~ *Multi-Axis Load Cell Calibration Summary*~

Model Number: 260A31/FCS-DN

Customer:

Serial Number: 17448

P.O. Number:

Description: Charge® 3-Component Force Sensor

Manufacturer: PCB Piezotronics, Inc.

Method: Back to Back Comparison (Test Procedure AT501-3)

Calibration Data

Temperature: 70 °F = 21 °C Humidity: 58 %

		X	Y	Z
Input:	(lbs.)	500	500	1000
	(N)	**2224**	**2224**	**4448**
Sensitivity:	(pC/lb)	32.27	32.49	14.33
	(pC/N)	**7.254**	**7.306**	**3.222**
Linearity:	(% FS)	0.4	0.6	0.4
Capacitance:	(pF)	17.5	17.3	17.7

Cross Talk Percentage

Cross Talk	%
X to Y	1.00
Y to X	0.36
X to Z	2.13
Y to Z	0.85
Z to X	0.75
Z to Y	0.77

Condition of Unit

As Found: In Tolerance

As Left: In Tolerance

Notes

1. Station #24 Sensivitity at 6744 lb is 17.42 pC/lb (30 kN is 3.92 pC/N)
2. This sensor is calbrated with a 081A70 beryllium copper mounting stud.
3. The sensor is preloaded to 5000 lbs. (22.24 kN) prior to calibration.
4. Calibration is N.I.S.T. Traceable thru Project # CA1341
5. This certificate shall not be reproduced, except in full, without written approval from PCB Piezotronics, Inc.
6. Calibration is performed in compliance with ISO 9001, ISO 10012-1, ANSI/NCSL Z540-1-1994 and ISO 17025.
7. See Manufacturer's Specification Sheet for a detailed listing of performance specifications.
8. Measurement uncertainty (95% confidence level with a coverage factor of 2) is +/-1%.

Technician: Fran Coleman

Date: 9/14/2018

ACCREDITED

Cert. No. 1862.01

PCB PIEZOTRONICS
FORCE / TORQUE DIVISION

3425 Walden Avenue
Depew, New York 14043
TEL: 888-684-0013 FAX: 716-685-3886 www.pcb.com

CALIBRATION CERTIFICATE

Model: 260A31/FCS-DN
Serial #: 17448 X - AXIS
Description: Force Sensor
Type: Charge **Capacitance:** 17.5 pF

Sensitivity*: 32.27 pC/LBF
7.254 pC/N

Linearity*: 0.4% FS
Uncertainty:** +/- 1 %

Date: 9/14/2018
By: Fran Coleman, Cal. Tech. FC
Station: 0-1,000 lb. Load Cell (Test Procedure AT501-3)

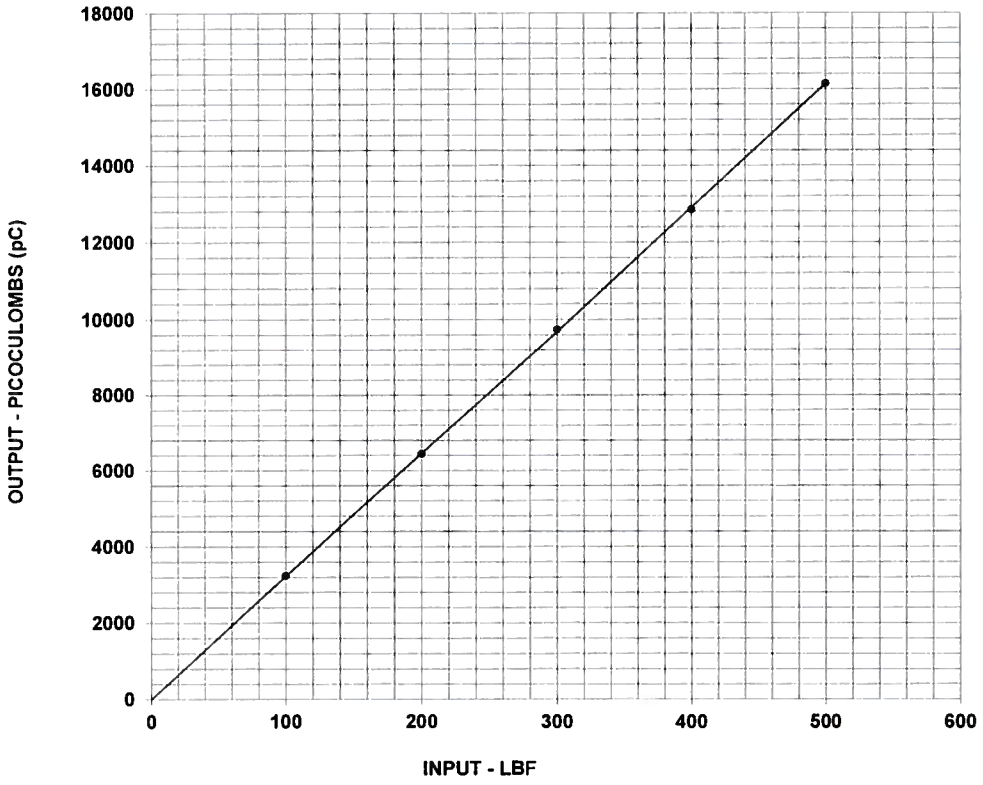
Temp: 70 deg F [21deg C]
Humidity: 58 %

Cert #: 714050

* Zero based, least-squares straight line.

