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Envi Equipment Service Co., Ltd.

110/254 Moo 3, Tumbon Bang Rak Phatthana, Amphur Bang Bua Thong, Nonthaburi 11110

Tel. 098 362 9152, 089 478 7885

E-mail: sales@envi-ees.com

Certificate No. : E21-0813

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**CERTIFICATE OF CALIBRATION**

**Customer** : United Analyst and Engineering Consultant Co., Ltd.

**Address** : 81 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260

**Description of Equipment** : Console meter

**Manufacturer** : Apex Instrument

**Model Number** : XC-572-V

**Serial Number** : 0807047

**ID./Control No.** : -

**Environment Conditions** : Temperature (25 ± 2) °C  
Humidity (50 ± 15) % RH

**Cal. Date** : 19/08/2021

**Issue Date** : 19/08/2021

**Calibration Method or Calibration Procedure Used**

US EPA Method (United State Environmental Protection Agency)


This certificate is traceable to national standard, which realize the units of measurement according to the International System of Units (IS).

**Result of Calibration**

This certificate may not be reproduced other than in full except with prior Written approval of the Technical Manager, Envi Equipment Service Company Limited.

These reported uncertainties of measurement are expanded by a coverage factor of k=2, providing a 95% confidence level

Calibrated by : Mr. Sanya Sangnil

Approved by :   
(Mr. Mana Fuekhud)  
Technical Manger



**เอกสารไม่ควบคุม**

**METHOD 5 CONSOLE CALIBRATION**  
**USING REFERENCE WET GAS METER W-NK-2.5-B-Z No.547425**  
**5-POINT METRIC UNIT**

Meter Console Information		Calibration Conditions				Factors/Conversions		
Console Model Number	XC-572-V	Date	Time	19/8/2021	01:00 PM	Std Temp	293	K
Console Serial Number	0807047	Calibration Reference No.		-		Std Press	760	mm Hg
DGM Model Number	SK25EX	Barometric Pressure		761.00	mm Hg	K <sub>1</sub>	0.386	
DGM Serial Number	00003580	Calibration Meter Gamma		0.999		Console Leak Check		PASS

Calibration Data									
Run Time	Metering Console					Calibration Meter			
Elapsed	DGM Orifice DH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final
(Q)	(P <sub>m</sub> )	(V <sub>mi</sub> )	(V <sub>mf</sub> )	(t <sub>mi</sub> )	(t <sub>mf</sub> )	(V <sub>wi</sub> )	(V <sub>wf</sub> )	(t <sub>wi</sub> )	(t <sub>wf</sub> )
min	mm H <sub>2</sub> O	m <sup>3</sup>	m <sup>3</sup>	°C	°C	m <sup>3</sup>	m <sup>3</sup>	°C	°C
12.17	13.0	3.3600	3.5000	23	23	23.01236	23.15126	26	26
12.30	13.0	3.5000	3.6400	23	23	23.15126	23.28948	26	26
8.72	26.0	3.6490	3.7890	24	24	23.29826	23.43644	26	26
8.88	26.0	3.7890	3.9290	24	24	23.43644	23.57434	26	26
14.83	40.0	3.9350	4.2150	25	25	23.58012	23.85818	26	26
14.67	40.0	4.2150	4.4950	25	25	23.85818	24.13456	26	26
10.37	70.0	4.5080	4.7880	25	25	24.14158	24.41250	26	26
10.13	70.0	4.7880	5.0680	26	26	24.41250	24.68290	26	26
8.90	90.0	5.0750	5.3550	27	27	24.68856	24.96012	26	26
8.88	90.0	5.3550	5.6350	27	27	24.96012	25.23050	26	26



