Furnace Survey Report

Wisconsin Oven
Heat Treat

April 12, 2021

AMERICAN INSTRUMENT CORPORATION
Serving Industry Since 1969

ACCREDITED
CERTIFICATE #1354.01
Calibration Lab
1354.01

702 Rose Drive - Hartland, WI 53029 - (P) 262-367-4409 - www.americaninstrument.biz

FURNACE TEMPERATURE UNIFORMITY SURVEY REPORT

Furnace Manufacture:	Wisconsin Oven
Furnace Identification:	Heat Treat
Specification:	AMS2750F
Furnace Class:	2
Furnace Instrument Type:	C
Heat Source Type:	Gas
Furnace Controls:	Control Eurotherm 3504
	Hi Limit Honeywell DC2500
	Recorder Honeywell QXE
Atmosphere:	No Atmosphere

Test Results:
This facility has passed the AMS2750F Uniformity Survey

Instrument Control Parameters: Pb: 0 Ti: 0 Td: 0 OT: 0%

Thermocouple #1:	Control Report No.:	88487
	Date Installed.:	4/12/2021
Thermocouple #2:	High Limit Report No.:	88487
	Date Installed.:	4/12/2021

Survey Instrument:	Yokogawa DX1012	S/N: S5K908806
Calibration Instrument:	Martel MC-1010	S/N: 2069094
Survey Wire:	Report: BA6019	

Start Condition: Furnace started at ambient without load.

Control Set Point - #1	300 °F	Tolerance +/- 10 °F
Control Set Point - #2	500 °F	Tolerance +/- 10 °F
Control Set Point - #3	1000 °F	Tolerance +/- 15 °F
Control Set Point - #4	1255 °F	Tolerance +/- 15 °F

Start Time:	9:23 Hrs.	4/12/2021
Stop Time:	19:00 Hrs.	4/12/2021
Run Time:	9:37 Hrs.	

Ambient Temperature:	(56.6 to 80.5) °F
Humidity:	(19.6 to 36.5) %

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Details

Temperature Summary #1:	300 °F (-2.5 / +4) °F	No overshoot was noted.
	Uncertainty: 300.4 °F +/- 3.4 °F	No Control bias required.
	Thermocouple: 8 Low / Thermocouple: 3 High	Bias: 0 °F
Remarks:	0	
Temperature Summary #2:	500 °F (-6 / +3) °F	No overshoot was noted.
	Uncertainty: 498 °F +/- 5.1 °F	No Control bias required.
	Thermocouple: 8 Low / Thermocouple: 3 High	Bias: 0 °F
Remarks:	0	
Temperature Summary #3:	1000 °F (-10 / +2) °F	No overshoot was noted.
	Uncertainty: 997.2 °F +/- 7 °F	No Control bias required.
	Thermocouple: 5 Low / Thermocouple: 6 High	Bias: 0 °F
Remarks:	0	
Temperature Summary #4:	1255 °F (-13 / +7) °F	No overshoot was noted.
	Uncertainty: 1252.9 °F +/- 8.2 °F	No Control bias required.
	Thermocouple: 5 Low / Thermocouple: 6 High	Bias: 0 °F
Remarks:	0	

The test results report raw data that does not take into consideration associated uncertainties of measurement. The uncertainty of measurement as stated was calculated using the expanded uncertainty at the 95% confidence level with a coverage factor of k=2. This certifies that all calibration standards are traceable to NIST, where available, and test results were performed in accordance with ISO/IEC 17025:2017.

Report Date:	April 12, 2021
Report Number:	FSR210412A
Next Survey Due:	July 12, 2021
Survey By:	**American Instrument Corporation**
Technician:	Jerry Dill
Approval:	Quality Control Manager or Designate
Customer:	

Temperature Uniformity Survey / AIC
Procedure: AIC 103A - AMS2750F

Revision: F
Approval: GND-QM
Approved: 7-21-2020

1.0 Control Instrument Calibration
1. Specification: ISO/IEC 17025:2017
2. Equipment: Traceable to NIST

2.0 Interval
1. See AMS2750F Table 18

3.0 Test Thermocouples
1. New: Installed at time of survey, single use only.

4.0 Location and Number of Test Thermocouples
1. AMS2750F Table 20 & 21

5.0 Test Thermocouples
1. Special limits of error (+/-2°F or +/- 0.4%)
2. Calibrated at temperatures used in the survey
3. NIST Traceable

6.0 Test Instrumentation
1. Yokogawa Recorder - +/-1.0 Deg F or +/-0.1% of the reading in F, whichever is greater.
2. Interval of readings AMS2750F 3.3.2.2.3

7.0 Procedure
1. See AMS2750F 3.5

8.0 Control Thermocouple Monitor
1. Special limits of error (+/- 0.4 deg.) thermocouple
2. Calibrated at temperatures used in survey
3. Located in control thermocouple protection tube or within 3" of control thermocouple

9.0 Pass/Fail Requirements
1. AMS2750F 3.5.14

10.0 Failures
1. AMS2750F 3.5.13

11.0 Documentation
1. Survey Report shall include: See AMS2750F 3.5.16

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702 Rose Drive
Hartland, WI 53029
Phone: (262) 367-4409 Fax: (262) 367-1154

ACCREDITED
CERTIFICATE #1354.01
Calibration Lab

CERTIFICATE of CALIBRATION

Customer		Instrument	
Name:	American Instrument Corporation	Manufacturer:	Yokogawa
Address:	702 Rose Drive	Description:	Digital Recorder
City:	Hartland	Model:	DX1012
State:	WI	Serial No.:	S5K908806
Zip Code:	53029	ID No.:	AI1055

As Found Condition:	In Tolerance	Calibration Date:	1/22/2021
As Left Condition:	In Tolerance	Due Date:	4/22/2021
Report Number:	DN210122-03	Procedure:	101A

AMS 2750F Calibration Required every 3 Months

Location: A I C

Temperature: 75 °F Humidity: 25%

Accuracy of standard used see manufacturer specifications.

ID NUMBER	MANUFACTURER	MODEL NUMBER	DESCRIPTION	DUE DATE
AI2073	Fluke	525B	Thermocouple/mV Calibrator	9/16/2021

The test results reported raw data that does not take into consideration associated uncertainties of measurement. The uncertainty of measurement was calculated using the expanded uncertainty at the 95% confidence level with a coverage factor of k=2.

Calibration performed by

David Nain

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This report certifies that all calibration standards are traceable to NIST where available and test results were performed in accordance with ISO.IEC 17025:2017.

Report - AS FOUND Sensitivity of UUT: 1 Deg F Pass ReportNumber: DN210122-03

Expression of Tolerance

Accuracy of UUT +/- 1 F or +/- 0.1% of Reading, whichever is greater.

Calibration procedure is performed within SAE-AMS 2750F requirement (Table 7)

Type K	0 F	100 F	200 F	400 F	600 F	800 F	1000 F	1200 F	1400 F	1600 F	1800 F	2000 F	2200 F	2400 F	IN / OUT
CH1	0.0	99.8	199.8	399.7	599.9	799.9	999.8	1199.9	1399.9	1599.9	1799.8	1999.8	2199.7	2399.8	IN
Correction factor	0.0	**0.2**	**0.2**	**0.3**	**0.1**	**0.1**	**0.2**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.3**	**0.2**	
CH2	0.2	100.1	200.2	400.2	600.2	800.3	1000.4	1200.1	1400.2	1600.2	1800.1	2000.1	2200.1	2400.2	IN
Correction factor	-0.2	-0.1	-0.2	-0.2	-0.2	-0.3	-0.4	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	
CH3	0.2	100.0	200.0	400.0	600.2	800.1	1000.2	1200.1	1400.0	1600.1	1800.0	2000.1	2200.1	2400.2	IN
Correction factor	-0.2	0.0	0.0	0.0	-0.2	-0.1	-0.2	-0.1	0.0	-0.1	0.0	-0.1	-0.1	-0.2	
CH4	0.0	100.0	200.0	399.8	600.2	800.1	1000.2	1200.0	1400.0	1600.1	1800.0	1999.9	2199.9	2400.0	IN
Correction factor	0.0	0.0	0.0	**0.2**	-0.2	-0.1	-0.2	0.0	0.0	-0.1	0.0	**0.1**	**0.1**	0.0	
CH5	0.0	100.0	199.9	399.8	600.1	800.1	1000.1	1200.0	1400.0	1600.1	1800.0	1999.9	2199.9	2400.0	IN
Correction factor	0.0	0.0	**0.1**	**0.2**	-0.1	-0.1	-0.1	0.0	0.0	-0.1	0.0	**0.1**	**0.1**	0.0	
CH6	0.0	99.8	199.9	399.8	600.1	800.1	1000.1	1200.0	1399.9	1599.9	1799.8	1999.9	2199.9	2400.0	IN
Correction factor	0.0	**0.2**	**0.1**	**0.2**	-0.1	-0.1	-0.1	0.0	**0.1**	**0.1**	**0.2**	**0.1**	**0.1**	0.0	
CH7	0.0	99.8	199.9	399.8	600.1	800.1	1000.1	1200.0	1399.9	1599.9	1799.8	1999.9	2199.9	2400.0	IN
Correction factor	0.0	**0.2**	**0.1**	**0.2**	-0.1	-0.1	-0.1	0.0	**0.1**	**0.1**	**0.2**	**0.1**	**0.1**	0.0	
CH8	-0.2	99.8	199.9	399.7	599.9	800.1	999.9	1199.9	1399.9	1599.9	1799.8	1999.8	2199.7	2399.8	IN
Correction factor	**0.2**	**0.2**	**0.1**	**0.3**	**0.1**	-0.1	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.3**	**0.2**	
CH9	-0.2	99.8	199.8	399.8	599.9	800.1	999.9	1199.9	1399.9	1599.9	1799.8	1999.8	2199.7	2399.8	IN
Correction factor	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	-0.1	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.3**	**0.2**	
CH10	-0.2	99.8	199.9	399.7	599.9	800.1	1000.1	1199.9	1399.9	1599.9	1799.8	1999.8	2199.7	2399.8	IN
Correction factor	**0.2**	**0.2**	**0.1**	**0.3**	**0.1**	-0.1	-0.1	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.3**	**0.2**	
CH11	-0.2	99.8	199.7	399.7	599.8	799.8	999.8	1199.8	1399.7	1599.9	1799.8	1999.8	2199.7	2399.8	IN
Correction factor	**0.2**	**0.2**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.1**	**0.2**	**0.2**	**0.3**	**0.2**	
CH12	-0.2	99.8	199.7	399.5	599.8	799.8	999.8	1199.8	1399.6	1599.7	1799.5	1999.7	2199.4	2399.6	IN
Correction factor	**0.2**	**0.2**	**0.3**	**0.5**	**0.2**	**0.2**	**0.2**	**0.2**	**0.4**	**0.3**	**0.5**	**0.3**	**0.6**	**0.4**	

	0	100	200	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400	
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	Tolerance
+/-	1.6	1.6	1.6	1.7	1.7	1.7	1.9	2.2	2.6	2.9	3.2	3.6	3.9	4.3	Uncertainty

Manufacture Specification

YokogawaDX1012

(+/-1.26 °F or 0.15% of Measurement whichever is greater)

Uncertainty K=2

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This report certifies that all calibration standards are traceable to NIST where available and test results were performed in accordance with ISO.IEC 17025:2017.

Report -AS LEFT Sensitivity of UUT: 1 Deg F Pass ReportNumber: DN210122-03

Expression of Tolerance

Accuracy of UUT +/- 1 F or +/- 0.1% of Reading, whichever is greater.
Calibration procedure is performed within SAE-AMS 2750F requirement (Table 7)

Type K	0 F	100 F	200 F	400 F	600 F	800 F	1000 F	1200 F	1400 F	1600 F	1800 F	2000 F	2200 F	2400 F	IN / OUT
CH1	0.0	99.8	199.8	399.7	599.9	799.9	999.8	1199.9	1399.9	1599.9	1799.8	1999.8	2199.7	2399.8	IN
Correction factor	0.0	**0.2**	**0.2**	**0.3**	**0.1**	**0.1**	**0.2**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.3**	**0.2**	
CH2	0.2	100.1	200.2	400.2	600.2	800.3	1000.4	1200.1	1400.2	1600.2	1800.1	2000.1	2200.1	2400.2	IN
Correction factor	-0.2	-0.1	-0.2	-0.2	-0.2	-0.3	-0.4	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	
CH3	0.2	100.0	200.0	400.0	600.2	800.1	1000.2	1200.1	1400.0	1600.1	1800.0	2000.1	2200.1	2400.2	IN
Correction factor	-0.2	0.0	0.0	0.0	-0.2	-0.1	-0.2	-0.1	0.0	-0.1	0.0	-0.1	-0.1	-0.2	
CH4	0.0	100.0	200.0	399.8	600.2	800.1	1000.2	1200.0	1400.0	1600.1	1800.0	1999.9	2199.9	2400.0	IN
Correction factor	0.0	0.0	0.0	**0.2**	-0.2	-0.1	-0.2	0.0	0.0	-0.1	0.0	**0.1**	**0.1**	0.0	
CH5	0.0	100.0	199.9	399.8	600.1	800.1	1000.1	1200.0	1400.0	1600.1	1800.0	1999.9	2199.9	2400.0	IN
Correction factor	0.0	0.0	**0.1**	**0.2**	-0.1	-0.1	-0.1	0.0	0.0	-0.1	0.0	**0.1**	**0.1**	0.0	
CH6	0.0	99.8	199.9	399.8	600.1	800.1	1000.1	1200.0	1399.9	1599.9	1799.8	1999.9	2199.9	2400.0	IN
Correction factor	0.0	**0.2**	**0.1**	**0.2**	-0.1	-0.1	-0.1	0.0	**0.1**	**0.1**	**0.2**	**0.1**	**0.1**	0.0	
CH7	0.0	99.8	199.9	399.8	600.1	800.1	1000.1	1200.0	1399.9	1599.9	1799.8	1999.9	2199.9	2400.0	IN
Correction factor	0.0	**0.2**	**0.1**	**0.2**	-0.1	-0.1	-0.1	0.0	**0.1**	**0.1**	**0.2**	**0.1**	**0.1**	0.0	
CH8	-0.2	99.8	199.9	399.7	599.9	800.1	999.9	1199.9	1399.9	1599.9	1799.8	1999.8	2199.7	2399.8	IN
Correction factor	**0.2**	**0.2**	**0.1**	**0.3**	**0.1**	-0.1	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.3**	**0.2**	
CH9	-0.2	99.8	199.8	399.8	599.9	800.1	999.9	1199.9	1399.9	1599.9	1799.8	1999.8	2199.7	2399.8	IN
Correction factor	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	-0.1	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.3**	**0.2**	
CH10	-0.2	99.8	199.9	399.7	599.9	800.1	1000.1	1199.9	1399.9	1599.9	1799.8	1999.8	2199.7	2399.8	IN
Correction factor	**0.2**	**0.2**	**0.1**	**0.3**	**0.1**	-0.1	-0.1	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.3**	**0.2**	
CH11	-0.2	99.8	199.7	399.7	599.8	799.8	999.8	1199.8	1399.7	1599.9	1799.8	1999.8	2199.7	2399.8	IN
Correction factor	**0.2**	**0.2**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.1**	**0.2**	**0.2**	**0.3**	**0.2**	
CH12	-0.2	99.8	199.7	399.5	599.8	799.8	999.8	1199.8	1399.6	1599.7	1799.5	1999.7	2199.4	2399.6	IN
Correction factor	**0.2**	**0.2**	**0.3**	**0.5**	**0.2**	**0.2**	**0.2**	**0.2**	**0.4**	**0.3**	**0.5**	**0.3**	**0.6**	**0.4**	

	0	100	200	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400	
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	Tolerance
+/-	1.6	1.6	1.6	1.7	1.7	1.7	1.9	2.2	2.6	2.9	3.2	3.6	3.9	4.3	Uncertainty

Manufacture Specification
YokogawaDX1012
(+/-126 °F or 0.15% of Measurement whichever is greater)

Uncertainty K=2

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ACCREDITED
CERTIFICATE #1354.01
Calibration Lab

CERTIFICATE of CALIBRATION

Customer		Instrument	
Name:	American Instrument Corporation	Manufacturer:	Martel
Address:	702 Rose Drive	Description:	Digital Calibrator
City:	Hartland	Model:	MC-1010
State:	WI	Serial No.:	2069094
Zip Code:	53029	ID No.:	AI 1077

As Found Condition:	Pass	Calibration Date:	2/12/2021
As Left Condition:	Pass	Due Date:	5/12/2021
Report Number:	DS210212 - 4	Procedure:	AIC107

AMS 2750F Calibration Required every 3 Months.

Location: A I C

Temperature: 80 °F Humidity: 14%

For accuracy of standards see manufacture manuals.

ID NUMBER	MANUFACTURER	MODEL NUMBER	DESCRIPTION	DUE DATE
AI2073	Fluke	525B	Temperature/Pressure Calibrator	9/16/2021
AI2069	KKMOON	MHS-5200A	Frequency Generator	1/8/2022
AI2081	Fluke	8845A	Precision Multimeter	4/20/2021

The test results reported raw data that does not take into consideration associated uncertainties of measurement. The uncertainty of measurement as stated was calculated using the expanded uncertainty at the 95% confidence level with a coverage factor of k=2. This certifies that all calibration standards are traceable to NIST. Where available and test results were preformed in accordance with ISO/IEC 17025:2017.

