

Title: individual Training Form

Document No: 730002657

Version No: 00

Page 1 of 1

Training Type:	Read and Understood		
Name:	Luo HuaZhen	Employee ID ¹	618078
Date of Training	19SEP2019		
Comments:	N/A		

Document Number	Title	Rev. #
730004135	Installation Qualification Protocol	03

 Senior Test Engineer 19SEP2018
Employee's Signature Title Date

 N/A self trained JG 19SEP2019
Trainer's Signature Title Date

Document No.: _____
Iteration No.: _____
Attachment: _____ Page: _____ of _____

¹ Without preceding "90"

Installation Qualification Protocol

Document # 730004135

Version # 03

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Test Script #	IQ-01	IQ Test Name:	Associated Documentation Verification
Equipment #	TE82526-4	Equipment Name:	Pump Tray Tester
Installation Site: Flextronics Contract Manufacturing Site in Singapore			
Purpose: To verify that supporting documentation is available prior to the completion of qualification.			
Test Execution: - List all applicable documents (Preventive Maintenance, Calibration, Operating Procedures, Test Specification Procedures, Manufacturing Procedures, etc.) under the Document type header, then complete the table below. Rows may be added/removed as needed. - All applicable documents must have a status of Ready, Pre-Rel-Prod, or Release General in SAP. If applicable documents are unavailable in SAP state why in the comments section.			
Objective Evidence: - Completed IQ-01 Test Script Data Sheet - SAP screenshots of below available document(s)			
Document Type	Title, Doc. #, Version/Revision #	Status in SAP	Initial & Date
TSP	TEST SPECIFICATION AND PROCEDURE, ALLIANCE PUMPTRAY, Rev 09	RELEASE GENERAL	
Comments:			
Overall Test Conclusion		Document No.: _____ Iteration No.: _____ Attachment: _____ Page: ____ of ____	
☐ Pass	☐ Fail		

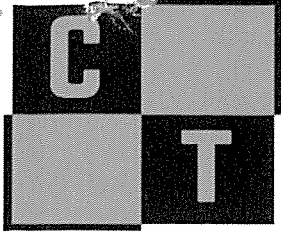
Installation Qualification Protocol

Document # 730004135

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Test Script #	IQ -02	IQ Test Name:	Site Verification		
Equipment #	TE82526-4	Equipment Name:	Pump Tray Tester		
Installation Site: Flextronics Contract Manufacturing Site in Singapore					
Purpose: To verify the location in which the test equipment is to be installed is suitable for use. Test Execution: - List additional applicable parameters in the Parameters column. Rows may be added as needed. - Using the applicable equipment documentation, define the specification(s) in the Acceptance Criteria column. - Verify and/or measure the applicable parameters and complete the Table below. Do not delete any of the listed defined parameters. Enter N/A for any parameter or cell that is not used or applicable. The reason for why the parameter is not used or applicable shall be explained within the corresponding Installation Qualification Report. Objective Evidence: - Completed IQ-02 Test Script Data Sheet - Photo(s) of the work area, as applicable - The source of each Acceptance Criterion shall be referenced in the IQR if stored in SAP. If not in SAP objective evidence specifying the Acceptance Criterion shall be provided in or as an attachment to the IQR. - Copies of calibration certificates for measurement tools, if applicable					
Parameters	Acceptance Criteria	As Found	Pass/Fail	Initial & Date	
Ambient Temperature	18 °C to 28 °C				
Relative Humidity	10 % to 80 %, Non-Condensing				
Electrical Supply	100 VAC to 240 VAC, 50 Hz/60 Hz ±5%				
Electrical Outlets	Minimum of 4 dedicated outlets				
Network Available	Minimum of 1 dedicated network				
Workspace	The system has sufficient room for the test station, UUT and service				
Test Station Bench	The Test Station Bench is large and strong enough to support the station				
Comments: - Ambient temperature/humidity measured using a Temperature/Humidity Meter, Control Number - Electrical supply measured using a Multimeter, Control Number Note: If the electrical supply range or tolerance is not specified for voltage and/or frequency, a tolerance of ±5% may be used in accordance with ANSI C84.1 – Voltage Tolerance Standard.					
Overall Test Conclusion		Document No.: _____ Iteration No.: _____ Attachment: _____ Page: ____ of ____			
☐ Pass ☐ Fail					



CALTEK PTE. LTD.

23 Tagore Lane, #04-08/09/10/11 Tagore 23 Warehouse, Singapore 787601
Tel: (65) 64520300 Fax: (65) 64520500
Email: info@caltekgroup.com Website: www.caltekgroup.com

CALIBRATION CERTIFICATE

CERTIFICATE NUMBER : CTS-111-1014-20	JOB NUMBER : CTJ19-8721
RECEIVED DATE : 30-Dec-19	ISSUE DATE : 08-Jan-20

INSTRUMENT : THERMOHYGROGRAPH	Ambient Temperature : (23 ± 5) °C
MANUFACTURER : HISAMATSU MFG. CO.	Relative Humidity : (55 ± 10) % r.h.
MODEL NO : TN-2500	Date of Calibration : 07-Jan-20
PART NO : -	Recommended Due Date : 07-Jan-21
SERIAL NO : 5650	Instrument Code : CT3260
CUSTOMER : FLEXTRONICS MANUFACTURING (SINGAPORE) PTE LTD.	Range : -
	Asset/Tag/Id/Code : 0418
	Page No : 1 of 2
	Status : As Found
	JR No : JR-17388

The described instrument has been calibrated at Caltek laboratory under the ambient conditions stated above.