**METHOD 5 CONSOLE CALIBRATION  
USING REFERENCE WET GAS METER W-NK-2.5-B-Z No.547425  
5-POINT METRIC UNIT**

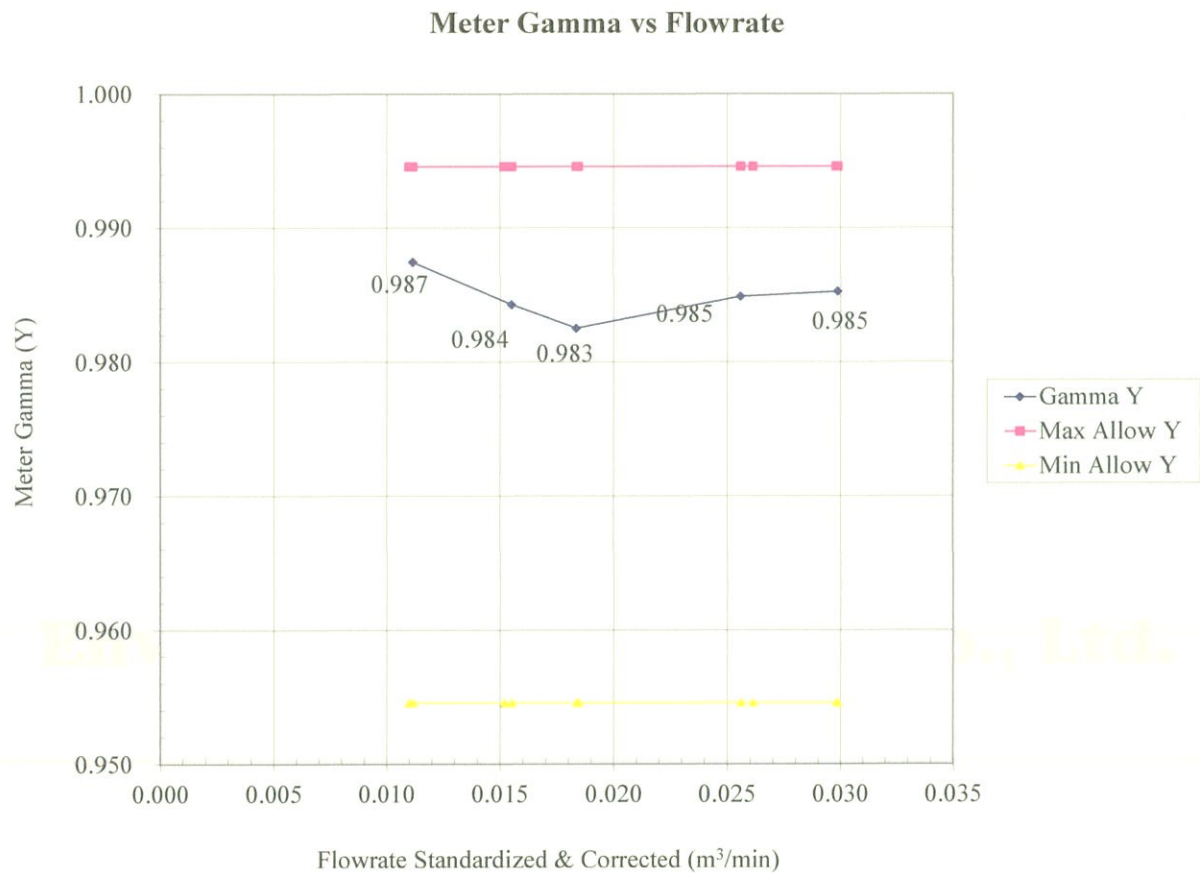
Calibration Data								
Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Calibration Meter		Calibration Factor		Flowrate	.0212 m <sup>3</sup> <sub>std</sub> /min	Variation
				Value	Variation	Std & Corr		
(V <sub>m(std)</sub> )	(Q <sub>m(std)</sub> )	(V <sub>w(std)</sub> )	(Q <sub>w(std)</sub> )	(Y)	(ΔY)	(Q <sub>m(std)(corr)</sub> )	(ΔH <sub>@</sub> )	(ΔH <sub>@</sub> )
m <sup>3</sup>	m <sup>3</sup> /min	m <sup>3</sup>	m <sup>3</sup> /min			m <sup>3</sup> /min	mm H <sub>2</sub> O	
0.138	0.011	0.136	0.011	0.990	0.015	0.011	46.043	-2.056
0.138	0.011	0.135	0.011	0.985	0.010	0.011	47.522	-0.577
0.138	0.016	0.135	0.016	0.984	0.009	0.016	47.880	-0.219
0.138	0.016	0.135	0.015	0.982	0.007	0.015	49.931	1.832
0.276	0.019	0.273	0.018	0.988	0.014	0.018	52.821	4.722
0.276	0.019	0.271	0.018	0.982	0.008	0.018	52.270	4.171
0.277	0.027	0.266	0.026	0.960	-0.014	0.026	47.835	-0.264
0.277	0.027	0.265	0.026	0.958	-0.016	0.026	45.881	-2.217
0.277	0.031	0.266	0.030	0.961	-0.014	0.030	45.290	-2.809
0.277	0.031	0.265	0.030	0.956	-0.018	0.030	45.515	-2.583
				0.975	Y Average		48.099	DH@ Average

**Note:** For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is  $\pm 0.02$ .

For  $\Delta H_{@}$ , orifice pressure differential that equates to 0.75 cfm (0.0212 m<sup>3</sup>/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is  $\pm 0.2$  inches (5.1mm) H<sub>2</sub>O.

