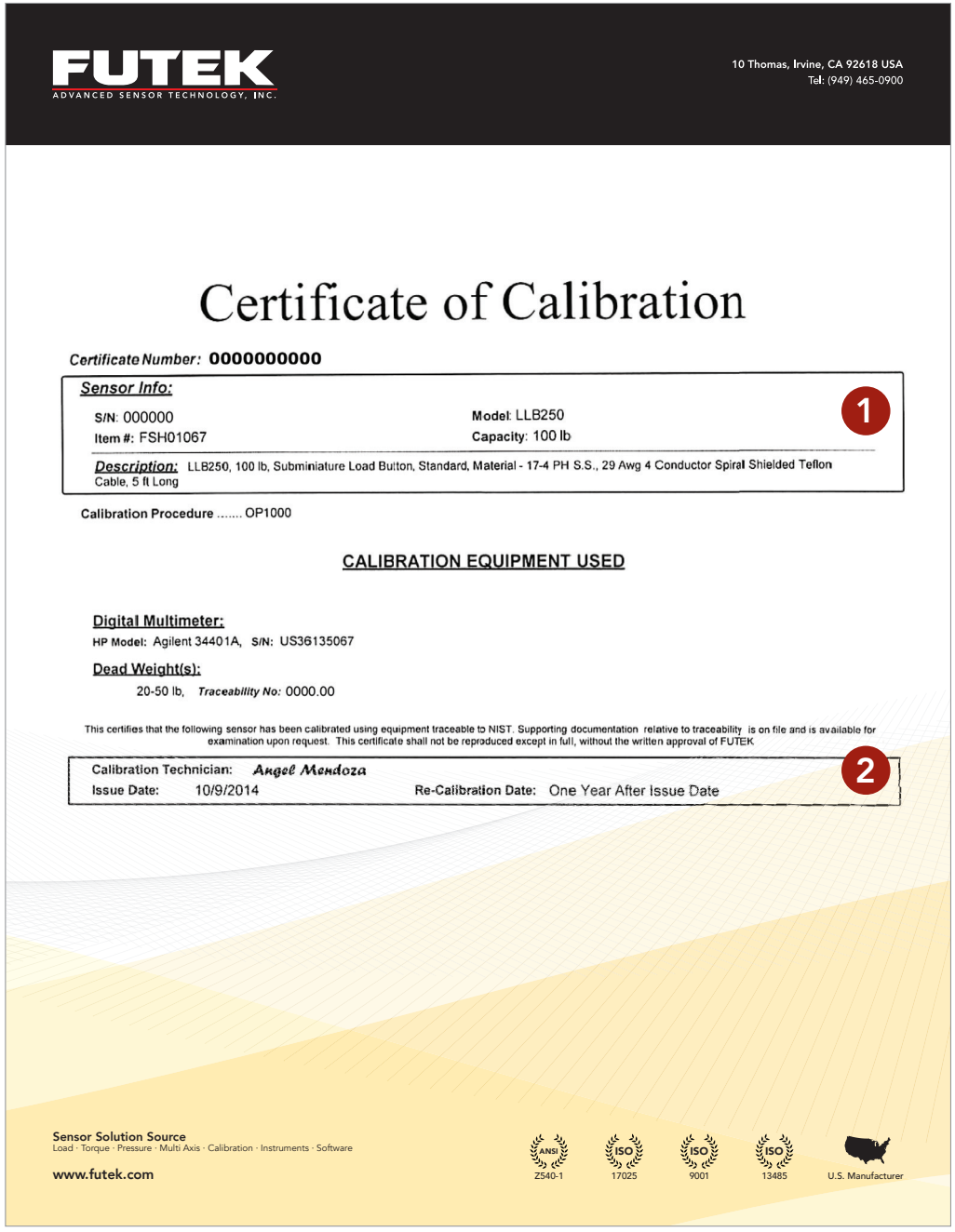
Reading Your Calibration Certificate



FUTEK
ADVANCED SENSOR TECHNOLOGY, INC.