Calibration performed by

Dave Shannon

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REV:082319JQJD

2021 **AMS2750FIELDUNIT**

Report Number: DS210212 - 4 *Sensitivity of UUT: 1 Deg F* *Pass* ***Uncertainty K=2***

Accuracy of UUT The greater of +/- 1 Deg F or +/- 0.1% F

Calibration procedure is performed within SAE-AMS 2750F requirement Section 3.2.2.3

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Source	B	1200 F	1200.7	1200.7	-0.7	1198.8 *to* 1201.2	IN	2.6
Source	B	1400 F	1400.7	1400.7	-0.7	1398.6 *to* 1401.4	IN	2.6
Source	B	1600 F	1600.5	1600.5	-0.5	1598.4 *to* 1601.6	IN	2.8
Source	B	1800 F	1800.7	1800.7	-0.7	1798.2 *to* 1801.8	IN	2.8
Source	B	2000 F	2000.6	2000.6	-0.6	1998.0 *to* 2002.0	IN	3.2
Source	B	2200 F	2200.5	2200.5	-0.5	2197.8 *to* 2202.2	IN	3.2
Source	B	2400 F	2400.5	2400.5	-0.5	2397.6 *to* 2402.4	IN	3.2
Source	B	2600 F	2600.7	2600.7	-0.7	2597.4 *to* 2602.6	IN	3.2
Source	B	2800 F	2800.6	2800.6	-0.6	2797.2 *to* 2802.8	IN	3.2
Source	B	3000 F	3000.6	3000.6	-0.6	2997.0 *to* 3003.0	IN	3.2
Source	B	3200 F	3200.5	3200.5	-0.5	3196.8 *to* 3203.2	IN	3.2

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Measure	B	1200 F	1200	1200	0	1198.8 *to* 1201.2	IN	2.6
Measure	B	1400 F	1400	1400	0	1398.6 *to* 1401.4	IN	2.6
Measure	B	1600 F	1600	1600	0	1598.4 *to* 1601.6	IN	2.8
Measure	B	1800 F	1800	1800	0	1798.2 *to* 1801.8	IN	2.8
Measure	B	2000 F	2000	2000	0	1998.0 *to* 2002.0	IN	3.2
Measure	B	2200 F	2200	2200	0	2197.8 *to* 2202.2	IN	3.2
Measure	B	2400 F	2400	2400	0	2397.6 *to* 2402.4	IN	3.2
Measure	B	2600 F	2600	2600	0	2597.4 *to* 2602.6	IN	3.2
Measure	B	2800 F	2800	2800	0	2797.2 *to* 2802.8	IN	3.2
Measure	B	3000 F	3000	3000	0	2997.0 *to* 3003.0	IN	3.2
Measure	B	3200 F	3200	3200	0	3196.8 *to* 3203.2	IN	3.2

Manufacture Specification

Martel Digital Calibrator MC-1010

Thermocouple Type: B

Range 1112 to 1472 +/-[2.16 °F]

Range 1472 to 1832 +/-[2.34 °F]

Range 1832 to 3308 +/-[2.7 °F]

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Report Number: DS210212 - 4 *Sensitivity of UUT: 1 Deg F* *Pass* ***Uncertainty K=2***

Accuracy of UUT Manufacture Specifications

Calibration procedure is performed within Manufacture Specifications

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Source	C	32 F	32.3	32.3	-0.3	30.9 *to* 33.1	IN	1.3
Source	C	500 F	500.1	500.1	-0.1	498.9 *to* 501.1	IN	1.3
Source	C	1000 F	1000.2	1000.2	-0.1	998.9 *to* 1001.1	IN	1.3
Source	C	1300 F	1300.1	1300.1	-0.1	1298.9 *to* 1301.1	IN	1.3
Source	C	1600 F	1600.2	1600.2	-0.2	1598.9 *to* 1601.1	IN	1.3
Source	C	1900 F	1900.2	1900.2	-0.2	1895.9 *to* 1904.1	IN	4.8
Source	C	2200 F	2200.2	2200.2	-0.2	2195.9 *to* 2204.1	IN	4.8
Source	C	2500 F	2500.3	2500.3	-0.3	2495.9 *to* 2504.1	IN	4.8
Source	C	2800 F	2800.2	2800.2	-0.2	2795.9 *to* 2804.1	IN	4.8
Source	C	3100 F	3100.4	3100.4	-0.4	3095.9 *to* 3104.1	IN	4.8
Source	C	3400 F	3400.3	3400.3	-0.3	3395.9 *to* 3404.1	IN	4.9
Source	C	3700 F	3700.3	3700.3	-0.3	3695.9 *to* 3704.1	IN	4.9
Source	C	4000 F	4000.5	4000.5	-0.5	3995.9 *to* 4004.1	IN	4.9
Source	C	4200 F	4200.4	4200.4	-0.4	4195.9 *to* 4204.1	IN	4.9

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Measure	C	32 F	32.1	32.1	-0.1	30.9 *to* 33.1	IN	1.3
Measure	C	500 F	500.2	500.2	-0.2	499.0 *to* 501.1	IN	1.3
Measure	C	1000 F	1000.3	1000.3	-0.3	999.0 *to* 1001.1	IN	1.3
Measure	C	1300 F	1300.2	1300.2	-0.2	1298.7 *to* 1301.1	IN	1.3
Measure	C	1600 F	1600.4	1600.4	-0.4	1598.4 *to* 1601.1	IN	1.3
Measure	C	1900 F	1900.4	1900.4	-0.4	1898.1 *to* 1904.1	IN	4.8
Measure	C	2200 F	2200.3	2200.3	-0.3	2197.8 *to* 2204.1	IN	4.8
Measure	C	2500 F	2500.3	2500.3	-0.3	2497.5 *to* 2504.1	IN	4.8
Measure	C	2800 F	2800.4	2800.4	-0.4	2797.2 *to* 2804.1	IN	4.8
Measure	C	3100 F	3100.2	3100.2	-0.2	3096.9 *to* 3104.1	IN	4.8
Measure	C	3400 F	3400.4	3400.4	-0.4	3396.6 *to* 3404.1	IN	4.9
Measure	C	3700 F	3700.7	3700.7	-0.7	3696.3 *to* 3704.1	IN	4.9
Measure	C	4000 F	4000.6	4000.6	-0.6	3996.0 *to* 4004.1	IN	4.9
Measure	C	4200 F	4200.9	4200.9	-0.9	4195.8 *to* 4204.1	IN	4.9

Manufacture Specification

Martel Digital Calibrator MC-1010

Thermocouple Type: C

Range 32 to 1832 +/-[1.08 °F]

Range 1832 to 4200.8 +/-[4.14 °F]

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This report certifies that all calibration standards are traceable to NIST where available and test results were performed in accordance with ISO/IEC 17025:2017.

Report Number: DS210212 - 4 *Sensitivity of UUT: 1 Deg F* *Pass* ***Uncertainty K=2***

Accuracy of UUT The greater of +/- 1 Deg F or +/- 0.1% F

Calibration procedure is performed within SAE-AMS 2750F requirement Section 3.2.2.3

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Source	J	-100 F	-99.81	-99.81	-0.19	-101.0 *to* -99.0	IN	0.87
Source	J	100 F	100.13	100.13	-0.13	99.0 *to* 101.0	IN	0.46
Source	J	150 F	150.15	150.15	-0.15	149.0 *to* 151.0	IN	0.46
Source	J	200 F	200.12	200.12	-0.12	199.0 *to* 201.0	IN	0.46
Source	J	250 F	250.16	250.16	-0.16	249.0 *to* 251.0	IN	0.46
Source	J	300 F	300.13	300.13	-0.13	299.0 *to* 301.0	IN	0.46
Source	J	500 F	500.14	500.14	-0.14	499.0 *to* 501.0	IN	0.46
Source	J	700 F	700.18	700.18	-0.18	699.0 *to* 701.0	IN	0.46
Source	J	900 F	900.16	900.16	-0.16	899.0 *to* 901.0	IN	0.46
Source	J	1100 F	1100.17	1100.17	-0.17	1098.9 *to* 1101.1	IN	0.46
Source	J	1300 F	1300.17	1300.17	-0.17	1298.7 *to* 1301.3	IN	0.46
Source	J	1500 F	1500.15	1500.15	-0.15	1498.5 *to* 1501.5	IN	0.69
Source	J	1800 F	1800.19	1800.19	-0.19	1798.2 *to* 1801.8	IN	0.69
Source	J	2100 F	2100.24	2100.24	-0.24	2097.9 *to* 2102.1	IN	0.69

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Measure	J	-100 F	-100.5	-100.5	0.5	-101.0 *to* -99.0	IN	0.87
Measure	J	100 F	99.6	99.6	0.4	99.0 *to* 101.0	IN	0.46
Measure	J	150 F	149.8	149.8	0.2	149.0 *to* 151.0	IN	0.46
Measure	J	200 F	199.7	199.7	0.3	199.0 *to* 201.0	IN	0.46
Measure	J	250 F	249.7	249.7	0.3	249.0 *to* 251.0	IN	0.46
Measure	J	300 F	299.8	299.8	0.2	299.0 *to* 301.0	IN	0.46
Measure	J	500 F	499.8	499.8	0.2	499.0 *to* 501.0	IN	0.46
Measure	J	700 F	699.8	699.8	0.2	699.0 *to* 701.0	IN	0.46
Measure	J	900 F	899.8	899.8	0.2	899.0 *to* 901.0	IN	0.46
Measure	J	1100 F	1099.8	1099.8	0.2	1098.9 *to* 1101.1	IN	0.46
Measure	J	1300 F	1299.8	1299.8	0.2	1298.7 *to* 1301.3	IN	0.46
Measure	J	1500 F	1499.9	1499.9	0.1	1498.5 *to* 1501.5	IN	0.69
Measure	J	1800 F	1799.8	1799.8	0.2	1798.2 *to* 1801.8	IN	0.69
Measure	J	2100 F	2099.9	2099.9	0.1	2097.9 *to* 2102.1	IN	0.69

Manufacture Specification

Martel Digital Calibrator MC-1010

Thermocouple Type: J

Range -346 to 32 +/-[0.72°F]

Range 32 to 1472 +/-[0.36°F]

Range 1472 to 2192 +/-[0.54°F]

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This report certifies that all calibration standards are traceable to NIST where available and test results were performed in accordance with ISO/IEC 17025:2017.

Report Number: DS210212 - 4 *Sensitivity of UUT: 1 Deg F* *Pass* ***Uncertainty K=2***

Accuracy of UUT The greater of +/- 1 Deg F or +/- 0.1% F

Calibration procedure is performed within SAE-AMS 2750F requirement Section 3.2.2.3

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Source	K	-100 F	-99.65	-99.65	-0.35	-101.0 *to* -99.0	IN	1.3
Source	K	100 F	100.29	100.29	-0.29	99.0 *to* 101.0	IN	0.7
Source	K	200 F	200.25	200.25	-0.25	199.0 *to* 201.0	IN	0.7
Source	K	400 F	400.23	400.23	-0.23	399.0 *to* 401.0	IN	0.7
Source	K	600 F	600.22	600.22	-0.22	599.0 *to* 601.0	IN	0.7
Source	K	800 F	800.24	800.24	-0.24	799.0 *to* 801.0	IN	0.7
Source	K	1000 F	1000.24	1000.24	-0.24	999.0 *to* 1001.0	IN	0.7
Source	K	1200 F	1200.31	1200.31	-0.31	1198.8 *to* 1201.2	IN	0.7
Source	K	1400 F	1400.22	1400.22	-0.22	1398.6 *to* 1401.4	IN	0.7
Source	K	1600 F	1600.30	1600.30	-0.30	1598.4 *to* 1601.6	IN	0.7
Source	K	1800 F	1800.27	1800.27	-0.27	1798.2 *to* 1801.8	IN	0.7
Source	K	2000 F	2000.34	2000.34	-0.34	1998.0 *to* 2002.0	IN	1.1
Source	K	2200 F	2200.37	2200.37	-0.37	2197.8 *to* 2202.2	IN	1.1
Source	K	2400 F	2400.40	2400.40	-0.40	2397.6 *to* 2402.4	IN	1.1

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Measure	K	-100 F	-100.1	-100.1	0.1	-101.0 *to* -99.0	IN	1.3
Measure	K	100 F	100.0	100.0	0.0	99.0 *to* 101.0	IN	0.7
Measure	K	200 F	199.9	199.9	0.1	199.0 *to* 201.0	IN	0.7
Measure	K	400 F	399.8	399.8	0.2	399.0 *to* 401.0	IN	0.7
Measure	K	600 F	600.0	600.0	0.0	599.0 *to* 601.0	IN	0.7
Measure	K	800 F	800.0	800.0	0.0	799.0 *to* 801.0	IN	0.7
Measure	K	1000 F	1000.0	1000.0	0.0	999.0 *to* 1001.0	IN	0.7
Measure	K	1200 F	1199.9	1199.9	0.1	1198.8 *to* 1201.2	IN	0.7
Measure	K	1400 F	1399.9	1399.9	0.1	1398.6 *to* 1401.4	IN	0.7
Measure	K	1600 F	1599.9	1599.9	0.1	1598.4 *to* 1601.6	IN	0.7
Measure	K	1800 F	1799.9	1799.9	0.1	1798.2 *to* 1801.8	IN	0.7
Measure	K	2000 F	1999.8	1999.8	0.2	1998.0 *to* 2002.0	IN	1.1
Measure	K	2200 F	2199.8	2199.8	0.2	2197.8 *to* 2202.2	IN	1.1
Measure	K	2400 F	2400.0	2400.0	0.0	2397.6 *to* 2402.4	IN	1.1

Manufacture Specification

Martel Digital Calibrator MC-1010

Thermocouple Type: K

Range -328 to 32 +/-[1.08 °F]

Range 32 to 1832 +/-[0.54 °F]

Range 1832 to 2501.6 +/-[0.9 °F]

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This report certifies that all calibration standards are traceable to NIST where available and test results were performed in accordance with ISO/IEC 17025:2017.

Report Number: DS210212 - 4 *Sensitivity of UUT: 1 Deg F* *Pass* ***Uncertainty K=2***

Accuracy of UUT The greater of +/- 1 Deg F or +/- 0.1% F

Calibration procedure is performed within SAE-AMS 2750F requirement Section 3.2.2.3

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Source	N	-100 F	-99.92	-99.92	-0.08	-101.0 *to* -99.0	IN	1.7
Source	N	100 F	100.02	100.02	-0.02	99.0 *to* 101.0	IN	0.9
Source	N	200 F	200.05	200.05	-0.05	199.0 *to* 201.0	IN	0.9
Source	N	400 F	400.03	400.03	-0.03	399.0 *to* 401.0	IN	0.9
Source	N	600 F	599.99	599.99	0.01	599.0 *to* 601.0	IN	0.9
Source	N	800 F	800.06	800.06	-0.06	799.0 *to* 801.0	IN	0.9
Source	N	1000 F	1000.08	1000.08	-0.08	999.0 *to* 1001.0	IN	0.9
Source	N	1200 F	1200.06	1200.06	-0.06	1198.8 *to* 1201.2	IN	0.9
Source	N	1400 F	1400.04	1400.04	-0.04	1398.6 *to* 1401.4	IN	0.9
Source	N	1600 F	1600.14	1600.14	-0.14	1598.4 *to* 1601.6	IN	0.9
Source	N	1800 F	1800.09	1800.09	-0.09	1798.2 *to* 1801.8	IN	0.9
Source	N	2000 F	2000.10	2000.10	-0.10	1998.0 *to* 2002.0	IN	0.9
Source	N	2200 F	2200.19	2200.19	-0.19	2197.8 *to* 2202.2	IN	0.9
Source	N	2300 F	2300.20	2300.20	-0.20	2297.7 *to* 2302.3	IN	0.9

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Measure	N	-100 F	-100.0	-100.0	0.0	-101.0 *to* -99.0	IN	1.7
Measure	N	100 F	100.0	100.0	0.0	99.0 *to* 101.0	IN	0.9
Measure	N	200 F	200.0	200.0	0.0	199.0 *to* 201.0	IN	0.9
Measure	N	400 F	400.0	400.0	0.0	399.0 *to* 401.0	IN	0.9
Measure	N	600 F	600.1	600.1	-0.1	599.0 *to* 601.0	IN	0.9
Measure	N	800 F	800.1	800.1	-0.1	799.0 *to* 801.0	IN	0.9
Measure	N	1000 F	1000.0	1000.0	0.0	999.0 *to* 1001.0	IN	0.9
Measure	N	1200 F	1200.1	1200.1	-0.1	1198.8 *to* 1201.2	IN	0.9
Measure	N	1400 F	1400.0	1400.0	0.0	1398.6 *to* 1401.4	IN	0.9
Measure	N	1600 F	1600.0	1600.0	0.0	1598.4 *to* 1601.6	IN	0.9
Measure	N	1800 F	1800.0	1800.0	0.0	1798.2 *to* 1801.8	IN	0.9
Measure	N	2000 F	2000.0	2000.0	0.0	1998.0 *to* 2002.0	IN	0.9
Measure	N	2200 F	2199.9	2199.9	0.1	2197.8 *to* 2202.2	IN	0.9
Measure	N	2300 F	2300.0	2300.0	0.0	2297.7 *to* 2302.3	IN	0.9

Manufacture Specification

Martel Digital Calibrator MC-1010

Thermocouple Type: N

Range -328 to 32 +/-[1.44 °F]

Range 32 to 2372 +/-[0.72 °F]

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This report certifies that all calibration standards are traceable to NIST where available and test results were performed in accordance with ISO/IEC 17025:2017.

Report Number: DS210212 - 4 *Sensitivity of UUT: 1 Deg F* *Pass* ***Uncertainty K=2***

Accuracy of UUT The greater of +/- 1 Deg F or +/- 0.1% F

Calibration procedure is performed within SAE-AMS 2750F requirement Section 3.2.2.3

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Source	R	32 F	32.9	32.9	-0.9	31.0 *to* 33.0	IN	2.6
Source	R	400 F	400.1	400.1	-0.1	399.0 *to* 401.0	IN	2.6
Source	R	800 F	800.3	800.3	-0.3	799.0 *to* 801.0	IN	2.5
Source	R	1200 F	1200.3	1200.3	-0.3	1198.8 *to* 1201.2	IN	2.5
Source	R	1400 F	1400.1	1400.1	-0.1	1398.6 *to* 1401.4	IN	2.5
Source	R	1600 F	1600.4	1600.4	-0.4	1598.4 *to* 1601.6	IN	2.5
Source	R	1800 F	1800.2	1800.2	-0.2	1798.2 *to* 1801.8	IN	2.5
Source	R	2000 F	2000.1	2000.1	-0.1	1998.0 *to* 2002.0	IN	2.5
Source	R	2200 F	2200.3	2200.3	-0.3	2197.8 *to* 2202.2	IN	2.5
Source	R	2400 F	2400.4	2400.4	-0.4	2397.6 *to* 2402.4	IN	2.5
Source	R	2600 F	2600.3	2600.3	-0.3	2597.4 *to* 2602.6	IN	2.6
Source	R	2800 F	2800.3	2800.3	-0.3	2797.2 *to* 2802.8	IN	2.6
Source	R	3000 F	3000.3	3000.3	-0.3	2997.0 *to* 3003.0	IN	2.6
Source	R	3100 F	3100.4	3100.4	-0.4	3096.9 *to* 3103.1	IN	2.6

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Measure	R	32 F	33.0	33.0	-1.0	31.0 *to* 33.0	IN	2.6
Measure	R	400 F	400.0	400.0	0.0	399.0 *to* 401.0	IN	2.6
Measure	R	800 F	800.0	800.0	0.0	799.0 *to* 801.0	IN	2.6
Measure	R	1200 F	1200.0	1200.0	0.0	1198.8 *to* 1201.2	IN	2.6
Measure	R	1400 F	1400.0	1400.0	0.0	1398.6 *to* 1401.4	IN	2.6
Measure	R	1600 F	1600.0	1600.0	0.0	1598.4 *to* 1601.6	IN	2.6
Measure	R	1800 F	1800.0	1800.0	0.0	1798.2 *to* 1801.8	IN	2.6
Measure	R	2000 F	2000.0	2000.0	0.0	1998.0 *to* 2002.0	IN	2.6
Measure	R	2200 F	2200.0	2200.0	0.0	2197.8 *to* 2202.2	IN	2.6
Measure	R	2400 F	2400.0	2400.0	0.0	2397.6 *to* 2402.4	IN	2.6
Measure	R	2600 F	2600.0	2600.0	0.0	2597.4 *to* 2602.6	IN	2.6
Measure	R	2800 F	2800.0	2800.0	0.0	2797.2 *to* 2802.8	IN	2.6
Measure	R	3000 F	3000.0	3000.0	0.0	2997.0 *to* 3003.0	IN	2.6
Measure	R	3100 F	3100.0	3100.0	0.0	3096.9 *to* 3103.1	IN	2.6

Manufacture Specification

Martel Digital Calibrator MC-1010

Thermocouple Type: R

Range 32 to 3212.6 +/-[2.16 °F]

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Report Number: DS210212 - 4 *Sensitivity of UUT: 1 Deg F* *Pass* ***Uncertainty K=2***

Accuracy of UUT The greater of +/- 1 Deg F or +/- 0.1% F

Calibration procedure is performed within SAE-AMS 2750F requirement Section 3.2.2.3

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Source	S	32 F	32.3	32.3	-0.3	31.0 *to* 33.0	IN	2.6
Source	S	400 F	400.2	400.2	-0.2	399.0 *to* 401.0	IN	2.6
Source	S	800 F	800.0	800.0	0.0	799.0 *to* 801.0	IN	2.5
Source	S	1200 F	1200.3	1200.3	-0.3	1198.8 *to* 1201.2	IN	2.5
Source	S	1400 F	1400.1	1400.1	-0.1	1398.6 *to* 1401.4	IN	2.5
Source	S	1600 F	1600.3	1600.3	-0.3	1598.4 *to* 1601.6	IN	2.5
Source	S	1800 F	1800.4	1800.4	-0.4	1798.2 *to* 1801.8	IN	2.5
Source	S	2000 F	2000.2	2000.2	-0.2	1998.0 *to* 2002.0	IN	2.5
Source	S	2200 F	2200.2	2200.2	-0.2	2197.8 *to* 2202.2	IN	2.5
Source	S	2400 F	2400.3	2400.3	-0.3	2397.6 *to* 2402.4	IN	2.5
Source	S	2600 F	2600.4	2600.4	-0.4	2597.4 *to* 2602.6	IN	2.6
Source	S	2800 F	2800.0	2800.0	0.0	2797.2 *to* 2802.8	IN	2.6
Source	S	3000 F	3000.4	3000.4	-0.4	2997.0 *to* 3003.0	IN	2.6
Source	S	3100 F	3100.6	3100.6	-0.6	3096.9 *to* 3103.1	IN	2.6