Calibration Date: 19-8-2021

Calibration Reference No: Ser21-0813



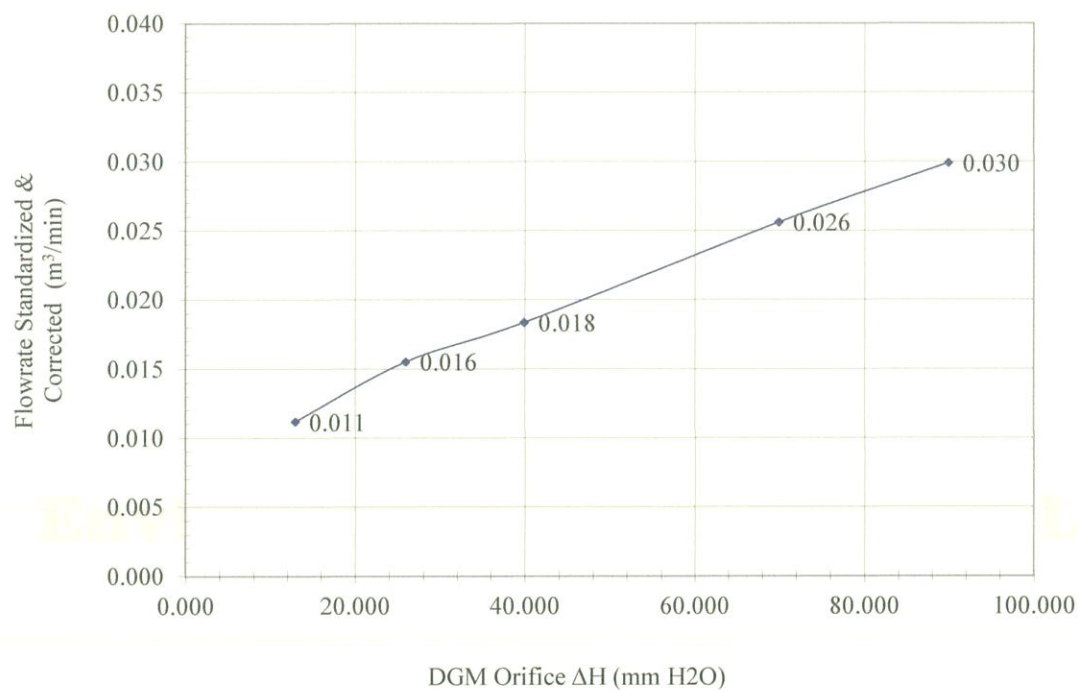
Console Serial: 0807047

Console Model: XC-572-V

Calibration Date: 19-8-2021

Calibration Reference No: Ser21-0813

## Meter Pressure vs Flowrate



Console Serial: 0807047

Console Model: XC-572-V



## THERMOCOUPLES SYSTEM CALIBRATION

Sampling System Equipment Information	
Console Model Number	XC-572-V
Console Serial Number	0807047
DGM Model Number	SK25EX
DGM Serial Number	00003580
Meter Box Model Number	JENCO 765 KF
Meter Box Serial Number	JC 17073

Calibration Conditions			
Date	Time	19/8/2021	03:00 PM
Calibration Reference No.			
Reference Thermometer		DIGICON	
Serial Number		183169105	

Results											
Console Thermocouple Simulator											
Channel and test point	Meter Box Channel Temperature Reading ( °C )										
	-18.0	25.0	38.0	93.0	149.0	260.0	371.0	482.0	593.0	816.0	1038.0
Stack	-17.0	24.0	37.0	93.0	149.0	259.0	371.0	482.0	594.0	817.0	1040.0
Aux	-17.0	24.0	37.0	93.0	149.0						
Probe	-18.0	24.0	37.0	93.0	149.0						
Filter	-18.0	24.0	37.0	93.0	149.0						
Oven	-	-	-	-	-						
Exit	-18.0	24.0	37.0								

Tolerance Range

Stack      ± 1.50%      Absolute  
 Probe     ± 3.0 °C  
 Filter     ± 3.0 °C

Meter      ± 3.0 °C  
 Exit        ± 2.0 °C

Envi Equipment Service Co., Ltd.

110/254 Moo 3, Tumbon Bang Rak Phatthana, Amphur Bang Bua Thong, Nonthaburi 11110

Tel. 098 362 9152, 089 478 7885

E-mail: sales@envi-ees.com

Certificate No. : E21-0821

Page : 1 of 6

**CERTIFICATE OF CALIBRATION**

**Customer** : United Analyst and Engineering Consultant Co., Ltd.

**Address** : 81 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260

**Description of Equipment** : Console meter

**Manufacturer** : Apex Instrument

**Model Number** : XC-572-V

**Serial Number** : 0807048

**ID./Control No.** : -

**Environment Conditions** : Temperature (25 ± 2) °C  
Humidity (50 ± 15) % RH

**Cal. Date** : 02/09/2021

**Issue Date** : 02/09/2021

**Calibration Method or Calibration Procedure Used**

US EPA Method (United State Environmental Protection Agency)


This certificate is traceable to national standard, which realize the units of measurement according to the International System of Units (IS).

