



MING DENG METROLOGY SERVICES PTE LTD

Company Registration No.: 199701342C
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CALIBRATION REPORT MDF200015-5

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

Description : **WEIGHING SCALE**
Manufacturer : AND (HR-200)
Serial Number : 12316922 (0278)
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 : 22.6 °C
Relative Humidity : 60 % relative humidity
Location : Production

REVIEWED & ACCEPTED
SIGN: CHANG MEI LAN
DATE: 31 JAN 2020
REMARKS: E&ID 0278
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





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Calibration Results

Repeatability of Reading

Applied Mass (g)	Standard Deviation of Reading (g)	Maximum Difference Between Successive Readings (g)
5.0000	0.00003	0.0001
75.0000	0.00003	0.0001

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	0.5000	0.0000
1.0000	1.0000	0.0000
2.0000	2.0000	0.0000
3.0000	3.0000	0.0000
4.0000	4.0000	0.0000
5.0000	5.0000	0.0000
6.0000	5.9999	- 0.0001
10.0000	9.9999	- 0.0001
50.0000	49.9998	- 0.0002
100.0000	99.9998	- 0.0002
200.0000	200.0002	+ 0.0002

Off-Centre Loading

Position on the pan	Centre	Front	Back	Left	Right	Maximum Difference
Reading (g)	99.9999	99.9999	100.0001	100.0001	99.9999	0.0002

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