This certificate provides traceability of measurement to the International System of Units (SI) and/or to units of measurement realised at the National Metrology Centre (NMC), Singapore or other recognized national metrology institutes.

The calibration method was carried out according to In-house Technical Calibration Procedure CTTM-T10-2007, as guide.

S.No.	REFERENCE INSTRUMENT(S)	SERIAL NO	DUE DATE
1.	Std.Hygrometer c/w probe	60813824/20055608	02-May-20

RESULTS OF CALIBRATION :

- The expanded uncertainty of measurement associated with the calibration is estimated at a level of confidence of approximately 95 % with a coverage factor of $k=2.00$.
- The results of calibration are given on the attached calibration data sheet(s).
- The user should determine the suitability of the instrument for its intended use.
- No Adjustments done.

REVIEWED & ACCEPTED

SIGN: CHANG MEL LAN

DATE: 09 JAN 2020

REMARKS: FOLD 0418

Yepthimich 10 JAN 20

Calibrated by :

Saathyish Vejayandran

EMP ID : 1107

Approved by :

Siva

EMP ID : NA

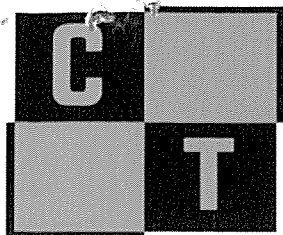
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The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council.



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Tel: (65) 64520300 Fax: (65) 64520500
Email: info@caltekgroup.com Website: www.caltekgroup.com

CALIBRATION CERTIFICATE

CERTIFICATE NUMBER : CTS-111-1014-20

JOB NUMBER : CTJ19-8721

ISSUE DATE : 08-Jan-20

PAGE NUMBER : 2 of 2

Calibration Results: RELATIVE HUMIDITY MEASUREMENT @ FIXED TEMPERATURE OF 23°C

Mean Reference Reading	Mean Instrument Reading - Before Adjustment	Error	Expanded Uncertainty
%rh	%rh	%rh	%rh
24.7	25.5	0.8	2.5
49.8	50.0	0.2	2.5
84.3	85.5	1.2	3.0

Calibration Results: TEMPERATURE MEASUREMENT @ NOMINAL RELATIVE HUMIDITY OF 50%r.h.

Mean Reference Reading	Mean Instrument Reading - Before Adjustment	Error	Expanded Uncertainty
°C	°C	°C	°C
17.8	18.2	0.4	0.6
23.9	24.2	0.3	0.6
29.8	30.4	0.6	0.6

Document No.: _____

Iteration No.: _____

Attachment : _____ Page ____ of ____

Calibrated by :

Saathyish Vejayandran

EMP ID : 1107

Approved by :

Siva

EMP ID : NA

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IQ-02 TEST SCRIP DATA SHEET:

AMBIENT TEMPERATURE: 21 °C to 22 °C

Verified using

THERMOHYGROGRAPH

Serial Number : 5650

EQID : 0418

Calibration Due Date: 07-Jan-2021



SKW-MFG4015-00
Temperature and Humidity Monitoring Record

Rev: A
Form A

Model: Year: 5650 2020

Plant Location: 201.1300

Equipment Used: Thermohygrometer

Serial Number: 5650

EQ ID: 0418

Compliance Range: 15°C to 25°C

Temp. Production: 21.1300

Collection Date: 07 Jan 21

Expiry Date: 07 Jan 21

Test Check	Time Check	Measurement				Status (Pass/Fail)	Use of Control Room				Remarks / Observations	Status
		Min Temp (°C)	Max Temp (°C)	Min Humidity (%)	Max Humidity (%)		Temp (°C)	Humidity (%)	Pass/Fail	Time Out		
1	X	X	X	X	X	Pass	X	X	X	X	Yes, Thim, wash q	X
2	0714	21	22	51	55	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
3	0734	21	22	53	54	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
4	0716	22	23	53	54	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
5	0727	22	23	53	54	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
6	0728	21	22	53	54	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
7	0721	21	22	53	54	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
8	X	X	X	X	X	Pass	X	X	X	X	Yes, Thim, wash q	X
9	0721	21	22	53	54	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
10	0727	20	22	54	55	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
11	0729	21	22	54	55	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
12	0751	21	22	54	56	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
13	1453	21	22	52	57	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
14	0726	21	22	56	57	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
15	X	X	X	X	X	Pass	X	X	X	X	Yes, Thim, wash q	X
16	0704	21	22	55	59	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
17	0714	21	22	53	56	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
18	0721	22	23	53	63	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
19	0724	22	23	53	63	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
20	0723	22	23	53	63	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
21	0737	22	23	51	53	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
22	X	X	X	X	X	Pass	X	X	X	X	Yes, Thim, wash q	X
23	1025	21	22	53	55	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
24	0712	21	22	53	55	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
25	0724	21	22	54	55	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
26	0739	21	22	54	55	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
27	0723	21	22	54	55	Pass	NA	NA	NA	NA	Yes, Thim, wash q	NA
28						Pass						
29						Pass						
30						Pass						
31						Pass						

