



ILLIANA INSTRUMENTATION

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CERTIFICATE OF CALIBRATION

<p align="center">CUSTOMER:</p> <p>Illiana Instrumentation Service 1831 Govert Drive Schererville, IN 46375</p>	<p align="center">MISCELLANEOUS DETAILS:</p> <p>Date Received 5/6/18 Certification Date: 5/6/18 Recalibration Date: 8/4/18 Cal. Number: 1228-050618 P.O. Number: Location of Calibration: Lab Detailed Results Attached: YES Procedure Used: Fluke Procedure</p>
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EQUIPMENT CALIBRATED	
MANUFACTURER:	Fluke
MODEL:	744
SERIAL NUMBER:	7607012
ITEM NUMBER:	1228
DESCRIPTION:	Calibrator
CONDITION AS FOUND:	In tolerance

STANDARDS USED
Item 1546 Fluke 525B; Item 1205 HP34401A

TEST CONDITIONS	
TEMPERATURE	75 Deg F.
HUMIDITY	35% rH

CERTIFIED BY: Paul Droll TITLE: ISA CCST DATE 5/6/18

APPROVED BY: Laura Goble TITLE: Deputy Quality Mgr. DATE 5/6/18

This certifies that the above equipment was calibrated using appropriate Illiana Instrumentation technical procedures. At planned intervals, Illiana Instrumentation standards are calibrated by comparison to or measurement against standards which are traceable to the SI units through the NIST or other recognized national measurement institutes or international standard bodies. The results in this report relate only to the item(s) calibrated. If so indicated above, detailed calibration results are attached to this certificate. These results are part of this certificate and this certificate shall not be reproduced except in full, without the written approval of Illiana Instrumentation. Any number of factors not under the control of the calibration laboratory may cause the calibration of the above item(s) to drift before the recommended recalibration date. Supporting documentation relative to traceability and technical procedures used is on file and is available for examination upon request and approval of our quality assurance manager. The above uncertainties represent an expanded uncertainty expressed at approximately 95% confidence level using a coverage factor of k=2.

Item calibrated	Item 1228 Fluke model 744									
Accuracy	Varies By Range, see upper and lower tolerance for details									
Standard used	1546 and 1205									
Cal Date	05/06/18									
Intentional Offset at Found	None									
Intentional Offset at Left	None									
Limitations	None									
Input range	Eng. Units	Cal Pt	Upper	lower	Initial	Final	Sensitivity	STD	Unc.	
							Check			
Measure K	C	-180	-179.4	-180.6	-180	-180	OK	1546	0.19	
Measure K	C	0	0.5	-0.5	0	0	OK	1546	0.19	
Measure K	C	400	400.6	399.4	400.1	400.1	OK	1546	0.19	
Measure K	C	800	800.7	799.3	799.9	799.9	OK	1546	0.19	
Measure K	C	1000	1001	999	1000	1000	OK	1546	0.19	
Measure K	C	1300	1300.9	1299.1	1300	1300	OK	1546	0.19	
Simulate K	C	-180	-179.4	-180.6	-179.8	-179.8	OK	1546	0.16	
Simulate K	C	0	0.6	-0.6	0.03	0.03	OK	1546	0.16	
Simulate K	C	400	400.6	399.4	400.1	400.1	OK	1546	0.16	
Simulate K	C	800	800.8	799.2	800.1	800.1	OK	1546	0.16	
Simulate K	C	1000	1001	999	1000	1000	OK	1546	0.16	
Simulate K	C	1300	1301.3	1298.7	1300.1	1300.1	OK	1546	0.16	
Measure J	C	-210	-209.4	-210.6	-210.2	-210.2	OK	1546	0.17	
Measure J	C	0	0.6	-0.6	-0.1	-0.1	OK	1546	0.17	
Measure J	C	300	300.6	299.4	300	300	OK	1546	0.17	
Measure J	C	600	600.6	599.4	599.9	599.9	OK	1546	0.17	
Measure J	C	900	900.9	899.1	899.8	899.8	OK	1546	0.17	
Measure J	C	1200	1201.2	1198.8	1199.9	1199.9	OK	1546	0.17	
Simulate J	C	-210	-209.4	-210.6	-209.8	-209.8	OK	1546	0.13	
Simulate J	C	0	0.6	-0.6	0.1	0.1	OK	1546	0.13	
Simulate J	C	300	300.6	299.4	300.1	300.1	OK	1546	0.13	
Simulate J	C	600	600.6	599.4	600.1	600.1	OK	1546	0.13	
Simulate J	C	900	900.9	899.1	900	900	OK	1546	0.13	
Simulate J	C	1200	1201.2	1198.8	1200.1	1200.1	OK	1546	0.13	
Measure S	C	0	0.6	-0.6	0.1	0.1	OK	1546	0.67	
Measure S	C	400	400.6	399.4	399.9	399.9	OK	1546	0.58	
Measure S	C	800	800.8	799.2	800	800	OK	1546	0.58	
Measure S	C	1200	1201.2	1198.8	1200	1200	OK	1546	0.58	
Measure S	C	1600	1601.6	1598.4	1600	1600	OK	1546	0.58	
Measure S	C	1767	1768.8	1765.2	1766.8	1766.8	OK	1546	0.58	
Simulate S	C	0	0.6	-0.6	0	0	OK	1546	0.66	
Simulate S	C	400	400.6	399.4	400.1	400.1	OK	1546	0.55	
Simulate S	C	800	800.8	799.2	800.1	800.1	OK	1546	0.55	
Simulate S	C	1200	1201	1198.8	1200.2	1200.2	OK	1546	0.55	
Simulate S	C	1600	1601.6	1598.4	1600.2	1600.2	OK	1546	0.55	
Simulate S	C	1767	1768.8	1765.2	1768.2	1768.2	OK	1546	0.55	
Measure N	C	-100	-99.4	-100.6	-100.4	-100.4	OK	1546	0.2	
Measure N	C	0	0.6	-0.6	-0.3	-0.3	OK	1546	0.2	
Measure N	C	300	300.6	299.4	299.7	299.7	OK	1546	0.2	
Measure N	C	600	600.6	599.4	599.8	599.8	OK	1546	0.2	
Measure N	C	900	900.9	899.1	899.8	899.8	OK	1546	0.2	
Measure N	C	1300	1301.3	1298.7	1299.7	1299.7	OK	1546	0.2	
Source N	C	-100	-99.4	-100.6	-99.6	-99.6	OK	1546	0.18	
Source N	C	0	0.6	-0.6	0.3	0.3	OK	1546	0.18	
Source N	C	300	300.6	299.4	300.2	300.2	OK	1546	0.18	
Source N	C	600	600.6	599.4	600.2	600.2	OK	1546	0.18	