10 Thomas, Irvine, CA 92618 USA
Tel: (949) 465-0900

Certificate of Calibration

Certificate Number: **0000000000**

Sensor Info:

S/N: 000000 — Model: LLB250
Item #: FSH01067 — Capacity: 100 lb

Description: LLB250, 100 lb, Subminiature Load Button, Standard, Material - 17-4 PH S.S., 29 Awg 4 Conductor Spiral Shielded Teflon Cable, 5 ft Long

1

Calibration Procedure OP1000

CALIBRATION EQUIPMENT USED

Digital Multimeter:
HP Model: Agilent 34401A, S/N: US36135067

Dead Weight(s):
20-50 lb, *Traceability No:* 0000.00

This certifies that the following sensor has been calibrated using equipment traceable to NIST. Supporting documentation relative to traceability is on file and is available for examination upon request. This certificate shall not be reproduced except in full, without the written approval of FUTEK

Calibration Technician: *Angel Mendoza*
Issue Date: 10/9/2014 — Re-Calibration Date: One Year After Issue Date

2

Sensor Solution Source
Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software
www.futek.com

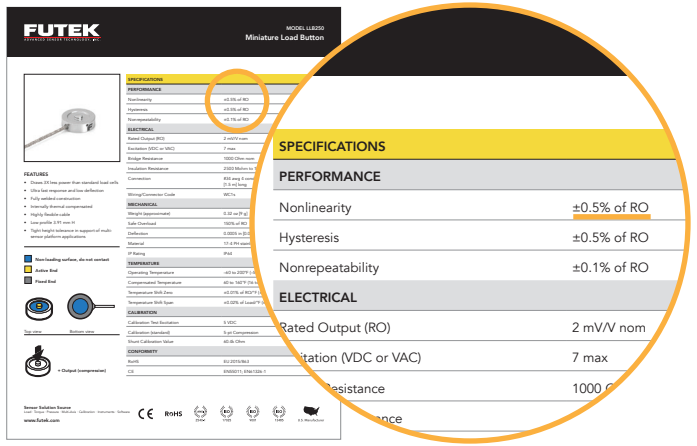
ANSI Z540-1 · ISO 17025 · ISO 9001 · ISO 13485 · U.S. Manufacturer

1 **Sensor information** is found here. If a system is calibrated then, instrument information paired with the sensor will be listed here as well.

2 FUTEK recommends a yearly recalibration.

Pass or Fail?

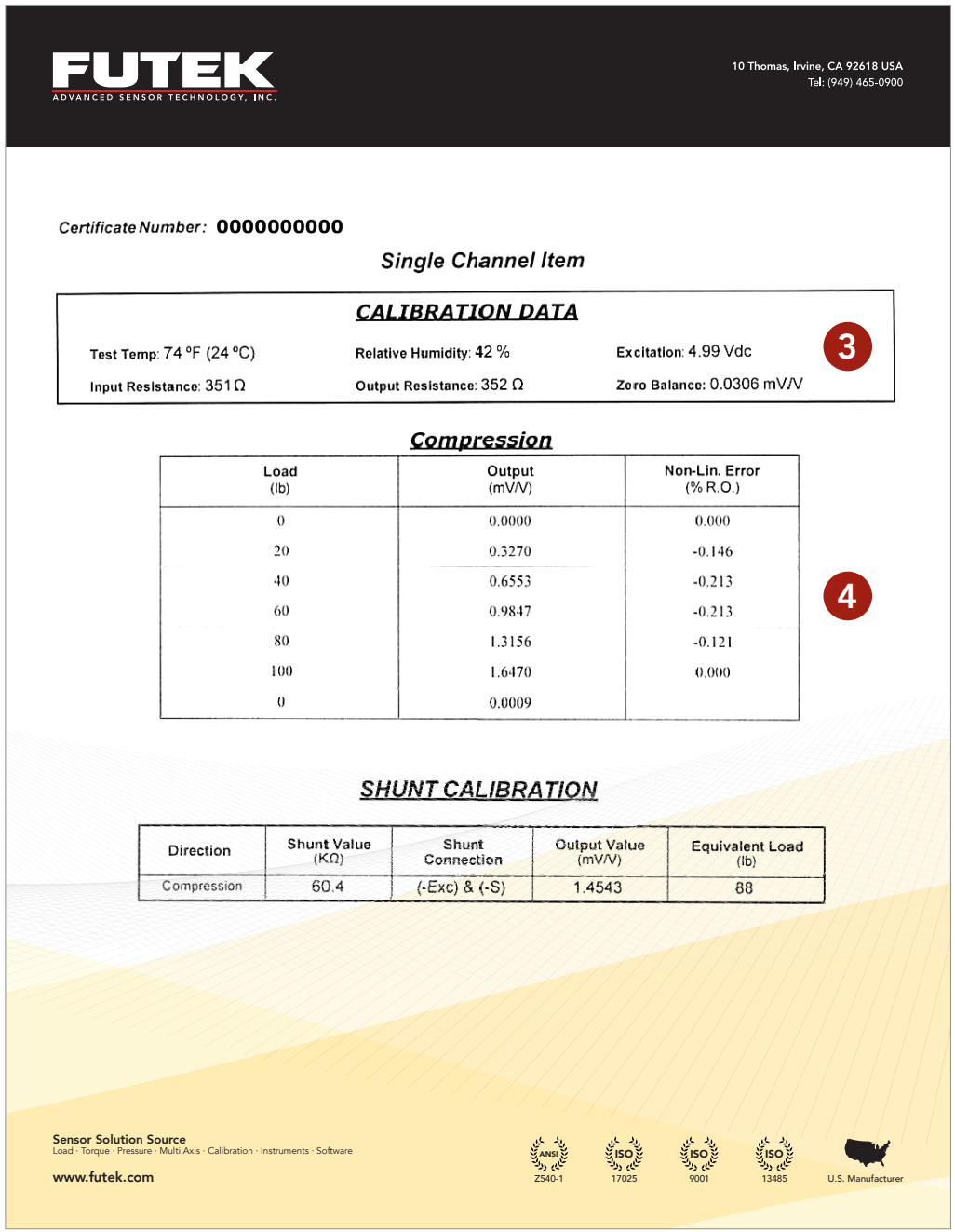
Sensors on their own are calibrated for nonlinearity and must meet the nonlinearity spec on the sensor specification sheet.