Notes: X - No Operation (examples: Saturday, Sunday, Plant Shutdown and Public Holiday)
 NA - Not Applicable

Monthly Verified By: _____

COMPANY CONFIDENTIAL

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Document No.: _____
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RELATIVE HUMIDITY: 54 % to 55 %

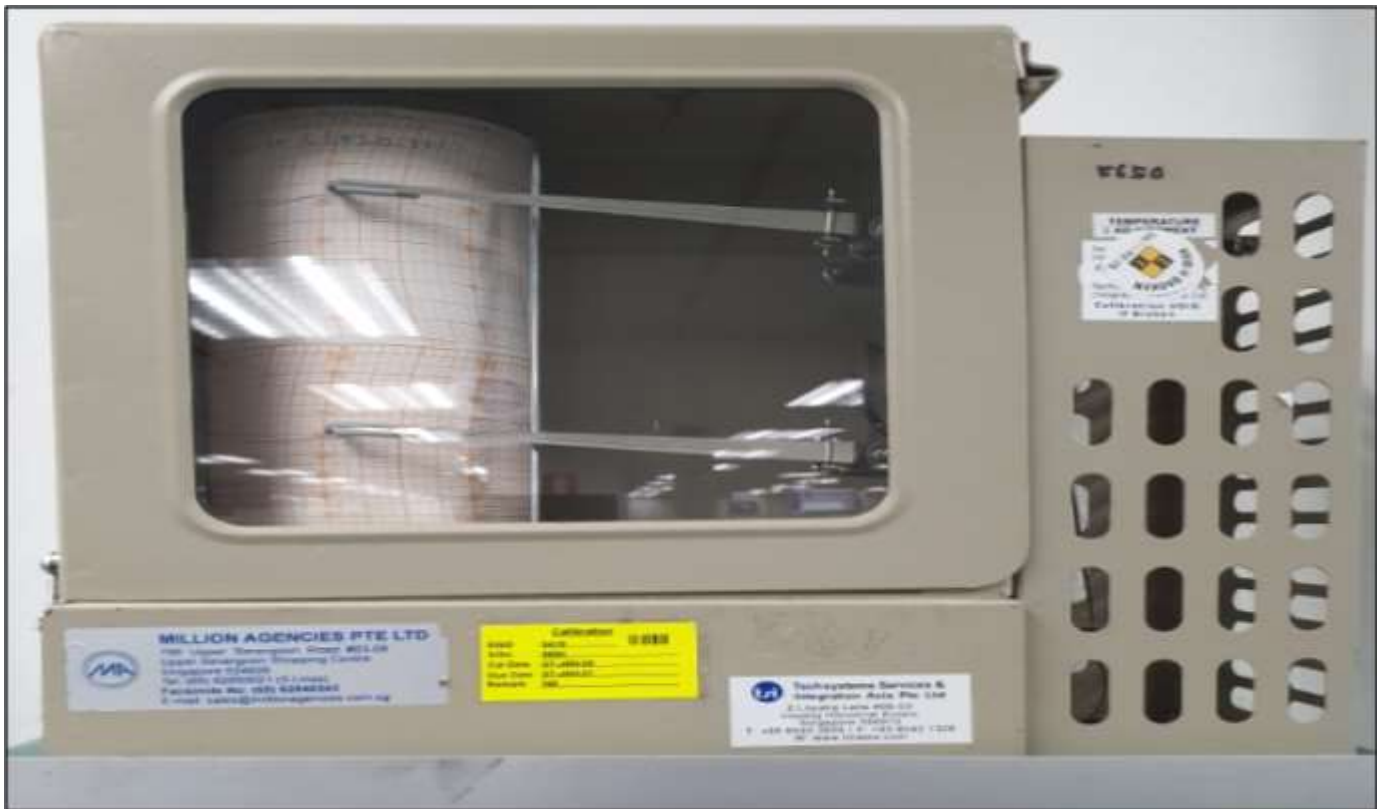
Verified using

THERMOHYGROGRAPH

Serial Number : 5650

EQID : 0418

Calibration Due Date: 07-Jan-2021



<u>Calibration</u>	
EQID	: 0418
S/No	: 5650
Cal Date	: 07-JAN-20
Due Date	: 07-JAN-21
Remark	: NA

Document No.: _____
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[Co Reg No: 199202282R | GST Reg No: M2-0106585-2]

CALIBRATION CERTIFICATE

Ref. No. : FMS / 2629

Page : 1 of 5

Customer : Flextronics Manufacturing (Singapore) Pte Ltd
Address : 1 Kallang Place
Singapore 339211

REVIEWED & ACCEPTED
SIGN: CHANG MEI LAN
DATE: 20 DEC 19
REMARKS: EQID 0245
Mord Shamsul 20 Dec 19

Equipment ID : 0245
Description : Multimeter
Model : 110
Manufacturer : Fluke
Serial No. : 85730619

Co-ordinator : Neo Hui Hui
Telephone : 6543 2855
Ext : 207

Date Calibrated : 16 Dec 2019
Next Due Date : 16 Dec 2020
Location : Electrical Laboratory

Temperature : $(23 \pm 3) ^\circ\text{C}$
Humidity : $(35 \sim 65) \% \text{rh}$

The above instrument has been tested in general accordance with its manufacturer's published specifications and Performance Test Procedure in Calibration Information PN1608592.