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Measure	S	32 F	32.0	32.0	0.0	31.0 *to* 33.0	IN	2.6
Measure	S	400 F	400.0	400.0	0.0	399.0 *to* 401.0	IN	2.6
Measure	S	800 F	800.0	800.0	0.0	799.0 *to* 801.0	IN	2.6
Measure	S	1200 F	1200.0	1200.0	0.0	1198.8 *to* 1201.2	IN	2.6
Measure	S	1400 F	1400.0	1400.0	0.0	1398.6 *to* 1401.4	IN	2.6
Measure	S	1600 F	1600.0	1600.0	0.0	1598.4 *to* 1601.6	IN	2.6
Measure	S	1800 F	1800.0	1800.0	0.0	1798.2 *to* 1801.8	IN	2.6
Measure	S	2000 F	2000.0	2000.0	0.0	1998.0 *to* 2002.0	IN	2.6
Measure	S	2200 F	2200.0	2200.0	0.0	2197.8 *to* 2202.2	IN	2.6
Measure	S	2400 F	2400.0	2400.0	0.0	2397.6 *to* 2402.4	IN	2.6
Measure	S	2600 F	2600.0	2600.0	0.0	2597.4 *to* 2602.6	IN	2.6
Measure	S	2800 F	2800.0	2800.0	0.0	2797.2 *to* 2802.8	IN	2.6
Measure	S	3000 F	3000.0	3000.0	0.0	2997.0 *to* 3003.0	IN	2.6
Measure	S	3100 F	3100.0	3100.0	0.0	3096.9 *to* 3103.1	IN	2.6

Manufacture Specification

Martel Digital Calibrator MC-1010

Thermocouple Type: S

Range 32 to 3212.6 +/- [2.16 °F]

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Report Number: DS210212 - 4 *Sensitivity of UUT: 1 Deg F* *Pass* ***Uncertainty K=2***

Accuracy of UUT The greater of +/- 1 Deg F or +/- 0.1% F

Calibration procedure is performed within SAE-AMS 2750F requirement Section 3.2.2.3

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Source	T	-200 F	-200.43	-200.43	0.43	-201.0 *to* -199.0	IN	1.3
Source	T	-100 F	-100.46	-100.46	0.46	-101.0 *to* -99.0	IN	1.3
Source	T	32 F	31.69	31.69	0.31	31.0 *to* 33.0	IN	0.5
Source	T	100 F	99.57	99.57	0.43	99.0 *to* 101.0	IN	0.5
Source	T	200 F	199.69	199.69	0.31	199.0 *to* 201.0	IN	0.5
Source	T	300 F	299.64	299.64	0.36	299.0 *to* 301.0	IN	0.5
Source	T	400 F	399.70	399.70	0.30	399.0 *to* 401.0	IN	0.5
Source	T	500 F	499.75	499.75	0.25	499.0 *to* 501.0	IN	0.5
Source	T	600 F	599.76	599.76	0.24	599.0 *to* 601.0	IN	0.5
Source	T	750 F	749.77	749.77	0.23	749.0 *to* 751.0	IN	0.5

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Measure	T	-200 F	-199.1	-199.1	-0.9	-201.0 *to* -199.0	IN	1.3
Measure	T	-100 F	-99.3	-99.3	-0.7	-101.0 *to* -99.0	IN	1.3
Measure	T	32 F	32.6	32.6	-0.6	31.0 *to* 33.0	IN	0.5
Measure	T	100 F	100.5	100.5	-0.5	99.0 *to* 101.0	IN	0.5
Measure	T	200 F	200.4	200.4	-0.4	199.0 *to* 201.0	IN	0.5
Measure	T	300 F	300.4	300.4	-0.4	299.0 *to* 301.0	IN	0.5
Measure	T	400 F	400.3	400.3	-0.3	399.0 *to* 401.0	IN	0.5
Measure	T	500 F	500.3	500.3	-0.3	499.0 *to* 501.0	IN	0.5
Measure	T	600 F	600.4	600.4	-0.4	599.0 *to* 601.0	IN	0.5
Measure	T	750 F	750.3	750.3	-0.3	749.0 *to* 751.0	IN	0.5

Manufacture Specification

Martel Digital Calibrator MC-1010

Thermocouple Type: T

Range -418 to 32 +/-[1.08 °F]

Range 32 to 752 +/-[0.36 °F]

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Uncertainty K=2

Accuracy of UUT Manufacture Specifications

Calibration procedure is performed within Manufacture Specifications

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Source	RTD	-300 F	-299.981	-299.981	-0.019	-300.36 *to* -299.64	IN	0.4
Source	RTD	-100 F	-99.994	-99.994	-0.006	-100.36 *to* -99.64	IN	0.4
Source	RTD	32 F	31.996	31.996	0.004	31.64 *to* 32.36	IN	0.4
Source	RTD	100 F	99.986	99.986	0.014	99.64 *to* 100.36	IN	0.4
Source	RTD	200 F	199.961	199.961	0.039	199.64 *to* 200.36	IN	0.4
Source	RTD	500 F	499.944	499.944	0.056	499.46 *to* 500.54	IN	0.6
Source	RTD	800 F	799.943	799.943	0.057	799.28 *to* 800.72	IN	0.8
Source	RTD	1000 F	999.889	999.889	0.111	999.28 *to* 1000.72	IN	0.8

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Measure	RTD	-300 F	-299.9	-299.9	-0.1	-300.36 *to* -299.64	IN	0.4
Measure	RTD	-100 F	-99.9	-99.9	-0.1	-100.36 *to* -99.64	IN	0.4
Measure	RTD	32 F	32.1	32.1	-0.1	31.64 *to* 32.36	IN	0.4
Measure	RTD	100 F	100.1	100.1	-0.1	99.64 *to* 100.36	IN	0.4
Measure	RTD	200 F	200.1	200.1	-0.1	199.64 *to* 200.36	IN	0.4
Measure	RTD	500 F	500.1	500.1	-0.1	499.46 *to* 500.54	IN	0.6
Measure	RTD	800 F	800.6	800.6	-0.6	799.28 *to* 800.72	IN	0.8
Measure	RTD	1000 F	1000.6	1000.6	-0.6	999.28 *to* 1000.72	IN	0.8

Manufacture Specification

Martel Digital Calibrator MC-1010

Type: RTD Pt385,100

Range -300 to 200 +/- [0.36°F]

Range 200 to 800 +/- [0.54°F]

Range 800 to 1000 +/- [0.72°F]

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Uncertainty K=2

Accuracy of UUT Manufacture Specifications

Calibration procedure is performed within Manufacture Specifications

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Source	RTD	-300 F	-299.981	-299.981	-0.019	-300.36 *to* -299.64	IN	0.4
Source	RTD	-100 F	-99.875	-99.875	-0.125	-100.36 *to* -99.64	IN	0.4
Source	RTD	32 F	31.995	31.995	0.005	31.64 *to* 32.36	IN	0.4
Source	RTD	100 F	99.991	99.991	0.009	99.64 *to* 100.36	IN	0.4
Source	RTD	200 F	199.857	199.857	0.143	199.64 *to* 200.36	IN	0.4
Source	RTD	500 F	499.964	499.964	0.036	499.46 *to* 500.54	IN	0.6
Source	RTD	800 F	799.977	799.977	0.023	799.28 *to* 800.72	IN	0.8
Source	RTD	1000 F	999.991	999.991	0.009	999.28 *to* 1000.72	IN	0.8

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Measure	RTD	-300 F	-300.0	-300.0	0.0	-300.36 *to* -299.64	IN	0.4
Measure	RTD	-100 F	-100.0	-100.0	0.0	-100.36 *to* -99.64	IN	0.4
Measure	RTD	32 F	32.0	32.0	0.0	31.64 *to* 32.36	IN	0.4
Measure	RTD	100 F	100.0	100.0	0.0	99.64 *to* 100.36	IN	0.4
Measure	RTD	200 F	200.0	200.0	0.0	199.64 *to* 200.36	IN	0.4
Measure	RTD	500 F	500.0	500.0	0.0	499.46 *to* 500.54	IN	0.6
Measure	RTD	800 F	800.0	800.0	0.0	799.28 *to* 800.72	IN	0.9
Measure	RTD	1000 F	1000.0	1000.0	0.0	999.28 *to* 1000.72	IN	0.9

Manufacture Specification

Martel Digital Calibrator MC-1010

Type: RTD Pt385 ,1000

Range -300 to 200 +/- [0.36°F]

Range 200 to 800 +/- [0.54°F]

Range 800 to 1000 +/- [0.72°F]

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Uncertainty K=2

Accuracy of UUT Manufacture Specifications

Calibration procedure is performed within Manufacture Specifications

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Source	dcmV	-10	-10.003	-10.003	0.003	-10.012 *to* -9.988	IN	0.014
Source	dcmV	0	0.003	0.003	-0.003	-0.010 *to* 0.010	IN	0.012
Source	dcmV	15	15.003	15.003	-0.003	14.987 *to* 15.013	IN	0.015
Source	dcmV	30	30.005	30.005	-0.005	29.984 *to* 30.016	IN	0.019
Source	dcmV	45	45.005	45.005	-0.005	44.981 *to* 45.019	IN	0.022
Source	dcmV	60	60.007	60.007	-0.007	59.978 *to* 60.022	IN	0.026
Source	dcmV	75	75.008	75.008	-0.008	74.975 *to* 75.025	IN	0.029
Source	dcV	0	0.002	0.002	-0.002	-0.002 *to* 0.002	IN	0.008
Source	dcV	0.2	0.200	0.200	0.000	0.198 *to* 0.202	IN	0.008
Source	dcV	0.4	0.400	0.400	0.000	0.398 *to* 0.402	IN	0.008
Source	dcV	0.6	0.600	0.600	0.000	0.598 *to* 0.602	IN	0.008
Source	dcV	0.8	0.800	0.800	0.000	0.798 *to* 0.802	IN	0.008
Source	dcV	1.0	1.000	1.000	0.000	0.998 *to* 1.002	IN	0.008
Source	dcV	2.0	2.000	2.000	0.000	1.998 *to* 2.002	IN	0.006

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Measure	dcmV	-10	-10.002	-10.002	0.002	-10.012 *to* -9.988	IN	0.014
Measure	dcmV	0	0.000	0.000	0.000	-0.010 *to* 0.010	IN	0.012
Measure	dcmV	15	14.999	14.999	0.001	14.987 *to* 15.013	IN	0.016
Measure	dcmV	30	29.999	29.999	0.001	29.984 *to* 30.016	IN	0.019
Measure	dcmV	45	44.999	44.999	0.001	44.981 *to* 45.019	IN	0.023
Measure	dcmV	60	59.998	59.998	0.002	59.978 *to* 60.022	IN	0.026
Measure	dcmV	75	74.997	74.997	0.003	74.975 *to* 75.025	IN	0.030
Measure	dcV	0	0.001	0.001	-0.001	-0.002 *to* 0.002	IN	0.004
Measure	dcV	0.2	0.200	0.200	0.000	0.198 *to* 0.202	IN	0.004
Measure	dcV	0.4	0.400	0.400	0.000	0.398 *to* 0.402	IN	0.004
Measure	dcV	0.6	0.600	0.600	0.000	0.598 *to* 0.602	IN	0.004
Measure	dcV	0.8	0.800	0.800	0.000	0.798 *to* 0.802	IN	0.004
Measure	dcV	1.0	1.000	1.000	0.000	0.998 *to* 1.002	IN	0.012
Measure	dcV	2.0	1.999	1.999	0.001	1.998 *to* 2.002	IN	0.12

Manufacture Specification

Martel Digital Calibrator MC-1010

Type: dcmV Source

Range -10 mV to 75 mV +/- [0.02% of reading + 0.01 mV]

Range 0 V to 2 V +/- [0.015% of reading + 0.002 V

Type: dcmV Measure

Range -10 mV to 75 mV +/- [0.02% of reading + 0.01 mV]

Range 0 V to 2 V +/- [0.015% of reading + 0.002 V

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Uncertainty K=2

Accuracy of UUT Manufacture Specifications

Calibration procedure is performed within Manufacture Specifications

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Source	Freq	3 Hz	3.0	3.0	0.0	2.9985 *to* 3.0015	IN	0.6
Source	Freq	5 Hz	5.0	5.0	0.0	4.9975 *to* 5.0025	IN	0.6
Source	Freq	10 Hz	10.0	10.0	0.0	9.9950 *to* 10.005	IN	0.6
Source	Freq	50 Hz	50.0	50.0	0.0	49.975 *to* 50.025	IN	0.6
Source	Freq	100 Hz	100.0	100.0	0.0	99.950 *to* 100.05	IN	0.6
Source	Freq	500 Hz	500.0	500.0	0.0	499.75 *to* 500.25	IN	0.9
Source	Freq	1000 Hz	1000.0	1000.0	0.0	999.50 *to* 1000.5	IN	1.4
Source	Freq	2000 Hz	2000.0	2000.0	0.0	1997.500 *to* 2002.50	IN	3.7
Source	Freq	3000 Hz	2998.5	2998.5	1.5	2996.250 *to* 3003.75	IN	5.6
Source	Freq	4000 Hz	4000.0	4000.0	0.0	3995.000 *to* 4005.00	IN	7.4
Source	Freq	5000 Hz	5000.0	5000.0	0.0	4993.750 *to* 5006.25	IN	9.3

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Measure	Freq	3 Hz	3.0	3.0	0.0	2.9985 *to* 3.0015	IN	0.6
Measure	Freq	5 Hz	5.0	5.0	0.0	4.9975 *to* 5.0025	IN	0.6
Measure	Freq	10 Hz	10.0	10.0	0.0	9.9950 *to* 10.005	IN	0.6
Measure	Freq	50 Hz	50.0	50.0	0.0	49.975 *to* 50.025	IN	0.6
Measure	Freq	100 Hz	100.0	100.0	0.0	99.950 *to* 100.05	IN	0.6
Measure	Freq	500 Hz	500.0	500.0	0.0	499.75 *to* 500.25	IN	0.9
Measure	Freq	1000 Hz	1000.0	1000.0	0.0	999.50 *to* 1000.5	IN	1.4
Measure	Freq	2000 Hz	2000.0	2000.0	0.0	1997.5 *to* 2002.5	IN	3.7
Measure	Freq	3000 Hz	3000.0	3000.0	0.0	2996.3 *to* 3003.8	IN	5.6
Measure	Freq	4000 Hz	4000.0	4000.0	0.0	3995.0 *to* 4005.0	IN	7.4
Measure	Freq	5000 Hz	5000.0	5000.0	0.0	4993.8 *to* 5006.3	IN	9.3

Manufacture Specification

Martel Digital Calibrator MC-1010

Type: Freq Source

Range 3 Hz to 1000 Hz +/- [0.05 % of reading + 0 Hz]

Range 1 kHz to 5 kHz +/- [0.125 % of reading + 0 kHz]

Type: Freq Measure

Range 3 Hz to 1000 Hz +/- [0.05 % of reading + 0.1 Hz]

Range 1 kHz to 5 kHz +/- [0.05 % of reading + 0.01 kHz]

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Uncertainty K=2

Accuracy of UUT Manufacture Specifications

Calibration procedure is performed within Manufacture Specifications

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Source	Resistance	5 Ω	5.007	5.007	-0.007	4.899 *to* 5.101	IN	0.1
Source	Resistance	200 Ω	200.038	200.038	-0.038	199.850 *to* 200.150	IN	0.2
Source	Resistance	400 Ω	400.075	400.075	-0.075	399.800 *to* 400.200	IN	0.2
Source	Resistance	600 Ω	600.04	600.04	-0.04	599.35 *to* 600.65	IN	0.8
Source	Resistance	800 Ω	800.00	800.00	0.00	799.30 *to* 800.70	IN	0.8
Source	Resistance	1000 Ω	999.97	999.97	0.03	999.25 *to* 1000.75	IN	0.9
Source	Resistance	1500 Ω	1499.93	1499.93	0.07	1499.13 *to* 1500.88	IN	1.0
Source	Resistance	2000 Ω	1999.85	1999.85	0.15	1999.00 *to* 2001.00	IN	1.2
Source	Resistance	4000 Ω	3999.73	3999.73	0.27	3998.50 *to* 4001.50	IN	1.7

Function	*Type*	*Nominal*	*As Found*	*As Left*	*Correction Factor*	*Tolerance*	*Condition*	*Uncertainty*
Measure	Resistance	5 Ω	5.03	5.03	-0.03	4.95 *to* 5.05	IN	0.1
Measure	Resistance	200 Ω	200.03	200.03	-0.03	199.90 *to* 200.10	IN	0.1
Measure	Resistance	400 Ω	400.0	400.0	0.0	399.9 *to* 400.2	IN	0.4
Measure	Resistance	600 Ω	600.0	600.0	0.0	599.4 *to* 600.7	IN	0.8
Measure	Resistance	800 Ω	800.0	800.0	0.0	799.3 *to* 800.7	IN	0.9
Measure	Resistance	1000 Ω	1000.0	1000.0	0.0	999.3 *to* 1000.8	IN	0.9
Measure	Resistance	1500 Ω	1500.0	1500.0	0.0	1499.1 *to* 1500.9	IN	1.1
Measure	Resistance	2000 Ω	2000.0	2000.0	0.0	1999.0 *to* 2001.0	IN	1.2
Measure	Resistance	4000 Ω	4000.0	4000.0	0.0	3998.5 *to* 4001.5	IN	1.8

Manufacture Specification

Martel Digital Calibrator MC-1010

Type: Resistance Source

Range 5 to 400 +/- [0.025% of Reading + 0.1]Ω

Range 401 to 4000 +/- [0.025% of Reading + 0.5]Ω

Type: Resistance Measure

Range 5 to 400 +/- [0.025% of Reading + 0.05]Ω

Range 401 to 4000 +/- [0.025% of Reading + 0.5]Ω

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Certificate of Calibration & Compliance For:

AMERICAN INSTRUMENT
702 ROSE DRIVE
HARTLAND, WI 53029

CALIBRATION
NVLAP LAB CODE: 200496-0

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Calibration #	BA6019	Temperature	*Reading*		*Correction*			ASTM E29 AVG.
Degree: °	F	Point	FRONT	BACK	FRONT	BACK		CORRECTION
		100	99.9	99.8	0.1	0.2		0.2
P.O. #:	10886	200	199.7	199.6	0.3	0.4		0.4
		400	399.3	399.2	0.7	0.8		0.8
Description:	Thermocouple Wire	600	598.8	598.8	1.2	1.2		1.2
TYPE	K	800	798.5	798.5	1.5	1.5		1.5
1000'	K20-2-HR	1000	998.2	998.2	1.8	1.8		1.8
		1200	1198.3	1198.3	1.7	1.7		1.7
		1400	1398.9	1398.9	1.1	1.1		1.1
		1600	1599.8	1599.8	0.2	0.2		0.2
		1800	1800.8	1800.8	-0.8	-0.8		-0.8
		2000	2001.8	2001.8	-1.8	-1.8		-1.8
		2200	2202.8	2202.8	-2.8	-2.8		-2.8
Spool Length:	1000'							
Spool #	GK00720-11-6B							
Test Date:	8/28/2020							
Job #:	240762							

9/1/20

This Item meets ASTM E230 ☒ Special Limits ☐ Standard Limits ☒ New Calibration ☐ Recalibration

☐ BAC 5621 L, Table V +/- 2 °F (+/- 1.1° C) to 1000° F, +/- 0.4% above ☐ AMS 2750 F Noble Metal +/- 1° F (+/- 0.6 ° C) or +/- 0.1%

☐ BAC 5621 L, Table V, FL 4 +/- 2 °F (+/- 1.1° C) or +/- 0.4% ☒ AMS 2750 F Base Metal +/- 2° F (+/- 1.1 ° C) or +/- 0.4%

The calibrated equipment used for this test, listed below, is maintained in accordance with AMS 2750F, BAC 5621L (no PSD's), ANSI/NCSL Z540-3, ISO 10012, ISO/IEC 17025, RRP 54000 , PWA (F-40). Measurement results are traceable to standards maintained at the NIST. Test methods are per ASTM E220-19, ASTM E230/E230M-17, GEOCORP QW-001-O

NIST SENSOR: *292827*	Primary Sensor: A-4265	Primary Inst: Keithley 2701	Humidity: 40% Nominal
Calibrated: 11/22/2019	Calibrated: 6/24/2020	S/N: 4096981	Ambient Temp 72° F
Due: 11/22/2020	Due: 6/24/2021	Calibrated: 7/8/2020	Immersion Depth: 24"
Type: *S*	Type: *S*	Due: 7/8/2021	tech: AG by: AG
			Issue Date: 8/28/2020

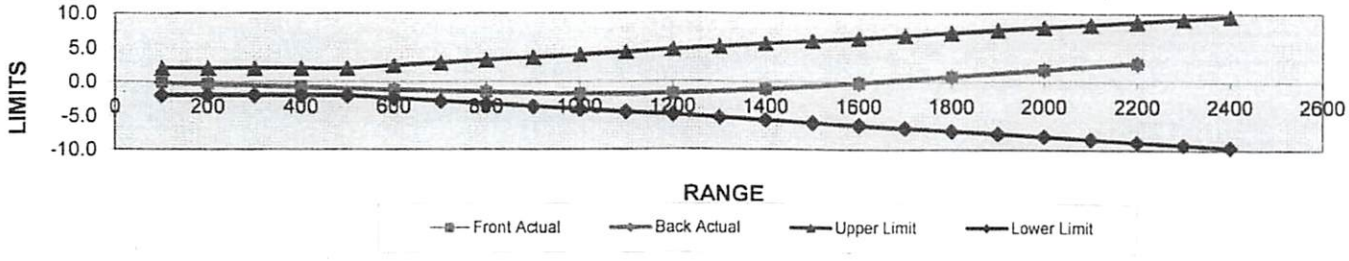
Estimated uncertainty, *k* =2, 95 %
Thermocouple Types-K *and* N: -196 °C to < 0 °C = 0.71 °C; 0 °C to 1093 = 0.89 °C; >1093 to 1344 = 1.9 °C
Thermocouple Type-J: -196 °C to < 0 °C = 0.70 °C; 0 °C to 760 °C = 0.88 °C

NOREEN ROTH
APPROVED SIGNATORY

TYPE
K Thermocouple Wire

GRAPH DATA

VARIATION FROM TRUE TEMPERATURE



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American Instrument Corporation
Survey Wire Correction Factor /Maximum Permitted Error
Cert No. BA6019

Temp	Average Correction Factor	Max Allowed	Result
200	0.4	4.0	Pass
400	0.8	4.0	Pass
600	1.2	4.5	Pass
800	1.5	6.0	Pass
1000	1.8	7.5	Pass
1200	1.7	9.0	Pass
1400	1.1	10.5	Pass
1600	0.2	12.0	Pass
1800	-0.8	13.5	Pass
2000	-1.8	15.0	Pass
2200	-2.8	16.5	Pass

Enter the ASTM E29 Average Correction Factor from the original calibration report into the yellow column above.

