TYPE-A 1 EVALUATION

Calibration Point: 8 °C

Sr. No.	READINGS x	MEAN $\bar{x}$	$x-\bar{x}$	$(x-\bar{x})^2$
1	10.002 °C	10.0353 °C	0.0333	0.00110889
2	10.052 °C	10.0353 °C	0.0167	0.00027889
3	10.052 °C	10.0353 °C	0.0167	0.00027889
			$(x-\bar{x})$	0.00166667
STANDARD DEVIATION OF THE MEAN (σ)				0.02886754 °C
MEAN OF STANDARD DEVIATION				0.01666668 °C
DEGREES OF FREEDOM				2

Type-B Contribution

Calibration Point: 8 °C

	Source	Distribution	DOF	Calculation	Value(±)
UB1	Uncertainty Due To Master 0.21 °C	/2	ω	Sensitivity Coeff. = 1	0.21 °C
UB2	uncertainty Due to master Accuracy 0.2 °C	√3	ω	Sensitivity Coeff. = 1	0.2 °C
UB3	Uncertainty Due To Duc Least Count 0.02 °C	√3	ω	Sensitivity Coeff. = 1	0.02 °C

Uncertainty Budget

Calibration Point: 8 °C

Sources of Uncertainty	Estimate	Limits Xi	Probability Distribution	Standard Uncertainty	Sensitivity Coefficient	Uncertainty Contribution	Degrees of freedom
UB 1 Uncertainty Due To Master	0.21 °C	0.21 °C	/2	0.105 °C	1	0.105 °C	∞
UB 2 uncertainty Due to master Accuracy	0.2 °C	0.2 °C	√3	0.1154700538 °C	1	0.1154700538 °C	∞
UB 3 Uncertainty Due To Duc Least Count	0.02 °C	0.01 °C	√3	0.0057735027 °C	1	0.0057735027 °C	∞
Repeatability	0.02886754 °C	0.02886754 °C	√3	0.016666682 °C	1	0.016666682 °C	2
	Uc			0.1570650978 °C	1	0.1570650978 °C	∞
	Expanded Uncertainty	=	2			0.45 °C	∞

COMBINED UNCERTAINTY (Uc)	EFFECTIVE DEGREES OF FREEDOM	Expanded Uncertainty	
0.1570650978264019 °C	15774.374841885041	0.45 °C	

TYPE-A 1 EVALUATION

Calibration Point: 8 °C

Sr. No.	READINGS x	MEAN $\bar{x}$	$x-\bar{x}$	$(x-\bar{x})^2$
1	10.002 °C	10.0353 °C	0.0333	0.00110889
2	10.052 °C	10.0353 °C	0.0167	0.00027889
3	10.052 °C	10.0353 °C	0.0167	0.00027889
			$(x-\bar{x})$	0.00166667
STANDARD DEVIATION OF THE MEAN (σ)				0.02886754 °C
MEAN OF STANDARD DEVIATION				0.01666668 °C
DEGREES OF FREEDOM				2

Type-B Contribution

Calibration Point: 8 °C

	Source	Distribution	DOF	Calculation	Value(±)

Calibrated By		Approved By
bfi		

	Customer Name	Job No
	United Calibration Pvt LTD	BFI/Maharashtra/2025/03/15/NABL/11/9

	Source	Distribution	DOF	Calculation	Value(±)
UB1	Uncertainty Due To Master 0.21 °C	/2	ω	Sensitivity Coeff. = 1	0.21 °C
UB2	uncertainty Due to master Accuracy 0.2 °C	√3	ω	Sensitivity Coeff. = 1	0.2 °C
UB3	Uncertainty Due To Duc Least Count 0.02 °C	√3	ω	Sensitivity Coeff. = 1	0.02 °C