The measurement report attached to this certificate indicates all the test results obtained at the time of testing.
The intended use of the instrument shall be ascertained based on the end user's requirement.
Recalibration interval was determined based on end user's requirements.

As Found : ☒ In / ☐ Out Tolerance
As Left : In Tolerance

Adjustment Done : ☐ Yes / ☒ No

The measurement standards are traceable to SI Units through National Metrology Centre (NMC), Singapore; National Institute of Standards and Technology (NIST), USA; National Physical Laboratory (NPL), UK or other recognised National Standard Laboratories.

The Laboratory's Quality System is in accordance with the Quality Standard ISO 9001:2015.

Conformance terms of "In Tolerance" and "Out of Tolerance" used in this certificate are determined by comparison of measured values against warranted specifications and do not take measurement uncertainties into account.

Test Performed By

Sj

Sandra Lim
Associate Engineer



Approved By

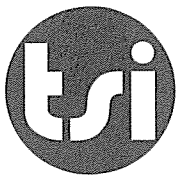
ku

Gee Chen Loong
Manager, Technical Services

Document No.: _____
Iteration No.: _____
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-Dec-2019

zby



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MEASUREMENT REPORT

Page : 2 of 5

Date : 16 Dec 2019

Reference : FMS / 2629

Description : Multimeter

Model : 110

Manufacturer : Fluke

Serial Number : 85730619

Measuring Instruments used in this performance test :-

Instrument	Serial No. (Cal Report No.)	Eqpt ID	Due Date	Remarks
MULTI-PRODUCT CALIBRATOR	6775016 (EL007672)	S0269	24 Apr 2020	

Legend and Explanations for Measurement Report:

- [*] - if shown next to the result recorded, it means the reading is out of the specified limits
- [Deviation] - if shown, is computed as [Deviation] = [UUT Reading] - [True Value] {Reference: Int Volcab in Metrology JCGM 200:2008}
- [Correction] - if shown, is computed as [Correction] = [True Value] - [UUT Reading].
Correction is used to apply to the UUT reading (add) to give a true reading.

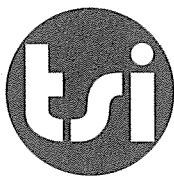
Test Performed By

Sandra Lim

Document No.: _____

Iteration No.: _____

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MEASUREMENT REPORT

Date : 16 Dec 2019

Ref. No. : FMS / 2629

Page : 3 of 5

Test			Specified Limits		Results	Comments
AC Voltage Test						
Range (V)	Freq (Hz)	Input (V)	Min (V)	Max (V)	Reading (V)	
6	50	300 m	0.294	0.306	0.301	
6	500	300 m	0.294	0.306	0.301	
6	50	5	4.947	5.053	5.000	
6	500	5	4.947	5.053	5.002	
60	500	50	49.47	50.53	50.25	
600	500	600	593.7	606.3	602.4	
Frequency Test						
Voltage : 5 V						
Range (kHz)		Input (kHz)	Min (kHz)	Max (kHz)	Reading (kHz)	
50		50	49.93	50.07	49.97	
DC Voltage Test						
Range (V)		Input (V)	Min (V)	Max (V)	Reading (V)	
6		0	-0.002	0.002	0.000	
6		5	4.963	5.037	5.001	
60		-50	-50.37	-49.63	-50.05	
600		600	595.6	604.4	600.4	
Continuity Test						
Beeper On @ 20 Ω			Pass / Fail		Pass	
Beeper Off @ 250 Ω			Pass / Fail		Pass	
Resistance Test						
Range (Ω)		Input (Ω)	Min (Ω)	Max (Ω)	Reading (Ω)	
600		0	-0.2	0.2	0.2	
600		500	495.3	504.7	500.2	
6 k		5 k	4.954 k	5.046 k	4.999 k	
60 k		50 k	49.54 k	50.46 k	49.97 k	
600 k		500 k	495.4 k	504.6 k	500.0 k	
6 M		5 M	4.954 M	5.046 M	4.984 M	
40 M		30 M	29.52 M	30.48 M	29.58 M	

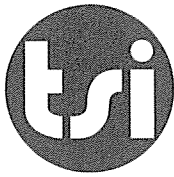
Test Performed By

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Document No.: _____

Iteration No.: _____

Attachment : _____ Page ____ of ____



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MEASUREMENT REPORT

Date : 16 Dec 2019

Ref. No. : FMS / 2629

Page : 4 of 5

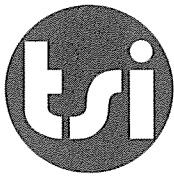
Test		Specified Limits		Results	Comments
Diode Test					
Range (V)	Input (V)	Min (V)	Max (V)	Reading (V)	
2.2	2	1.980	2.020	2.001	
Capacitance Test					
Range (nF)	Input (nF)	Min (nF)	Max (nF)	Reading (nF)	
1000	800	783	817	799	

				Test Completed	

Test Performed By


Sandra Lim

Document No.: _____
Iteration No.: _____
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MEASUREMENT REPORT

Date : 16 Dec 2019

Ref. No. : FMS / 2629

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The Expanded Uncertainties of measurement (excluding the uncertainties of the Unit Under Test) for the results given in this report, with a confidence level of approximately 95% at Coverage Factor $k = 2$, are as follows:

