



## CERTIFICATE OF CALIBRATION

Certification No: MES/201211/C1

Calibrated for: TALUK HEAD QUARTERS HOSPITAL, KOYILANDY.

### DEVICE UNDER CALIBRATION

EQUIPMENT : MICRO PIPETTE

RANGE : 50-500 $\mu$ l

SL.NO/ID : 80113021

NO OF CHANNELS : 1

Date of Calibration : 11/12/2020

MAKE : MICO

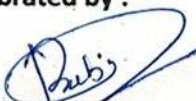
MODEL NO : NA

Next calibration due : 10/12/2021

Certified that the above instrument has been calibrated by trained technical person. The calibration Results attached with the certificate are authentic quantitative analysis report of the related instrument's which are calibrated and under valid traceability on the date of calibration.

Date of issue : 12/11/2020

Calibrated by :

  
PRABIN. K P

(Lab In Charge )

Approved Signatory

  
BINOJ THOMAS

(Quality /Technical Manager)

## CALIBRATION REPORT

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### CALIBRATION RESULT OF MICROPIPETTE

Sl. No.	Set Volume $\mu\text{l}$	Actual Volume $\mu\text{l}$	# Expanded uncertainty ( $\mu\text{l}$ )	Coverage factor (k)
1	50	49.97	$\pm 8.165$	2
2	250	249.61	$\pm 8.178$	2
3	500	499.96	$\pm 8.167$	2

# The reported expanded uncertainty is the uncertainty in measurement multiplied by the coverage factor k corresponds to a normal distribution at a confidence level of 95.45%.

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**Uncertainty Budget**

Source of uncertainty	Estimates	Unit	Exp. Uncertainty	k	Probability Distribution	Standard uncertainty	Sensitivity Coefficient	Uncertainty contribution	Degree of Freedom
Balance	497.61	mg	3.04E-05	2.00	Type B, Normal	1.518E-05	1.005E+00	1.525E-05	∞
Readability of balance	0.01	mg	5.00E-03	1.22	Type B, Rtglr	4.082E-03	1.005E+00	4.100E-03	∞
Temperature measurement	1.0045	µl/mg	1.40E-04	2.00	Type B, Normal	7.000E-05	4.976E+02	3.483E-02	∞
Thermal Exp. Coeff	0.0003	per °C	0.0003	1.73	Type B, Rtglr	1.732E-04	1.750E+02	3.031E-02	∞
Resolution of micropipette	10.0	µl	1.00E+01	1.22	Type B, Rtglr	8.164E+00	1.000E+00	8.164E+00	∞
Repeatability	499.96	µl	-	-	Type A	7.365E-02	1.000E+00	7.365E-02	4
Va	499.96	µl						8.164E+00	

Combined Standard uncertainty = 8.164 µl  
 Effective Degree of freedom = 603873815  
 For the calculated DOF and at a confidence of 95.45 %, the coverage factor, k, determined from student's distribution table = 2  
**Expanded uncertainty  $U_E$ , in the determination of volume = ± 16.328 µl**

**Calibration procedure:**

- 1) MES work procedure: MES/WP/VOLUME.

**Environmental Factors:**

Temperature: 27.5 °C ± 1 °C  
 Air pressure: 1003 mbar  
 Double distilled water,  
 Relative humidity: 75 %



**Note:** Results Presented in this certificate & report shall not be reproduced except in full without the written approval of this centre.