



SOUTHWEST RESEARCH INSTITUTE®

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Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-4834



Calibration Laboratory
Certificate #0972-01

Certificate of Calibration

Cost Center / Customer: DIV20 / DON BANNON

Mail Stop: B57

Manufacturer/Model: FLUKE / 54 II

Description: THERMOCOUPLE THERMOMETER

Serial Number: 90810070

Asset Number: 012159

Procedure: DIGITAL THERMOMETERS/MODULES - 28 JAN 11

Work Order: 303101828

Date Issued: 6-Jun-2011

Date Calibrated: 6-Jun-2011

*** Date Due :** 6-Jun-2012

**** Results:** FOUND-LEFT

Temperature: 72.0 °F

Humidity: 45 %RH

Barometer: N/A

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 2005, ANSI/NCCL Z540-1-1994 and relevant requirements of the ISO 9000-2000 standard. This certificate shall not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. This certificate shall not be used to claim product endorsement by Southwest Research Institute, American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government. Results of this calibration relate only to the instrument described above at the time of calibration and does not imply any long term stability of the instrument.

*Determined by the customer, does not imply the instrument will remain within tolerance as any number of factors may cause an out-of-tolerance condition before this date. **Data type found in this certificate or attached measurement report must be interpreted as: Found-left - adjustment and/or repair was not performed, As-found - data is before unit is adjusted and/or repaired, As-left - data is after adjusted and/or repaired was performed. The customer has sole responsibility for determination of in-/out-of-tolerance or compliance/noncompliance.

Measurement uncertainty calculated in accordance with the method described in the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM), for a confidence level of approximately 95 percent using a coverage factor of $k=2$.

Remarks: Cal'd type J, K, T, E thermocouple


Standards Used

<u>Asset #</u>	<u>Manufacturer</u>	<u>Model</u>	<u>Description</u>	<u>Cal Date</u>	<u>Due Date</u>
006413	FLUKE	5520A/SC1100	MULTI-PRODUCT CALIBRATOR	3-May-2011	3-May-2012


Walt Hill

Laboratory Manager

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Joe Greagrey
Metrology Technician

Southwest Research Institute
Calibration Laboratory
Measurement Report

Work Order:	303101828	Mfr:	Fluke	Technician:	JRG
Asset No:	012159	Model:	54 II	Type Data:	Found-left
Serial No:	90810070	Type:	Temperature Meter	Cal Date:	6-Jun-11
Remarks:					

Function/Range	Test Point	TI Reading	Difference	± Limit	± Uncertainty	Result	% Limit
T1 Type J	°F	°F	°F	°F	°F		
	-300	-299.5	0.5	1.3	0.57	Pass	38%
	110	110.0	0.0	0.7	0.30	Pass	0%
	525	524.9	0.1	1.0	0.30	Pass	10%
	940	939.7	0.3	1.2	0.30	Pass	25%
	1350	1350	0.0	1.4	0.68	Pass	0%
	°C	°C	°C	°C	°C		
	-200	-199.5	0.5	0.9	0.32	Pass	56%
	40	40.1	0.1	0.4	0.18	Pass	25%
	275	275.1	0.1	0.5	0.21	Pass	20%
	510	510.0	0.0	0.7	0.21	Pass	0%
	750	749.9	-0.1	0.9	0.21	Pass	11%
T1 Type K	°F	°F	°F	°F	°F		
	-300	-299.9	0.1	1.3	0.69	Pass	8%
	390	390.1	0.1	0.9	0.55	Pass	11%
	1075	1075	0.0	1.2	0.55	Pass	0%
	1760	1759	1.0	1.7	0.55	Pass	59%
	2450	2449	1.0	2.0	1.0	Pass	50%
	°C	°C	°C	°C	°C		
	-150	-149.6	0.4	0.8	0.40	Pass	50%
	210	210.0	0.0	0.5	0.32	Pass	0%
	575	575.0	0.0	0.7	0.32	Pass	0%
	940	939.9	-0.1	1.0	0.32	Pass	10%
	1300	1300	0.0	1.2	0.75	Pass	0%
T1 Type T	°F	°F	°F	°F	°F		
	-370	-368.3	1.7	2.8	1.3	Pass	61%
	0	0.3	0.3	0.6	0.51	Pass	50%
	212	212.2	0.2	0.8	0.36	Pass	25%
	392	392.0	0.0	0.8	0.31	Pass	1%
	730	729.9	0.1	1.1	0.31	Pass	9%
	°C	°C	°C	°C	°C		
	-225	-224.0	1.0	1.7	0.73	Pass	59%
	32	32.2	0.2	0.4	0.30	Pass	50%
	100	100.2	0.2	0.5	0.21	Pass	40%
	200	200.2	0.2	0.5	0.19	Pass	40%
	390	390.0	0.0	0.7	0.19	Pass	0%

