

**CERTIFICATE OF CALIBRATION**

FT-Q-25		Page 1 of 2	
ULR No.	: CC293720000000801P	Date of Issue	: 21-Nov-20
Certificate No	: TVCS 20/11/189 - 01	Recom. Due Date	: 17-May-21
Date of Calibration	: 18-Nov-20		
<b>Customer Details:</b>		SRF No.	: 189
<b>M/s. KALPANA MICROBIOLOGY LAB,</b>		Calibrated at	: Lab
# 40/25, Pookadai Corner,		Date of Receipt	: 17-Nov-20
South Car St,		Cond. On Receipt	: Satisfactory
Thirucengode - 637211.			
<b>Details of Test Instrument:</b>			
Description	: Micropipette	Model No.	: --
Range	: 5-50 µl	Serial No	: YE174AB0061013
Least Count	: 0.5 µl	Identification No.	: --
Make	: D - Lab	Accuracy	: As per Manual
Working range	: --	Location	: Lab
<b>Details of Standard Used</b>			
Name	Certificate No.	Valid upto	Traceability
Electronic SemiMicro Balance	TVCSP 20/05/364-01	12-May-21	TVCSP, Chennai.
Work Instruction	: WI-M-03 (Reference Standard ISO 8655-6)		
Environmental Details	: Temperature : 25±2°C      Relative Humidity : 50±10 % RH		
<b>MECHANICAL CALIBRATION</b>			
(Volume)			
<b>Calibration Results</b>			
<b>1. Lower Volume :</b>	<b>5</b>	<b>µl</b>	<b>No. of Measurements :</b>
			<b>10</b>
4.99	4.93	4.98	4.97
5.00	4.94	4.96	4.98
5.00	4.97		
<b>Mean Value :</b>	4.98	µl	
<b>Error Limits(±)</b>			
<b>Systematic Error :</b>	-0.02	µl	0.13
<b>Systematic Error :</b>	-0.46	%	2.50
<b>Random Error :</b>	0.02	µl	0.08
<b>Random Error :</b>	0.47	%	1.50
<b>Measurement Uncertainty :</b>	±	0.14	µl

Calibrated by :

Authorised by:

Ms. S. Manikala  
(Calibration Engineer)

Mr. G. John  
(The Head)

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MECHANICAL CALIBRATION				
(Volume)				
Calibration Results				
2. Middle Volume :	25	$\mu\text{l}$	No. of Measurements :	10
25.01	24.93		24.88	24.91
24.88	24.89		24.82	24.87
24.83	24.96			
Mean Value :	24.90	$\mu\text{l}$		
Error Limits( $\pm$ )				
Systematic Error :	-0.10	$\mu\text{l}$	0.20	$\mu\text{l}$
Systematic Error :	-0.41	%	1.00	%
Random Error :	0.06	$\mu\text{l}$	0.10	$\mu\text{l}$
Random Error :	0.23	%	0.50	%
Measurement Uncertainty :	$\pm$		0.14 $\mu\text{l}$	
3. Nominal Volume :	50	$\mu\text{l}$	No. of Measurements :	10
50.08	50.12		50.14	49.99
50.11	50.04		50.23	50.24
50.21	50.23			
Mean Value :	50.14	$\mu\text{l}$		
Error Limits( $\pm$ )				
Systematic Error :	0.14	$\mu\text{l}$	0.50	$\mu\text{l}$
Systematic Error :	0.28	%	1.00	%
Random Error :	0.09	$\mu\text{l}$	0.20	$\mu\text{l}$
Random Error :	0.18	%	0.40	%
Measurement Uncertainty :	$\pm$		0.14 $\mu\text{l}$	

**Remarks**

1. The reported Expanded Uncertainty is calculated at 95.45 % C.L with coverage factor  $k=2$
2. The Above Results are within the maximum permissible Error

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