Certificate of System Calibration

ACCREDITED CALIBRATION
Certificate No. 2412.01

Certificate Number: **2005200029**

System Information

Sensor:

S/N: 123456 temNo: FSH04097 Model: LSB205 Capacity: 25 lb

Description: LSB205 , 25 lb , JR S-Beam Load Cell 2.0 , Overload Protection w/ Integrated TEDS IEEE1451.4 Recognition & Temperature Sensor , RoHS Compliant , Material - 17-4 PH S.S. , M3x0.5-Thread , 7 Pin Quick Disconnect "Break Away" Nano Receptacle

Instrument:

S/N: 123456 ItemNo: FSH03633 Model: IPM650

Description: IPM650 Pro , Intelligent Panel Mount , mV/V , VDC , Current Measurement , Analog Output , Alarm Relays , TEDS and USB Output

Calibration Settings: Capacity: 25.000 lb, Sensitivity (+): 1.9961 mV/V, Sensitivity (-): 1.9933 mV/V, Ch: 0 TEDS

Defaults Settings: Type: Strain Gauge, Excitation: 5.0 Vdc, InRange: 2 mV/V

Calibration Procedure: OP1000

Customer's Name: Company
Address:
State: City: Zip: Country:

Calibration Standards Used

S/N	Model	Traceability No.	Description
VARIOUS	Slotted type	2751931B	Test Weights Set, 1 -10 lbs, Class F
VARIOUS	Slotted DW	2736660A	Test Weights Set, 1- 10 lbs, Class F

This certifies that the following sensor has been calibrated using equipment traceable to NIST in accordance with ISO/IEC 17025:2005 & ANSI/NCSL Z540-1-1994.
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: *Efrain Delgado*

Issue Date: 5/20/2020

Calibration Date: 5/19/2020

Re-Calibration Interval: 1 year

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Channel Single

Calibration Data

Temperature: 75 °F (24 °C)	Relative Humidity: 44 %
Max System Error Tolerance: ±0.2 % R.O.	
AsFound Zero Offset: 0.001 lb	AsLeft Zero Offset: 0.004 lb

Tension

As Found = As Left	
• Max System Error: **-0.024** % R.O.	
Load (lb)	Output (lb)
0	0
5	4.995
10	9.994
15	14.994
20	19.999
25	25.000
0	0.006

Residual Standard Deviation: 0.00156751 lb   **Instrument Res:** 0.001 lb
ASTM Uncertainty: 0.003135 lb

* Error and Uncertainty were calculated using Straight Line Method in accordance with ASTM E-74, K = 2.0 or the maximum system instrument resolution, whichever larger.

Best-Fit, 2nd Degree Polynomial Equations (Load – x, Output – y):

$$y = A_0 + A_1 {}^* x^1 + A_2 {}^* x^2 + ... + A_n {}^* x^n \qquad x = B_0 + B_1 {}^* y^1 + B_2 {}^* y^2 + ... + B_n {}^* y^n$$

A0 = -0.00360088348381263   B0 = 0.00360490504190878
A1 = 0.999528756822846   B1 = 1.00047060826407
A2 = 2.57083347869336E-05   B2 = -2.56894506043409E-05

Best-fit polynomial coefficients are computed using the Method of Least Squares, in accordance with E-74 standard.

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

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ISO 9001:2008   U.S. Manufacturer

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Channel Single

Compression

As Found = As Left	
• Max System Error: **0.020** % R.O.	
Load (lb)	Output (lb)
0	0
5	-5.000
10	-10.001
15	-15.003
20	-20.004
25	-25.005
0	-0.003

Residual Standard Deviation: 0.00033821 lb   **Instrument Res:** 0.001 lb
ASTM Uncertainty: 0.001 lb

* Error and Uncertainty were calculated using Straight Line Method in accordance with ASTM E-74, K = 2.0 or the maximum system instrument resolution, whichever larger.

Best-Fit, 2nd Degree Polynomial Equations (Load – x, Output – y):

$$y = A_0 + A_1 * x^1 + A_2 * x^2 + ... + A_n * x^n \qquad x = B_0 + B_1 * y^1 + B_2 * y^2 + ... + B_n * y^n$$

A0 = 0.0018005371092448

B0 = 0.00179999694549454

A1 = -1.00034586497713

B1 = -0.999654248456515

A2 = 2.86374773229153E-06

B2 = 2.86171120596201E-06

Best-fit polynomial coefficients are computed using the Method of Least Squares, in accordance with E-74 standard.

Shunt Calibration Data

Shunt Value (KΩ)	Shunt Connection	Shunt Output (lb)
Internal	(-Exc) & (-S)	7.338