

Certificate No.

24PTP_0104240278

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Certificate of Calibration

EQUIPMENT : DEFIBRILLATORS, EXTERNAL, MANUAL

ID CODE : PTP00618 MANUFACTURER : PHILIPS

MODEL : HeartStart XL (M4735A)

SERIAL No. : US00584077

LOCATION : Operating Room

SUBMITTED BY : PHYATHAI PHAHOLYOTHIN HOSPITAL

670/1 Phaholyothin Road, Samsen Nai, Phaya Thai, Bangkok 10400

Tel: 02-271-7000 Fax: -

CALIBRATED DATE : 24 APRIL 2024

ISSUE DATE : 1 MAY 2024

Performed by:

USANEE CHALONGPHOKSILCHAI

Approved by:

PHUWASIN YIWKIM

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CONDITION OF THIS RESULT OF TEST

1. REFERENCE STANDARD INSTRUMENT:

MASTERMANUFACTURERMODELSERIAL NO.CERTIFICATE NO.DUE DATEDefibrillatorFlukeImpulse 7000DP207933523MD7757 Jun 2024

Analyzer

Vitalsign Simulator Fluke ProSim8 2541031 23MD777 7 Jun 2024

2. THIS CERTIFICATION IS TRACEABLE TO:

- Technology Promotion Association (Thai-Japan)
- Technology Promotion Association (Thai-Japan)

3. THIS RESULT OF TEST WAS FOUND ACCURATE AS SHOW ON DATE AND PLACE OF TEST ONLY



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DATE OF CALIBRATION : 24 APRIL 2024

ENVIRONMENT : TEMPERATURE 22 °C

RELATIVE HUMIDITY 55 %

PROCEDURE USED:

This instrument was calibration by comparison with standard

MEASURMENT RESULT:

/	Without Adjustment		Before Adjustment		After Adjustment
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Output Energy				
UUC* Setting	Standard Reading	Error	% Error	Uncertainty
(Joule)	(Joule)	(Joule)	(%)	(Joule)
10	10.10	0.10	1.00	± 0.1400
100	98.40	-1.60	-1.60	± 0.2800
200	194.90	-5.10	-2.55	± 0.5500

Output Energy (Energy after 50 Sec (Manual Mode) ≥85%)					
UUC* Setting	Standard Reading	Error	% Error	Uncertainty	
(Joule)	(Joule)	(Joule)	(%)	(Joule)	
100	97.50	-2.50	-2.50	± 0.2800	

Heart Rate					
Standard Setting	UUC* Reading	Error	% Error	Uncertainty	
(BPM)	(BPM)	(BPM)	(%)	(BPM)	
60	60.00	0.00	0.00	± 0.0150	
80	80.00	0.00	0.00	± 0.0170	
120	120.00	0.00	0.00	± 0.0150	

%Spo2					
Standard Setting	UUC* Reading	Error	% Error	Uncertainty	
(%SPO ₂)	(%SPO ₂)	(%SPO ₂)	(%)	(%SPO ₂)	
90	90.00	0.00	0.00	± 0.1039	
96	96.00	0.00	0.00	± 0.1109	



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%Spo2 (Continues)						
Standard Setting	UUC* Reading	Error	% Error	Uncertainty		
$(\%SPO_2)$	(%SPO ₂)	(%SPO ₂)	(%)	(%SPO ₂)		
100	100.00	0.00	0.00	± 0.1155		

Gain				
Standard Setting	UUC* Reading	Error	% Error	Uncertainty
(mm/mV)	(mm/mV)	(mm/mV)	(%)	(mm/mV)
5	5.00	0.00	0.00	± 0.0577
10	10.00	0.00	0.00	± 0.0577
20	20.00	0.00	0.00	± 0.0577

Amplitude				
Standard Setting	UUC* Reading	Error	% Error	Uncertainty
(mV)	(mV)	(mV)	(%)	(mV)
1	1.00	0.00	0.00	± 0.0042
2	2.00	0.00	0.00	± 0.0042

Paper Speed					
Standard Setting	UUC* Reading	Error	% Error	Uncertainty	
(mm/sec)	(mm/sec)	(mm/sec)	(%)	(mm/sec)	
25	25.00	0.00	0.00	± 0.2887	

Heart Rate(Noninvasive Pacing)					
Standard Setting	UUC* Reading	Error	% Error	Uncertainty	
(PPM)	(PPM)	(PPM)	(%)	(PPM)	
60	60.00	0.00	0.00	± 0.0150	
180	179.10	-0.90	-0.50	± 0.1500	

Current (Noninvasive Pacing)					
Standard Setting	UUC* Reading	Error	% Error	Uncertainty	
(mA)	(mA)	(mA)	(%)	(mA)	
60	59.20	-0.80	-1.33	± 0.6929	
140	139.80	-0.20	-0.14	± 1.6166	



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UUC*: Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%

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