NVLAP
CALIBRATION
NVLAP LAB CODE 200348-0

FLUKE
Calibration

Certificate Of Calibration
Fluke Calibration, American Fork
Temperature Laboratory

Certificate Number:	C1809037		
Status:	As-Left: Pass	**Date of Calibration:**	06 Aug 2021
		Date Due:	
Model:	4180	**Temperature:**	20 to 26 °C
Serial Number:	C18721	**Relative Humidity:**	< 60 %rh
Description:	IR Calibrator	**Pressure:**	83.5 to 88.5 kPa
Procedure:	AFC3001 Rev 002	**Issue Date:**	09 Aug 2021
Calibration Model:	418x		
Customer:	NEW PRODUCT		
Location:			
PO Number:	12587		
RMA/SO Number:	32231232		

This calibration is traceable to the International System of Units (SI) through recognized national metrology institutes (NIST, NRC, PTB, NPL, etc.), ratiometric techniques, or natural physical constants and is in compliance with ISO17025:2017. Calibration certificates without identification of the authorizing person are not valid. This certificate applies to only the item identified and shall not be reproduced except in full, without the specific written approval by Fluke Corporation. This certificate shall not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

This certificate of calibration may contain data that is not covered by the Scope of Accreditation. The unaccredited measurement points are indicated by the # symbol or confined to clearly marked sections.

Measurement uncertainties at the time of calibration are given where applicable. They are calculated in accordance with the method described in the ISO Guide to the Expression of Uncertainty in Measurement (GUM). The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95 %.

Calibration status should be interpreted as follows:
As-Found: Data collected before the unit was adjusted and / or repaired.
Found-Left: Data collected without any adjustment and / or repair performed.
As–Left: Data collected after the unit has been adjusted and/or repaired.

Comments:

APROVADO
Responsável: RENATO
Padrão: J001 A03 BN
Data: 10/10/2021
Validade: 06/08/2023

Cert:C1809037
Due :
S/N :C18721

Authorized By

Levi Dillman
Material Scheduler

Quality Manuals

This calibration has been completed in accordance with:
- The Fluke Corporate Quality Manual, QSD 111.0, and/or
- The Fluke 17025 Quality Manual, QSD 111.41

Fluke values feedback. Please contact us at http://us.flukecal.com/about/contact.

Method Used

The instrument described herein was calibrated by direct measurement of generated temperatures using the reference standards listed in the Standards Used section of this report. The calibration was performed radiometrically as described in the technical guide with the emissivity set to 0.95. The IR thermometer used has a spectral response of 8 to 14 µm. Thus, this calibration represents this spectral range only. When in use, the uncertainty of the measurement due to the instrument will be different if the spectral response of the IR thermometer under test is other than 8 to 14 µm. Please refer to the technical guide for further guidance. The calibration data, internal calibration constants, and uncertainties are shown on the following pages.

Additional notes on spectral band and emissivity:
1) Data represents 8 to 14 µm spectral band as described in the technical manual.
2) Where applicable, if the DUT was received with an emissivity setting other than 0.95, then this setting was changed to 0.95, as indicated, prior to collection of "As Found" data. The emissivity setting prior to the change is shown in the Comments section.

The Calibration Data section is described as follows. Reference Value is the temperature indicated by the reference thermometer system. Measurement Result is the DUT measurement result. Measurement Error is the DUT measurement error. Maximum Permissible Error is the DUT specification or tolerance as stated in the DUT manual. Expanded Uncertainty is the measurement uncertainty of the results as described on page 1. The measurement uncertainty accounts for all known uncertainties present at the time of calibration including long-term behavior of the calibration system, measurement precision, and contributions from the DUT. It is recommended that the DUT specification or tolerance be used as the contribution of the DUT rather than the calibration expanded uncertainty in any uncertainty analysis where the DUT is used.

Calibration uncertainties have been taken into account in the determination of tolerance status using risk analysis algorithms. The possible Status results are Pass, Marginal, and Fail. Marginal status is *indicated with a M and is applied when Measurement Error is within Maximum Permissible Error* but is too close to determine a status of Pass with a false accept risk of 2% or less.

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Certificate Number: C1809037 **Date of Calibration** 06 Aug 2021

Standards Used

Description	Model	Serial No.	Due Date
Precision IR Calibrator Test Equipment			NCR
Precision Digital Thermometer	1560	A2C135	NCR
Precision Digital Thermometer	2562-H	A55644	27 Feb 2022
Platinum Resistance Thermometer	APER_RTD	B1442910	03 Feb 2022
Radiation Thermometer	KT19.82	2574	11 Oct 2021
Precision IR Calibrator Test Station		1	NCR

Calibration Data

Description	Reference Value °C	Measurement Result °C	Measurement Error °C	Expanded Uncertainty °C	Maximum Permissible Error °C	Status
As Left Data						
IR CAL 1: 0.03						
IR CAL 2: -0.12						
IR CAL 3: 0.02						
TEMP PBAND: 6.0						
TEMP INT: 30.0						
TEMP DER: 3.0						
EMISSIVITY: 0.950						
Test ID: C1217225320203						
Temperature Results						
Set-point -15 °C	-14.875	-15.000	0.125	0.20	0.400	P
Set-point 0 °C	-0.069	0.000	-0.069	0.16	0.400	P
Set-point 50 °C	50.012	50.000	0.012	0.16	0.500	P
Set-point 100 °C	100.041	100.000	0.041	0.20	0.500	P
Set-point 120 °C	119.956	120.000	-0.044	0.23	0.550	P

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