A sensor and digital instrument system calibration must meet a max system error of two times the sensor's nonlinearity spec.

A note is placed on the calibration certificate if the sensor or system does not pass recalibration.

Reading Your Calibration Certificate



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10 Thomas, Irvine, CA 92618 USA
Tel: (949) 465-0900

Certificate Number: **0000000000**

Single Channel Item

CALIBRATION DATA

Test Temp: 74 °F (24 °C)	Relative Humidity: 42 %	Excitation: 4.99 Vdc	3
Input Resistance: 351 Ω	Output Resistance: 352 Ω	Zero Balance: 0.0306 mV/V	

Compression

Load (lb)	Output (mV/V)	Non-Lin. Error (% R.O.)
0	0.0000	0.000
20	0.3270	-0.146
40	0.6553	-0.213
60	0.9847	-0.213
80	1.3156	-0.121
100	1.6470	0.000
0	0.0009	

4

SHUNT CALIBRATION

Direction	Shunt Value (KΩ)	Shunt Connection	Output Value (mV/V)	Equivalent Load (lb)
Compression	60.4	(-Exc) & (-S)	1.4543	88

Sensor Solution Source
Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software

www.futek.com

ANSI Z540-1 · ISO 17025 · ISO 9001 · ISO 13485 · U.S. Manufacturer

3 **Zero Balance** is the output of the sensor without any fixtures or loads. A Tare is performed before loads are placed on the sensor as indicated by the 0 reading under output.

4 **Nonlinearity** is the difference of the observed output under load from the expected output under load and is expressed as a percentage of the final calibration output, or Rated Output (R.O.). The difference represents how well the observed output falls on a straight predictable line from zero to the final loaded output.

A system calibration of a sensor and digital instrument will state the **Max System Error**. The Max System Error is the difference between the observed displayed value under load and the expected displayed load and is expressed as a percentage of the full calibration load (R.O.). The Max System Error must be within two times the sensor's nonlinearity spec as found on the sensor's spec sheet.

R.O. is Rated Output and is the sensor's fully loaded output or final load placed on the sensor.

As Found = As Left

During a recalibration, an as-found calibration is performed with items as received. If the as-found calibration meets specifications then no further actions are needed and the calibration is listed As Found = As Left.

If the as-found does not meet specifications then a note is placed and adjustments are made. After adjustments, another calibration is performed and will be listed As Left.

Reading Your Calibration Certificate

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Tel: (949) 465-0900

Certificate Number: **0000000000**

Single Channel Item

CALIBRATION DATA

Test Temp: 74 °F (24 °C)	**Relative Humidity:** 42 %	**Excitation:** 4.99 Vdc
Input Resistance: 351 Ω	**Output Resistance:** 352 Ω	**Zero Balance:** 0.0306 mV/V

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Load (lb)	Output (mV/V)	Non-Lin. Error (% R.O.)
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60	0.9847	-0.213
80	1.3156	-0.121
100	1.6470	0.000
0	0.0009	

SHUNT CALIBRATION 5

Direction	Shunt Value (KΩ)	Shunt Connection	Output Value (mV/V)	Equivalent Load (lb)
Compression	60.4	(-Exc) & (-S)	1.4543	88

Sensor Solution Source
Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software

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ANSI Z540-1 · ISO 17025 · ISO 9001 · ISO 13485 · U.S. Manufacturer

5 **Shunt Calibration** information is performed and provided to assist in sensor testing and instrument setup. The shunt is a simulated load through external resistance as is subject to sensor variables.