**Result of Calibration**

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These reported uncertainties of measurement are expanded by a coverage factor of k=2, providing a 95% confidence level

Calibrated by : Mr. Sanya Sangnil

Approved by :   
(Mr. Mana Fuekhud)  
Technical Manger



**เอกสารไม่ควบคุม**



**METHOD 5 CONSOLE CALIBRATION  
USING REFERENCE WET GAS METER W-NK-2.5-B-Z No.547425  
5-POINT METRIC UNIT**

Meter Console Information		Calibration Conditions				Factors/Conversions		
Console Model Number	XC-572-V	Date	Time	02/9/2021	01:00 PM	Std Temp	293	K
Console Serial Number	0807048	Calibration Reference No.	-			Std Press	760	mm Hg
DGM Model Number	SK25EX	Barometric Pressure	761.00		mm Hg	K <sub>1</sub>	0.386	
DGM Serial Number	00003811	Calibration Meter Gamma	0.999			Console Leak Check	PASS	

Calibration Data									
Run Time	Metering Console					Calibration Meter			
Elapsed	DGM Orifice DH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final
(Q)	(P <sub>m</sub> )	(V <sub>mi</sub> )	(V <sub>mf</sub> )	(t <sub>mi</sub> )	(t <sub>mf</sub> )	(V <sub>wi</sub> )	(V <sub>wf</sub> )	(t <sub>wi</sub> )	(t <sub>wf</sub> )
min	mm H <sub>2</sub> O	m <sup>3</sup>	m <sup>3</sup>	°C	°C	m <sup>3</sup>	m <sup>3</sup>	°C	°C
12.27	13.0	544.3460	544.4860	25	25	32.17136	32.30750	24	24
12.40	13.0	544.4860	544.6260	24	24	32.30750	32.44346	24	24
8.77	26.0	544.6320	544.7720	24	24	32.44932	32.58574	24	24
8.58	26.0	544.7720	544.9120	24	24	32.58574	32.72218	24	24
14.17	40.0	544.9190	545.1990	24	24	32.72886	33.00296	23	23
14.17	40.0	545.1990	545.4790	24	24	33.00296	33.27582	23	23
10.45	70.0	545.4860	545.7670	25	25	33.28250	33.55462	23	23
10.42	70.0	545.7670	546.0470	26	26	33.55462	33.82500	23	23
9.18	90.0	546.0590	546.3390	26	26	33.83612	34.10576	23	23
9.15	90.0	546.3390	546.6190	27	27	34.10576	34.37388	23	23

**METHOD 5 CONSOLE CALIBRATION**  
**USING REFERENCE WET GAS METER W-NK-2.5-B-Z No.547425**  
**5-POINT METRIC UNIT**

Calibration Data								
Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Calibration Meter		Calibration Factor		Flowrate	.0212 m <sup>3</sup> <sub>std</sub> /min	Variation
				Value	Variation	Std & Corr		
(V <sub>m(std)</sub> )	(Q <sub>m(std)</sub> )	(V <sub>w(std)</sub> )	(Q <sub>w(std)</sub> )	(Y)	(ΔY)	(Q <sub>m(std)(corr)</sub> )	(ΔH <sub>@</sub> )	(ΔH <sub>@</sub> )
m <sup>3</sup>	m <sup>3</sup> /min	m <sup>3</sup>	m <sup>3</sup> /min			m <sup>3</sup> /min	mm H <sub>2</sub> O	
0.138	0.011	0.134	0.011	0.970	0.006	0.011	48.394	-0.204
0.138	0.011	0.134	0.011	0.969	0.004	0.011	49.583	0.985
0.139	0.016	0.135	0.015	0.971	0.006	0.015	49.356	0.758
0.139	0.016	0.135	0.016	0.971	0.007	0.016	47.300	-1.298
0.279	0.020	0.271	0.019	0.974	0.010	0.019	49.084	0.486
0.279	0.020	0.270	0.019	0.970	0.005	0.019	49.531	0.933
0.280	0.027	0.269	0.026	0.961	-0.004	0.026	47.696	-0.902
0.279	0.027	0.268	0.026	0.958	-0.006	0.026	48.004	-0.594
0.280	0.030	0.267	0.029	0.954	-0.011	0.029	48.418	-0.180
0.280	0.031	0.265	0.029	0.948	-0.016	0.029	48.614	0.016
				0.965	Y Average		48.598	DH@ Average