** Measurement uncertainty represented using a coverage factor of k=2 which provides a level of confidence of approximately 95 %.

Condition of Unit:
As Found: Not applicable
As Left: In tolerance, new unit



TEST DATA

INPUT (LBF)	OUTPUT (pC)
100	3243
200	6442
300	9740
400	12853
500	16140

Notes:
1 Station # 24
2 This sensor is calibrated with a 081A70 beryllium copper mounting stud. The sensor is preloaded to 5000 lbs prior to calibration.
3 Calibration is traceable to NIST and is accredited to ISO 17025 and ANSI/NCSL Z540.3.
4 NIST traceability through PCB control # CA1341.
5 This certificate may not be reproduced, except in full, without written approval from PCB Piezotronics, Inc.

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CALIBRATION CERT #1862.01

PCB PIEZOTRONICS INC
Tel: 716-684-0001 Fax: 716-684-0987 Email: sales@pcb.com
3425 Walden Avenue, Depew NY 14043

CALIBRATION CERTIFICATE

Model:	260A31/FCS-DN			**Date:**	9/14/2018
Serial #:	17448 Y - AXIS			**By:**	Fran Coleman, Cal. Tech.
Description:	Force Sensor			**Station:**	0-1,000 lb. Load Cell (Test Procedure AT501-3)
Type:	Charge	**Capacitance:**	17.3 pF		
Sensitivity*:	32.49 pC/LBF			**Temp:**	70 deg F [21deg C]
	7.306 pC/N			**Humidity:**	58 %
Linearity*:	0.6% FS			**Cert #:**	714051
Uncertainty:**	+/- 1 %				

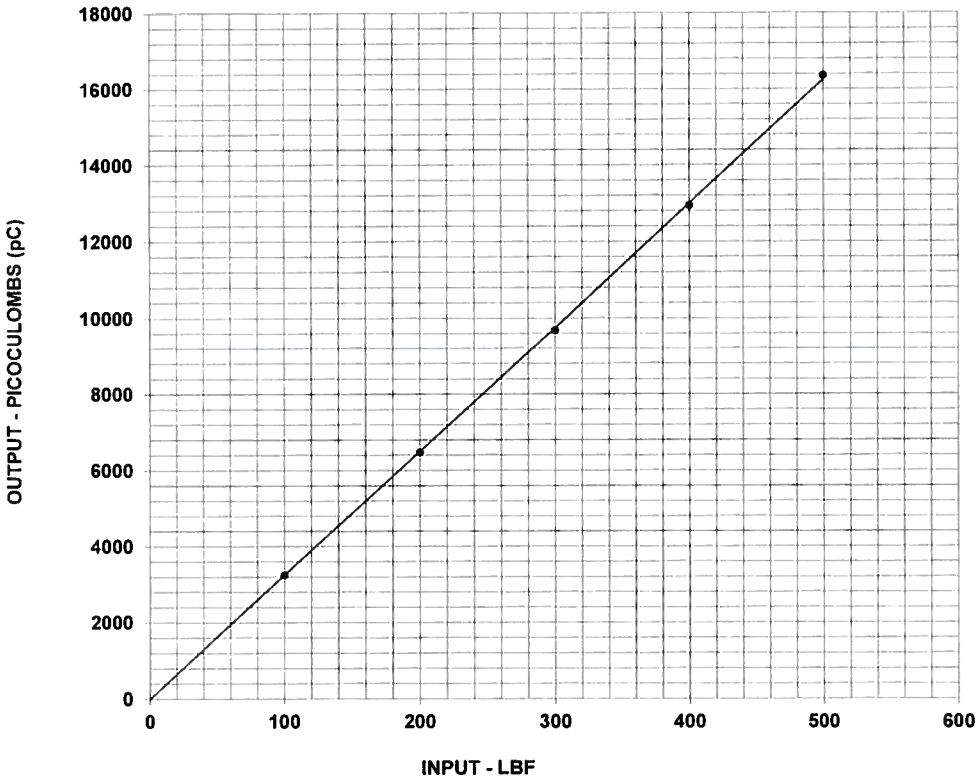
* Zero based, least-squares straight line.

