TITLE: OPERATION AND CALIBRATION OF ANALYTICAL BALANCE

1.0 PURPOSE:

To describe the Operation and Calibration of Analytical balance.

2.0 SCOPE:

This procedure is applicable to the following Analytical balance. In Quality control Laboratory.

Make : Citizen.

Model : CY204

ID No. : DIPL/QC/INS/AB/001

3.0 RESPONSIBILITY:

3.1 Analyst-QC is responsible to follow this SOP.

3.2 Head-QC/Designee is responsible for ensuring implementation of this SOP.

3.3 Head-QA/Designee is responsible for monitoring overall compliance of this SOP.

4.0 DEFINITIONS:

Nil.

5.0 PROCEDURE:

5.1 OPERATION:

5.1.1 Clean the balance pan with soft nylon brush

5.1.2 Check the ensure the bubble within the circle of the level Indicator

5.1.3 Switch ON the main switch.

5.1.4 The Balance automatically calibrates the sensitivity and shows OFF Switch ‘ON’ the Balance by pressing ON/OFF Switch

5.1.5 Press the ON/OFF key again, the Stan-by indicator shall light and the balance enters warm up state.

5.1.6 Press the ON/OFF key, whole display shall be illuminated.

5.1.7 Press TARE key, the span calibration takes place automatically.

Note: The system calibration is chosen automatically when the variation of room temperature is Large or right after powder is supplied

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5.1.8 Place a butter paper on the pan after the stability arrow is lit

5.1.9 Press TARE key and ensure that appears in the display

5.1.10 Load a sample when the stability arrow is lit

5.1.11 Record the display reading.

5.1.12 Transfer the sample into the measuring flask and weigh the butter paper. Record the weighing in the balance log book.

5.2 **CALIBRATION :**

5.2.1 **Routine Calibration.**

5.2.1.1 **Frequency:** Daily

5.2.1.2 **Do not Use Hands for holding the standard Weights. Use FORCEPS**

5.2.1.3 Procedure Carry out the following checks before taking up calibration.

5.2.1.4 Balance cleanliness.

5.2.1.5 Air bubble centering

5.2.1.6 Shall be done Auto calibration.

5.2.1.7 The procedure for Auto calibration is

- ❖ Switch on power by press POWER/BRK key before one hour for warm up.
- ❖ Wait for display to show 0.0000
- ❖ Press CAL button .display LOAD.
- ❖ 200 grams standard wt put on Pan, display CAL
- ❖ Then display UNLOAD, then display 0.0000

5.2.2 **Six Point Certification:**

5.2.2.1 Carry out the daily verification test by placing the standard weights certificate from the Govt. authorized test house and record the weighing and results of the Test in the format (Current version of QC-010-F-01).

5.2.2.2 Perform the calibration test with following loads.

5.2.2.3 50.00 gr, 10.00 gr, 1.00 gr, 100 mg, 50 mg and 10 mg.

5.2.2.4 Enter all weighing in the Current version of QC-010-F-01.

5.2.2.5 **Acceptance Tolerance:** The displayed load shall be within the range specified in table-1

Table -1

S.No	Weights	Acceptance Tolerance
01	50 gr to 100 mg	Not more than 0.1%
02	50 mg	Not more than 0.2%
03	10 mg	Not more than 1.0%

5.2.3 **Uncertainty:**

5.2.3.1 Uncertainty is defined as three times the standard deviation of not less than ten replicate weighing Divided by the amount weighed should not exceed 0.0001 or 0.1% of the reading. Carry out the Uncertainty test by placing the standard weights certified from the Govt. Authorized test house and record the weighing and results of the Test in the format (Current Version of QC-010-F-02)

5.2.3.2 Before start the calibration ensure that the display indicate “0.0000”

5.2.3.3 Record the weights of the standard analytical weights one by one.

5.2.3.4 Perform the calibration test with following loads.

5.2.3.5 Press TARE key display shows 0.0000

5.2.3.6 Place weights (100 g to 10 mg) on the pan.

5.2.3.7 Weigh 10 times of each weights (100 g to 10 mg)

5.2.3.8 Enter all value in format as per current version of QC-010-F-02

5.2.3.9 Calculate uncertainty test for each weights by using following formula:

$$Uncertainty = \frac{3 \times STDEVA}{Weight}$$

5.2.3.10 Acceptance Criteria : The displayed load shall be within the range specified in table-2

Table-2

S. No	Weights	Acceptance criteria
01	100 gr to 1.0 gr	0.001
02	500 mg to 10 mg	0.02

5.2.4 **Eccentricity:**

5.2.4.1 Before start the calibration ensure that the display indicate “0.0000”

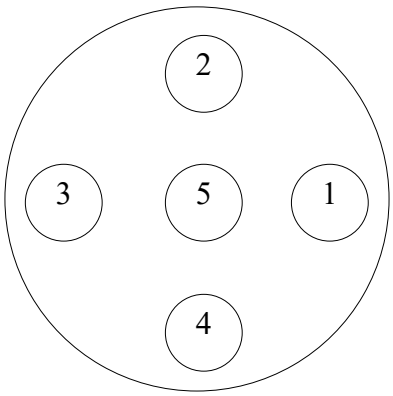
5.2.4.2 Record the weights of the standard analytical weights one by one.

5.2.4.3 Perform the calibration test with following loads.

5.2.4.4 Press TARE key display shows 0.0000

5.2.4.5 Place weights (100 g to 10 mg) on the pan.

5.2.4.6 Weigh 5 times of each weight (100 g to 10 mg) in specified place as shown in the following Diagram



5.2.4.7 Enter all values in format No current version of QC-010-F-04

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5.2.4.8 Acceptance Criteria: The displayed load shall be within the range specified in table-3

Table -3

S.No	Standard weight	Tolerance
1	100 gr	±100 mg
2	50 gr	±50 mg
3	20 gr	±20 mg
4	10 gr	±10 mg
5	5 gr	±5 mg
6	2 gr	±2 mg
7	1 gr	±1 mg
8	500 mg	±0.5 mg
9	200 mg	±0.2 mg
10	100 mg	±0.1 mg
11	50 mg	±0.1 mg
12	20 mg	±0.1 mg
13	10 mg	±0.1 mg

6.0 FORMATS / ANNEXURE(S):

S.No	Details	Format No. (Current version)
1.	Analytical balance Daily performance check record	
2.	Analytical balance uncertainty test record	
3.	Analytical balance Usage Log book	
4.	Analytical balance eccentricity test record	
5.	Analytical balance monthly calibration record	

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7.0 CHANGE HISTORY:

Revision No.	Effective Date	Details of Revision	Ref CCF No.
00	01.06.2007	New SOP introduced "Operation and calibration of analytical balance".	--
01	01.08.2009	In the SOP Formats change with more clear and clarity	--
02	01.12.2010	In this SOP incorporate Eccentricity test for analytical balance.	--
03	01.01.2012	In this SOP introduce the outside calibration values in place of normal standard weights values for weighing balance.	--
04		1. Formats removed from SOP 2. Periodical calibration frequency change month to 4 months	--
05	01.01.2017		

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