

Spring Pack Calibration Stand (SPCS) Update

Presented by:
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TELEDYNE LECROY TEST SERVICES
Everywhereyoulook™

Spring Pack Calibration Stand (SPCS) Update



TOPICS

- SPCS Load Cell Accuracies
- SMB-000 Accommodations
- QL3-FS System Integration
- CC-158 Spring Pack Calibration Stand Assembly Manual
- CC-159 Spring Pack Calibration Manual



SPCS Load Cell Accuracies



CERTIFICATE OF CALIBRATION

Client: Exelon Power Labs
Project No: 102770

Type: Load Cell Serial No: 332155

Manufacturer: Keithley

Data Pt.	Standard (lbs)	Strain
1	-0.08	
2	2998.98	
3	5998.47	
4	9001.77	
5	12004.76	
6 *	15008.38	
7	12004.62	
8	9002.00	
9	6001.19	
10	2998.33	
11	0.93	

Sensitivity for Compression = 4992.0840 (lbs)
Y-Intercept for Compression = 2.24 (lbs)
Coefficient of Determination (Rsquare) = 1.000

Input/Output Resistance : 350 Ohms +/-5 Ohm
Bridge to Ground/Shield Resistance : >100MΩ
Zero balance : -0.0055 mV/V
Excitation Voltage : 10.000 Vdc

Accuracy: Less than or Equal to: 0.5% Reading
Less than or Equal to: 0.25% Full Scale
As Found / As Left

CERTIFIED BY: Technician: [Signature]
Engineer: [Signature]

513 Mill Street Marion, Massachusetts 02748
P:102770 - ...COM12305-15K.CAL MRN

CERTIFICATE OF CALIBRATION

Client: Exelon Power Labs
Project No: 102770

Type: Load Cell Serial No: 332155

Manufacturer: Keithley

Data Pt.	Standard (lbs)	Strain
1	-0.01	
2	1000.08	
3	1999.75	
4	2999.24	
5	3999.77	
6 *	5000.87	
7	4001.36	
8	3001.72	
9	2002.26	
10	1002.78	
11	0.53	

Sensitivity for Compression = 5000.1972 (lbs)
Y-Intercept for Compression = 0.72 (lbs)
Coefficient of Determination (Rsquare) = 1.000

Input/Output Resistance : 350 Ohms +/-5 Ohm
Bridge to Ground/Shield Resistance : >100MΩ
Zero balance : -0.0055 mV/V
Excitation Voltage : 10.000 Vdc

Accuracy: Less than or Equal to: 0.5% Reading
Less than or Equal to: 0.25% Full Scale
As Found / As Left

CERTIFIED BY: Technician: [Signature]
Engineer: [Signature]

513 Mill Street Marion, Massachusetts 02748
P:102770 - ...COM12307-5K.CAL MRN

CERTIFICATE OF CALIBRATION

Client: Exelon Power Labs, LLC
Project No: 102770 Purchase Order No: CC-2016010174

Type: Load Cell Serial No: 332155 Model: 160083-15K Capacity: 2,000 (lbs)

Manufacturer: Interface 5k Compression
Model No: 1110EKT-5K Br-A
Serial No: 425/s/7
Calibration Date: 7/24/2015
Calibration Due: 7/24/2016

Data Pt.	Standard (lbs)	Strain Gage Sens (mV/Vdc)	Best Fit (lbs)	Deviation (lbs)
1	-0.01	0.0000	0.37	0.38
2	400.85	0.0802	401.31	0.47
3	800.72	0.1603	801.56	0.83
4	1200.24	0.2402	1201.04	0.80
5	1600.27	0.3201	1600.77	0.50
6 *	2000.62	0.4000	2000.18	-0.44
7	1600.41	0.3200	1600.34	-0.07
8	1201.04	0.2402	1201.17	0.13
9	801.41	0.1599	799.80	-1.61
10	401.29	0.0800	400.44	-0.85
11	0.12	0.0000	0.18	0.06

Sensitivity for Compression = 4999.2748 (lbs) / (mV/Vdc)
Y-Intercept for Compression = 0.36 (lbs)
Coefficient of Determination (Rsquare) = 1.0000

Input/Output Resistance : 350 Ohms +/-5 Ohms
Bridge to Ground/Shield Resistance : >100MΩ
Zero balance : -0.0055 mV/V
Excitation Voltage : 10.000 Vdc

Accuracy: Less than or Equal to: 0.5% Reading, 20-100% Capacity
Less than or Equal to: 0.25% Full Scale, 0-20% Capacity
As Found / As Left

CERTIFIED BY: Technician: [Signature] Date: 5/2/16
Engineer: [Signature] Date: 5/2/16

TELEDYNE INSTRUMENTS
A Teledyne Technologies Company
513 Mill Street Marion, Massachusetts 02748 Telephone: 508-748-0103 Fax: 508-748-2029
TTSCalPro 2007.295 Page 1 of 2
MRNTTSMFD003.dbrnman 5/2/2016 1:04:55 PM