CORRECTION FACTOR INPUT

Temp	Average Correction Factor	Math	Math
200	0.40	-0.40	-0.05
400	0.80	-0.40	-0.05
600	1.20	-0.30	-0.04
800	1.50	-0.30	-0.04
1000	1.80	0.10	0.01
1200	1.70	0.60	0.08
1400	1.10	0.90	0.11
1600	0.20	1.00	0.13
1800	-0.80	1.00	0.13
2000	-1.80	1.00	0.13
2200	-2.80	-2.80	-0.35

CORRECTION FACTORS

200	**0.4**		**1200**	**1.7**
225	0.5		1225	1.6
250	0.5		1250	1.6
275	0.6		1275	1.5
300	0.6		1300	1.4
325	0.7		1325	1.3
350	0.7		1350	1.3
375	0.8		1375	1.2
400	**0.8**		**1400**	**1.1**
425	0.9		1425	1.0
450	0.9		1450	0.9
475	1.0		1475	0.8
500	1.0		1500	0.7
525	1.1		1525	0.5
550	1.1		1550	0.4
575	1.2		1575	0.3
600	**1.2**		**1600**	**0.2**
625	1.2		1625	0.1
650	1.3		1650	-0.1
675	1.3		1675	-0.2
700	1.4		1700	-0.3
725	1.4		1725	-0.4
750	1.4		1750	-0.6
775	1.5		1775	-0.7
800	**1.5**		**1800**	**-0.8**
825	1.5		1825	-0.9
850	1.6		1850	-1.1
875	1.6		1875	-1.2
900	1.7		1900	-1.3
925	1.7		1925	-1.4
950	1.7		1950	-1.6
975	1.8		1975	-1.7
1000	**1.8**		**2000**	**-1.8**
1025	1.8		2025	-1.9
1050	1.8		2050	-2.1
1075	1.8		2075	-2.2
1100	1.8		2100	-2.3
1125	1.7		2125	-2.4
1150	1.7		2150	-2.6
1175	1.7		2175	-2.7
			2200	**-2.8**

9/1/20
Prepared By Date

9.1.20
Review By Date

NVLAP CALIBRATION NVLAP LAB CODE 200502-0

Report of Calibration

pyromation inc
beyond measure
5211 Industrial Road, Fort Wayne, IN 46825
www.pyromation.com 260.484.2580

Report Number: 93527

Calibration Date: 01/20/2021

Submitted By: American Instrument Corp. Hartland, WI 53029

SO Number: 1370846

PO Number: 10976

Type N Thermocouple Lot Calibration of N33M for
N33UMZ-024-00-4,(Z233)

Tolerance: SAE AMS2750F

Spool/Coil: 15238 (28.5 ft.)

Item	Serial / Reference	Target (°F)	Actual (°F)	Reading (°F)	Reading (mV)	Correction (°F)	Tolerance (± °F)	U_c (k = 2) (± °F)	TUR N:1	Acceptance (± °F)	Status (in/out)
BEG		300	299.9	299.2	4.252	0.7	2.0	1.2	2	1.6	in
		550	549.9	548.6	8.883	1.3	2.2	1.2	2	1.8	in
		800	799.9	799.0	13.948	0.9	3.1	1.5	2	2.7	in
		1050	1050.0	1049.3	19.259	0.7	4.1	1.5	3	3.9	in
		1300	1300.4	1300.0	24.705	0.4	5.0	1.5	3	4.9	in
END		300	299.9	299.2	4.251	0.7	2.0	1.2	2	1.6	in
		550	549.9	548.6	8.884	1.3	2.2	1.2	2	1.8	in
		800	799.9	798.5	13.936	1.4	3.1	1.5	2	2.7	in
		1050	1050.0	1048.7	19.246	1.3	4.1	1.5	3	3.9	in
		1300	1300.4	1299.9	24.698	0.5	5.0	1.5	3	4.9	in
AVG		300				0.7					
		550				1.3					
		800				1.2					
		1050				1.0					
		1300				0.4					

Remarks:

The correction must be added algebraically to the UUT reading to obtain the correct value.

Equipment and Standards Used

ID Number	Manufacturer	Model	Description	Calibration Due
03-1268	Hewlett Packard	3458A	8 1/2 Digit Digital Multimeter	05/13/2021
03-2399	Hart Scientific	5626	SSPRT Working Standard	01/22/2021
03-3758	Pyromation	SPEC 621-00	Type S Reference Standard	03/20/2021

Environmental Conditions at time of Calibration: Temperature: 23 °C [73 °F] Relative Humidity: 15%

Procedure Used: OP-525-09 Rev 6 which is based on ASTM E220-19 and SAE AMS2750F

DUT Condition: Initial Calibration

Metrology Technician Authorized by

The temperatures written in this report are those defined by the International Temperature Scale of 1990 (ITS-90).

The combined standard uncertainty includes the standard uncertainty reported for the standard, and the measurement process. The combined standard uncertainty is multiplied by a coverage factor of 2 to give an expanded uncertainty, which defines an interval having a level of confidence of approximately 95 percent. The expanded uncertainty presented in this report is consistent with the JCGM100:2008 Guide to the Expression of Uncertainty in Measurement. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

The DUT Acceptance tolerance is based on the DUT specification, the measurement uncertainty, the resulting test uncertainty ratio (TUR), and the maximum allowable probability of false accept risk (PFA, assumed to be 2%). In cases where the TUR ≥ 4:1, the acceptance tolerance = the DUT tolerance (guard bands are not necessary to achieve a PFA of 2%). In cases where the TUR < 4:1, the acceptance limits are reduced by guard bands calculated using method 6 of NCSLI Z540.3. Refer to NCSLI Z540.3 or Pyromation SD-525-15 for additional information.

For purposes of determining conformance with these specifications, an observed value or a calculated value shall be rounded in accordance with the rounding method of ASTM Practice E29-19

The standards of Pyromation Laboratory are traceable to the International System of Units (SI) through NIST or other National Metrology Institute, and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported by this laboratory. The laboratory report number identified above is the unique report number to be used in referencing measurement traceability for the items identified in this report only.

This calibration is compliant to ISO/IEC 17025:2017. This calibration report applies only to the items described. It must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government. This report shall not be reproduced except in full without written approval of Pyromation, Inc.

NVLAP CALIBRATION NVLAP LAB CODE 200502-0

Report of Calibration

pyromation inc
beyond measure
5211 Industrial Road, Fort Wayne, IN 46825
www.pyromation.com 260.484.2580

Report Number: 88487

Calibration Date: 12/30/2019

Submitted By: American Instrument Corp. Hartland, WI 53029
PO Number: 10688

SO Number: 1328459

Type K Thermocouple Lot Calibration of K33M for
K33UM-024-00-4,(Z233)

Tolerance: SAE AMS2750E

Spool/Coil: 13319

Item	Serial No	Target (°F)	Actual (°F)	Reading (°F)	Correction (°F)	Tolerance (°F)	Status	Immersion (in)	Uncertainty (°F)
BEG		300	299.9	300.4	-0.5	± 2.0	In Tolerance	6	1.2
		550	549.8	549.4	0.4	± 2.2	In Tolerance	8	1.2
		800	800.7	801.2	-0.5	± 3.1	In Tolerance	17	1.5
		1050	1049.8	1051.4	-1.6	± 4.1	In Tolerance	17	1.5
		1300	1300.4	1302.4	-2.0	± 5.0	In Tolerance	17	1.5
END		300	299.9	300.3	-0.4	± 2.0	In Tolerance	6	1.2
		550	549.8	549.3	0.5	± 2.2	In Tolerance	8	1.2
		800	800.7	801.1	-0.4	± 3.1	In Tolerance	17	1.5
		1050	1049.8	1051.4	-1.6	± 4.1	In Tolerance	17	1.5
		1300	1300.4	1302.4	-2.0	± 5.0	In Tolerance	17	1.5
AVG		300			-0.4				
		550			0.4				
		800			-0.4				
		1050			-1.6				
		1300			-2.0				

Remarks:

The correction must be added algebraically to the UUT reading to obtain the correct value.

Equipment and Standards Used

ID Number	Manufacturer	Model	Description	Calibration Due
03-2400	Hart Scientific	5626	IPRT Working Standard	01/24/2020
03-2787	Agilent	3458A	8 1/2 Digit Digital Multimeter	10/24/2020
03-3474	Pyromation	SPEC 621-00	Type S Reference Standard	02/09/2020

Environmental Conditions at time of Calibration: Temperature: 23 °C [73 °F] Relative Humidity: 35%

Procedure Used: OP-525-07 Rev 6 which is based, in part on ASTM E220-13 and SAE AMS2750E

As Found: In Tolerance As Left: In Tolerance

Calibration performed by: Lindi Bunn, Metrology Technician

The temperatures written in this report are those defined by the International Temperature Scale of 1990 (ITS-90).

The combined standard uncertainty includes the standard uncertainty reported for the standard, and the measurement process. No allowance is included in the uncertainty for thermocouple drift and inhomogeneity. The combined standard uncertainty is multiplied by a coverage factor of 2 to give an expanded uncertainty, which defines and interval having a level of confidence of approximately 95 percent. The expanded uncertainty presented in this report is consistent with the JCGM100:2008 Guide to the Expression of Uncertainty in Measurement. The expanded uncertainty is not to be confused with a tolerance limit for the user during application. Uncertainties are not included in the determination of acceptance.

For purposes of determining conformance with these specifications, an observed value or a calculated value shall be rounded in accordance with the rounding method of ASTM Practice E29-19.

The standards of Pyromation Laboratory are traceable to the International System of Units (SI) through NIST or other National Metrology Institute, and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported by this laboratory. The laboratory report number identified above is the unique report number to be used in referencing measurement traceability for the items identified in this report only.

This calibration is compliant to ISO/IEC 17025:2017. This calibration report applies only to the items described. It must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

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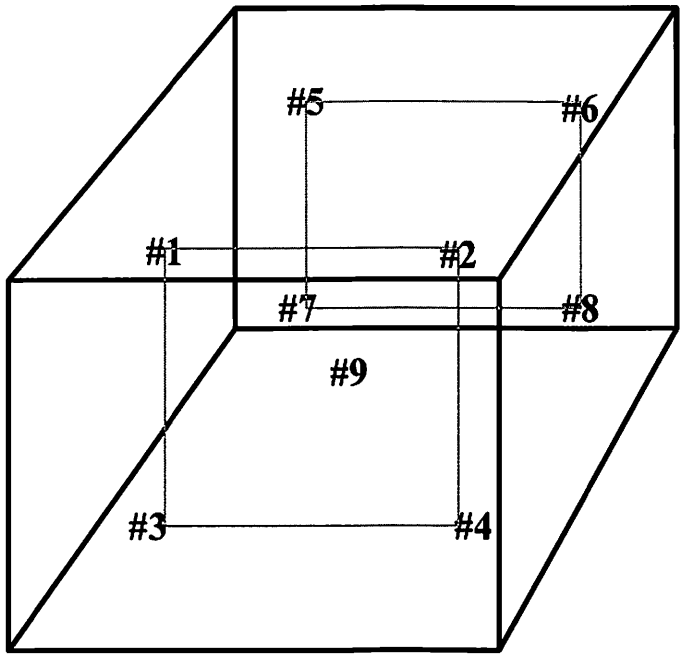
FURNACE SURVEY REPORT

Wisconsin Oven
Heat Treat



TUS	TC Location	
Temperature	Low	High
300 °F	8	3
500 °F	8	3
1000 °F	5	6
1255 °F	5	6

Survey taken at: 300 °F 500 °F 1000 °F 1255 °F

Survey Date: April 12, 2021 Survey Due: July 12, 2021

Thermocouple fixture and placement done by: AIC

Interior Furnace Dimensions:		Work Zone Dimensions:		125.0 cu. Ft
Width:	7.0 Ft.	Width:	5.0 Ft.	Type
Depth:	7.0 Ft.	Depth:	5.0 Ft.	Box
Height:	7.0 Ft.	Height:	5.0 Ft.	

Thermocouples required: 9 Total wire length 125'

Thermocouple placement:

Thermocouple #1 and #2 front on top #3 and #4 front on bottom.

Thermocouple #5 and #6 back on top #7 and #8 back on bottom.

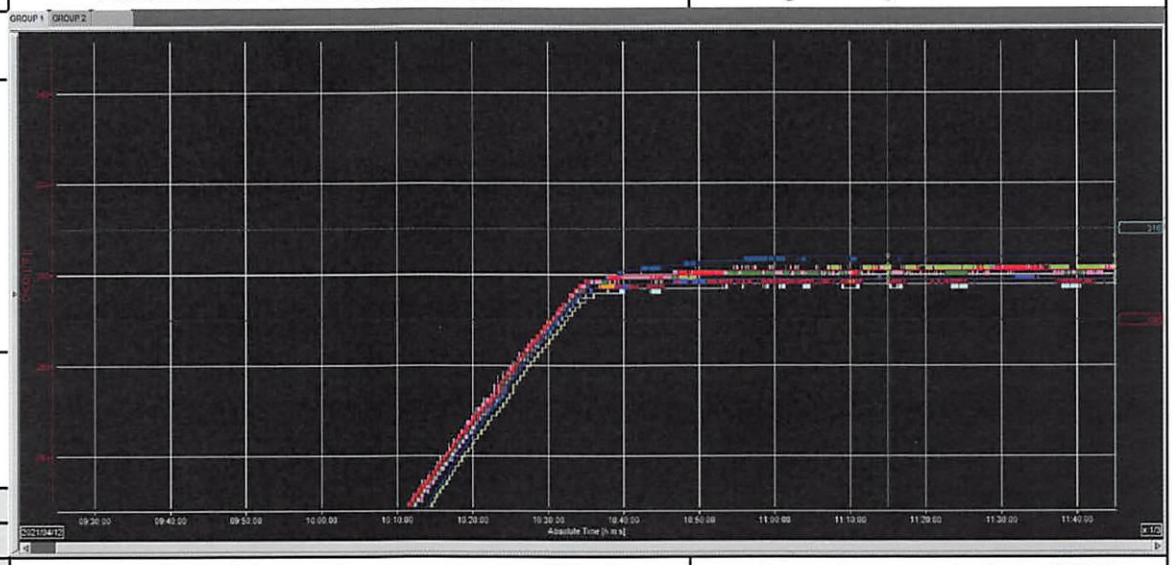
Thermocouple #9 is located in the center.

American Instrument Corp.

702 Rose Drive * Hartland, WI 53029 262.367.4409 www.americaninstrument.biz

AMS2750F	**Wisconsin Oven Heat Treat**	**Target Temperature**	**300**

Survey Date	4/12/2021	
Due Date	7/12/2021	
Device Type	Yokogawa DX1012	
Serial No.	S5K908806	
File Message		
File Number	014547_20210412A	
Starting Condition	Manual	
Meas Ch.	9 Thermocouples	
Data Count	4297	
Sampling Interval	2.00	sec.
Start Time	9:23	Hrs.
Stop Time	11:45	Hrs.
Elapsed Time	2:22	Hrs.
Stabilized Time	10:33	Hrs.
Condition	**Pass**	
Offset Type	**None**	
Offset Value	**0**	**Deg F**



Required tolerance +/- 10 °F @ 300 °F

Survey wire report number # BA6019

Ramp up and soak survey test data @ 2 minute intervals with survey wire and survey recorder correction factor applied.

Recorder Correction		0	0	0	0	0	0	0	0	0	Survey wire correction factor	0.60	
Date	Time	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	CH09	Remarks	Min °F	Max °F
2021/04/12	09:23:00	63.0	62.5	60.0	60.0	62.5	63.0	60.5	61.0	60.0		60.0	63.0
2021/04/12	09:25:00	65.5	66.0	64.0	65.0	66.5	66.0	64.5	66.0	65.5		64.0	66.5
2021/04/12	09:27:00	68.5	69.5	67.5	69.0	70.5	69.5	68.0	72.0	68.5		67.5	72.0
2021/04/12	09:29:00	94.5	94.0	86.0	94.0	96.0	93.0	89.0	96.0	93.0		86.0	96.0
2021/04/12	09:31:00	98.5	99.0	94.5	98.0	99.0	97.5	93.5	99.5	97.0		93.5	99.5
2021/04/12	09:33:00	102.5	102.0	99.5	102.0	102.0	101.0	97.5	103.0	100.5		97.5	103.0
2021/04/12	09:35:00	105.5	106.0	103.0	105.0	105.5	104.5	102.0	106.0	104.0		102.0	106.0
2021/04/12	09:37:00	110.0	109.5	106.5	109.5	109.5	108.5	105.5	110.0	108.0		105.5	110.0
2021/04/12	09:39:00	113.5	114.0	110.5	113.5	114.5	113.0	109.0	115.0	112.5		109.0	115.0
2021/04/12	09:41:00	122.0	122.0	117.5	122.0	123.5	121.5	117.0	123.5	120.5		117.0	123.5
2021/04/12	09:43:00	131.0	131.0	125.5	131.0	131.0	129.0	125.0	132.0	129.0		125.0	132.0
2021/04/12	09:45:00	139.5	139.5	133.5	139.0	140.5	138.0	133.0	140.5	137.5		133.0	140.5
2021/04/12	09:47:00	147.0	147.0	141.0	146.5	147.5	145.5	140.0	148.0	144.5		140.0	148.0
2021/04/12	09:49:00	155.0	155.0	148.0	155.0	155.5	153.0	147.0	156.0	152.5		147.0	156.0
2021/04/12	09:51:00	163.5	163.0	155.0	163.0	163.5	161.5	154.5	163.0	160.0		154.5	163.5
2021/04/12	09:53:00	172.0	172.0	163.0	171.0	173.0	169.5	162.5	172.0	168.0		162.5	173.0
2021/04/12	09:55:00	180.5	180.0	170.5	180.0	180.0	177.5	170.5	180.0	176.5		170.5	180.5
2021/04/12	09:57:00	190.0	189.0	179.0	188.5	189.0	186.0	179.0	188.0	184.5		179.0	190.0
2021/04/12	09:59:00	198.5	198.0	187.0	197.0	198.5	194.5	187.5	197.0	193.5		187.0	198.5
2021/04/12	10:01:00	207.0	206.5	196.0	206.0	208.0	203.5	196.0	206.0	203.5		196.0	208.0
2021/04/12	10:03:00	216.0	215.5	205.0	215.0	216.5	213.0	206.0	215.0	212.5		205.0	216.5
2021/04/12	10:05:00	225.0	224.0	214.0	223.0	226.0	222.5	214.5	223.0	222.5		214.0	226.0
2021/04/12	10:07:00	233.0	232.0	223.0	231.5	234.0	231.0	223.5	232.0	230.5		223.0	234.0
2021/04/12	10:09:00	242.0	241.0	232.5	240.0	242.5	240.0	233.0	240.0	240.0		232.5	242.5
2021/04/12	10:11:00	248.0	247.0	240.0	245.5	248.0	246.0	239.5	246.0	246.0		239.5	248.0
2021/04/12	10:13:00	252.5	252.0	246.5	250.0	252.0	251.0	245.0	251.0	251.0		245.0	252.5
2021/04/12	10:15:00	257.0	256.0	252.0	255.0	256.0	256.0	251.0	255.0	256.0		251.0	257.0
2021/04/12	10:17:00	261.5	261.0	257.5	259.0	261.0	260.0	256.0	259.5	261.0		256.0	261.5
2021/04/12	10:19:00	266.0	265.0	262.0	264.0	265.0	265.0	261.0	264.0	265.5		261.0	266.0

American Instrument Corp.