Input range	Eng. Units	Cal Pt	Upper	lower	Initial	Final	Sensitivity	STD	Unc.
							Check		
Source N	C	900	900.9	899.1	900.2	900.2	OK	1546	0.18
Source N	C	1300	1301.3	1298.7	1300.3	1300.3	OK	1546	0.18
Measure T	C	-200	-199.4	-200.6	-199.7	-199.7	OK	1546	0.74
Measure T	C	0	0.6	-0.6	0.1	0.1	OK	1546	0.73
Measure T	C	100	100.6	99.4	100	100	OK	1546	0.73
Measure T	C	200	200.6	199.4	200	200	OK	1546	0.73
Measure T	C	300	300.6	299.4	300	300	OK	1546	0.73
Measure T	C	400	400.6	399.6	400	400	OK	1546	0.73
Source T	C	-200	-199.4	-200.6	-200.3	-200.3	OK	1546	0.73
Source T	C	0	0.6	-0.6	-0.1	-0.1	OK	1546	0.33
Source T	C	100	100.6	99.4	99.9	99.9	OK	1546	0.33
Source T	C	200	200.6	199.4	199.9	199.9	OK	1546	0.33
Source T	C	300	300.6	299.4	300	300	OK	1546	0.33
Source T	C	400	400.6	399.6	400	400	OK	1546	0.33
Meas mVDC 0n 110 mv range	mDVC	0	0.017	-0.017	0.004	0.004	OK	1546	0.0033
		100	100.042	99.959	100.005	100.005	OK	1546	0.0033
		-100	-99.959	-100.042	-100.003	-100.003	OK	1546	0.0033
Meas VDC on 1.1 VDC range	VDC	0	0.00006	-0.00006	0	0	OK	1546	0.000033
		1	1.00031	0.9997	1.000005	1.000005	OK	1546	0.00045
Meas VDC on 11 VDC range	VDC	0	0.0006	-0.0006	0	0	OK	1546	0.000033
		10	10.0031	9.997	10.0007	10.0007	OK	1546	0.005
Meas mADC 30 mA range	mADC	4	4.0037	3.9963	4	4	OK	1546	0.0016
		20	20.0053	19.9947	19.998	19.998	OK	1546	0.0016
Resistance Measure 11 Ohm Range	Ohms	0	0.05	-0.05	0.02	0.02	OK	1546	0.042
11 ohm range	Ohms	10	10.055	9.945	10.021	10.021	OK	1546	0.025
110 Ohm range	Ohms	0	0.05	-0.05	0	0	OK	1546	0.042
110 Ohm range	Ohms	100	100.1	99.9	100.02	100.02	OK	1546	0.025
1100 Ohm range	Ohms	0	0.5	-0.5	0	0	OK	1546	0.042
1100 Ohm range	Ohms	1000	1001	999	1000	1000	OK	1546	0.34
Source mVDC	mVDC	100	100.0155	99.9845	100.004	100.004	OK	1205	0.01
	mVDC	120	120.067	119.933	120	120	OK	1205	0.062
		1000	1000.155	999.845	1000.03	1000.03	OK	1205	0.53
		14000	14002.15	13997.85	13999	13999	OK	1205	5.8
Source mADC	mADC	2	2.0035	1.9965	2.0002	2.0002	OK	1205	0.01
		4	4.0037	3.9963	4.0002	4.0002	OK	1205	0.01
		22	22.0055	21.9945	22.003	22.003	OK	1205	0.012
Resistanace source 11 Ohm range	Ohms	0.1	0.12	0.08	0.1	0.1	OK	1546	0.02
11 Ohm range	Ohms	1	1.0201	0.9799	1	1	OK	1546	0.02
11 ohm range	Ohms	10	10.021	9.979	10.002	10.002	OK	1546	0.02
110 ohm range	Ohms	20	20.042	19.958	19.999	19.999	OK	1546	0.02
110 ohm range	Ohms	100	100.05	99.95	99.996	99.996	OK	1546	0.02
1100 ohm range	Ohms	200	200.54	199.46	199.97	199.97	OK	1546	0.11
1100 ohm range	Ohms	1000	1000.7	999.3	999.9	999.9	OK	1546	0.11
11 kohm range	kohms	2	2.0056	1.9944	1.9999	1.9999	OK	1546	1.1
RTD meas. plt 100 (385) (27.096 Ohms)	Deg C	-180	-179.7	-180.3	-180	-180	OK	1546	0.63
4 wire 138.505 Ohms		100	100.5	99.5	99.9	99.9	OK	1546	0.049
RTD source plt 100 (385) 138.505 ohms at 100 degrees C	Deg C	100	100.5	99.5	99.998	99.998	OK	1546	0.049