**Note:** For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is  $\pm 0.02$ .

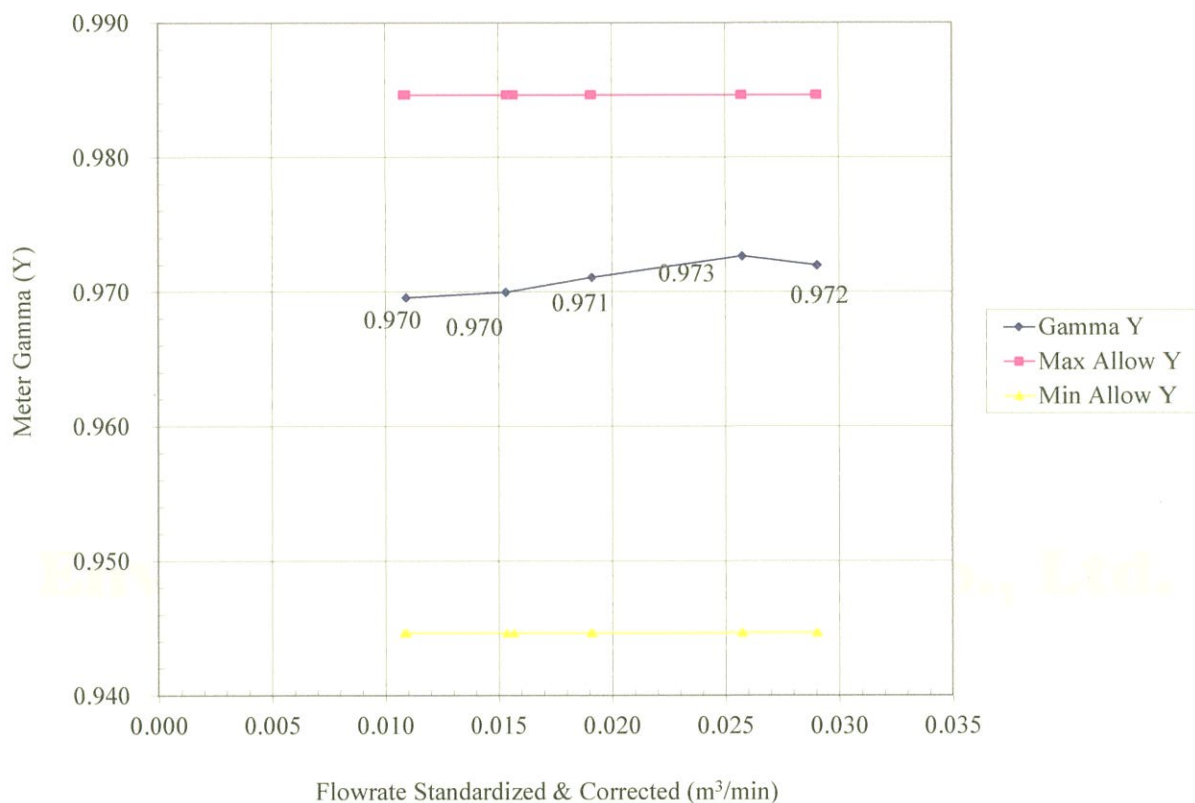
For  $\Delta H_{@}$ , orifice pressure differential that equates to 0.75 cfm (0.0212 m<sup>3</sup>/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is  $\pm 0.2$  inches (5.1mm) H<sub>2</sub>O.