Calibration Point: 8 °C

Uncertainty Budget

Sources of Uncertainty	Estimate	Limits Xi	Probability Distribution	Standard Uncertainty	Sensitivity Coefficient	Uncertainty Contribution	Degrees of freedom
UB 1 Uncertainty Due To Master	0.21 °C	0.21 °C	/2	0.105 °C	1	0.105 °C	∞
UB 2 uncertainty Due to master Accuracy	0.2 °C	0.2 °C	√3	0.1154700538 °C	1	0.1154700538 °C	∞
UB 3 Uncertainty Due To Duc Least Count	0.02 °C	0.01 °C	√3	0.0057735027 °C	1	0.0057735027 °C	∞
Repeatability	0.02886754 °C	0.02886754 °C	√3	0.016666682 °C	1	0.016666682 °C	2
	Uc			0.1570650978 °C	1	0.1570650978 °C	∞
	Expanded Uncertainty	=	2			0.45 °C	∞
COMBINED UNCERTAINTY (Uc)		**EFFECTIVE DEGREES OF FREEDOM**		**Expanded Uncertainty**			
0.1570650978264019 °C		**15774.374841885041**		**0.45 °C**			

Calibration Point: 10 °C

TYPE-A 1 EVALUATION

Sr. No.	READINGS x	MEAN x⁻	x-x⁻	(x-x)²
1	10.002 °C	10.0353 °C	0.0333	0.00110889
2	10.052 °C	10.0353 °C	0.0167	0.00027889
3	10.052 °C	10.0353 °C	0.0167	0.00027889
			(x-x)⁻	0.00166667
STANDARD DEVIATION OF THE MEAN (σ)				0.02886754 °C
MEAN OF STANDARD DEVIATION				0.01666668 °C
DEGREES OF FREEDOM				2

Calibration Point: 10 °C

Type-B Contribution

	Source	Distribution	DOF	Calculation	Value(±)
UB1	Uncertainty Due To Master 0.21 °C	/2	ω	Sensitivity Coeff. = 1	0.21 °C
UB2	uncertainty Due to master Accuracy 0.2 °C	√3	ω	Sensitivity Coeff. = 1	0.2 °C
UB3	Uncertainty Due To Duc Least Count 0.02 °C	√3	ω	Sensitivity Coeff. = 1	0.02 °C

Calibration Point: 10 °C

Uncertainty Budget

Sources of Uncertainty	Estimate	Limits Xi	Probability Distribution	Standard Uncertainty	Sensitivity Coefficient	Uncertainty Contribution	Degrees of freedom
UB 1 Uncertainty Due To Master	0.21 °C	0.21 °C	/2	0.105 °C	1	0.105 °C	∞

Calibrated By		**Approved By**
bfi		

Customer Name	Job No
United Calibration Pvt LTD	BFI/Maharashtra/2025/03/15/NABL/11/9

Sources of Uncertainty	Estimate	Limits Xi	Probability Distribution	Standard Uncertainty	Sensitivity Coefficient	Uncertainty Contribution	Degrees of freedom
UB 2 uncertainty Due to master Accuracy	0.2 °C	0.2 °C	√3	0.1154700538 °C	1	0.1154700538 °C	∞
UB 3 Uncertainty Due To Duc Least Count	0.02 °C	0.01 °C	√3	0.0057735027 °C	1	0.0057735027 °C	∞
Repeatability	0.02886754 °C	0.02886754 °C	√3	0.016666682 °C	1	0.016666682 °C	2
	Uc			0.1570650978 °C	1	0.1570650978 °C	∞
	Expanded Uncertainty	=	2			0.45 °C	∞
COMBINED UNCERTAINTY (Uc)	EFFECTIVE DEGREES OF FREEDOM		Expanded Uncertainty				
0.1570650978264019 °C	15774.374841885041		0.45 °C				

Calibration Point: 11 °C   **TYPE-A 1 EVALUATION**

Sr. No.	READINGS x	MEAN x⁻	x-x⁻	(x-x)²
1	10.002 °C	10.0353 °C	0.0333	0.00110889
2	10.052 °C	10.0353 °C	0.0167	0.00027889
3	10.052 °C	10.0353 °C	0.0167	0.00027889
			(x-x)	0.00166667
STANDARD DEVIATION OF THE MEAN (σ)				0.02886754 °C
MEAN OF STANDARD DEVIATION				0.01666668 °C
DEGREES OF FREEDOM				2

