



United Calibration Corporation

Established 1964

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Certificate of Calibration

CERTIFICATE NO. 12345-14

ZYX Corporation
111 Main Street
Huntington Beach, CA 92649
LAB

Calibrate Testing Machine in Accordance with ASTM E 4-02

| | |
|---|---|
| System Under Test: United SFM-20 | System ID: XXXXXXX |
| Location Work Performed: UCC Huntington Beach CA | Date Performed: 12/21/2001 |
| Device Under Test: UNITED Load Cell | Calibration Due Date: 12/21/2002 |
| Device S/N: 12345 | Method: Follow-the-Force |
| | Accuracy: +/- 1% (ASTM) |
| Calibration Range: 0 to 20000 Lbf | Temp (Deg F): 74 |
| Capacity: 20,000 Lbf | Rel Humidity (%): 55 |
| Indicator or Recorder: United PC S/N A0999876 Resolution = 0.1 Lbf | |

This document certifies that the equipment identified above has been calibrated in accordance with the requirements of ASTM E 4-02 and UCC Procedure 100 using standards which are traceable to standards maintained by NIST.

Standards Used Note: Weights have been corrected to local gravity according to ASTM E 74-01, Local gravity correction = 0.9989
ID# 0402: United 5K Deadweight Tester, 5,000 Lbf, S/N 001, Calibrated 2/27/2002 by UCC, Calibration Due Date: 2/27/2003 0.01

ID# 0507: Tovey Engineering Load Cell, 100,000 Lbf, S/N 101116A, Calibrated 7/2/2002 by N.I.S.T., Calibration Due Date: 7/2/2003 Class A
Lower Limit in Tension: 3000 Lbf Class A Lower Limit in Compression: 3000 Lbf

UNITED CALIBRATION CORPORATION maintains a quality system which meets the requirements of ISO/IEC Guide 17025, ANSI/NCSL Z540-1 and ISO-9002. Accredited by NVLAP for the specific scope of accreditation under lab code 200521. Calibration results relate only to items tested or calibrated.

Performed By:

Jason Turrill
Calibration Technician

Approved Signatory:

Jere H. Watson
Technical Director
UNITED CALIBRATION CORPORATION

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Tension Run # 1 (As Found)

| Nominal (Lbf) | Std Reading (Lbf) | UUT Reading (Lbf) | Error (Lbf) | Error (%) |
|---------------|-------------------|-------------------|-------------|-----------|
| 0 | 0.00 | 0.00 | 0.00 | |
| 1,000 | 998.90 | 997.80 | -1.10 | -0.11 |
| 2,000 | 1,998.10 | 1,996.10 | -2.00 | -0.10 |
| 4,000 | 3,995.40 | 3,992.20 | -3.20 | -0.08 |
| 6,400 | 6,445.00 | 6,445.00 | 0.00 | 0.00 |
| 8,000 | 8,010.00 | 8,009.00 | -1.00 | -0.01 |
| 10,000 | 10,010.00 | 10,010.00 | 0.00 | 0.00 |
| 12,000 | 12,000.00 | 12,002.00 | 2.00 | 0.02 |
| 14,000 | 14,020.00 | 14,026.00 | 6.00 | 0.04 |
| 16,000 | 16,010.00 | 16,022.00 | 12.00 | 0.07 |
| 18,000 | 18,030.00 | 18,051.00 | 21.00 | 0.12 |
| 20,000 | 20,030.00 | 20,060.00 | 30.00 | 0.15 |