Calibration Date: 24-8-2021

Calibration Reference No: Ser21-0813

## Meter Gamma vs Flowrate



Console Serial: 0807048

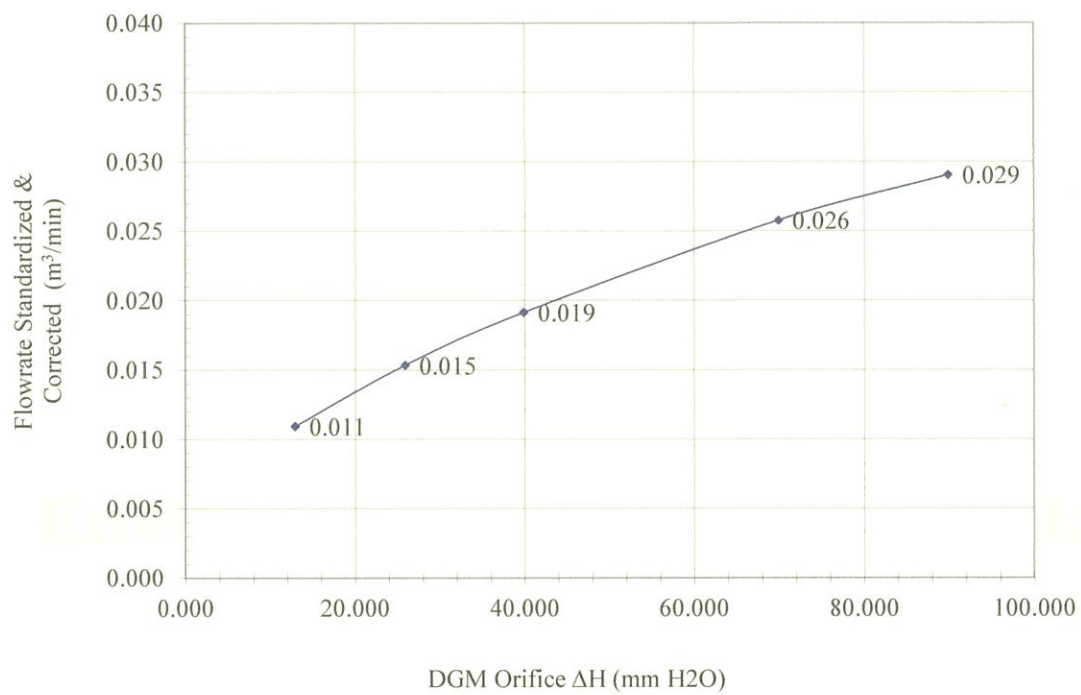
Console Model: XC-572-V



Calibration Date: 24-8-2021

Calibration Reference No: Ser21-0813

**Meter Pressure vs Flowrate**



Console Serial: 0807048

Console Model: XC-572-V

## THERMOCOUPLES SYSTEM CALIBRATION

Sampling System Equipment Information	
Console Model Number	XC-572-V
Console Serial Number	0807048
DGM Model Number	SK25EX
DGM Serial Number	00003811
Meter Box Model Number	JENCO 765 KF
Meter Box Serial Number	JC 08944

Calibration Conditions			
Date	Time	02/9/2021	03:30 PM
Calibration Reference No.			
Reference Thermometer		DIGICON	
Serial Number		183169105	

Results											
Console Thermocouple Simulator											
Channel and test point	Meter Box Channel Temperature Reading ( °C )										
	-18.0	25.0	38.0	93.0	149.0	260.0	371.0	482.0	593.0	816.0	1038.0
Stack	-17.0	26.0	39.0	94.0	150.0	261.0	372.0	482.0	593.0	816.0	1039.0
Aux	-17.0	26.0	39.0	94.0	150.0						
Probe	-17.0	26.0	39.0	94.0	150.0						
Filter	-17.0	26.0	39.0	94.0	150.0						
Oven	-	-	-	-	-						
Exit	-17.0	26.0	39.0								

Tolerance Range

Stack      ± 1.50%      Absolute  
 Probe      ± 3.0 °C  
 Filter      ± 3.0 °C

Meter      ± 3.0 °C  
 Exit      ± 2.0 °C

## Certificate of Calibration

### Customer

Name : UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.  
Address : 81 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Prakanong, Bangkok 10260

Certificate No : 21-AFM-073

Request No : Req-2021-0791

### Unit Under Calibration Details

Measurement Item : Air flow meter  
Manufacturer : TSI  
Model : 4146  
Serial Number : 41461813030  
ID : UAE.EFM.102/2561  
Location of Calibration : LAB 4 AIR VELOCITY METER

### Calibration Environment and Details

Temperature : 23 °C ± 3 °C  
Humidity : 55 %RH ± 20 %RH  
Barometric Pressure : 1013 hPa ± 10 hPa  
Received Date : 22 June 2021  
Calibration Date : 23 July 2021  
Calibration Procedure : In-house method CP-AFM-01 by Comparison technique with Standard Primary Flow Calibrator


Reference Standard	Model	Serial Number	Traceble	Due Calibration
Air Flow Meter	Gilibrator 3 Low flow	18501010006	Sensidyne	21 May 2022
Air Flow Meter	Gilibrator 3 Standard flow	19031011003	Sensidyne	20 May 2022


### Traceability :

This certificate provides traceability of measurement to recognized national standard, and to the realization of the international System of Units (SI)

### Note :

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor k=2, providing a level of confidence approximately 95 %.