702 Rose Drive * Hartland, WI 53029 262.367.4409 www.americaninstrument.biz

Date	Time	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	CH09	Remarks	Min °F	Max °F
2021/04/12	10:21:00	270.0	269.0	267.0	268.0	269.5	269.0	265.0	268.0	269.5		265.0	270.0
2021/04/12	10:23:00	274.0	273.0	271.0	272.0	273.0	273.0	269.0	272.0	273.5		269.0	274.0
2021/04/12	10:25:00	279.0	278.0	277.0	277.0	278.0	278.0	274.0	277.0	278.5		274.0	279.0
2021/04/12	10:27:00	283.0	283.0	281.0	281.0	282.5	282.0	279.0	281.0	283.0		279.0	283.0
2021/04/12	10:29:00	287.5	287.0	286.0	285.0	286.0	286.0	283.0	285.0	286.5		283.0	287.5
2021/04/12	10:31:00	291.0	291.0	290.0	289.0	290.0	290.0	287.0	289.0	291.0		287.0	291.0
2021/04/12	10:33:00	296.0	294.5	294.0	293.0	294.0	294.0	291.0	293.0	294.5	Stabilize	291.0	296.0
2021/04/12	10:35:00	299.0	297.0	297.0	296.0	297.0	297.0	295.0	295.5	297.5		295.0	299.0
2021/04/12	10:37:00	299.0	298.0	299.0	297.0	297.0	297.0	296.0	296.0	298.5		296.0	299.0
2021/04/12	10:39:00	300.0	299.0	300.0	297.0	297.5	298.0	297.0	296.0	299.0		296.0	300.0
2021/04/12	10:41:00	300.0	299.0	301.0	298.0	297.5	298.0	298.0	297.0	299.5		297.0	301.0
2021/04/12	10:43:00	300.0	299.0	301.5	298.0	298.0	298.0	298.0	297.0	299.5		297.0	301.5
2021/04/12	10:45:00	300.0	299.0	302.0	298.0	298.0	298.0	298.5	297.0	299.0		297.0	302.0
2021/04/12	10:47:00	300.0	300.0	302.0	299.0	298.5	298.0	299.0	297.0	300.0		297.0	302.0
2021/04/12	10:49:00	300.0	300.0	302.5	298.0	298.0	298.0	299.0	297.0	300.5		297.0	302.5
2021/04/12	10:51:00	300.5	300.0	303.0	299.0	298.0	298.0	300.0	297.0	300.0		297.0	303.0
2021/04/12	10:53:00	301.0	300.0	303.0	299.0	298.0	299.0	300.0	297.0	300.0		297.0	303.0
2021/04/12	10:55:00	301.0	300.0	303.0	299.0	298.5	299.0	301.0	298.0	301.0		298.0	303.0
2021/04/12	10:57:00	301.0	300.5	303.5	299.0	298.5	299.0	301.0	298.0	301.0		298.0	303.5
2021/04/12	10:59:00	301.0	300.0	303.5	299.0	298.5	299.0	301.0	297.5	300.5		297.5	303.5
2021/04/12	11:01:00	301.0	300.0	303.5	299.0	298.5	299.0	301.0	298.0	300.5		298.0	303.5
2021/04/12	11:03:00	301.0	301.0	304.0	299.0	298.5	299.0	301.0	298.0	301.0		298.0	304.0
2021/04/12	11:05:00	301.0	301.0	304.0	299.0	299.0	299.0	301.0	298.0	301.0		298.0	304.0
2021/04/12	11:07:00	301.0	300.5	304.0	299.0	298.5	299.0	301.0	298.0	301.5		298.0	304.0
2021/04/12	11:09:00	301.0	300.5	304.0	299.0	298.5	299.0	301.0	297.5	301.0		297.5	304.0
2021/04/12	11:11:00	300.5	300.0	304.0	299.0	298.0	299.0	301.0	297.5	300.5		297.5	304.0
2021/04/12	11:13:00	301.0	301.0	304.0	299.0	299.0	299.0	302.0	298.0	300.5		298.0	304.0
2021/04/12	11:15:00	**301.0**	**301.0**	**304.0**	**299.0**	**299.0**	**299.0**	**301.0**	**298.0**	**301.5**	Start Window	298.0	304.0
2021/04/12	11:17:00	**301.0**	**300.0**	**304.0**	**299.0**	**299.0**	**299.0**	**301.0**	**298.0**	**301.0**		298.0	304.0
2021/04/12	11:19:00	**301.0**	**301.0**	**304.0**	**299.0**	**299.0**	**299.0**	**301.5**	**298.0**	**301.5**		298.0	304.0
2021/04/12	11:21:00	**301.0**	**301.0**	**304.0**	**299.0**	**299.0**	**299.0**	**302.0**	**298.0**	**301.0**		298.0	304.0
2021/04/12	11:23:00	**301.0**	**300.5**	**304.0**	**299.0**	**298.5**	**299.0**	**301.5**	**298.0**	**300.5**		298.0	304.0
2021/04/12	11:25:00	**301.0**	**300.5**	**304.0**	**299.0**	**299.0**	**299.0**	**301.0**	**297.5**	**301.0**		297.5	304.0
2021/04/12	11:27:00	**301.0**	**301.0**	**304.0**	**299.0**	**299.0**	**299.0**	**302.0**	**298.0**	**301.0**		298.0	304.0
2021/04/12	11:29:00	**301.0**	**301.0**	**304.0**	**299.0**	**299.0**	**299.0**	**302.0**	**298.0**	**301.5**		298.0	304.0
2021/04/12	11:31:00	**301.0**	**301.0**	**304.0**	**299.0**	**299.0**	**299.0**	**302.0**	**298.0**	**301.0**		298.0	304.0
2021/04/12	11:33:00	**302.0**	**301.0**	**304.0**	**300.0**	**299.0**	**299.0**	**302.0**	**298.0**	**301.0**		298.0	304.0
2021/04/12	11:35:00	**301.0**	**301.0**	**304.0**	**299.5**	**299.0**	**299.0**	**302.0**	**298.0**	**301.0**		298.0	304.0
2021/04/12	11:37:00	**301.0**	**301.0**	**304.0**	**299.0**	**299.0**	**299.0**	**301.5**	**298.0**	**301.0**		298.0	304.0
2021/04/12	11:39:00	**301.0**	**300.0**	**304.0**	**299.0**	**298.5**	**299.0**	**301.0**	**297.5**	**301.0**		297.5	304.0
2021/04/12	11:41:00	**301.0**	**301.0**	**304.0**	**299.0**	**299.0**	**299.0**	**301.5**	**298.0**	**301.0**		298.0	304.0
2021/04/12	11:43:00	**301.0**	**301.0**	**304.0**	**299.0**	**299.0**	**299.0**	**301.5**	**298.0**	**300.5**		298.0	304.0
2021/04/12	11:45:00	**301.0**	**301.0**	**304.0**	**299.0**	**299.0**	**299.0**	**302.0**	**298.0**	**301.5**	Stop Window	298.0	304.0

	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	CH09			
										Maximum Set Point Overshoot	4.00	Pass
Minimum Deviation During Soak	1.00	0.00	4.00	-1.00	-1.50	-1.00	1.00	-2.50	0.50	Minimum Deviation	-2.50	Pass
Maximum Deviation During Soak	2.00	1.00	4.00	0.00	-1.00	-1.00	2.00	-2.00	1.50	Maximum Deviation	4.00	Pass

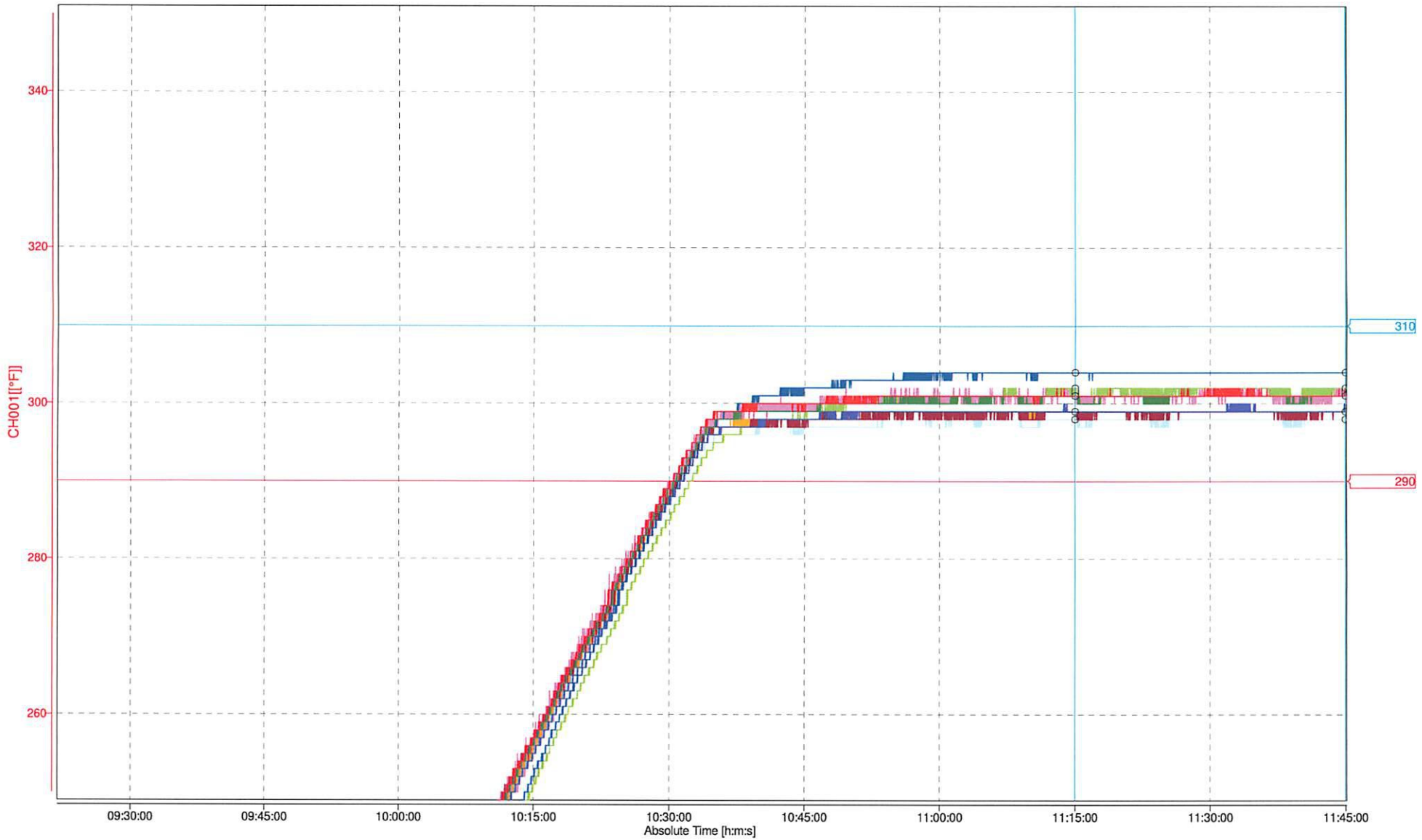
Remarks:

Low Value. 297.5 T/C 8 High Value. 304.0 T/C 3

File Message
File Name : 014547_20210412A.DAD,...,014561_20210412A.DAD
Device Type : DX1000
Serial No. : S5K908806
Meas Ch. : 9
Math Ch. : 0

Data Count : 4297
Sampling Interval : 2.000 sec
Start Time : 2021/04/12 09:21:52.000
Stop Time : 2021/04/12 11:45:04.000

Printed Group : GROUP 1
Printed Range : 2021/04/12 09:21:52.000 - 2021/04/12 11:45:04.000
Comment : Target Temperature 300 °F | Scale 250 °F - 350 °F | Window 11:15 - 11:45 marked | Pass



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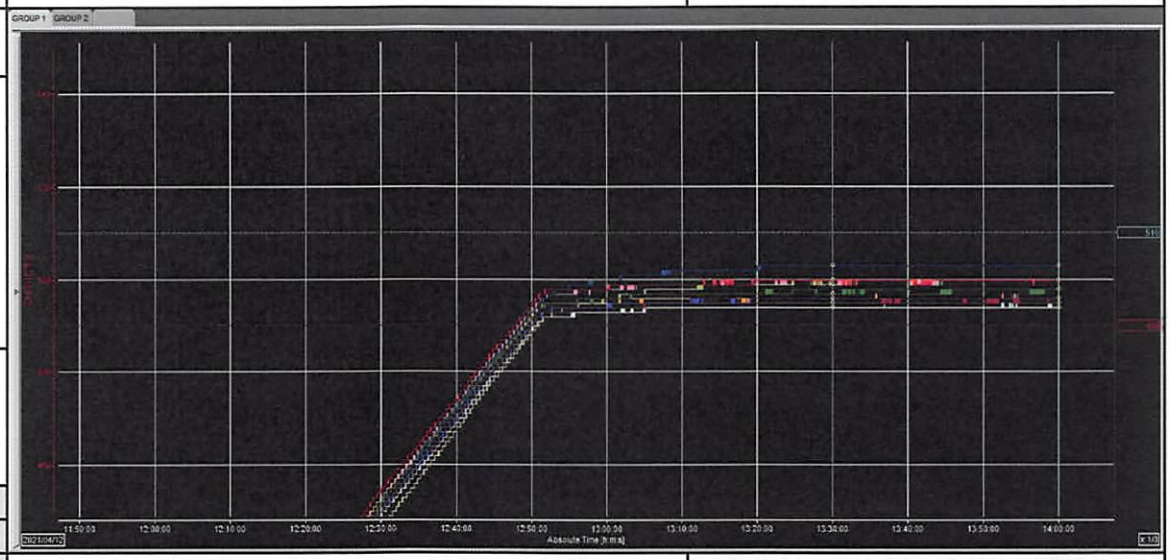
AMS2750F			Wisconsin Oven Heat Treat	Target Temperature	500
Survey Date	4/12/2021				
Due Date	7/12/2021				
Device Type	Yokogawa DX1012				
Serial No.	S5K908806				
File Message					
File Number	014562_20210412B				
Starting Condition	Manual				
Meas Ch.	9 Thermocouples				
Data Count	3988				
Sampling Interval	2.00	sec.			
Start Time	11:48	Hrs.			
Stop Time	14:00	Hrs.			
Elapsed Time	2:12	Hrs.			
Stabilized Time	12:52	Hrs.			
Condition	Pass				
Offset Type	None				
Offset Value	0	Deg F	Required tolerance +/- 10 °F @ 500 °F	Survey wire report number #	BA6019

Ramp up and soak survey test data @ 2 minute intervals with survey wire and survey recorder correction factor applied.

Recorder Correction		0	0	0	0	0	0	0	0	0	Survey wire correction factor	1.00	
Date	Time	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	CH09	Remarks	Min °F	Max °F
2021/04/12	11:48:00	300.5	300.0	303.0	299.0	298.0	298.0	301.0	297.0	300.0		297.0	303.0
2021/04/12	11:50:00	301.0	300.0	303.0	299.0	298.5	299.0	301.0	298.0	301.0		298.0	303.0
2021/04/12	11:52:00	306.0	305.5	306.5	304.0	304.5	304.0	305.0	303.0	306.0		303.0	306.5
2021/04/12	11:54:00	314.0	313.0	312.5	311.0	312.0	311.0	311.0	311.0	313.0		311.0	314.0
2021/04/12	11:56:00	322.0	320.0	319.0	319.0	320.0	319.0	318.0	318.5	321.0		318.0	322.0
2021/04/12	11:58:00	329.0	328.0	327.0	327.0	328.0	327.0	325.0	326.0	328.0		325.0	329.0
2021/04/12	12:00:00	337.0	336.0	334.0	334.0	335.0	335.0	332.0	334.0	336.0		332.0	337.0
2021/04/12	12:02:00	346.0	344.0	342.0	343.0	343.5	343.5	340.0	342.0	344.0		340.0	346.0
2021/04/12	12:04:00	355.0	353.0	350.0	350.0	352.0	352.0	347.0	349.5	353.0		347.0	355.0
2021/04/12	12:06:00	363.0	361.0	359.0	359.0	360.0	361.0	355.5	359.0	361.0		355.5	363.0
2021/04/12	12:08:00	370.0	369.0	366.5	367.0	368.0	369.0	363.0	367.0	369.0		363.0	370.0
2021/04/12	12:10:00	379.0	377.0	374.5	375.0	376.0	377.0	371.0	375.0	377.0		371.0	379.0
2021/04/12	12:12:00	388.0	385.0	382.5	383.0	385.0	385.0	379.0	383.0	386.0		379.0	388.0
2021/04/12	12:14:00	395.5	393.0	391.0	391.0	392.0	393.5	387.0	391.0	393.5		387.0	395.5
2021/04/12	12:16:00	404.0	401.5	399.0	400.0	401.0	402.0	394.5	399.0	402.0		394.5	404.0
2021/04/12	12:18:00	412.0	409.0	407.0	407.5	409.0	410.0	403.0	407.0	410.0		403.0	412.0
2021/04/12	12:20:00	421.0	418.0	415.0	416.0	417.0	419.0	411.0	415.0	418.5		411.0	421.0
2021/04/12	12:22:00	429.0	426.0	423.5	424.0	425.0	427.0	419.0	423.0	427.0		419.0	429.0
2021/04/12	12:24:00	437.5	434.0	432.0	433.0	434.0	436.0	427.0	432.0	435.0		427.0	437.5
2021/04/12	12:26:00	445.0	442.0	440.0	440.0	441.0	443.5	435.0	439.5	443.0		435.0	445.0
2021/04/12	12:28:00	450.0	447.0	446.0	445.0	446.0	448.0	441.0	444.0	448.0		441.0	450.0
2021/04/12	12:30:00	455.0	452.0	451.5	450.0	450.0	453.0	446.0	449.0	453.0		446.0	455.0
2021/04/12	12:32:00	459.0	456.0	456.0	454.0	454.5	457.0	450.5	453.0	457.0		450.5	459.0
2021/04/12	12:34:00	462.0	460.0	460.0	458.0	458.0	460.0	455.0	457.0	461.0		455.0	462.0
2021/04/12	12:36:00	466.0	463.5	464.0	462.0	462.0	464.0	459.0	461.0	465.0		459.0	466.0
2021/04/12	12:38:00	470.0	468.0	468.0	466.0	466.0	468.0	463.0	465.0	469.0		463.0	470.0
2021/04/12	12:40:00	474.0	471.5	472.0	470.0	470.0	472.0	467.5	469.0	473.0		467.5	474.0
2021/04/12	12:42:00	478.0	476.0	476.0	474.0	474.5	476.0	472.0	473.0	477.0		472.0	478.0
2021/04/12	12:44:00	483.0	480.0	481.0	478.5	478.5	480.0	476.0	477.0	482.0		476.0	483.0