Load Cell Calibrations

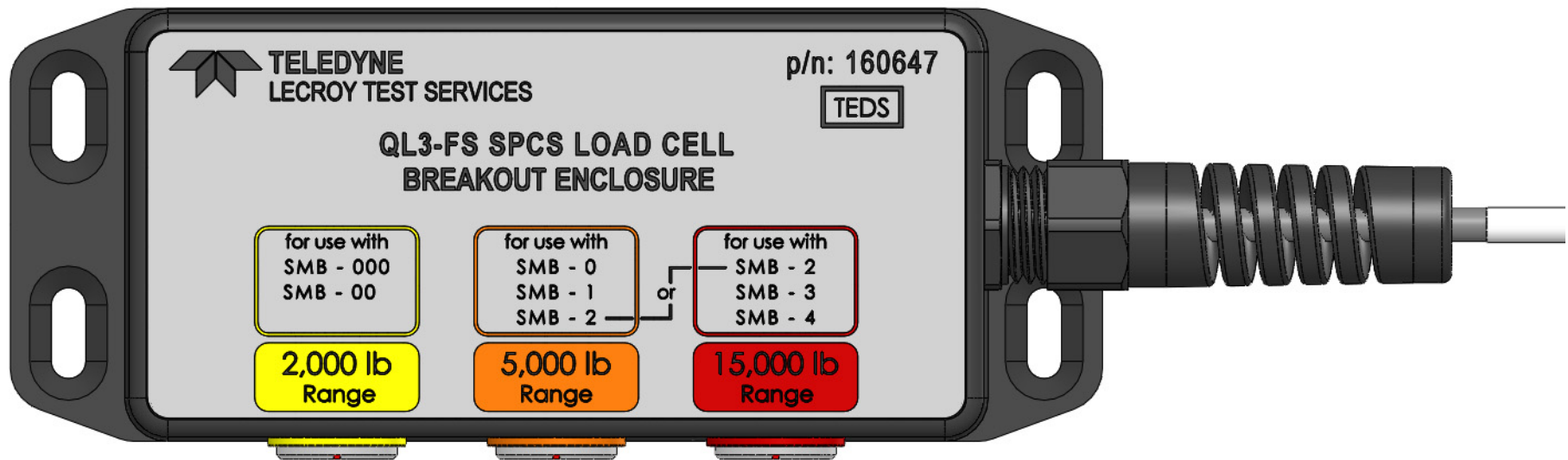
- 2,000 lbs
- 5,000 lbs
- 15,000 lbs
- 0.5% of Reading

SPCS Load Cell Accuracies

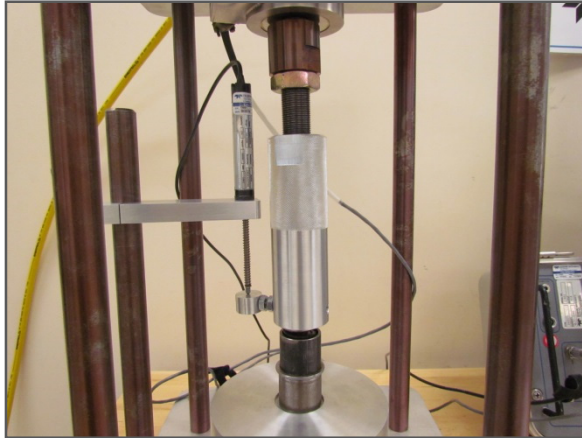


QL3-FS TEDS Interface

- 2,000 lbs Range
- 5,000 lbs Range
- 15,000 lbs Range

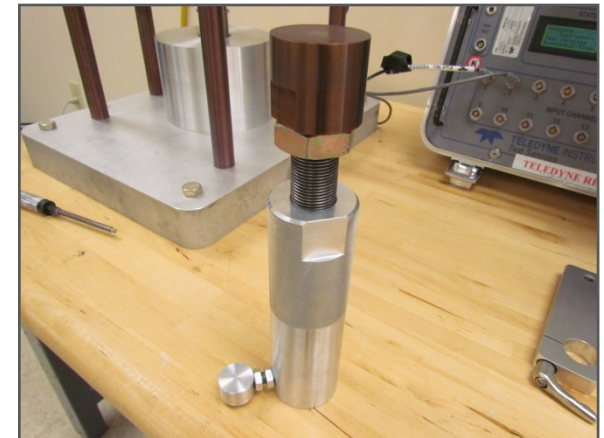


SMB-000 Accommodations



SMB-000 Loading

- Reduced LVDT Spring Rate
- Lightweight Aluminum Anvil ASM
- 2,000 lbs Range



QL3-FS Integration

Updated for use with QL3-FS System

- TEDS Interface Connections
- QUIKLOOK-FS Setup Ease
- No External Monitor, Keyboard, or Mouse Required



CC-158 Spring Pack Calibration Stand Assembly Manual



TECHNICAL REPORT
TTS-CC-158, REV. 4

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RECORD OF REVISIONS

<u>Revision</u>	<u>Date</u>	<u>Description</u>
0	3/1/10	Original Issue
1	5/5/10	Updated pictures and text after second build
2	6/17/11	Add optional leg assemblies note, Add anti-seize to hydraulic cylinder installation.
3	11/19/14	Include section for monitor USB port hookup and use.
4	07/13/16	Add 160647 SPCS Load Cell Breakout Enclosure Details. Add updated feet layout. Add SMB-000 Anvil details. Update to TLTS Logo.

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CC-159 Spring Pack Calibration Manual



TECHNICAL REPORT
TTS-CC-159, REV. 5

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RECORD OF REVISIONS

<u>Revision</u>	<u>Date</u>	<u>Description</u>
0	3/1/10	Original Issue
1	5/5/10	Updated pictures and text after second build
2	6/17/11	Change load cell CHANNEL 1 setup to be Sensitivity: See Calibration Sheet. Change LVDT CHANNEL 2 setup to be Range: +/-10.24 Vdc and Sensitivity: See Calibration Sheet.
3	12/30/11	Added sections 6.2.4 and 6.2.5, added - sign to LVDT sensitivity. Revised section 7.9 about zeroing traces. Added notes for configuring QUIKLOOK sections 6.2.3 and 6.2.5.
4	11/11/14	Added sections for the SMB-000 (compression spring version) lightweight fixtures and setup.
5	07/13/16	Add 160647 SPCS Load Cell Breakout Enclosure Details. Add updated feet layout. Add SMB-000 Anvil details. Update to TLTS Logo.

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Any Questions?

THANK YOU



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