Calibration By :   
Mr. Noppadon Luangart  
Service Calibration Engineer

Approved By :   
Mr. Pacit Mathavorn  
Calibration Engineer Supervisor

Issue Date : 23 July 2021



Certificate No : 21-AFM-073

Request No : Req-2021-0791

**Result of Calibration :**

Flow Setting	STD Flow Reading	UUC Flow Reading	Correction Flow	Uncertainty
LPM	LPM	LPM	LPM	LPM
0.02	0.01919	0.022	-0.00307	0.00086
0.05	0.05084	0.053	-0.00216	0.00093
0.10	0.1047	0.102	0.0027	0.0019
0.20	0.2013	0.197	0.0043	0.0036
0.5	0.5020	0.493	0.0095	0.0073
1.0	1.008	1.002	0.006	0.017
1.7	1.699	1.679	0.020	0.024
2.0	2.006	1.999	0.007	0.031

**Note**

STD : Standard

UUC : Unit Under Calibration

\* Indicates non accredited

End of Certificate



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES  
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG, BANGKOK 10250  
TEL. 0-2717-3000-24 FAX. 0-2719-9484



## Certificate of Calibration

Certificate No. : 22P1169

Page : 1 of 2

Equipment : Aneroid Barometer

Manufacturer: Barigo

Model : 111MS

Serial No.: -

ID No.: UAE.EMA2.060/2552

Condition As-Received: Used Item

Received Date: 30 March 2022

Calibration Date: 05 April 2022

Reference: 2203-1125WSC

Submitted by: United Analyst and Engineering Consultant Co.,Ltd.

Ambient Temperature: ( 23 ± 2 ) °C

Relative Humidity: ( 50 ± 15 ) %

Atmospheric Pressure: 1010 mbar

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except with the prior written approval of the head of  
Corporate Services 3: Equipment Calibration and Testing Services.

81 Soi Udomsuk 41, Sukhumvit Road, Bangchak,  
Phrakhanong, Bangkok 10260

**Procedure used:** The calibration was conducted by direct comparison method against Pressure Measuring Instruments Standard according to in-house calibration procedure CP-P10, using " DKD-R 6-1 ; Calibration of Pressure Gauges, Edition 03/2014 " as a guidelines.

### Condition of this result of calibration

1.Reference standards instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
1) Standard Barometer	DPI142	1422505046	MP-0053-21	08 Apr 2022

2.This instrument was installed in vertical orientation and center of the dial was used as the reference level.

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

4.Scale and conversion factor is 1 kPa = 7.50062 mmHg

5.This result of calibration instrument was in absolute pressure.

6.This instrument was used clean air as pressure media.

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

8.This Certification is traceable to the International System of Unit maintained at:-

-National Institute of Metrology Thailand (NIMT)

Calibrated by : Suwit Aussarree

Issue Date : 05 April 2022

Approved Signatory :

[ ] Phalinee Prabpaipal

[x] Sura Suwannasri

[ ] Attapol Panurach

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B 0283995





Cert.No.: 22P1169

Page: 2 of 2

**Result of calibration:- Without adjustment**

**Range :** 720 mmHg to 770 mmHg

**Function:- Absolute Pressure Measurement**

**Scale Interval :** 1 mmHg ( The Fifth Estimate )

**Increasing Pressure**

Applied Pressure (mmHg)	716.80	727.85	738.84	749.79	761.82	772.77
UUC* Indication (mmHg)	720.0	730.0	740.0	750.0	760.0	770.0
Error (mmHg)	3.20	2.15	1.16	0.21	-1.82	-2.77

**Decreasing Pressure**

Applied Pressure (mmHg)	772.76	761.81	749.78	738.81	727.83	716.78
UUC* Indication (mmHg)	770.0	760.0	750.0	740.0	730.0	720.0
Error (mmHg)	-2.76	-1.81	0.22	1.19	2.17	3.22

The uncertainty of measurement was  $\pm 0.24$  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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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES  
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG, BANGKOK 10250  
TEL. 0-2717-3000-24 FAX. 0-2719-9484



## Certificate of Calibration

Certificate No. : 22H771

Page : 1 of 2

Equipment : Dial Thermo-Hygrometer

Manufacturer: Barigo

Model : -

Serial No.: -

ID No.: UAE.ANV.003/2548

Condition As-Received: Used Item

Received Date: 30 March 2022

Calibration Date: 01 April 2022  
to 05 April 2022

Reference: 2203-1124WSC

Ambient Temperature: ( 25 ± 3 ) °C

Relative Humidity: ( 50 ± 20 ) %

This certificate may not be reproduced other than in full,  
except with the prior written approval of the head of  
Corporate Services 3: Equipment Calibration and Testing Services.

Submitted by: United Analyst and Engineering Consultant Co.,Ltd.

81 Soi Udomsuk 41, Sukhumvit Road, Bangchak,  
Phrakhanong, Bangkok 10260

**Procedure used:** Calibration were conducted using in-house calibration procedure CP-H02 according to comparison with standard chilled mirror sensor for humidity measurement function and comparison with standard temperature probe for temperature measurement function into humidity / temperature chamber.