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Date	Time	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	CH09	Remarks	Min °F	Max °F
2021/04/12	12:46:00	487.0	484.0	485.0	482.0	482.0	484.0	480.0	481.0	485.0		480.0	487.0
2021/04/12	12:48:00	490.5	488.0	488.5	486.0	486.0	488.0	484.0	485.0	489.0		484.0	490.5
2021/04/12	12:50:00	495.0	492.0	493.0	490.0	490.0	492.0	488.0	489.0	493.0		488.0	495.0
2021/04/12	12:52:00	498.0	495.0	496.0	493.0	493.0	495.0	492.0	492.0	496.5	Stabilize	492.0	498.0
2021/04/12	12:54:00	498.0	495.0	498.0	494.0	493.0	495.0	493.5	492.0	497.0		492.0	498.0
2021/04/12	12:56:00	498.0	495.5	499.0	494.0	494.0	495.0	494.0	493.0	497.5		493.0	499.0
2021/04/12	12:58:00	498.0	495.5	500.0	494.0	494.0	495.0	495.0	493.0	498.0		493.0	500.0
2021/04/12	13:00:00	498.0	496.0	500.0	494.0	494.0	495.0	496.0	493.0	498.0		493.0	500.0
2021/04/12	13:02:00	499.0	496.0	501.0	495.0	494.0	496.0	497.0	493.5	498.5		493.5	501.0
2021/04/12	13:04:00	499.0	497.0	501.0	495.0	494.0	496.0	497.0	493.0	499.0		493.0	501.0
2021/04/12	13:06:00	499.0	497.0	501.0	495.0	495.0	496.0	498.0	494.0	499.0		494.0	501.0
2021/04/12	13:08:00	499.0	497.0	501.5	495.0	495.0	496.0	498.0	494.0	499.0		494.0	501.5
2021/04/12	13:10:00	499.0	497.0	502.0	495.0	495.0	496.0	498.0	494.0	499.0		494.0	502.0
2021/04/12	13:12:00	499.0	497.0	502.0	495.5	495.0	496.0	498.0	494.0	499.0		494.0	502.0
2021/04/12	13:14:00	499.0	497.0	502.0	496.0	495.0	496.0	499.0	494.0	499.0		494.0	502.0
2021/04/12	13:16:00	499.5	497.0	502.0	496.0	495.0	496.0	499.0	494.0	499.5		494.0	502.0
2021/04/12	13:18:00	499.0	497.0	502.0	495.0	495.0	496.0	499.0	494.0	499.0		494.0	502.0
2021/04/12	13:20:00	500.0	497.0	502.0	496.0	495.0	496.0	499.0	494.0	499.5		494.0	502.0
2021/04/12	13:22:00	500.0	497.0	503.0	496.0	495.0	496.0	499.0	494.0	500.0		494.0	503.0
2021/04/12	13:24:00	500.0	497.0	503.0	496.0	495.0	496.0	499.0	494.0	500.0		494.0	503.0
2021/04/12	13:26:00	500.0	498.0	503.0	496.0	495.0	496.0	500.0	494.0	500.0		494.0	503.0
2021/04/12	13:28:00	500.0	497.0	503.0	496.0	495.0	496.0	499.0	494.0	500.0		494.0	503.0
2021/04/12	13:30:00	**500.0**	**497.0**	**503.0**	**496.0**	**495.0**	**496.0**	**499.0**	**494.0**	**500.0**	Start Window	494.0	503.0
2021/04/12	13:32:00	**499.5**	**498.0**	**503.0**	**496.0**	**495.0**	**496.0**	**499.5**	**494.0**	**500.0**		494.0	503.0
2021/04/12	13:34:00	**500.0**	**498.0**	**503.0**	**496.0**	**495.0**	**496.0**	**500.0**	**494.0**	**500.0**		494.0	503.0
2021/04/12	13:36:00	**500.0**	**498.0**	**503.0**	**496.0**	**495.0**	**496.0**	**500.0**	**494.0**	**500.0**		494.0	503.0
2021/04/12	13:38:00	**500.0**	**498.0**	**503.0**	**496.0**	**495.0**	**496.0**	**500.0**	**494.0**	**500.0**		494.0	503.0
2021/04/12	13:40:00	**500.0**	**498.0**	**503.0**	**496.0**	**495.0**	**496.0**	**500.0**	**494.0**	**500.0**		494.0	503.0
2021/04/12	13:42:00	**499.5**	**497.0**	**503.0**	**496.0**	**495.0**	**496.0**	**500.0**	**494.0**	**499.5**		494.0	503.0
2021/04/12	13:44:00	**500.0**	**497.0**	**503.0**	**496.0**	**495.0**	**496.0**	**499.5**	**494.0**	**499.5**		494.0	503.0
2021/04/12	13:46:00	**500.0**	**498.0**	**503.0**	**496.0**	**495.0**	**496.0**	**500.0**	**494.0**	**500.0**		494.0	503.0
2021/04/12	13:48:00	**500.0**	**498.0**	**503.0**	**496.0**	**495.0**	**496.0**	**500.0**	**494.0**	**500.0**		494.0	503.0
2021/04/12	13:50:00	**500.0**	**498.0**	**503.0**	**496.0**	**495.0**	**496.0**	**500.0**	**494.0**	**500.0**		494.0	503.0
2021/04/12	13:52:00	**500.0**	**498.0**	**503.0**	**496.0**	**496.0**	**496.0**	**500.0**	**494.0**	**500.0**		494.0	503.0
2021/04/12	13:54:00	**500.0**	**498.0**	**503.0**	**496.0**	**495.5**	**496.0**	**500.0**	**494.0**	**500.0**		494.0	503.0
2021/04/12	13:56:00	**500.0**	**498.0**	**503.0**	**496.0**	**495.0**	**496.0**	**500.0**	**494.0**	**500.0**		494.0	503.0
2021/04/12	13:58:00	**500.0**	**497.5**	**503.0**	**496.0**	**495.0**	**496.0**	**500.0**	**494.0**	**500.0**		494.0	503.0
2021/04/12	14:00:00	**500.0**	**498.0**	**503.0**	**496.0**	**495.0**	**496.0**	**500.0**	**494.0**	**500.0**	Stop Window	494.0	503.0

	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	CH09			
										Maximum Set Point Overshoot	3.00	Pass
Minimum Deviation During Soak	-0.50	-3.00	3.00	-4.00	-5.00	-4.00	-1.00	-6.00	-0.50	Minimum Deviation	-6.00	Pass
Maximum Deviation During Soak	0.00	-2.00	3.00	-4.00	-4.00	-4.00	0.00	-6.00	0.00	Maximum Deviation	3.00	Pass

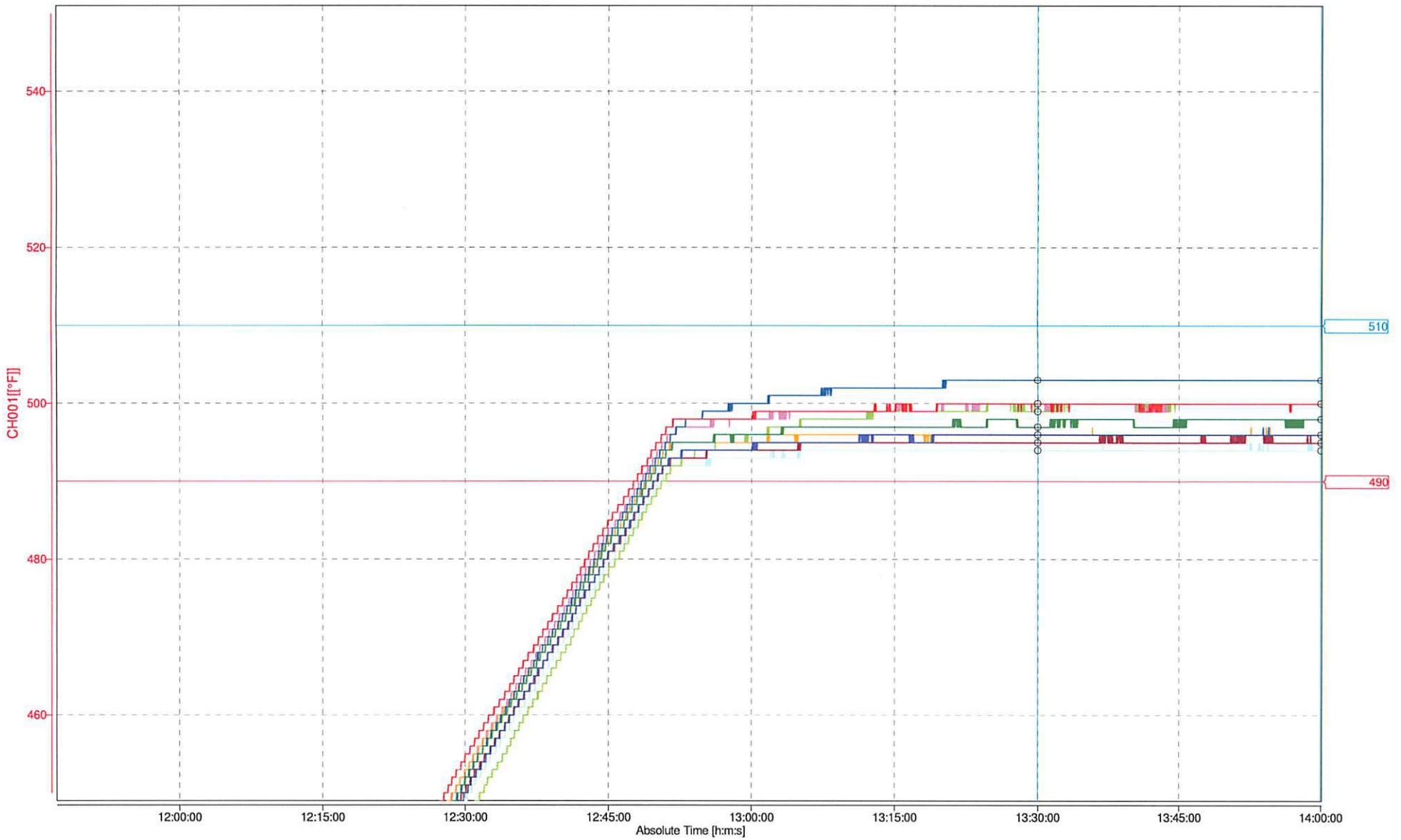
Remarks:

Low Value. 494.0 T/C 8 High Value. 503.0 T/C 3

File Message
File Name : 014562_20210412B.DAD,...,014575_20210412B.DAD
Device Type : DX1000
Serial No. : S5K908806
Meas Ch. : 9

Data Count : 3988
Sampling Interval : 2.000 sec
Start Time : 2021/04/12 11:47:10.000
Stop Time : 2021/04/12 14:00:04.000

Printed Group : GROUP 1
Printed Range : 2021/04/12 11:47:10.000 - 2021/04/12 14:00:04.000
Comment : Target Temperature 500 °F | Scale 450 °F - 550 °F | Window 13:30 - 14:00 marked | Pass



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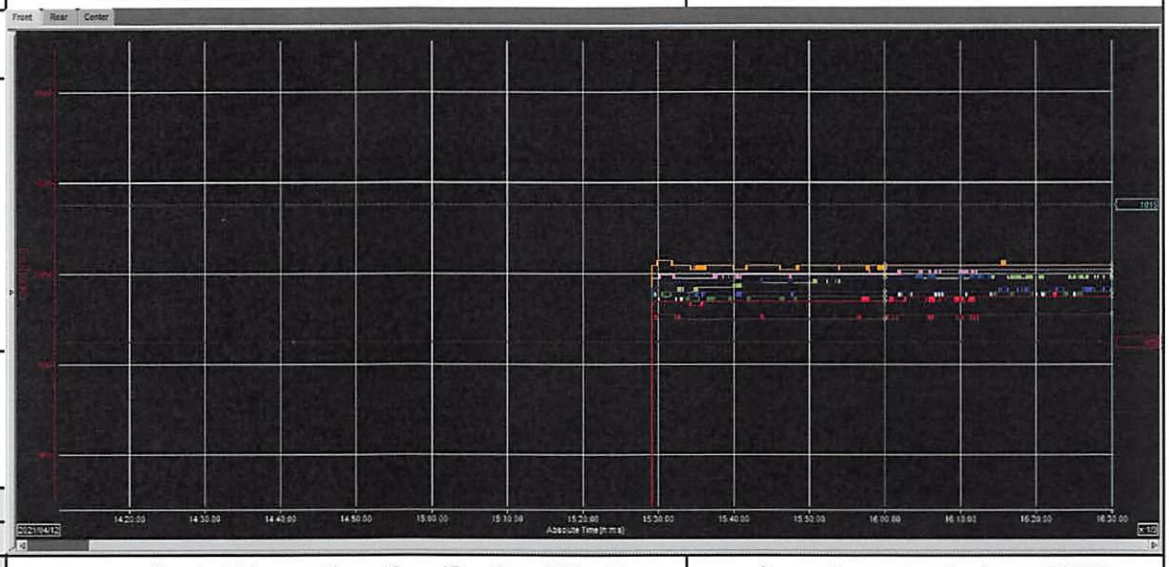
AMS2750F			Wisconsin Oven Heat Treat	Target Temperature	1000
Survey Date	4/12/2021				
Due Date	7/12/2021				
Device Type	Yokogawa DX1012				
Serial No.	S5K908806				
File Message					
File Number	014576_20210412C				
Starting Condition	Manual				
Meas Ch.	9 Thermocouples				
Data Count	4427				
Sampling Interval	2.00	sec.			
Start Time	14:04	Hrs.			
Stop Time	16:30	Hrs.			
Elapsed Time	2:26	Hrs.			
Stabilized Time	15:30	Hrs.			
Condition	Pass				
Offset Type	None				
Offset Value	0	Deg F	Required tolerance +/- 15 °F @ 1000 °F	Survey wire report number #	BA6019

Ramp up and soak survey test data @ 2 minute intervals with survey wire and survey recorder correction factor applied.

Recorder Correction		0	0	0	0	0	0	0	0	0	Survey wire correction factor	1.80	
Date	Time	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	CH09	Remarks	Min °F	Max °F
2021/04/12	14:04:00	585.0	584.0	587.0	582.0	582.0	582.0	585.0	581.0	585.0		581.0	587.0
2021/04/12	14:06:00	590.0	588.0	589.0	587.0	587.0	588.0	589.0	587.0	590.0		587.0	590.0
2021/04/12	14:08:00	600.0	597.5	597.0	597.0	598.0	599.0	597.0	597.0	599.0		597.0	600.0
2021/04/12	14:10:00	612.0	608.0	606.5	608.0	609.0	610.0	605.5	607.0	610.0		605.5	612.0
2021/04/12	14:12:00	623.0	620.0	617.0	619.0	620.0	622.0	615.0	619.0	621.5		615.0	623.0
2021/04/12	14:14:00	635.0	631.0	627.0	630.0	631.5	634.5	625.0	630.0	632.0		625.0	635.0
2021/04/12	14:16:00	646.5	643.0	637.5	641.0	643.0	646.0	636.0	641.0	644.0		636.0	646.5
2021/04/12	14:18:00	658.0	654.0	649.0	653.0	654.5	658.0	647.0	653.0	655.0		647.0	658.0
2021/04/12	14:20:00	670.0	665.0	660.0	664.0	665.5	670.0	658.0	664.0	667.0		658.0	670.0
2021/04/12	14:22:00	681.0	676.0	671.0	675.0	676.5	681.0	668.5	675.0	678.0		668.5	681.0
2021/04/12	14:24:00	693.5	688.0	681.5	686.5	689.0	695.0	679.0	687.0	690.5		679.0	695.0
2021/04/12	14:26:00	706.0	701.0	694.5	699.0	701.0	707.5	691.5	699.0	703.0		691.5	707.5
2021/04/12	14:28:00	717.0	713.5	707.0	711.0	713.5	719.0	703.0	711.0	714.5		703.0	719.0
2021/04/12	14:30:00	729.0	724.5	719.0	723.0	725.0	731.0	715.0	723.0	726.0		715.0	731.0
2021/04/12	14:32:00	741.0	736.0	730.5	734.5	736.0	744.0	727.0	734.5	738.5		727.0	744.0
2021/04/12	14:34:00	752.5	749.0	742.0	746.0	748.5	755.5	739.0	746.0	750.0		739.0	755.5
2021/04/12	14:36:00	764.0	761.0	754.0	759.0	761.0	768.0	751.0	758.5	762.0		751.0	768.0
2021/04/12	14:38:00	776.0	772.0	766.0	771.0	772.0	780.0	763.0	770.5	774.0		763.0	780.0
2021/04/12	14:40:00	787.5	784.5	777.0	782.0	784.0	792.0	774.0	782.0	786.0		774.0	792.0
2021/04/12	14:42:00	799.5	796.0	789.5	795.0	795.5	804.0	787.0	794.0	797.5		787.0	804.0
2021/04/12	14:44:00	811.0	807.5	801.0	806.5	807.0	816.0	798.5	805.0	809.5		798.5	816.0
2021/04/12	14:46:00	823.0	820.0	812.5	818.0	819.0	828.0	810.0	817.0	821.0		810.0	828.0
2021/04/12	14:48:00	834.0	832.0	825.0	830.0	831.0	840.0	822.0	830.0	833.0		822.0	840.0
2021/04/12	14:50:00	845.0	843.5	836.0	843.0	843.0	853.0	834.0	842.0	845.0		834.0	853.0
2021/04/12	14:52:00	857.0	856.0	848.0	854.5	854.5	864.0	845.5	853.5	857.0		845.5	864.0
2021/04/12	14:54:00	868.0	867.5	860.0	866.0	866.0	876.0	858.0	865.5	868.5		858.0	876.0
2021/04/12	14:56:00	880.0	879.0	871.5	878.0	878.0	888.0	870.0	877.0	881.0		870.0	888.0
2021/04/12	14:58:00	890.5	890.0	883.0	888.5	888.0	899.0	881.0	888.0	892.0		881.0	899.0
2021/04/12	15:00:00	901.0	901.0	894.0	900.0	899.0	911.0	892.0	899.0	903.0		892.0	911.0

