



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES

534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250

TEL. 0-2717-3000-29 FAX. 0-2719-9484


Cert. No.: 23MD1169

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Certificate of Calibration

Equipment : Infusion Pump Analyzer
Model : Multi-Flo
Serial No. : 23Q-1412
ID No. : -
Manufacturer : RIGEL Medical
Submitted by : National Healthcare Systems Co., Ltd.
2301/2 New Phetchburi Road, Bangkokpi,
Huaykwang, Bangkok 10310
Place of calibration : TPA Medical Equipment Calibration Lab.
Ambient Temperature : (23 ± 2) °C
Relative humidity : (50 ± 15) %
Calibrated by : Itsara Sabcharoen

Approved by :


Approved signatory

- () Pornthippa Tameyakul
(☒) Surin Yenprasert
() Nattachai Sawangkunnopchai

Issue date : 31 August 2023

The Uncertainties are for a confidence probability of approximately 95%.

This certificate may not be reproduced other than in full, except with the prior written approval of the head of Calibration and Testing Equipment Services.

A 0011766



Received order : 24 August 2023
Condition as received : New item
Calibration date : 25 - 29 August 2023
Reference : 2308-0768WN-1

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Procedure used :-

The flow rate calibration was conducted using in-house calibration procedure: CP-MD08, according to flow rate indirect measurement method based on IEC 60601-2-24 (section 8).
The pressure measurement was conducted using in-house calibration procedure: CP-MD12 based on Guideline DKD-R 6-1, according to comparison method against the Digital Test Gauge, using clean air as pressure media.

Conditions of this result of calibration

1. Reference standard instrument :-

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due date</u>
1) Electronic Balance	GR-300	14233821	23MM334	18 Apr 2024
2) Digital Test Gauge	100PSIXP2i	351140	23P1066	28 Mar 2024

2. The certificate is valid only to the item calibrated on date and place of calibration.

3. This result of calibration was made on requested at the point specified by customer.

4. This certification is traceable to the International System of Units, through :-

- National Institute of Metrology (Thailand), through Technology Promotion Association (Thailand-Japan)



Result of calibration : Without adjustment

Function : Flow rate measurement

Port of UUC* : CH 1

UUC* setting : Back pressure = 141 mmHg

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Standard Value (ml/h)	UUC* Average flow (ml/h)	UUC* Error (ml/h)	Uncertainty (± ml/h)
303.6990	301.03	-2.6690	0.71
101.1296	100.58	-0.5496	0.26
50.0261	49.86	-0.1661	0.25
4.6595	4.71	+0.0505	0.060

Function : Pressure measurement

Port of UUC* : CH 1

Applied Pressure (mmHg)	Before adjustment UUC* Reading (mmHg)	Without adjustment		Uncertainty (± mmHg)
		UUC* Reading (mmHg)	Error (mmHg)	
0.0	-	0	0	1.0
300.0	-	298	-2	1.0
600.0	-	598	-2	1.4
900.0	-	898	-2	1.4
1200.0	-	1198	-2	1.4
1500.0	-	1499	-1	1.4
1500.0	-	1499	-1	1.4
1200.0	-	1198	-2	1.4
900.0	-	898	-2	1.4
600.0	-	598	-2	1.4
300.0	-	298	-2	1.0
0.0	-	0	0	1.0

UUC* : Unit Under Calibration

Signature



Result of calibration : Without adjustment

Function : Flow rate measurement

Port of UUC* : CH 2

UUC* setting : Back pressure = 65 mmHg

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Standard Value (ml/h)	UUC* Average flow (ml/h)	UUC* Error (ml/h)	Uncertainty (± ml/h)
300.2641	301.69	+1.4259	1.6
99.7166	99.58	-0.1366	0.34
49.8525	49.58	-0.2725	0.39
4.7892	4.75	-0.0392	0.052

Function : Pressure measurement

Port of UUC* : CH 2

Applied Pressure (mmHg)	Before adjustment UUC* Reading (mmHg)	Without adjustment UUC* Reading (mmHg)	Error (mmHg)	Uncertainty (± mmHg)
0.0	-	1	+1	1.0
300.0	-	300	0	1.0
600.0	-	600	0	1.4
900.0	-	899	-1	1.4
1200.0	-	1199	-1	1.4
1500.0	-	1498	-2	1.4
1500.0	-	1498	-2	1.4
1200.0	-	1199	-1	1.4
900.0	-	899	-1	1.4
600.0	-	600	0	1.4
300.0	-	300	0	1.0
0.0	-	1	+1	1.0

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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