Southwest Research Institute
Calibration Laboratory
Measurement Report

Work Order:	303101828	Mfr:	Fluke	Technician:	JRG
Asset No:	012159	Model:	54 II	Type Data:	Found-left
Serial No:	90810070	Type:	Temperature Meter	Cal Date:	6-Jun-11

Function/Range	Test Point	TI Reading	Difference	± Limit	± Uncertainty	Result	% Limit
T1 Type E	°F	°F	°F	°F	°F		
	-230	-229.4	0.6	1.2	1.0	Pass	50%
	32	32.4	0.4	0.6	0.29	Pass	67%
	100	100.4	0.4	0.8	0.29	Pass	50%
	900	899.9	0.1	1.2	0.34	Pass	8%
	1800	1800	0.0	1.7	0.73	Pass	0%
	°C	°C	°C	°C	°C		
	-145	-144.7	0.3	0.8	0.59	Pass	38%
	0	0.2	0.2	0.4	0.20	Pass	50%
	40	40.2	0.2	0.4	0.20	Pass	50%
	500	500.0	0.0	0.8	0.22	Pass	0%
	950	949.9	-0.1	1.0	0.27	Pass	10%
	°F	°F	°F	°F	°F		
	0	-0.2	-0.2	1.0	0.43	Pass	20%
	°C	°C	°C	°C	°C		
	0	0.0	0.0	0.6	0.26	Pass	0%
T2 Type J	°F	°F	°F	°F	°F		
	-300	-299.6	0.4	1.3	0.57	Pass	31%
	110	109.9	0.1	0.7	0.30	Pass	14%
	525	525.1	0.1	1.0	0.30	Pass	10%
	940	939.9	0.1	1.2	0.30	Pass	8%
	1350	1350	0.0	1.4	0.68	Pass	0%
	°C	°C	°C	°C	°C		
	-200	-199.6	0.4	0.9	0.32	Pass	44%
	40	40.1	0.1	0.4	0.18	Pass	25%
	275	275.2	0.2	0.5	0.21	Pass	40%
	510	510.0	0.0	0.7	0.21	Pass	0%
	750	750.2	0.2	0.9	0.21	Pass	22%
	°F	°F	°F	°F	°F		
	-300	-299.3	0.7	1.3	0.69	Pass	54%
	390	390.0	0.0	0.9	0.55	Pass	0%
T2 Type K	1075	1075	0.0	1.2	0.55	Pass	0%
	1760	1760	0.0	1.7	0.55	Pass	0%
	2450	2450	0.0	2.0	1.0	Pass	0%
	°C	°C	°C	°C	°C		
	-150	-149.6	0.4	0.8	0.40	Pass	50%
	210	210.1	0.1	0.5	0.32	Pass	20%
	575	574.9	-0.1	0.7	0.32	Pass	14%
	940	939.9	-0.1	1.0	0.32	Pass	10%
	1300	1300	0.0	1.2	0.75	Pass	0%

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Measurement Report

Work Order:	303101828	Mfr:	Fluke	Technician:	JRG
Asset No:	012159	Model:	54 II	Type Data:	Found-left
Serial No:	90810070	Type:	Temperature Meter	Cal Date:	6-Jun-11

Function/Range	Test Point	TI Reading	Difference	± Limit	± Uncertainty	Result	% Limit
T2 Type T	°F	°F	°F	°F	°F		
	-370	-368.2	1.8	2.8	1.3	Pass	64%
	0	0.2	0.2	0.6	0.51	Pass	33%
	212	212.2	0.2	0.8	0.36	Pass	25%
	392	392.2	0.2	0.8	0.31	Pass	25%
	730	730.1	0.1	1.1	0.31	Pass	9%
	°C	°C	°C	°C	°C		
	-225	-224.0	1.0	1.7	0.73	Pass	59%
	32	32.2	0.2	0.4	0.30	Pass	50%
	100	100.2	0.2	0.5	0.21	Pass	40%
	200	200.2	0.2	0.5	0.19	Pass	40%
	390	390.1	0.1	0.7	0.19	Pass	14%
T2 Type E	°F	°F	°F	°F	°F		
	-230	-229.4	0.6	1.2	1.0	Pass	50%
	32	32.1	0.1	0.6	0.29	Pass	17%
	100	100.3	0.3	0.8	0.29	Pass	37%
	900	900.1	0.1	1.2	0.34	Pass	8%
	1800	1800	0.0	1.7	0.73	Pass	0%
	°C	°C	°C	°C	°C		
	-145	-144.5	0.5	0.8	0.59	Pass	63%
	0	0.2	0.2	0.4	0.20	Pass	50%
	40	40.2	0.2	0.4	0.20	Pass	50%
	500	500.3	0.3	0.8	0.22	Pass	38%
	950	950.1	0.1	1.0	0.27	Pass	10%

END OF REPORT