Calibration Point: 11 °C   **Type-B Contribution**

	Source	Distribution	DOF	Calculation	Value(±)
UB1	Uncertainty Due To Master 0.21 °C	/2	ω	Sensitivity Coeff. = 1	0.21 °C
UB2	uncertainty Due to master Accuracy 0.2 °C	√3	ω	Sensitivity Coeff. = 1	0.2 °C
UB3	Uncertainty Due To Duc Least Count 0.02 °C	√3	ω	Sensitivity Coeff. = 1	0.02 °C

Calibration Point: 11 °C   **Uncertainty Budget**

Sources of Uncertainty	Estimate	Limits Xi	Probability Distribution	Standard Uncertainty	Sensitivity Coefficient	Uncertainty Contribution	Degrees of freedom
UB 1 Uncertainty Due To Master	0.21 °C	0.21 °C	/2	0.105 °C	1	0.105 °C	∞
UB 2 uncertainty Due to master Accuracy	0.2 °C	0.2 °C	√3	0.1154700538 °C	1	0.1154700538 °C	∞
UB 3 Uncertainty Due To Duc Least Count	0.02 °C	0.01 °C	√3	0.0057735027 °C	1	0.0057735027 °C	∞
Repeatability	0.02886754 °C	0.02886754 °C	√3	0.016666682 °C	1	0.016666682 °C	2
	Uc			0.1570650978 °C	1	0.1570650978 °C	∞
	Expanded Uncertainty	=	2			0.45 °C	∞
COMBINED UNCERTAINTY (Uc)	EFFECTIVE DEGREES OF		Expanded Uncertainty				

Calibrated By		Approved By
bfi		

Customer Name	Job No
United Calibration Pvt LTD	BFI/Maharashtra/2025/03/15/NABL/11/9

Sources of Uncertainty	Estimate	Limits Xi	Probability Distribution	Standard Uncertainty	Sensitivity Coefficient	Uncertainty Contribution	Degrees of freedom
		FREEDOM					
0.1570650978264019 °C		15774.374841885041		0.45 °C			

TYPE-A 1 EVALUATION

Calibration Point: 10 °C

Sr. No.	READINGS x	MEAN x⁻	x-x⁻	(x-x⁻)²
1	10.002 °C	10.0353 °C	0.0333	0.00110889
2	10.052 °C	10.0353 °C	0.0167	0.00027889
3	10.052 °C	10.0353 °C	0.0167	0.00027889
			(x-x⁻)	0.00166667
STANDARD DEVIATION OF THE MEAN (σ)				0.02886754 °C
MEAN OF STANDARD DEVIATION				0.01666668 °C
DEGREES OF FREEDOM				2

Type-B Contribution

Calibration Point: 10 °C

	Source	Distribution	DOF	Calculation	Value(±)
UB1	Uncertainty Due To Master 0.21 °C	/2	ω	Sensitivity Coeff. = 1	0.21 °C
UB2	uncertainty Due to master Accuracy 0.2 °C	√3	ω	Sensitivity Coeff. = 1	0.2 °C
UB3	Uncertainty Due To Duc Least Count 0.02 °C	√3	ω	Sensitivity Coeff. = 1	0.02 °C

Uncertainty Budget

Calibration Point: 10 °C

Sources of Uncertainty	Estimate	Limits Xi	Probability Distribution	Standard Uncertainty	Sensitivity Coefficient	Uncertainty Contribution	Degrees of freedom
UB 1 Uncertainty Due To Master	0.21 °C	0.21 °C	/2	0.105 °C	1	0.105 °C	∞
UB 2 uncertainty Due to master Accuracy	0.2 °C	0.2 °C	√3	0.1154700538 °C	1	0.1154700538 °C	∞
UB 3 Uncertainty Due To Duc Least Count	0.02 °C	0.01 °C	√3	0.0057735027 °C	1	0.0057735027 °C	∞
Repeatability	0.02886754 °C	0.02886754 °C	√3	0.016666682 °C	1	0.016666682 °C	2
	Uc			0.1570650978 °C	1	0.1570650978 °C	∞
	Expanded Uncertainty	=	2			0.45 °C	∞
COMBINED UNCERTAINTY (Uc)		**EFFECTIVE DEGREES OF FREEDOM**		**Expanded Uncertainty**			
0.1570650978264019 °C		**15774.374841885041**		**0.45 °C**			