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Date	Time	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	CH09	Remarks	Min °F	Max °F
2021/04/12	15:02:00	909.0	910.0	904.0	909.0	908.0	920.0	901.0	908.0	912.0		901.0	920.0
2021/04/12	15:04:00	912.0	913.0	911.0	912.0	909.5	922.0	906.5	911.0	915.0		906.5	922.0
2021/04/12	15:06:00	914.0	914.0	914.0	914.0	911.0	921.0	910.0	912.0	917.0		910.0	921.0
2021/04/12	15:08:00	914.0	915.5	917.0	915.5	912.0	922.0	913.0	914.0	919.0		912.0	922.0
2021/04/12	15:10:00	917.0	917.0	920.0	918.0	914.0	924.0	916.0	916.0	921.0		914.0	924.0
2021/04/12	15:12:00	919.0	920.5	923.0	921.0	917.0	927.0	919.0	919.0	924.0		917.0	927.0
2021/04/12	15:14:00	922.0	923.0	926.5	923.0	919.5	929.0	922.0	922.0	927.0		919.5	929.0
2021/04/12	15:16:00	924.0	925.0	929.0	926.0	922.0	931.0	925.0	924.0	929.0		922.0	931.0
2021/04/12	15:18:00	927.0	928.0	931.0	928.0	924.0	933.0	927.0	927.0	931.0		924.0	933.0
2021/04/12	15:20:00	929.0	929.0	932.0	930.0	927.0	935.0	930.0	929.0	933.0		927.0	935.0
2021/04/12	15:22:00	931.0	932.0	934.0	932.0	929.0	937.0	932.0	932.0	935.0		929.0	937.0
2021/04/12	15:24:00	933.0	934.0	936.0	934.0	931.0	939.0	934.0	934.0	937.0		931.0	939.0
2021/04/12	15:26:00	935.0	936.0	938.0	937.0	933.0	941.0	937.0	936.0	939.0		933.0	941.0
2021/04/12	15:28:00	937.0	938.0	939.0	939.0	935.0	943.5	939.0	938.0	941.0		935.0	943.5
2021/04/12	15:30:00	994.0	995.0	997.0	996.0	991.0	1002.5	996.0	994.0	999.0	Stabilize	991.0	1002.5
2021/04/12	15:32:00	994.0	995.0	998.0	996.0	991.0	1002.0	996.0	995.0	999.5		991.0	1002.0
2021/04/12	15:34:00	994.0	994.0	998.0	995.5	990.0	1002.0	996.0	994.0	999.0		990.0	1002.0
2021/04/12	15:36:00	994.0	994.0	998.0	996.0	990.0	1001.5	997.0	994.0	999.0		990.0	1001.5
2021/04/12	15:38:00	994.0	995.0	998.0	996.0	990.0	1002.0	997.0	995.0	1000.0		990.0	1002.0
2021/04/12	15:40:00	994.0	994.0	998.0	996.0	990.0	1001.0	997.5	994.0	1000.0		990.0	1001.0
2021/04/12	15:42:00	994.0	994.0	998.0	996.0	990.0	1002.0	998.0	995.0	1000.0		990.0	1002.0
2021/04/12	15:44:00	994.0	995.0	999.0	996.0	990.5	1002.0	998.0	995.0	1000.0		990.5	1002.0
2021/04/12	15:46:00	994.0	995.0	999.0	996.0	990.0	1002.0	998.0	995.0	1000.0		990.0	1002.0
2021/04/12	15:48:00	994.0	994.0	999.0	996.0	990.0	1001.0	998.0	994.0	1000.0		990.0	1001.0
2021/04/12	15:50:00	994.0	995.0	999.0	996.0	990.0	1002.0	998.0	995.0	1000.0		990.0	1002.0
2021/04/12	15:52:00	994.0	995.0	999.0	996.0	990.0	1002.0	999.0	995.0	1000.0		990.0	1002.0
2021/04/12	15:54:00	994.0	995.0	999.0	996.0	990.0	1002.0	999.0	995.0	1000.0		990.0	1002.0
2021/04/12	15:56:00	994.0	995.0	999.0	996.0	990.0	1002.0	999.0	995.0	1000.0		990.0	1002.0
2021/04/12	15:58:00	994.0	995.0	999.0	996.0	990.0	1002.0	999.0	995.0	1000.5		990.0	1002.0
2021/04/12	16:00:00	**994.0**	**995.0**	**999.0**	**996.0**	**990.0**	**1001.5**	**999.0**	**995.0**	**1000.0**	Start Window	990.0	1001.5
2021/04/12	16:02:00	**994.0**	**995.0**	**999.0**	**996.0**	**991.0**	**1002.0**	**999.0**	**996.0**	**1001.0**		991.0	1002.0
2021/04/12	16:04:00	**995.0**	**995.0**	**999.0**	**996.0**	**991.0**	**1002.0**	**999.0**	**995.0**	**1001.0**		991.0	1002.0
2021/04/12	16:06:00	**994.5**	**995.0**	**999.5**	**996.0**	**990.5**	**1002.0**	**999.0**	**995.0**	**1000.0**		990.5	1002.0
2021/04/12	16:08:00	**994.5**	**995.0**	**1000.0**	**996.0**	**991.0**	**1002.0**	**999.0**	**995.0**	**1001.0**		991.0	1002.0
2021/04/12	16:10:00	**994.5**	**995.0**	**1000.0**	**996.0**	**990.0**	**1002.0**	**999.0**	**995.0**	**1000.5**		990.0	1002.0
2021/04/12	16:12:00	**995.0**	**995.0**	**999.0**	**996.0**	**990.0**	**1002.0**	**999.0**	**995.0**	**1000.0**		990.0	1002.0
2021/04/12	16:14:00	**995.0**	**995.0**	**1000.0**	**996.0**	**991.0**	**1002.0**	**999.0**	**995.5**	**1001.0**		991.0	1002.0
2021/04/12	16:16:00	**995.0**	**996.0**	**1000.0**	**997.0**	**991.0**	**1002.0**	**1000.0**	**996.0**	**1001.0**		991.0	1002.0
2021/04/12	16:18:00	**995.0**	**996.0**	**1000.0**	**996.0**	**991.0**	**1002.0**	**999.0**	**996.0**	**1001.0**		991.0	1002.0
2021/04/12	16:20:00	**995.0**	**995.0**	**1000.0**	**996.0**	**991.0**	**1002.0**	**1000.0**	**996.0**	**1001.0**		991.0	1002.0
2021/04/12	16:22:00	**995.0**	**996.0**	**1000.0**	**996.0**	**991.0**	**1002.0**	**1000.0**	**996.0**	**1001.0**		991.0	1002.0
2021/04/12	16:24:00	**995.0**	**995.0**	**1000.0**	**996.0**	**991.0**	**1002.0**	**1000.0**	**995.5**	**1001.0**		991.0	1002.0
2021/04/12	16:26:00	**995.0**	**996.0**	**1000.0**	**996.0**	**991.0**	**1002.0**	**999.0**	**996.0**	**1001.0**		991.0	1002.0
2021/04/12	16:28:00	**995.0**	**996.0**	**1000.0**	**996.0**	**991.0**	**1002.0**	**1000.0**	**996.0**	**1001.0**		991.0	1002.0
2021/04/12	16:30:00	**995.0**	**996.0**	**1000.0**	**996.0**	**991.0**	**1002.0**	**999.5**	**996.0**	**1001.0**	Stop Window	991.0	1002.0

	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	CH09			
Minimum Deviation During Soak	-6.00	-5.00	-1.00	-4.00	-10.00	1.50	-1.00	-5.00	0.00	Maximum Set Point Overshoot	2.50	Pass
Maximum Deviation During Soak	-5.00	-4.00	0.00	-3.00	-9.00	2.00	0.00	-4.00	1.00	Minimum Deviation	-10.00	Pass
										Maximum Deviation	2.00	Pass

Remarks:

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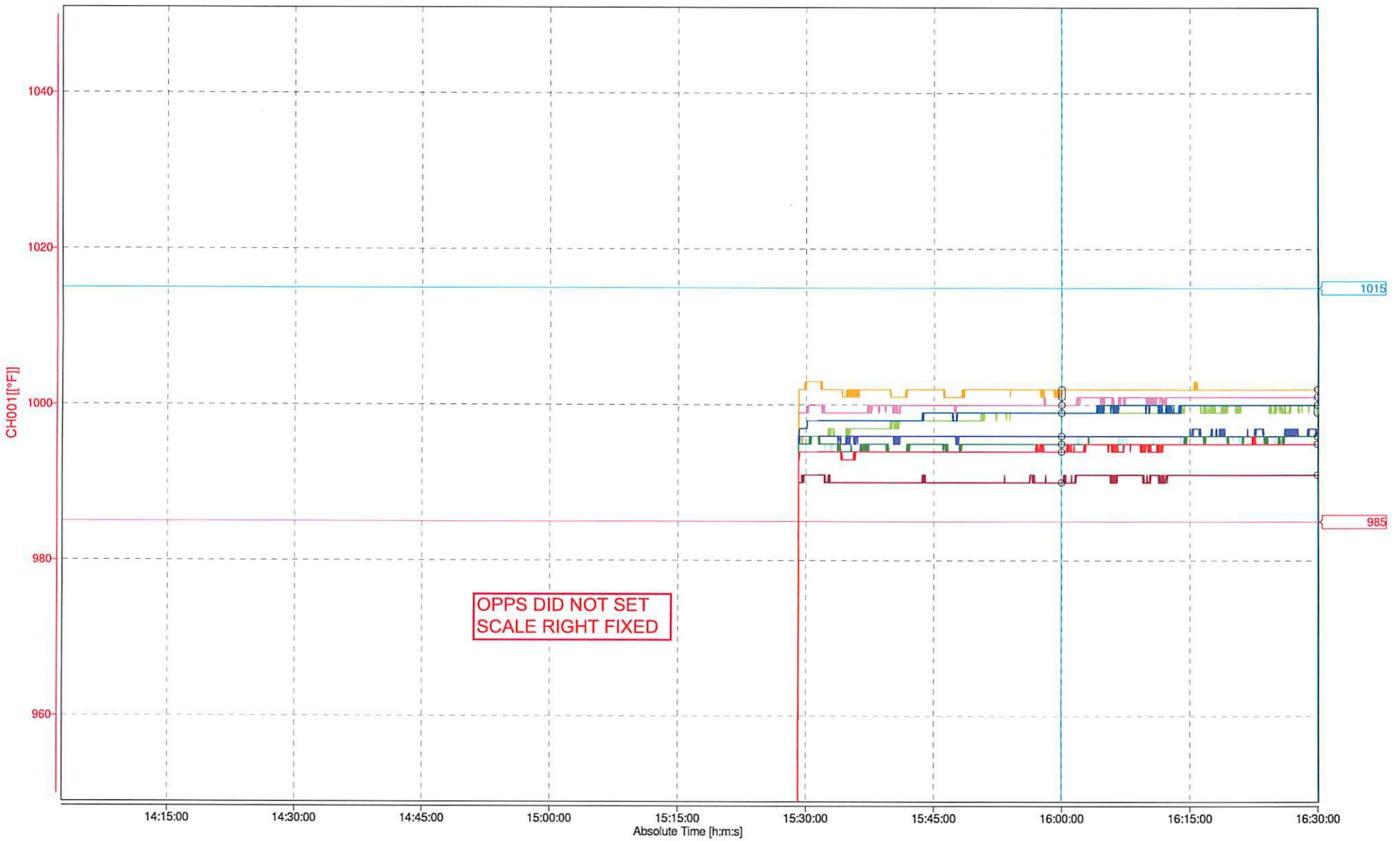
Date	Time	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	CH09	Remarks	Min °F	Max °F
	Low Value.		990.0	T/C	5	High Value.		1002.0	T/C	6			

File Message
File Name : 014576_20210412C.DAD,...,014590_20210412C.DAD
Device Type : DX1000
Serial No. : S5K908806
Meas Ch. : 9

Data Count : 4427
Sampling Interval : 2.000 sec
Start Time : 2021/04/12 14:02:32.000
Stop Time : 2021/04/12 16:30:04.000

Printed Group : Front
Printed Range : 2021/04/12 14:02:32.000 - 2021/04/12 16:30:04.000
Comment : Target Temperature 1000 °F | Scale 950 °F - 1050 °F | Window 16:00 - 16:30 marked | Pass



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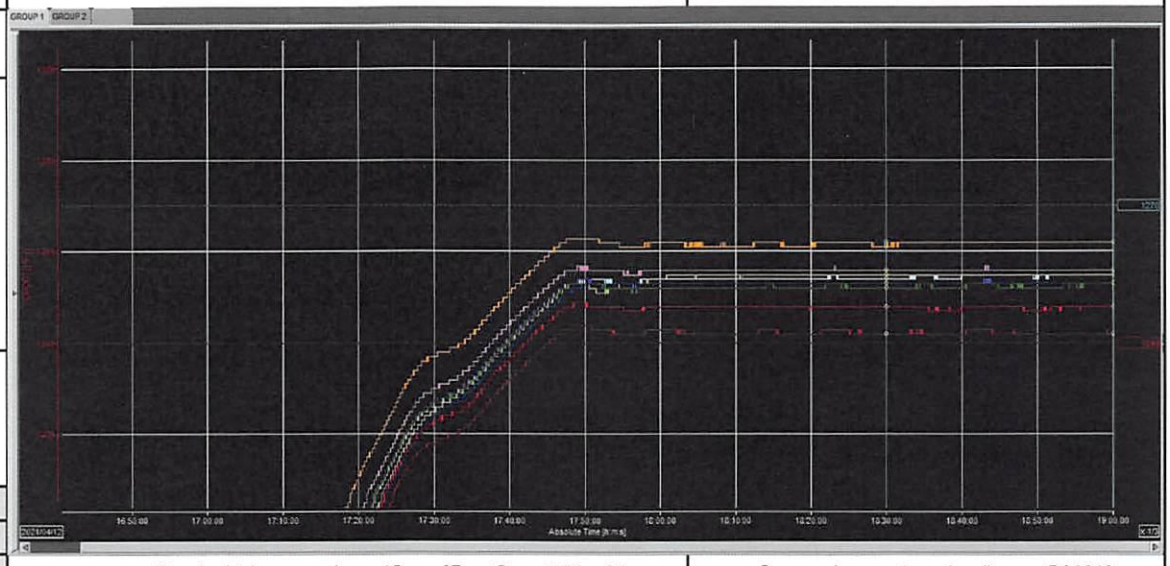
AMS2750F			Wisconsin Oven Heat Treat		Target Temperature	1255
Survey Date	4/12/2021					
Due Date	7/12/2021					
Device Type	Yokogawa DX1012					
Serial No.	S5K908806					
File Message						
File Number	014591_20210412D					
Starting Condition	Manual					
Meas Ch.	9 Thermocouples					
Data Count	4378					
Sampling Interval	2.00	sec.				
Start Time	16:36	Hrs.				
Stop Time	19:00	Hrs.				
Elapsed Time	2:24	Hrs.				
Stabilized Time	17:46	Hrs.				
Condition	Pass		Required tolerance +/-	15 °F @	1255 °F	Survey wire report number # BA6019
Offset Type	None					
Offset Value	0	Deg F				

Ramp up and soak survey test data @ 1 minute intervals with survey wire and survey recorder correction factor applied.

Recorder Correction		0	0	0	0	0	0	0	0	0	Survey wire correction factor	1.60	
Date	Time	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	CH09	Remarks	Min °F	Max °F
2021/04/12	16:36	994.0	995.0	999.0	996.0	990.0	1001.0	998.0	995.0	1000.0		990.0	1001.0
2021/04/12	16:38	993.0	994.0	998.5	995.0	989.0	1001.0	998.0	994.0	999.0		989.0	1001.0
2021/04/12	16:40	994.5	995.0	999.0	996.0	990.0	1002.0	999.0	996.0	1000.0		990.0	1002.0
2021/04/12	16:42	1004.5	1006.0	1005.0	1007.0	1001.5	1014.0	1006.5	1006.0	1011.0		1001.5	1014.0
2021/04/12	16:44	1019.0	1021.0	1016.0	1021.0	1016.5	1030.0	1018.5	1020.5	1025.5		1016.0	1030.0
2021/04/12	16:46	1033.0	1036.0	1029.0	1035.0	1031.5	1046.0	1032.0	1035.0	1040.0		1029.0	1046.0
2021/04/12	16:48	1047.5	1050.0	1042.5	1049.5	1045.5	1061.0	1044.0	1049.0	1053.5		1042.5	1061.0
2021/04/12	16:50	1060.0	1063.0	1054.5	1062.0	1058.0	1073.0	1057.0	1061.0	1066.0		1054.5	1073.0
2021/04/12	16:52	1072.0	1075.0	1066.0	1074.0	1070.0	1086.0	1068.5	1073.0	1078.0		1066.0	1086.0
2021/04/12	16:54	1084.0	1086.5	1077.5	1085.5	1081.0	1097.0	1080.0	1084.0	1090.0		1077.5	1097.0
2021/04/12	16:56	1094.0	1097.5	1089.0	1096.0	1091.5	1108.0	1090.0	1095.0	1100.0		1089.0	1108.0
2021/04/12	16:58	1104.0	1107.0	1099.0	1106.5	1101.5	1118.0	1101.0	1105.5	1110.0		1099.0	1118.0
2021/04/12	17:00	1114.0	1117.0	1109.0	1117.0	1111.0	1128.0	1111.0	1116.0	1120.0		1109.0	1128.0
2021/04/12	17:02	1123.0	1126.5	1119.0	1126.0	1120.0	1137.0	1120.5	1125.0	1129.0		1119.0	1137.0
2021/04/12	17:04	1131.0	1135.0	1128.0	1135.0	1129.0	1146.0	1130.0	1134.0	1138.0		1128.0	1146.0
2021/04/12	17:06	1140.0	1144.0	1137.0	1144.0	1138.0	1155.0	1139.0	1143.0	1147.0		1137.0	1155.0
2021/04/12	17:08	1149.0	1153.0	1146.0	1153.0	1146.0	1164.0	1148.0	1152.0	1156.0		1146.0	1164.0
2021/04/12	17:10	1158.0	1162.0	1155.0	1162.0	1155.0	1172.5	1157.0	1160.5	1164.5		1155.0	1172.5
2021/04/12	17:12	1166.0	1170.0	1163.0	1170.0	1163.0	1181.0	1165.0	1169.0	1172.5		1163.0	1181.0
2021/04/12	17:14	1173.0	1177.5	1171.0	1177.0	1170.0	1188.0	1173.0	1176.0	1180.0		1170.0	1188.0
2021/04/12	17:16	1181.0	1185.0	1179.0	1185.0	1177.5	1196.0	1181.0	1184.0	1188.0		1177.5	1196.0
2021/04/12	17:18	1187.5	1192.0	1186.0	1192.0	1184.0	1202.0	1188.0	1191.0	1195.0		1184.0	1202.0
2021/04/12	17:20	1195.0	1199.0	1193.0	1199.0	1191.0	1210.5	1195.0	1198.0	1202.0		1191.0	1210.5
2021/04/12	17:22	1201.0	1207.0	1200.0	1206.0	1198.0	1217.0	1202.0	1205.0	1209.5		1198.0	1217.0
2021/04/12	17:24	1209.0	1213.0	1208.0	1213.0	1204.0	1223.5	1210.0	1212.0	1216.0		1204.0	1223.5
2021/04/12	17:26	1215.0	1219.5	1214.0	1219.0	1211.0	1230.0	1217.0	1219.0	1222.0		1211.0	1230.0
2021/04/12	17:28	1220.0	1224.0	1220.0	1224.0	1216.0	1235.0	1222.0	1224.0	1227.5		1216.0	1235.0
2021/04/12	17:30	1223.0	1227.0	1224.0	1227.0	1218.0	1237.0	1225.0	1227.0	1230.0		1218.0	1237.0
2021/04/12	17:32	1224.0	1228.0	1226.0	1229.0	1220.0	1238.5	1227.0	1228.5	1232.0		1220.0	1238.5