Parameters	Range		Uncertainty
AC Voltage Generation	33 ~ 329.999 mV	45 Hz ~ 10 kHz	0.0058 % + 23 μ V
	3.3 ~ 32.9999 V	45 Hz ~ 10 kHz	0.05 % + 693 μ V
	33 ~ 329.999 V	45 Hz ~ 1 kHz	0.06 % + 8 mV
	330 ~ 1000 V	45 Hz ~ 1 kHz	0.06 % + 92 mV
Frequency Generation	1.2 ~ 11.999 kHz		29 ppm + 1 mHz
DC Voltage Generation	0 ~ 32.99999 V		0.0058 % + 50 μ V
	30 ~ 329.9999 V		0.0064 % + 500 μ V
	100 ~ 1000 V		0.0064 % + 1.5 mV
Resistance Generation	330 ohm ~ 1.09999 k Ω		0.17 % + 0.07 Ω
	3.3 ~ 10.9999 k Ω		0.010 % + 0.7 Ω
	33 ~ 109.999 k Ω		0.013 % + 7 Ω
	330 k Ω ~ 1.09999 M Ω		0.017 % + 63 Ω
	3.3 ~ 10.9999 M Ω		0.07 % + 635 Ω
	11 ~ 32.9999 M Ω		0.12 % + 635 Ω
Capacitance Generation	0.33 ~ 1.0999 μ F		0.29 % + 1.2 nF

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Sr

Sandra Lim

ELECTRICAL SUPPLY : Minimum 4 dedicated outlets

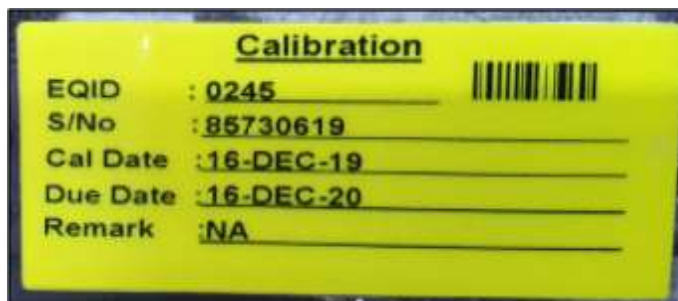
Verified using :