TYPE-A 1 EVALUATION

Calibration Point: 11 °C

Sr. No.	READINGS x	MEAN x⁻	x-x⁻	(x-x⁻)²
1	10.002 °C	10.0353 °C	0.0333	0.00110889
2	10.052 °C	10.0353 °C	0.0167	0.00027889
3	10.052 °C	10.0353 °C	0.0167	0.00027889
			(x-x⁻)	0.00166667
STANDARD DEVIATION OF THE MEAN (σ)				0.02886754 °C
MEAN OF STANDARD DEVIATION				0.01666668 °C

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Sr. No.	READINGS x	MEAN x⁻	x-x⁻	(x-x)²
DEGREES OF FREEDOM				2

Calibration Point: 11 °C   Type-B Contribution

	Source	Distribution	DOF	Calculation	Value(±)
UB1	Uncertainty Due To Master 0.21 °C	/2	ω	Sensitivity Coeff. = 1	0.21 °C
UB2	uncertainty Due to master Accuracy 0.2 °C	√3	ω	Sensitivity Coeff. = 1	0.2 °C
UB3	Uncertainty Due To Duc Least Count 0.02 °C	√3	ω	Sensitivity Coeff. = 1	0.02 °C

Calibration Point: 11 °C   Uncertainty Budget

Sources of Uncertainty	Estimate	Limits Xi	Probability Distribution	Standard Uncertainty	Sensitivity Coefficient	Uncertainty Contribution	Degrees of freedom
UB 1 Uncertainty Due To Master	0.21 °C	0.21 °C	/2	0.105 °C	1	0.105 °C	∞
UB 2 uncertainty Due to master Accuracy	0.2 °C	0.2 °C	√3	0.1154700538 °C	1	0.1154700538 °C	∞
UB 3 Uncertainty Due To Duc Least Count	0.02 °C	0.01 °C	√3	0.0057735027 °C	1	0.0057735027 °C	∞
Repeatability	0.02886754 °C	0.02886754 °C	√3	0.016666682 °C	1	0.016666682 °C	2
	Uc			0.1570650978 °C	1	0.1570650978 °C	∞
	Expanded Uncertainty	=	2			0.45 °C	∞

COMBINED UNCERTAINTY (Uc)	EFFECTIVE DEGREES OF FREEDOM	Expanded Uncertainty	
0.1570650978264019 °C	15774.374841885041	0.45 °C	

Calibration Point: 10 °C   TYPE-A 1 EVALUATION

Sr. No.	READINGS x	MEAN x⁻	x-x⁻	(x-x)²
1	10.002 °C	10.0020 °C	0.0000	0.00000000
2	10.002 °C	10.0020 °C	0.0000	0.00000000
3	10.002 °C	10.0020 °C	0.0000	0.00000000
			(x-x⁻)	0.00000000
STANDARD DEVIATION OF THE MEAN (σ)				0.00000000 °C
MEAN OF STANDARD DEVIATION				0.00000000 °C
DEGREES OF FREEDOM				2

Calibration Point: 10 °C   Type-B Contribution

	Source	Distribution	DOF	Calculation	Value(±)
UB1	Uncertainty Due To Master 0.21 °C	/2	ω	Sensitivity Coeff. = 1	0.21 °C
UB2	uncertainty Due to master Accuracy 0.2 °C	√3	ω	Sensitivity Coeff. = 1	0.2 °C
UB3	Uncertainty Due To Duc Least Count 0.02 °C	√3	ω	Sensitivity Coeff. = 1	0.02 °C

