

Certificate No.

24PTP_0104240006

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Certificate of Calibration

EQUIPMENT : DEFIBRILLATORS, EXTERNAL, MANUAL

ID CODE : PTP02177

MANUFACTURER : PHILIPS

MODEL : HeartStart MRx (M3535A)

SERIAL No. : US00568018

LOCATION : Emergency & Ambulance

SUBMITTED BY : PHYATHAI PHAHOLYOTHIN HOSPITAL

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

Tel: 02-271-7000 Fax: -

CALIBRATED DATE : 16 APRIL 2024

ISSUE DATE : 1 MAY 2024

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	Approved by :	•

SUPATCHA BUAPUEAN PHUWASIN YIWKIM

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CONDITION OF THIS RESULT OF TEST

Performed by:

1. REFERENCE STANDARD INSTRUMENT:

MASTER	MANUFACTURER	MODEL	SERIAL NO.	CERTIFICATE NO.	DUE DATE
CARBON	GASCO AFFILIA	PRECISION GAS	=	PO20220615	15 Jul 2026
DIOXIDE	TES,LLC.	MIXTURE			
NITROGEN 5%					
CARBON	GASCO AFFILIA	PRECISION GAS	=	=	18 Sep 2026
DIOXIDE	TES,LLC.	MIXTURE			
NITROGEN 10%					
Defibrillator	Fluke	Impulse 7000DP	2079335	23MD775	7 Jun 2024
Analyzer					
Vitalsign Simulator	Fluke	ProSim8	2541031	23MD777	7 Jun 2024

2. THIS CERTIFICATION IS TRACEABLE TO:

- GASCO AFFILIATES,LLC.
- GASCO AFFILIATES,LLC.
- 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 : 16 APRIL 2024

ENVIRONMENT : TEMPERATURE 24 °C

RELATIVE HUMIDITY 56 %

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	9.20	-0.80	-8.00	± 0.1400
100	92.78	-7.22	-7.22	± 0.2844
200	186.70	-13.30	-6.65	± 0.5500

Output Energy (Energy after 50 Sec (Manual Mode) ≥85%)					
UUC* Setting	Standard Reading	Error	% Error	Uncertainty	
(Joule)	(Joule)	(Joule)	(%)	(Joule)	
100	92.80	-7.20	-7.20	± 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	± 0.0460	
120	120.00	0.00	0.00	± 0.0460	

%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	

Systolic				
Standard Setting	UUC* Reading	Error	% Error	Uncertainty
(mmHg)	(mmHg)	(mmHg)	(%)	(mmHg)
60	57.25	-2.75	-4.58	± 1.0767
120	124.75	4.75	3.96	± 1.3651
200	205.25	5.25	2.63	± 2.0286

Diastolic					
Standard Setting	UUC* Reading	Error	% Error	Uncertainty	
(mmHg)	(mmHg)	(mmHg)	(%)	(mmHg)	
30	30.25	0.25	0.83	± 2.4069	
80	86.00	6.00	7.50	± 1.0393	
150	151.50	1.50	1.00	± 1.8526	

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

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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	180.70	0.70	0.39	± 0.1751		

Current (Noninvasive Pacing)						
Standard Setting	UUC* Reading	Error	% Error	Uncertainty		
(mA)	(mA)	(mA)	(%)	(mA)		
60	59.90	-0.10	-0.17	± 0.6929		
140	140.40	0.40	0.29	± 1.6166		

Note: Carbon Dioxide Concentration 5% (36.8 mmHg) ±2.6 mmHg = 35 mmHg Carbon Dioxide Concentration 10% (73.6 mmHg) ±5.2 mmHg = 77 mmHg

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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