** Measurement uncertainty represented using a coverage factor of k=2 which provides a level of confidence of approximately 95 %.

Condition of Unit:

As Found: Not applicable

As Left: In tolerance, new unit



TEST DATA

INPUT (LBF)	OUTPUT (pC)
100	3248
200	6471
300	9684
400	12930
500	16352

Notes:

1 Station # 24

2 This sensor is calibrated with a 081A70 beryllium copper mounting stud. The sensor is preloaded to 5000 lbs prior to calibration.

3 Calibration is traceable to NIST and is accredited to ISO 17025 and ANSI/NCSL Z540.3.

4 NIST traceability through PCB control # CA1341.

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CALIBRATION CERT #1882.01

PCB PIEZOTRONICS INC
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CALIBRATION CERTIFICATE

Model: 260A31/FCS-DN
Serial #: 17448 Z - AXIS
Description: Force Sensor
Type: Charge
Capacitance: 17.7 pF

Sensitivity*: 14.33 pC/LBF
3.222 pC/N

Linearity*: 0.4% FS
Uncertainty:** +/- 1 %

Date: 9/14/2018
By: Fran Coleman, Cal. Tech. FC
Station: 0-1,000 lb. Load Cell (Test Procedure AT501-3)

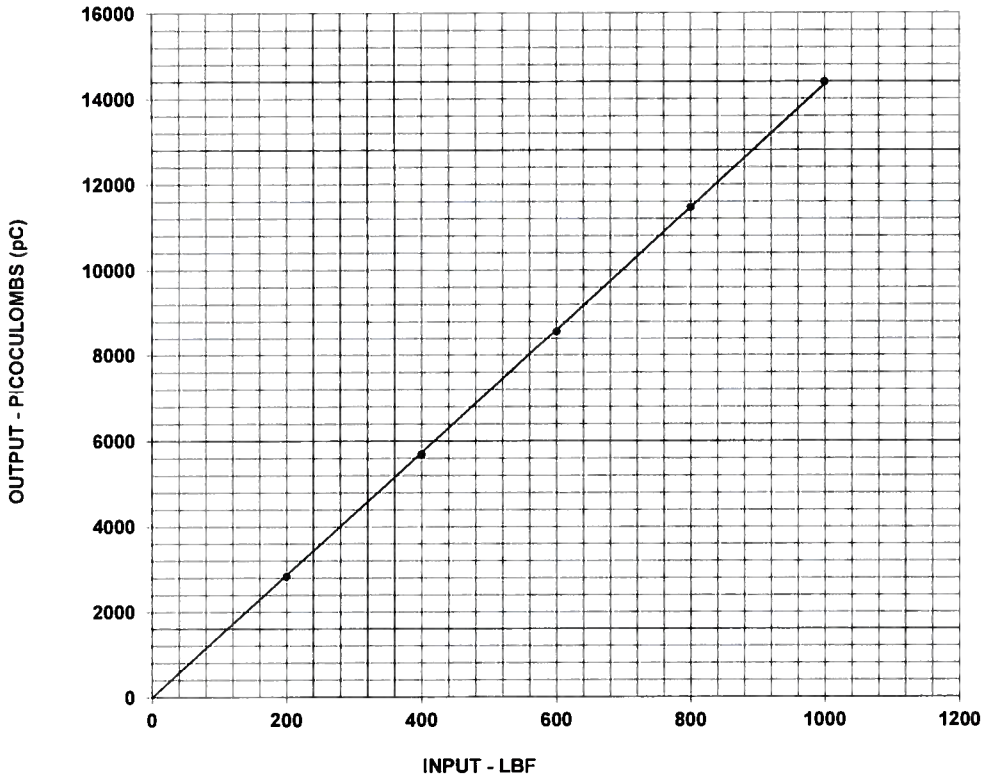
Temp: 70 deg F [21deg C]
Humidity: 58 %

Cert #: 714188

* Zero based, least-squares straight line.

** Measurement uncertainty represented using a coverage factor of k=2 which provides a level of confidence of approximately 95 %.

Condition of Unit:
As Found: Not applicable
As Left: In tolerance, new unit



TEST DATA

INPUT (LBF)	OUTPUT (pC)
200	2831
400	5682
600	8559
800	11460
1000	14388

Notes:
1 Station # 24 Sensitivity at 6744 is 17.42 pC/lb (30kN is 3.92 pC/N)
2 This sensor is calibrated with a 081A70 beryllium copper mounting stud. The sensor is preloaded to 5000 lbs prior to calibration.
3 Calibration is traceable to NIST and is accredited to ISO 17025 and ANSI/NCSL Z540.3.
4 NIST traceability through PCB control # CA1341.
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CALIBRATION CERT #1862.01

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