Calibration Point: 10 °C   Uncertainty Budget

Calibrated By		Approved By
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Customer Name	Job No
United Calibration Pvt LTD	BFI/Maharashtra/2025/03/15/NABL/11/9

Sources of Uncertainty	Estimate	Limits Xi	Probability Distribution	Standard Uncertainty	Sensitivity Coefficient	Uncertainty Contribution	Degrees of freedom
UB 1 Uncertainty Due To Master	0.21 °C	0.21 °C	/2	0.105 °C	1	0.105 °C	∞
UB 2 uncertainty Due to master Accuracy	0.2 °C	0.2 °C	√3	0.1154700538 °C	1	0.1154700538 °C	∞
UB 3 Uncertainty Due To Duc Least Count	0.02 °C	0.01 °C	√3	0.0057735027 °C	1	0.0057735027 °C	∞
Repeatability	0.00000000 °C	0.00000000 °C	√3	0 °C	1	0 °C	2
	Uc			0.1561783169 °C	1	0.1561783169 °C	∞
	Expanded Uncertainty	=	2			0.45 °C	∞
COMBINED UNCERTAINTY (Uc)	EFFECTIVE DEGREES OF FREEDOM		Expanded Uncertainty				
0.156178316890235 °C	Infinity		0.45 °C				

TYPE-A 1 EVALUATION

Calibration Point: 10 °C

Sr. No.	READINGS x	MEAN x⁻	x-x⁻	(x-x⁻)²
1	10.002 °C	10.0020 °C	0.0000	0.00000000
2	10.002 °C	10.0020 °C	0.0000	0.00000000
3	10.002 °C	10.0020 °C	0.0000	0.00000000
			(x-x⁻)	0.00000000
STANDARD DEVIATION OF THE MEAN (σ)				0.00000000 °C
MEAN OF STANDARD DEVIATION				0.00000000 °C
DEGREES OF FREEDOM				2

Type-B Contribution

Calibration Point: 10 °C

	Source	Distribution	DOF	Calculation	Value(±)
UB1	Uncertainty Due To Master 0.21 °C	/2	ω	Sensitivity Coeff. = 1	0.21 °C
UB2	uncertainty Due to master Accuracy 0.2 °C	√3	ω	Sensitivity Coeff. = 1	0.2 °C
UB3	Uncertainty Due To Duc Least Count 0.02 °C	√3	ω	Sensitivity Coeff. = 1	0.02 °C

Uncertainty Budget

Calibration Point: 10 °C

Sources of Uncertainty	Estimate	Limits Xi	Probability Distribution	Standard Uncertainty	Sensitivity Coefficient	Uncertainty Contribution	Degrees of freedom
UB 1 Uncertainty Due To Master	0.21 °C	0.21 °C	/2	0.105 °C	1	0.105 °C	∞
UB 2 uncertainty Due to master Accuracy	0.2 °C	0.2 °C	√3	0.1154700538 °C	1	0.1154700538 °C	∞
UB 3 Uncertainty Due To Duc Least Count	0.02 °C	0.01 °C	√3	0.0057735027 °C	1	0.0057735027 °C	∞
Repeatability	0.00000000 °C	0.00000000 °C	√3	0 °C	1	0 °C	2
	Uc			0.1561783169 °C	1	0.1561783169 °C	∞

Calibrated By		Approved By
bfi		

Customer Name	Job No
United Calibration Pvt LTD	BFI/Maharashtra/2025/03/15/NABL/11/9

Sources of Uncertainty	Estimate	Limits Xi	Probability Distribution	Standard Uncertainty	Sensitivity Coefficient	Uncertainty Contribution	Degrees of freedom
	Expanded Uncertainty	=	2			0.45 °C	∞
COMBINED UNCERTAINTY (Uc)		**EFFECTIVE DEGREES OF FREEDOM**		**Expanded Uncertainty**			
0.156178316890235 °C		**Infinity**		**0.45 °C**			

Calibrated By		Approved By
bfi		