

Certificate # : 202409773

Issue Date : 21-Jul-24

Asset Number : GCS054055

CUSTOMER INFORMATION

Customer Name : Homeland Security Trading Est.

Address : Al Murabaa, Riyadh , K.S.A

UUT INFORMATION

Description : Multiparameter Simulator

Manufacturer : Fluke

Model : MPS450

Range : N/A

Received Date : 09-Jul-24

Serial Number : 0917712

ID Number : N/A

UUT Location : N/A

CALIBRATION INFORMATION

Calibration Date : 18-Jul-24

Due Date : 18-Jul-25

Procedure Used : FLUKE MPS450:CAL VER/34401

Result Type : As Found

Amb.Temperature : $23 \pm 5^{\circ}\text{C}$

Relative Humidity : 20 to 80 %RH

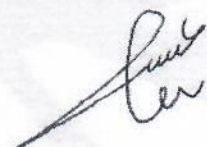
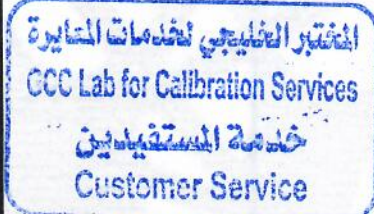
Cal Site : GCS Riyadh

TRACEABILITY INFORMATION

Measurements are traceable to the SI Units (International System of Units) via national or international laboratories. The estimated expanded uncertainty (if specified) of measurement to be associated with the results is calculated at a confidence level of approximately 95% with a coverage factor of $k = 2$.

REMARKS / DEVIATIONS IF ANY

1. The measurement results are given on the attached sheet(s). The page numbers may be numbered separately.
2. This calibration certificate applies only to the item identified and shall not be reproduced except in full without the approval by GCS.
3. The described instrument has been calibrated under the ambient conditions stated above.
4. UUT meets manufacturer's tolerances for the parameters listed.
5. The UUT was received in good condition.
6. Pass/Fail decisions "if any" are based on acceptance limits chosen based on simple acceptance ($w=0$, $AL = TL$).

Asset # of UUT	Authorized By	
 GCS054055	 Eng. Abdullah Saeed	 المختبر الخليجي لخدمات المعايرة GCC Lab for Calibration Services خدمة المستفيدين Customer Service

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ECG AMPLITUDE TEST; @ HIGH LEVEL OUTPUT

100.0 mV @ 0.5 mV	100.1 mV	95.0 mV	105.0 mV	Pass
200.00 mV @ 1 mV	199.86 mV	190.00 mV	210.00 mV	Pass
300.00 mV @ 1.5 mV	299.50 mV	285.00 mV	315.00 mV	Pass
400.00 mV @ 2 mV	405.30 mV	380.00 mV	420.00 mV	Pass

ECG RATE TEST:

2.000 s @ 30 BPM	2.000 s	1.980 s	2.020 s	Pass	2.50
1.490 s @ 40 BPM	1.500 s	1.416 s	1.564 s	Pass	
1.000 s @ 60 BPM	1.000 s	0.950 s	1.050 s	Pass	
750.0 ms @ 80 BPM	749.8 ms	712.5 ms	787.5 ms	Pass	
600.0 ms @ 100 BPM	599.3 ms	570.0 ms	630.0 ms	Pass	
500.0 ms @ 120 BPM	499.6 ms	475.0 ms	525.0 ms	Pass	
428.6 ms @ 140 BPM	424.2 ms	407.2 ms	450.0 ms	Pass	
375.0 ms @ 160 BPM	374.8 ms	356.2 ms	393.8 ms	Pass	
333.3 ms @ 180 BPM	349.5 ms	316.6 ms	350.0 ms	Pass	
300.0 ms @ 200 BPM	298.8 ms	285.0 ms	315.0 ms	Pass	
272.7 ms @ 220 BPM	272.8 ms	259.1 ms	286.3 ms	Pass	
250.0 ms @ 240 BPM	249.2 ms	237.5 ms	262.5 ms	Pass	
230.8 ms @ 260 BPM	241.2 ms	219.3 ms	242.3 ms	Pass	
214.3 ms @ 280 BPM	214.3 ms	203.6 ms	225.0 ms	Pass	
200.0 ms @ 300 BPM	200.2 ms	190.0 ms	210.0 ms	Pass	