FLUKE 110 TRUE RMS MULTIMETER

Serial Number: 85730619

EQID: 0245

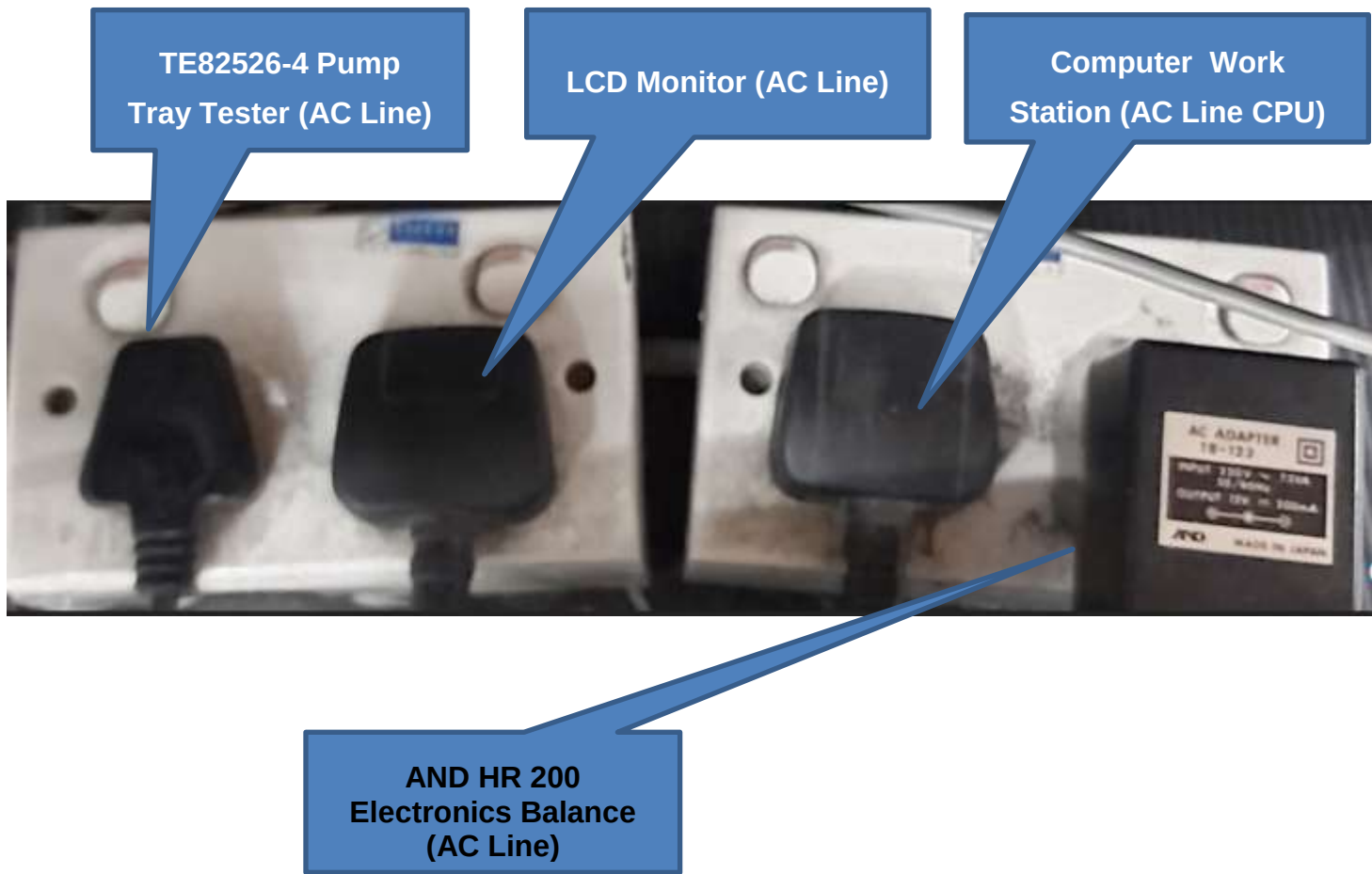
Calibration Due Date: 16-Dec-2020



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Minimum 4 dedicated outlets

ELECTRICAL OUTLET



NETWORK AVAILABLE : Minimum of 1 dedicated network
Blue Sticker : Dedicated network for Pump Tray Area



WS-9 is a dedicated network

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WORK SPACE: The system has sufficient room for the test station, UUT and service



TEST STATION BENCH : The test station bench is large and strong enough to support the station



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Installation Qualification Protocol

Document # 730004135

Version # 03

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Test Script #	IQ-03	IQ Test Name:	Instrumentation Calibration Verification
Equipment #	TE82526-4	Equipment Name:	Pump Tray Tester
Installation Site: Flextronics Contract Manufacturing Site in Singapore			
Purpose: To verify that all critical instruments are in the calibration database and that a calibration and/or a preventive maintenance has been performed, as appropriate. Test Execution: - List all critical instruments/components and/or sub-systems that require calibration and/or preventive maintenance in the Description column. Rows may be added as needed. - Verify that all listed critical instruments/components have had a preventive maintenance and/or calibration performed in accordance with the PM and/or Calibration procedure(s) or by an outside source, and are listed within the associated calibration database, then complete the table below. Objective Evidence: - Completed IQ-03 Test Script Data Sheet - Copies of calibration and/or maintenance certificates - Screen captures from the associated Calibration database			
Description	Asset #	Cal/PM Dates	Initial & Date
Electronics Weigh Balance	12200404	Last Cal/PM: 13-Jan-2020 Cal/PM Due: 13-Jul-2020	
Comments: - Electronics Weigh Balance is the only equipment that require calibration			
Overall Test Conclusion		Document No.: _____ Iteration No.: _____ Attachment: _____ Page: ____ of ____	
☐ Pass ☐ Fail			



MING DENG METROLOGY SERVICES PTE LTD

Company Registration No.: 199701342C
Blk 20, #04-12, Woodlands Link, Singapore 738733
Tel: (65) 6759 1189 (3 lines) Fax: (65) 6759 7656
Email: singapore@mdmetrology.com.sg
Website: www.mdmetrology.com.sg



CALIBRATION REPORT MDF200015-2

Issue to : **Flextronics Manufacturing (Singapore) Pte Ltd**
No. 1, Kallang Place
Singapore 339211

Description : **WEIGHING SCALE**
Manufacturer : AND (HR-200)
Serial Number : 12200404 (0216)
Capacity : 0 - 210g
Graduation : 0.0001g
Date of Calibration : 13 Jan 2020
Date of Issue : 16 Jan 2020
Date Due : 13 Jul 2020
Ambient Temperature : 22.2 °C
Relative Humidity : 62.5 % relative humidity
Location : Production

REVIEWED & ACCEPTED
SIGN: CHANG MEI LAN
DATE: 31 JAN 2020
REMARKS: FAID 0216
JOEL 31 JAN 2020

Calibration Method

As generally given in In-house Procedure MDCP-20 : 2005.

Repeatability

The repeatability was expressed as a standard deviation together with the relative size of the maximum difference between two successive readings. The repeatability was determined at near zero, half maximum and maximum load of the weighing scale. The largest standard deviation was selected as the repeatability of the weighing scale.

Linearity

The linearity of the weighing scale was determined by placing known masses on the pan in increasing steps up to its maximum capacity of 200g. The difference between the applied mass and the corresponding actual readings were calculated as the errors of the scale readings.

Off-centre

The off-centre loading result was determined by placing a mass of 100g for the 0 to 200g range and moving the mass to various positions on the pan. The maximum difference between the readings was then obtained.

Hysteresis

The hysteresis of the weighing scale was determined using a mass of 75g for the 0 to 200g range, applied at an increasing and decreasing directions on the pan up to the maximum load. The difference between the indicated values and that of the applied mass was determined.

Reference Standard Used

Standard Weights, S/No: M105, traceable to SI units through NMC(Singapore) & NIM(Thailand) via Report No: MDL190571-1 & MTL190924; due date: 01 Mar 2020.

Calibration Result

The expanded uncertainty is $\pm 0.0001g$, at approximately 95% confidence level with coverage factor, $k = 2$. No adjustment was done unless After Adjustment readings are reported.

The requirements stated in this report are taken from Manufacturer's Specification, $\pm 0.0002g$.