Tension Run # 2

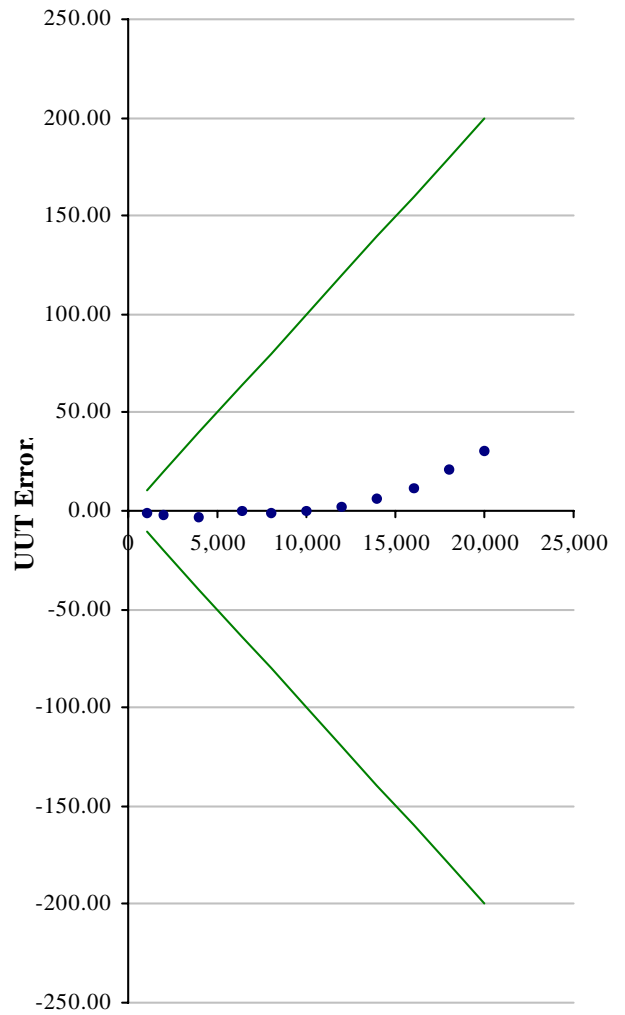
| Nominal (Lbf) | Std Reading (Lbf) | UUT Reading (Lbf) | Error (Lbf) | Error (%) |
|---------------|-------------------|-------------------|-------------|-----------|
| 0 | 0.00 | 0.00 | 0.00 | |
| 1,000 | 998.90 | 997.80 | -1.10 | -0.11 |
| 2,000 | 1,998.10 | 1,996.10 | -2.00 | -0.10 |
| 4,000 | 3,995.40 | 3,992.20 | -3.20 | -0.08 |
| 6,400 | 6,445.00 | 6,445.00 | 0.00 | 0.00 |
| 8,000 | 8,010.00 | 8,009.00 | -1.00 | -0.01 |
| 10,000 | 10,010.00 | 10,010.00 | 0.00 | 0.00 |
| 12,000 | 12,000.00 | 12,002.00 | 2.00 | 0.02 |
| 14,000 | 14,020.00 | 14,026.00 | 6.00 | 0.04 |
| 16,000 | 16,010.00 | 16,022.00 | 12.00 | 0.07 |
| 18,000 | 18,030.00 | 18,051.00 | 21.00 | 0.12 |
| 20,000 | 20,030.00 | 20,060.00 | 30.00 | 0.15 |

Tension Run # 3

| Nominal (Lbf) | Std Reading (Lbf) | UUT Reading (Lbf) | Error (Lbf) | Error (%) |
|---------------|-------------------|-------------------|-------------|-----------|
| 0 | 0.00 | 0.00 | 0.00 | |
| 1,000 | 998.90 | 997.80 | -1.10 | -0.11 |
| 2,000 | 1,998.10 | 1,996.10 | -2.00 | -0.10 |
| 4,000 | 3,995.40 | 3,992.20 | -3.20 | -0.08 |
| 6,400 | 6,445.00 | 6,445.00 | 0.00 | 0.00 |
| 8,000 | 8,010.00 | 8,009.00 | -1.00 | -0.01 |
| 10,000 | 10,010.00 | 10,010.00 | 0.00 | 0.00 |
| 12,000 | 12,000.00 | 12,002.00 | 2.00 | 0.02 |
| 14,000 | 14,020.00 | 14,026.00 | 6.00 | 0.04 |
| 16,000 | 16,010.00 | 16,022.00 | 12.00 | 0.07 |
| 18,000 | 18,030.00 | 18,051.00 | 21.00 | 0.12 |
| 20,000 | 20,030.00 | 20,060.00 | 30.00 | 0.15 |

| | |
|--|----------------------|
| Calibration Uncertainty U (+/-) at 4000 Lb = | 6.6 Lbf |
| | 20000 Lbf = 33.4 Lbf |

Load Cell Measurement Error (Lbf) - Tension



Standard Force Reading

● Data Point
 — ASTM E4 Limit (± 1%)

Calibration Results Summary:

As found condition for UUT meets the requirements of ASTM E 4. No adjustments required. Uncertainty calculations are performed in accordance with UCC Procedure UP-01.

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