ACCREDITED
Calibration Laboratory
CERT#2230.01

ILLIANA INSTRUMENTATION

1831 Govert Drive Schererville, IN 46375 Phone (219)227-8788 Fax (219)515-6161

CERTIFICATE OF CALIBRATION

CUSTOMER:	MISCELLANEOUS DETAILS:
Illiana Instrumentation Service 1831 Govert Drive Schererville, IN 46375	Date Received 10/12/18 Certification Date: 10/12/18 Recalibration Date: 1/12/19 Cal. Number: 1228-101218 P.O. Number: Location of Calibration: Lab Detailed Results Attached: YES Procedure Used: Fluke Procedure

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	71 Deg F.
HUMIDITY	50% rH

CERTIFIED BY: Paul Hrolla TITLE: ISA CCST III DATE 10/12/18

APPROVED BY: Laura Hrolla TITLE: Deputy Quality Manager DATE 10/12/18

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	10/12/18								
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	-0.1	-0.1	OK	1546	0.19
Measure K	C	400	400.6	399.4	399.9	399.9	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	999.8	999.8	OK	1546	0.19
Measure K	C	1300	1300.9	1299.1	1299.8	1299.8	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	0.1	0.1	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	800	OK	1546	0.16
Simulate K	C	1000	1001	999	1000.1	1000.1	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	-0.2	-0.2	OK	1546	0.17
Measure J	C	300	300.6	299.4	299.8	299.8	OK	1546	0.17
Measure J	C	600	600.6	599.4	599.8	599.8	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	-209.6	-209.6	OK	1546	0.13
Simulate J	C	0	0.6	-0.6	0.2	0.2	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	900.2	900.2	OK	1546	0.13
Simulate J	C	1200	1201.2	1198.8	1200.2	1200.2	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	400	400	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	1766.9	1766.9	OK	1546	0.58
Simulate S	C	0	0.6	-0.6	0.1	0.1	OK	1546	0.66
Simulate S	C	400	400.6	399.4	400	400	OK	1546	0.55
Simulate S	C	800	800.8	799.2	800	800	OK	1546	0.55
Simulate S	C	1200	1201	1198.8	1200.1	1200.1	OK	1546	0.55
Simulate S	C	1600	1601.6	1598.4	1600.1	1600.1	OK	1546	0.55
Simulate S	C	1767	1768.8	1765.2	1767	1767	OK	1546	0.55
Measure N	C	-100	-99.4	-100.6	-100.3	-100.3	OK	1546	0.2
Measure N	C	0	0.6	-0.6	-0.2	-0.2	OK	1546	0.2
Measure N	C	300	300.6	299.4	299.8	299.8	OK	1546	0.2
Measure N	C	600	600.6	599.4	599.9	599.9	OK	1546	0.2
Measure N	C	900	900.9	899.1	899.9	899.9	OK	1546	0.2
Measure N	C	1300	1301.3	1298.7	1299.9	1299.9	OK	1546	0.2
Source N	C	-100	-99.4	-100.6	-99.4	-99.4	OK	1546	0.18
Source N	C	0	0.6	-0.6	0.4	0.4	OK	1546	0.18
Source N	C	300	300.6	299.4	300.3	300.3	OK	1546	0.18
Source N	C	600	600.6	599.4	600.3	600.3	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	900.3	900.3	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	0.2	0.2	OK	1546	0.73
Measure T	C	100	100.6	99.4	99.8	99.8	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	-200.1	-200.1	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	100	100	OK	1546	0.33
Source T	C	200	200.6	199.4	200	200	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	-0.001	-0.001	OK	1546	0.0033
		100	100.042	99.959	100.006	100.006	OK	1546	0.0033
		-100	-99.959	-100.042	-99.97	-99.97	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	1.00005	1.00005	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	10.0006	10.0006	OK	1546	0.005
Meas mADC 30 mA range	mADC	4	4.0037	3.9963	3.999	3.999	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	0.004	0.004	OK	1546	0.042
11 ohm range	Ohms	10	10.055	9.945	10.05	10.05	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	100.05	100.05	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	100.012	100.012	OK	1205	0.01
	mVDC	120	120.067	119.933	120	120	OK	1205	0.062
		1000	1000.155	999.845	1000.04	1000.04	OK	1205	0.53
		14000	14002.15	13997.85	14000	14000	OK	1205	5.8
Source mADC	mADC	2	2.0035	1.9965	2.0001	2.0001	OK	1205	0.01
		4	4.0037	3.9963	4.0003	4.0003	OK	1205	0.01
		22	22.0055	21.9945	22.004	22.004	OK	1205	0.012
Resistanace source 11 Ohm range	Ohms	0.1	0.12	0.08	0.097	0.097	OK	1546	0.02
11 Ohm range	Ohms	1	1.0201	0.9799	0.997	0.997	OK	1546	0.02
11 ohm range	Ohms	10	10.021	9.979	9.999	9.999	OK	1546	0.02
110 ohm range	Ohms	20	20.042	19.958	19.996	19.996	OK	1546	0.02
110 ohm range	Ohms	100	100.05	99.95	100	100	OK	1546	0.02
1100 ohm range	Ohms	200	200.54	199.46	199.96	199.96	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	1.9998	1.9998	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	100	100	OK	1546	0.049
RTD source plt 100 (385) 138.505 ohms	Deg C	100	100.5	99.5	99.99	99.99	OK	1546	0.049
at 100 degrees C									