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Date	Time	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	CH09	Remarks	Min °F	Max °F
2021/04/12	17:34	1226.0	1230.0	1229.0	1231.0	1221.5	1240.0	1230.0	1231.0	1234.0		1221.5	1240.0
2021/04/12	17:36	1229.0	1233.0	1232.0	1234.0	1225.0	1243.5	1233.0	1234.0	1237.0		1225.0	1243.5
2021/04/12	17:38	1233.0	1237.0	1235.0	1238.0	1229.0	1248.0	1237.0	1237.0	1241.0		1229.0	1248.0
2021/04/12	17:40	1236.0	1241.0	1239.0	1241.0	1232.0	1251.0	1240.0	1241.0	1244.0		1232.0	1251.0
2021/04/12	17:42	1240.0	1244.0	1242.0	1245.0	1235.0	1254.0	1244.0	1244.0	1248.0		1235.0	1254.0
2021/04/12	17:44	1243.0	1248.0	1245.5	1248.0	1238.5	1258.0	1247.0	1248.0	1251.0		1238.5	1258.0
2021/04/12	17:46	1246.0	1250.5	1248.5	1251.0	1241.5	1261.0	1250.0	1251.0	1254.0	Stabilize	1241.5	1261.0
2021/04/12	17:48	1248.0	1253.0	1251.0	1253.0	1243.0	1263.0	1253.0	1253.0	1256.0		1243.0	1263.0
2021/04/12	17:50	1249.0	1253.0	1253.0	1254.0	1244.0	1263.0	1253.0	1254.0	1256.5		1244.0	1263.0
2021/04/12	17:52	1248.0	1253.0	1253.0	1253.0	1243.0	1262.0	1251.0	1254.0	1256.0		1243.0	1262.0
2021/04/12	17:54	1248.0	1252.0	1253.0	1253.0	1242.5	1262.0	1252.0	1253.0	1256.0		1242.5	1262.0
2021/04/12	17:56	1247.0	1252.0	1253.0	1253.0	1242.0	1261.0	1253.0	1253.0	1255.0		1242.0	1261.0
2021/04/12	17:58	1248.0	1252.0	1253.0	1253.0	1242.5	1261.5	1253.0	1254.0	1256.0		1242.5	1261.5
2021/04/12	18:00	1248.0	1252.0	1253.0	1253.0	1243.0	1262.0	1254.0	1254.0	1256.0		1243.0	1262.0
2021/04/12	18:02	1248.0	1252.0	1253.0	1253.0	1243.0	1262.0	1255.0	1254.0	1256.0		1243.0	1262.0
2021/04/12	18:04	1248.0	1252.0	1253.0	1253.0	1242.0	1261.0	1255.0	1254.0	1256.0		1242.0	1261.0
2021/04/12	18:06	1248.0	1252.0	1253.0	1253.0	1242.0	1261.0	1255.0	1254.0	1256.0		1242.0	1261.0
2021/04/12	18:08	1248.0	1252.0	1253.0	1253.0	1242.0	1261.5	1255.0	1254.0	1256.0		1242.0	1261.5
2021/04/12	18:10	1248.0	1252.0	1253.0	1253.0	1242.0	1261.0	1255.0	1254.0	1256.0		1242.0	1261.0
2021/04/12	18:12	1248.0	1252.0	1253.0	1253.0	1242.0	1261.0	1255.0	1254.0	1256.0		1242.0	1261.0
2021/04/12	18:14	1248.0	1252.5	1253.0	1253.0	1243.0	1262.0	1255.0	1254.0	1256.0		1243.0	1262.0
2021/04/12	18:16	1248.0	1252.0	1253.0	1253.0	1242.0	1262.0	1255.0	1254.0	1256.0		1242.0	1262.0
2021/04/12	18:18	1248.0	1252.0	1253.0	1253.0	1242.0	1261.0	1255.0	1254.0	1256.0		1242.0	1261.0
2021/04/12	18:20	1248.0	1252.0	1253.0	1253.0	1242.0	1261.0	1255.0	1254.0	1256.0		1242.0	1261.0
2021/04/12	18:22	1248.0	1253.0	1253.0	1253.0	1243.0	1262.0	1255.0	1254.0	1256.0		1243.0	1262.0
2021/04/12	18:24	1248.0	1253.0	1253.0	1253.0	1243.0	1262.0	1255.0	1254.0	1256.0		1243.0	1262.0
2021/04/12	18:26	1248.0	1252.0	1253.0	1253.0	1242.0	1262.0	1255.0	1254.0	1256.0		1242.0	1262.0
2021/04/12	18:28	1248.0	1252.0	1253.0	1253.0	1242.0	1261.5	1255.0	1254.0	1256.0		1242.0	1261.5
2021/04/12	18:30	**1248.0**	**1252.0**	**1253.0**	**1253.0**	**1242.0**	**1261.5**	**1255.0**	**1254.0**	**1256.0**	Start Window	1242.0	1261.5
2021/04/12	18:32	**1248.0**	**1252.0**	**1253.0**	**1253.0**	**1242.0**	**1262.0**	**1255.0**	**1254.0**	**1256.0**		1242.0	1262.0
2021/04/12	18:34	**1248.0**	**1252.0**	**1253.0**	**1253.0**	**1242.0**	**1262.0**	**1255.0**	**1255.0**	**1256.0**		1242.0	1262.0
2021/04/12	18:36	**1247.0**	**1252.5**	**1253.0**	**1253.0**	**1242.0**	**1262.0**	**1255.0**	**1255.0**	**1256.0**		1242.0	1262.0
2021/04/12	18:38	**1247.0**	**1252.0**	**1253.0**	**1253.0**	**1242.0**	**1262.0**	**1255.0**	**1254.0**	**1256.0**		1242.0	1262.0
2021/04/12	18:40	**1247.5**	**1252.0**	**1253.0**	**1253.0**	**1242.0**	**1262.0**	**1255.0**	**1255.0**	**1256.0**		1242.0	1262.0
2021/04/12	18:42	**1248.0**	**1253.0**	**1253.0**	**1253.0**	**1243.0**	**1262.0**	**1255.0**	**1255.0**	**1256.0**		1243.0	1262.0
2021/04/12	18:44	**1248.0**	**1253.0**	**1253.0**	**1253.0**	**1242.5**	**1262.0**	**1255.0**	**1255.0**	**1256.0**		1242.5	1262.0
2021/04/12	18:46	**1248.0**	**1252.0**	**1253.0**	**1253.0**	**1242.0**	**1262.0**	**1255.0**	**1255.0**	**1256.0**		1242.0	1262.0
2021/04/12	18:48	**1248.0**	**1252.5**	**1253.0**	**1253.0**	**1242.0**	**1262.0**	**1255.0**	**1255.0**	**1256.0**		1242.0	1262.0
2021/04/12	18:50	**1247.0**	**1252.0**	**1253.0**	**1253.0**	**1242.0**	**1262.0**	**1255.0**	**1255.0**	**1256.0**		1242.0	1262.0
2021/04/12	18:52	**1248.0**	**1252.0**	**1253.0**	**1253.0**	**1242.0**	**1262.0**	**1255.0**	**1255.0**	**1256.0**		1242.0	1262.0
2021/04/12	18:54	**1248.0**	**1253.0**	**1253.0**	**1253.0**	**1242.0**	**1262.0**	**1255.0**	**1255.0**	**1256.0**		1242.0	1262.0
2021/04/12	18:56	**1248.0**	**1252.5**	**1253.0**	**1253.0**	**1242.0**	**1262.0**	**1255.0**	**1255.0**	**1256.0**		1242.0	1262.0
2021/04/12	18:58	**1248.0**	**1253.0**	**1253.0**	**1253.0**	**1242.0**	**1262.0**	**1255.0**	**1255.0**	**1256.0**		1242.0	1262.0
2021/04/12	19:00	**1248.0**	**1253.0**	**1253.0**	**1253.0**	**1242.0**	**1262.0**	**1255.0**	**1255.0**	**1256.0**	Stop Window	1242.0	1262.0

	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	CH09			
										Maximum Set Point Overshoot	8.00	Pass
Minimum Deviation During Soak	-8.00	-3.00	-2.00	-2.00	-13.00	6.50	0.00	-1.00	1.00	Minimum Deviation	-13.00	Pass
Maximum Deviation During Soak	-7.00	-2.00	-2.00	-2.00	-12.00	7.00	0.00	0.00	1.00	Maximum Deviation	7.00	Pass

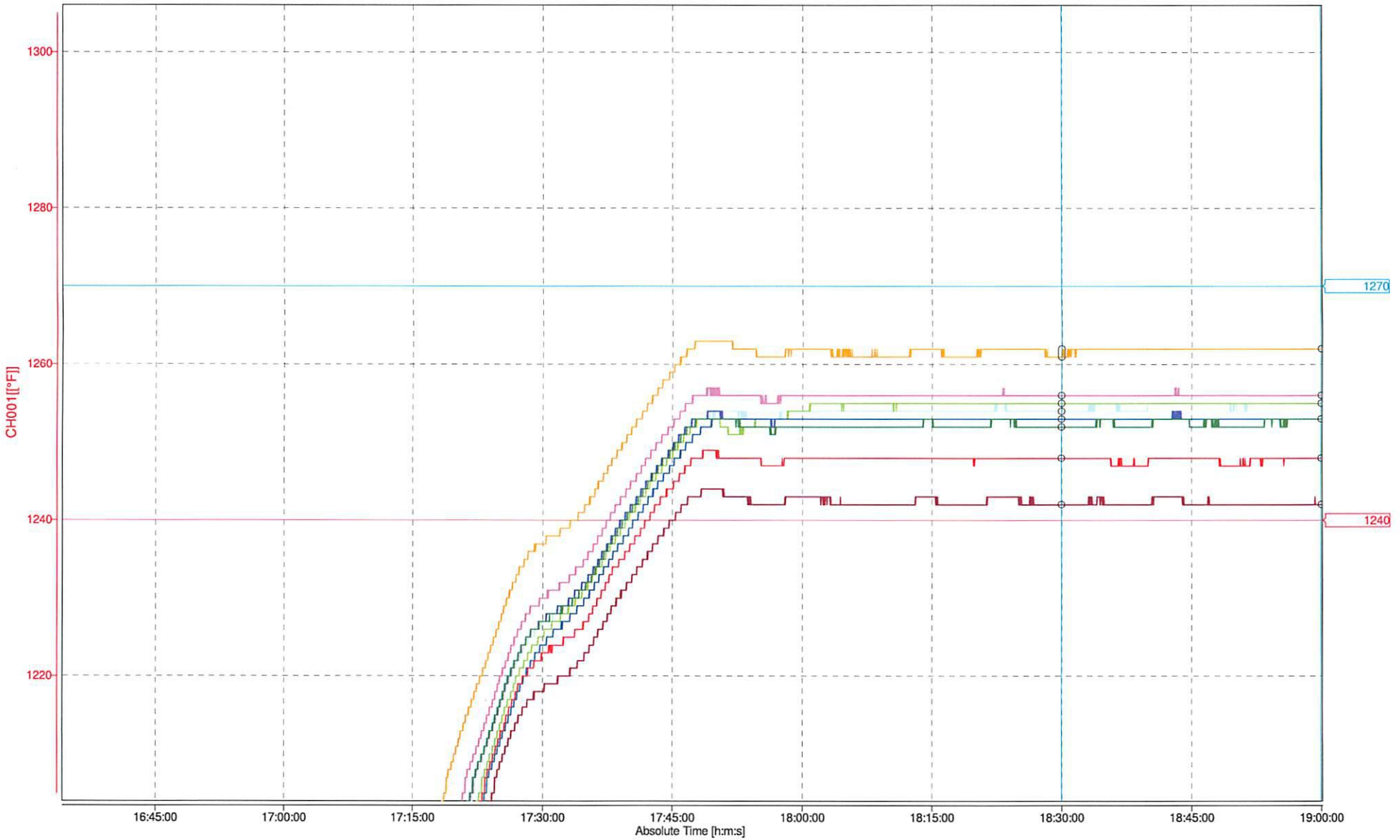
Remarks:

Low Value. 1242.0 T/C 5 High Value. 1262.0 T/C 6

File Message

File Name	: 014591_20210412D.DAD,...,014605_20210412D.DAD	Data Count	: 4378
Device Type	: DX1000	Sampling Interval	: 2.000 sec
Serial No.	: S5K908806	Start Time	: 2021/04/12 16:34:10.000
Meas Ch.	: 9	Stop Time	: 2021/04/12 19:00:04.000

Printed Group : GROUP 1
Printed Range : 2021/04/12 16:34:10.000 - 2021/04/12 19:00:04.000
Comment : Target Temperature 1255 °F | Scale 1205 °F - 1355 °F | Window 18:30 - 19:00 marked | Pass



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ACCREDITED
CERTIFICATE #1354.01
Calibration Lab

CERTIFICATE OF CALIBRATION

Customer
Name:
Address:
City:
State:
Zip Code:

Report Number: JD210412-3
Calibration Interval: 3 Months
Calibration Date: 4/12/2021
Due Date: 7/12/2021

Procedure: See Data Page
Calibration Site: Customer
Temperature (°F): (56.6 to 80.5)
Humidity (%): (19.6 to 36.5)

Standards Used

ID NUMBER	MANUFACTURER	MODEL	DESCRIPTION	DUE DATE
AI2097	Extech	445590	Temperature/Humidity Pen	1/27/2022
AI1077	Martel	MC1010	Temperature Calibrator	5/12/2021

Calibration Comments

Calibration Method: AMS2750F Three Point
Tolerance: +/- (2 °F or 0.2% of reading whichever is greater)
SAT Method: AMS2750F Three Point
Tolerance: See SAE AMS2750F Table 7

The test results reported raw data that does not take into consideration associated uncertainties of measurement. The uncertainty of measurement as stated was calculated using the expanded uncertainty at the 95% confidence level with a coverage factor of k=2. This certifies that all calibration standards are traceable to NIST. Where available and test results were preformed in accordance with ISO/IEC 17025:2017. Items found "Out of Calibration" and subject to re-calibration are reported on the attached Recalibration Report.

Calibration performed by: Jerry Diehl

Customer Approval: _____

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Report Number: JD210412-3

Application	Asset #	Mfg	Model	S/N or Comment	Sensor Type	Unit	Bias	Input 1	Input 2	Input 3	Read 1 or Compare (Calibrator)	Read 2 or Compare (Control)	Read 3	Tolerance 1	Tolerance 2	Tolerance 3	IN OUT	Condition of Item
Calibration Procedure: AIC 101A																		
Heat Treat 158																		
Control	B1TC-CON	Euro	3504		K	°F	0	300	750	1255	299.4	749.7	1254.9	2.00	2.00	2.51	IN	As Found / Left
								Sensitivity: PASS				Unc (300+0.6 +/- 0.7) , (750+0.3 +/- 1.7) , (1255+0.1 +/- 2.9) °F						
Hi Limit	B1TC-HI	HW	DC2500		K	°F	0	300	750	1255	299.5	749.6	1255	2.00	2.00	2.51	IN	As Found / Left
								Sensitivity: PASS				Unc (300+0.5 +/- 6.9) , (750+0.4 +/- 6.9) , (1255+0 +/- 7) °F						
Recorder IN1	A1TC-CON	HW	Qxe		K	°F	0	300	750	1255	298.9	748.9	1253.9	2.00	2.00	2.51	IN	As Found / Left
								Sensitivity: PASS				Unc (300+1.1 +/- 2.8) , (750+1.1 +/- 2.8) , (1255+1.1 +/- 2.8) °F						
Recorder IN2	TC-LOW				K	°F	0	300	750	1255	300.9	750.8	1255.8	2.00	2.00	2.51	IN	As Found / Left
								Sensitivity: PASS				Unc (300-0.9 +/- 2.8) , (750-0.8 +/- 2.8) , (1255-0.8 +/- 2.8) °F						
Recorder IN3	A1TC-HI				K	°F	0	300	750	1255	300.7	750.6	1255.7	2.00	2.00	2.51	IN	As Found / Left
								Sensitivity: PASS				Unc (300-0.7 +/- 2.8) , (750-0.6 +/- 2.8) , (1255-0.7 +/- 2.8) °F						
Recorder IN4	Load				K	°F	0	300	750	1255	299.9	749.8	1254.8	2.00	2.00	2.51	IN	As Found / Left
								Sensitivity: PASS				Unc (300+0.1 +/- 2.8) , (750+0.2 +/- 2.8) , (1255+0.2 +/- 2.8) °F						

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Report Number: JD210412-3

Calibration Procedure: AIC 117

Application Set Point / Time	Class	Control Reading	Control Instrument Calibration	Control T/C Calibration	Control Bias	Corrected Control Reading	Test Instrument Reading	Test T/C Correction	Test Instrument Correction	True Test Temperature	SAT Difference	Tolerance °F	IN OUT	Condition of Item
Heat Treat 158		**Control Sensor Type K Report No. 88487**					**SAT Sensor Type N Report No. 93527**							
Set Point #1														
Control	2	300	0.6	-0.4	0	300.1	299.0	0.7	0.0	299.7	0.4	3.0	IN	As Found / As Left
11:40														Unc: 0.4 +/- 1) °F
Hi Limit	2	307	0.5	-0.4	0	306.8	306.3	0.7	0.0	307.0	-0.2	3.0	IN	As Found / As Left
														Unc: (-0.2 +/- 1) °F
Recorder IN1	2	300	1.1	-0.4	0	300.7	299.0	0.7	0.0	299.7	1.0	3.0	IN	As Found / As Left
														Unc: (1 +/- 1) °F
Recorder IN2	2	300	-0.9	-0.4	0	298.4	297.1	0.7	0.0	297.8	0.6	3.0	IN	As Found / As Left
														Unc: (0.6 +/- 1) °F
Recorder IN3	2	307	-0.7	-0.4	0	305.6	306.3	0.7	0.0	307.0	-1.4	3.0	IN	As Found / As Left
														Unc: (-1.4 +/- 1) °F
Set Point #2														
Control	2	500	0.3	0.2	0	500.6	499.4	1.2	-0.1	500.5	0.2	3.0	IN	As Found / As Left
13:55														Unc: (0.2 +/- 1) °F
Hi Limit	2	511	0.4	0.2	0	511.4	511.0	1.2	-0.1	512.1	-0.6	3.0	IN	As Found / As Left
														Unc: (-0.6 +/- 1) °F
Recorder IN1	2	500	1.1	0.2	0	501.0	499.3	1.2	-0.1	500.4	0.7	3.0	IN	As Found / As Left
														Unc: (0.7 +/- 1) °F
Recorder IN2	2	498	-0.8	0.2	0	496.9	495.4	1.2	-0.1	496.5	0.5	3.0	IN	As Found / As Left
														Unc: (0.5 +/- 1) °F
Recorder IN3	2	512	-0.6	0.2	0	511.3	511.0	1.2	-0.1	512.1	-0.7	3.0	IN	As Found / As Left
														Unc: (-0.7 +/- 1) °F

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Report Number: JD210412-3

Calibration Procedure: AIC 117

Application Set Point / Time	Class	Control Reading	Control Instrument Calibration	Control T/C Calibration	Control Bias	Corrected Control Reading	Test Instrument Reading	Test T/C Correction	Test Instrument Correction	True Test Temperature	SAT Difference	Tolerance °F	IN OUT	Condition of Item
Heat Treat 158		**Control Sensor Type K Report No. 88487**					**SAT Sensor Type N Report No. 93527**							
Set Point #3														
Control	3	1000	0.3	-1.4	0	999.1	998.4	1.0	0.0	999.4	-0.3	4.0	IN	As Found / As Left
16:25														Unc: (-0.3 +/- 1) °F
Hi Limit	3	1010	0.4	-1.4	0	1009.0	1010.0	1.0	0.0	1011.0	-2.0	4.0	IN	As Found / As Left
														Unc: (-2 +/- 1) °F
Recorder IN1	3	1000	1.1	-1.4	0	999.7	998.4	1.0	0.0	999.4	0.3	4.0	IN	As Found / As Left
														Unc: (0.3 +/- 1) °F
Recorder IN2	3	999	-0.8	-1.4	0	996.5	995.1	1.0	0.0	996.1	0.4	4.0	IN	As Found / As Left
														Unc: (0.4 +/- 1) °F
Recorder IN3	3	1012	-0.6	-1.4	0	1010.1	1010.1	1.0	0.0	1011.1	-1.0	4.0	IN	As Found / As Left
														Unc: (-1 +/- 1) °F
Set Point #4														
Control	3	1255	0.1	-1.9	0	1253.2	1252.9	0.5	-0.1	1253.3	-0.1	5.0	IN	As Found / As Left
18:55														Unc: (-0.1 +/- 1) °F
Hi Limit	3	1258	0.0	-1.9	0	1256.3	1258.2	0.5	-0.1	1258.6	-2.3	5.0	IN	As Found / As Left
														Unc: (-2.3 +/- 1) °F
Recorder IN1	3	1255	1.1	-1.9	0	1253.9	1252.9	0.5	-0.1	1253.3	0.6	5.0	IN	As Found / As Left
														Unc: (0.6 +/- 1) °F
Recorder IN2	3	1255	-0.8	-1.9	0	1251.8	1252.7	0.5	-0.1	1253.1	-1.3	5.0	IN	As Found / As Left
														Unc: (-1.3 +/- 1) °F
Recorder IN3	3	1259	-0.7	-1.9	0	1256.6	1258.2	0.5	-0.1	1258.6	-2.0	5.0	IN	As Found / As Left
														Unc: (-2 +/- 1) °F

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Report Number: JD210412-3

Parts Left or Installed					
Part Number	Description	Qty	Equipment	Asset No.	Remarks

Condition of Test Item Key	
Adjustments	A
Could not locate	CNL
Inoperative battery	IB
Locked out	LO
Not in use	NU
Received inoperative	RI
Received out of tolerance	RO
Returned within manufacturer specification	RTM

Technician Notes

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