### Condition of this result of calibration

1.Reference standards instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
1) Standard Chilled Mirror Hygrometer Sensor	Dew Prime II	31863	19714	17 Sep 2022
2) Standard Humidity/Temperature Meter	400	10203027	TH-0063-21	01 Jul 2022

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

3.This Certification is traceable to the International System of Unit maintained at:-

- National Institute of Standards and Technology (NIST) , The United States of America
- National Institute of Metrology Thailand (NIMT)

Calibrated by : Somchai Dumwor  
Issue Date : 08 April 2022

Approved Signatory :

☒ Chakrit Waewanjua

☐ Pornthippa Tameyakul

☐ Viporn Tantiyawutti

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Cert. No.: 22H771

Page.: 2 of 2

**Result of Calibration:-**

Without Adjustment

Function:

Humidity measurement.

Reference Temperature (°C)	Standard Humidity (%R.H.)	UUC* Reading (%R.H.)	Error (%R.H.)	Uncertainty of Measurement (±%R.H.)
25.0	40.1	42	1.9	1.6
25.0	60.0	61	1.0	1.8
25.0	80.0	78	-2.0	2.0

**Result of Calibration:-**

Without Adjustment

Function:

Temperature measurement.

Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of Measurement (±°C)
20.02	20.0	-0.02	0.72
29.98	30.0	0.02	0.72
35.02	35.0	-0.02	0.72
40.03	40.0	-0.03	0.72

**UUC\*** : Unit Under Calibration

The reported uncertainty of measurement was base on standard uncertainty multiplied by coverage factor  $k = 2.00$ , providing confidence level approximately 95%.

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บริษัท เอกเสคคิวทิฟ เทรตติ้ง จำกัด (สำนักงานใหญ่)

48/194-5 ซอยประดิษฐ์มนูธรรม 19 ถนนประดิษฐ์มนูธรรม แขวงลาดพร้าว เขตลาดพร้าว กรุงเทพฯ 10230  
TEL. (662) 515-0145-50 FAX. (662) 515-0144 www.etlthai.com E-mail : info@etlthai.com

No. RA 094/21

## Certificate of Calibration

**Customer** : United Analyst and Engineering Consultant Co., Ltd.  
**Address** : 81 Soi Udomsuk 41, Sukhumvit Road., Bangchak, Prakanong, Bangkok, 10260.  
**Calibration location** : Executive Trading Limited.  
**Address** : 48/194-5 Soi Praditmanutham 19, Pradit Manutham Road, Latphrao, Bangkok 10230

**Tools :**

**Environmental Condition :**

Instrument	: Gas Detector	Temperature	: $(25 \pm 3) ^\circ\text{C}$
Product	: RAE Systems	Relative Humidity	: $(33 \pm 15) \%$
Model Name	: MiniRAE3000 <sup>+</sup>	Pressure	: 760 mmHg
Serial Number	: 592-928075		

**Date of Calibration** : June 21, 2021

**Due Date of Calibration** : June 21, 2022

**Calibration Method** : This instrument has been calibrated using calibration gases. Test and calibration data is  
On file with Executive trading limited.

**Reference Standard** : Isobutylene Standard Gas 100 ppm; Lot number 1291364.

### Test Result

Sensor Type	Reference Concentration	Before Cal.	After Cal.	Error Reading	Result
PID	0.0 ppm (Air Zero)	0.0 ppm	0.0 ppm	0.0 ppm	Pass
PID	100 ppm (Isobutylene)	192.5 ppm	100.0 ppm	0.0 ppm	Pass

**Flow Rate of Pump** : 493 cc/min.

**Accuracy** :  $\pm 2 \%$  at calibration point

Calibrated By : Surinthorn S.  
(Mr. Surinthorn Sainate)  
Service Engineer

Approved By : [Signature]  
(Mr. Suttiwong Kongtongsang.)  
Service Engineer Manager

The results relate only to the items tested or calibrated.

Advertising the Report/Certificate and publicity of the results except in full are prohibited unless written permission is obtained from the company.

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Honeywell Analytics – Singapore Office  
17 Changi Business Park Central 1  
Singapore 486073  
Cert Ref : 00317

**Honeywell**  
THE POWER OF CONNECTED

Gas Detection



# CERTIFICATE Of Attendance

It is hereby certified that

**Mr Suttiwong Kongthongsang**  
**(Executive Trading Limited)**

has attended the

**RAE Products & Maintenance Training Course**

Conducted by

**RAE Systems BY HONEYWELL**

on **31<sup>st</sup> July to 2<sup>nd</sup> August 2018**

A handwritten signature in blue ink, appearing to be "Desmond Tan".



Conducted by : Desmond Tan  
Service Engineer/Technical Trainer  
Date of Issue : 2<sup>nd</sup> August 2018  
Valid for 2 years from date of issue

**เอกสารไม่ควบคุม**