The user should decide on the usability and recalibration interval of this item based on its requirements and intended use.

This calibration report only applies to the calibration of this item.

Calibrated by :
Treerayut Soodtumrong
Calibration Officer

Reviewed by :
Koo Chih Wei
Approving Officer

Document No.: _____
Iteration No.: _____
Attachment : _____ Page _____ of _____

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M I N G D E N G

METROLOGY SERVICES PTE LTD

Company Registration No.: 199701342C
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Tel: (65) 6759 1189 (3 lines) Fax: (65) 6759 7656
Email: singapore@mdmetrology.com.sg
Website: www.mdmetrology.com.sg

Report Number : MDF200015-2
Serial Number : 12200404 (0216)
Date of Calibration : 13 Jan 2020

Calibration Results

Repeatability of Reading

Applied Mass (g)	Standard Deviation of Reading (g)	Maximum Difference Between Successive Readings (g)
5.0000	0.00003	0.0000
75.0000	0.00003	0.0000

Linearity and Errors of the Weighing Scale

Applied Mass (g)	Actual Reading (g)	Error (g)
0.0000	0.0000	0.0000
0.2000	0.2000	0.0000
0.5000	0.5001	+ 0.0001
1.0000	0.9999	- 0.0001
2.0000	1.9999	- 0.0001
3.0000	2.9999	- 0.0001
4.0000	3.9999	- 0.0001
5.0000	5.0000	0.0000
6.0000	6.0000	0.0000
10.0000	9.9999	- 0.0001
50.0000	49.9999	- 0.0001
100.0000	99.9998	- 0.0002
200.0000	200.0000	0.0000

Off-Centre Loading

Position on the pan	Centre	Front	Back	Left	Right	Maximum Difference
Reading (g)	100.0000	99.9998	100.0002	99.9998	99.9998	0.0004

Hysteresis

Load (g)	Hysteresis (g)
75.0000	< 0.0001

Note: The user is recommended to re-verify the performance of the weighing scale on site prior to use.

Calibrated by : 
Treerayut Soodtumrong
Calibration Officer

Document No.: _____
Iteration No.: _____
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Installation Qualification Protocol

Document # 730004135

Version # 03

Page 4 of 19

Test Script #	IQ-04	IQ Test Name: Test Software and Instrument Firmware Version		
Equipment #	TE82526-4	Equipment Name: Pump Tray Tester		
Installation Site: Flextronics Contract Manufacturing Site in Singapore				
Purpose: To verify that the installed software/firmware is correct per the applicable design and/or operational document(s). Test Execution: - List all relevant Equipment software and/or instrument firmware in the Description column. Specify the associated part number for the instrument firmware, if applicable. Rows may be added/removed as needed. - List the associated required equipment software and/or critical instrument/internet connection sharing firmware version(s), as defined in the applicable design/operational document(s), in the Acceptance Criteria column. - Verify that the software version displayed on the Operator Interface of the program and/or the firmware loaded on the instruments/PC match the acceptance criteria identically, if applicable, then complete the table below. Objective Evidence: - Completed IQ-04 Test Script Data Sheet - Identify and/or provide a screen capture/print out/copy of the applicable design/operational document that defines the required software/firmware version(s) within or as an attachment to the associated Installation Qualification Report. - Screen capture and/or test record displaying/indicating the software and/or firmware version(s), as applicable				
Description	Acceptance Criteria	As Found	Pass/Fail	Initial & Date
TE82526	Version: 1.0	Version:		
Comments: This test station does not download firmware				
Overall Test Conclusion		Document No.: _____ Iteration No.: _____ Attachment: _____ Page: ____ of ____		
☐ Pass ☐ Fail				

Test Script #	IQ-05	IQ Test Name:	General Safety and Alarms
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IQ-04 Test Software and Instrument Firmware Version

Waters

THE SCIENCE OF WHAT'S POSSIBLE.™

Document Number: WAT210700

Test Specification and Procedure

Revision: 09

Page 1 of 4

DOCUMENT TITLE: **TEST SPECIFICATION AND PROCEDURE, ALLIANCE PUMPTRAY**

SYSTEM/ASSEMBLY NAME: **ALLIANCE PUMPTRAY**

PART NUMBER AFFECTED **279000419, 279000524, 289000526, 700000713, 700001030,
WAT270463, WAT271078**

TEST EQUIPMENT NAME: **ALLIANCE PUMPTRAY TESTER**

TEST EQUIPMENT NUMBER: **TE82526**

TEST SOFTWARE:



