1631	1428	1790	uA		
(2 to 20)mA Range							
5.00 mA @ 50 Hz	5.024	5.06	4.50	5.55	mA		
16.00 mA @ 50 Hz	15.673	15.64	14.09	17.26	mA		
DIFFERENTIAL LEAKAGE VERIFICATION - REVERSE POLARITY							
(2 to 20)mA Range							
16.00 mA @ 50 Hz	15.673	15.64	14.09	17.26	mA		
ECG LEAKAGE FUNCTIONALITY VERIFICATION							
Applied Part (RA), 101 uA Detected							
Applied Part (RA) Open Measures > 1 Gigaohm							
Applied Part (LL), 101 uA Detected							
Applied Part (LL) Open Measures > 1 Gigaohm							
Applied Part (LA), 101 uA Detected							
Applied Part (LA) Open Measures > 1 Gigaohm							
Applied Part (RL), 101 uA Detected							
Applied Part (RL) Open Measures > 1 Gigaohm							
Applied Part (V1), 101 uA Detected							
Applied Part (V1) Open Measures > 1 Gigaohm							
DIRECT APPLIED PART LEAKAGE - STD 353 VERIFICATION							
GND to RA							
1.000 mA @ 50 Hz	0.9288	0.918	0.889	0.969	mA		
RED to RA							
1.000 mA @ 50 Hz	0.9285	0.918	0.888	0.969	mA		
ALTERNATIVE EQUIPMENT LEAKAGE							
RED to HOT							
1.000 mA @ 50 Hz	0.9415	0.940	0.901	0.982	mA		
ALTERNATIVE EQUIPMENT, APPLIED PART LEAKAGE							
RA to HOT (SAF)							
1.000 mA @ 50 Hz	0.9452	0.939	0.904	0.986	mA		
ALTERNATIVE APPLIED PART PATIENT LEAKAGE							
RA to NEUTRAL (SPAT)							
1.000 mA @ 50 Hz	0.9370	0.925	0.897	0.977	mA		
PATIENT AUXILIARY LEAKAGE - STD 601							
RA to RL							
0.1000 mA @ 100 Hz	0.10062	0.0998	0.0986	0.1026	mA		

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MODEL NUMBER: **ESA 615** SERIAL NUMBER: **3025021**TEST RESULTS: **IN TOLERANCE**

Test Description	Expected Value	Measured Value	Lower Limit	Upper Limit	Units	Status	TUR
DIRECT EQUIPMENT, PATIENT LEAKAGE - STD 353							
GND to RA							
0.1000 mA @ 100 Hz	0.10156	0.0998	0.0995	0.1036	mA		
DIRECT EQUIPMENT, PATIENT LEAKAGE - STD 601							
GND to RA							
0.1000 mA @ 100 Hz	0.10166	0.0998	0.0996	0.1037	mA		
DIRECT EQUIPMENT, ENCLOSURE LEAKAGE - STD 353							
GND to RED							
0.1000 mA @ 100 Hz	0.10178	0.0998	0.0998	0.1038	mA		
DIRECT EQUIPMENT, ENCLOSURE LEAKAGE - STD 601							
GND to RED							
0.1000 mA @ 100 Hz	0.10182	0.0998	0.0998	0.1038	mA		
FILTER TESTS							
Apply 100Hz, Measure DC							
0.00 μ A @ 100 Hz	0.000	0.00	0.00	1.00	μ A		
Apply DC, Measure AC							
0.00 μ A	0.000	0.00	0.00	1.00	μ A		
MAP VOLTAGE AND CURRENT LIMIT TESTS							
120.0 V @ 60 Hz	120.62	121.6	112.2	129.1	V		
230.0 V @ 50 Hz	231.15	234.8	215.0	247.3	V		
3.50 mA @ 50 Hz	3.510	3.51	2.63	4.39	mA		
7.50 mA @ 50 Hz	7.186	7.17	5.39	8.98	mA		
1.00 mA @ 60 Hz	1.041	1.03	0.78	1.30	mA		
ECG WAVEFORM TESTS - 2 Hz SQUAREWAVE							
2.000 Hz	2.000	2.0000	1.9600	2.0400	Hz		
EQUIPMENT CURRENT VERIFICATION							
Test 1	1.5363	1.300	1.260	1.813	A		3.7
Test 2	3.4583	3.400	3.085	3.831	A		
WIRELESS COMMUNICATIONS TEST (Zigbee)							
UUT Communicates Over Wireless Interface							

Cal Info SN: 3025021, CAL DATE: 27 April 2025

*** End of Procedure ***

*** END_OF_REPORT ***