ECG PERFORMANCE TEST**Square Wave:**

2.000 Hz	2.000 Hz	1.900 Hz	2.100 Hz	Pass
0.125 Hz	0.125 Hz	0.119 Hz	0.131 Hz	Pass

Triangular Wave:

2.000 Hz	2.000 Hz	1.900 Hz	2.100 Hz	Pass
2.500 Hz	2.498 Hz	2.375 Hz	2.625 Hz	Pass

Pulse Wave:

500.0 mHz @ 30 BPM	499.8 mHz	475.0 mHz	525.0 mHz	Pass
1.000 Hz @ 60 BPM	1.000 Hz	0.950 Hz	1.050 Hz	Pass

Sine Wave:

500.0 mHz	499.8 mHz	475.0 mHz	525.0 mHz	Pass
5.000 Hz	5.000 Hz	4.750 Hz	5.250 Hz	Pass
10.00 Hz	10.01 Hz	9.50 Hz	10.50 Hz	Pass
40.00 Hz	40.01 Hz	38.00 Hz	42.00 Hz	Pass
50.00 Hz	50.01 Hz	47.50 Hz	52.50 Hz	Pass
60.00 Hz	60.02 Hz	57.00 Hz	63.00 Hz	Pass
100.0 Hz	100.1 Hz	95.0 Hz	105.0 Hz	Pass

RESPIRATION BASELINE TEST**RA - RL:**

500 Ohm	523.2 Ohm	475.0 Ohm	525.0 Ohm	Pass
1000 Ohm	1002.2 Ohm	950.0 Ohm	1050.0 Ohm	Pass
1500 Ohm	1501.1 Ohm	1425.0 Ohm	1575.0 Ohm	Pass

CALIBRATION CERTIFICATE

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TEST DESCRIPTION	TRUE VALUE	TEST RESULT	LOWER LIMIT	UPPER LIMIT	STATUS	TUR
2000 Ohm		2002.3 Ohm	1900.0 Ohm	2100.0 Ohm	Pass	
LA - RL:						
500 Ohm		521.4 Ohm	475.0 Ohm	525.0 Ohm	Pass	
1000 Ohm		1002.3 Ohm	950.0 Ohm	1050.0 Ohm	Pass	
1500 Ohm		1502.2 Ohm	1425.0 Ohm	1575.0 Ohm	Pass	
2000 Ohm		2002.5 Ohm	1900.0 Ohm	2100.0 Ohm	Pass	
LL - RL:						
500 Ohm		524.1 Ohm	475.0 Ohm	525.0 Ohm	Pass	
1000 Ohm		1002.1 Ohm	950.0 Ohm	1050.0 Ohm	Pass	
1500 Ohm		1502.4 Ohm	1425.0 Ohm	1575.0 Ohm	Pass	
2000 Ohm		2002.3 Ohm	1900.0 Ohm	2100.0 Ohm	Pass	
V1 - RL:						
750 Ohm		745.6 Ohm	713.0 Ohm	787.0 Ohm	Pass	
V2 - RL:						
750 Ohm		748.5 Ohm	713.0 Ohm	787.0 Ohm	Pass	
V3 - RL:						
750 Ohm		748.2 Ohm	713.0 Ohm	787.0 Ohm	Pass	
V4 - RL:						
750 Ohm		748.2 Ohm	713.0 Ohm	787.0 Ohm	Pass	
V5 - RL:						
750 Ohm		746.3 Ohm	713.0 Ohm	787.0 Ohm	Pass	
V6 - RL:						
750 Ohm		745.3 Ohm	713.0 Ohm	787.0 Ohm	Pass	

***** End of Results *****

Standards Used

Asset #	Description	Due Date	Certificate #	Traceability
100300277	Bench Multimeter	13-May-25	202406691	GCS RD
100300409	Digital Storage Oscilloscope	15-Nov-24	202316849	GCS RD

***** End of Certificate *****