AUTHOR(S): **MIKE COTTER**

DATE: **April 30, 1998**

REVISED BY: **MIKE COTTER**

DATE: **May 05, 2016**

Document No.: _____

Iteration No.: _____

Attachment : _____ Page ____ of ____

IQ-04 Test Software and Instrument Firmware Version



Document No.: _____

Iteration No.: _____

Attachment : _____ Page ____ of ____

Installation Qualification Protocol

Document # 730004135

Version # 03

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Equipment #	TE82526-4	Equipment Name:	Pump Tray Tester
Installation Site:	Flextronics Contract Manufacturing Site in Singapore		
Purpose: To verify that the equipment can operate in a safe manner, within its designated location.			
Test Execution: - List any additional safety related conditions or alarms in the Safety Inspection column, such as: guarding, interlocks, thermal or mechanical safety, chemical, secured gas tanks, restart or power loss, emergency stop, environmental exhaust, electrical safety, noise, safety labels, etc. Rows may be added as needed. EH&S shall be consulted as necessary. - List the associated safety requirement(s)/specification(s) in the Acceptance Criteria column. - Perform an inspection/test of the equipment to assess its safety related conditions, then complete the table below.			
Objective Evidence: - Completed IQ-05 Test Script Data Sheet - Photo(s) of the secured glass bottles, tanks, etc., if applicable - The source of any applicable Acceptance Criterion shall be summarized in the IQR if stored in SAP. If the source is not stored in SAP, at a minimum the page specifying the applicable Acceptance Criterion shall be provided as an attachment.			
Safety Inspection	Acceptance Criteria	Pass/Fail	Initial & Date
Mechanical Safety/ Pinch Points/Sharp Edges	None Found (or mitigated appropriately)		
Glass Bottles	Secure		
Waste Tanks	Secure and located below the system		
Emergency Stop	System ceases operation upon depressing the Emergency Stop button		
Guarding	Shielding in place to prevent hazard during operation		
Comments:			
Overall Test Conclusion		Document No.: _____ Iteration No.: _____ Attachment: _____ Page: ____ of ____	
☐ Pass ☐ Fail			

Test Script #	IQ-06	IQ Test Name:	Functional Verification
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IQ-05 Test Script Data Sheet:

Station does not have Pinch Points/ sharp edges
Glass Bottle is secured by plastic container



Document No.: _____
Iteration No.: _____
Attachment : _____ Page ____ of ____

Installation Qualification Protocol

Document # 730004135

Version # 03

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Equipment #	TE82526-4	Equipment Name:	Pump Tray Tester
Installation Site: Flextronics Contract Manufacturing Site in Singapore			
Purpose: To verify that the system operates as expected. Test Execution: - Select the UUT(s) or tests to be performed as defined within the Installation Qualification Section of 730001835. - List the Part Number and Serial Number, if applicable, in the UUT Part Number/Serial Number column. - Define the appropriate Acceptance Criteria within the Acceptance Criteria column. - Perform a test of the UUT(s), verify the Acceptance Criteria, then complete the table below. If an associated Test Record is being used as objective evidence the Header/Footer information should be verified for accuracy. Objective Evidence: - Completed IQ-06 Test Script Data Sheet - Copy of the Test Record(s) for the UUT(s), as applicable - The UUT(s) selected for this Test Script and the reasoning for why it/they were selected shall be summarized within the associated Installation Qualification Report. - If this Acceptance Criteria is other than "All required CTQ Specification measurements result in a Pass" then it shall be summarized within the associated VAF, Process Validation Plan, and/or Installation Qualification Report. - For systems that download firmware to product the BOM showing the firmware requirement shall be provided within the IQR.			
UUT Part Number/Serial Number	Acceptance Criteria	Pass/Fail	Initial & Date
Part Number: Serial Number:	All required CTQ Specification measurements result in a Pass		
Comments:			
Overall Test Conclusion		Document No.: _____ Iteration No.: _____ Attachment: _____ Page: ____ of ____	
☐ Pass ☐ Fail			

Waters Corporation

SUBASSEMBLY TEST RECORD

Part Number:	289000526	Description:	Alliance Pump Tray
Tested By:	246154	Date:	26/3/2020 4:44:07 pm
Serial Number:	13L0H042	Control Number:	N/A
Software Revision:	N/A	Factory Order:	N/A

Seal Wash Functional Test

PASS ☒ FAIL ☐ see note # _____ PASS ☐

Accumulator Decay Test

Total decay (≤ 150 psi) - Actual: 20 PSI PASS ☒ FAIL ☐ see note # _____ PASS ☐
Compress Volume (≤ 20 %) - Actual: 15 % PASS ☒ FAIL ☐ see note # _____ PASS ☐

Primary Decay Test

Total decay (≤ 150 psi) - Actual: 102 PSI PASS ☒ FAIL ☐ see note # _____ PASS ☐
Compress Volume (≤ 20 %) - Actual: 10 % PASS ☒ FAIL ☐ see note # _____ PASS ☐

Flow Rate Test

[Measured Flow: 0.999 ml/min]

($\leq \pm 1\%$) - Actual: -0.15 % ERROR PASS ☒ FAIL ☐ see note # _____ PASS ☐

Ripple Test

($\leq 2.5\%$) - Actual: 1.2 % PASS ☒ FAIL ☐ see note # _____ PASS ☐

Pump Tray Result: PASS ☒ FAIL ☐ Signed: 246154 *[Signature]* Date: 26/MAR/2020

Notes: N/A

210000425 -E
Pump PCB S/N: 250220159 Accum. Xducer S/N: 299361 Prim. Xducer S/N: 299414

This Test Record and any data contained within it are proprietary to Waters Corporation and must be retained by Waters for the time period prescribed in its Quality Records Retention Policy. If any of the individual tests noted above fail; a note must be referenced that details the work performed to correct that specific deficiency. An overall failure indicates a special circumstance in which case a complete retest is to be done. A second form is required to document that testing; the initial form must be attached and retained.

Document No.: _____
Iteration No.: _____
Attachment: _____ Page _____ of _____