

INTRODUCTION

This instructions describe the calibration procedure, where calibration password will need to be pressed to enter certain modes of the software.

Note: Throughout this procedure, all masses used to apply a load to the loadcell should be calibrated.

TEMPERATURE ACCLIMATISATION

Inspect the instrument for damage and check order requirements before placing in the calibration laboratory. Before any calibration can commence, the gauge must acclimatize to the operating temperature of the calibration laboratory for at least two hours.

PREPARATION

The gauge should have battery fully charged. It is recommended that the gauge use power from internal rechargeable battery while calibration is performed.

CALIBRATION

1. Turn the gauge on
2. Go to the main menu by pressing MENU key and press UP and DOWN key to move the cursor to point to CALIBRATION and press ENTER key, the display will show ENTER PASSWORD page.

**ENTER PASSWORD
4 DIGIT**

PASSWORD : 0000

Figure 1 Enter Password Page

**** Permanent password = 7780**

Press UP and DOWN to change the numerical, press and hold to scroll change.
Press LEFT and RIGHT to change the digit, press and hold to scroll change digit.

Press ENTER key to accept your password. If your password is correct, the display will show the Calibration menu page.

If not, the display will return to the main menu page.

CALIBRATION MENU
1) MAX CAPACITY
2) TENSION GAIN
3) COMPRESSION GAIN
4) SET NEW PASSWORD

Figure 2 Calibration Menu Page

3. Select the correct loadcell capacity for the gauge. To set load capacity, press UP and DOWN key to move the cursor to point to MAX CAPACITY and press ENTER key, the display will show set max capacity menu page.

SET MAX CAPACITY	1/2
1) 5 N	
2) 10 N	
3) 25 N	
4) 50 N	
5) 100 N	
6) 250 N	

Figure 3 Max Capacity Menu Page 1

SET MAX CAPACITY	2/2
7) 500 N	
8) 1000 N	
9) 2500 N	

Figure 4 Max Capacity Menu Page 2

Press UP and DOWN to change max capacity, press and hold to scroll change. Press ENTER key to save selected and return to Calibration Menu page.

4. Tension Calibration

At the Calibration menu page, press UP and DOWN key to move the cursor point to TENSION GAIN and press the ENTER key, the display will show tension gain menu page.

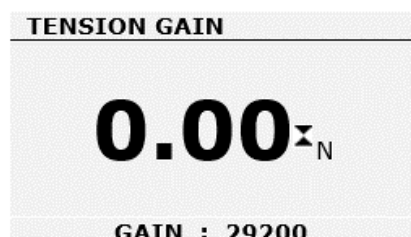


Figure 5 Tension Gain Menu Page

4.1 Tension Zero

- Set the gauge up with the necessary fixtures to carry out tension calibration
- Pre-stress the loadcell to 100% of gauge capacity
- Remove the masses but retain the fixtures
- When the counts have settled, press ZERO key to store the zero counts

4.2 Tension Maximum

- Apply 100% gauge capacity load onto the fixture(s) for tension
- Press UP, DOWN, RIGHT ARROW, LEFT ARROW keys to adjust tension gain until the gauge displayed max capacity count.
- Press ENTER key to store the counts for full-scale tension.

5. Compression Calibration

At the Calibration menu page, Press UP and DOWN key to move the cursor point to COMPRESSION GAIN and press ENTER key, the display will show compression gain menu page.



Figure 6 Compression Gain Menu Page

5.1 Compression Zero

- Set the gauge up with the necessary fixtures to carry out compression calibration.
- Pre-stress the loadcell to 100% of gauge capacity.
- Remove the masses but retain the fixtures
- When the counts have settled, press ZERO key to store the zero counts

5.2 Compression Maximum

- Apply 100% gauge capacity load onto the fixture(s) for compression.
- Press UP, DOWN, RIGHT ARROW or LEFT ARROW keys to adjust compression gain until the gauge displayed max capacity count.
- Press ENTER key to store the counts for full-scale compression.

6. After successful calibration, remove any accessories fitted on the gauge and place the gauge on its back, on a level surface.

Go to TENSION GAIN menu page, Press ZERO key to store Original Offset, Date and Time of calibration and clear Overload Center.

LINEARITY AND CREEP CHECKING

NOTE 1:

For the following linearity and creep tests, refer to appendix A for acceptable limits.

NOTE 2:

If any record reading is not within acceptable limits, repeat the calibration procedure section 4 to 6. If any record result is still not within acceptable limits after two additional calibration attempts, turn the gauge OFF and reject the gauge to quarantine for further investigation.

1. Tension Linearity and Creep Checking

- 1.1. Set the gauge up with the necessary fixture to carry out tension linearity check.
- 1.2. Apply full-scale tension pre-load. Remove the masses but retain the fixture.
- 1.3. Press ZERO key on the gauge.
- 1.4. Add a tensile load of 20% of gauge loadcell capacity.
- 1.5. When the display has settled, record the reading if it is within acceptable limits. If not within acceptable limits, follow procedure in NOTE 2 above.

- 1.6. Repeat steps 1.4 to 1.5 for loads of 40%, 60%, 80% and 100% of the loadcell capacity, recording all the readings.
 - 1.7. Remove the load but retain the fixtures.
2. Compression Linearity and Creep Checking
- 2.1. Set the gauge up with the necessary fixture to carry out compression linearity check.
 - 2.2. Apply full scale compression pre-load. Remove the masses but retain the compression fixture.
 - 2.3. Press ZERO key on the gauge.
 - 2.4. Add a compressive load of 20% of gauge loadcell capacity.
 - 2.5. When the display has settled, record the reading if it is within acceptable limits. If not within acceptable limits, follow procedure in NOTE 2 above.
 - 2.6. Repeat steps 2.4 to 2.5 for loads of 40%, 60%, 80% and 100% of the loadcell capacity, recording all the readings.
 - 2.7. Leave the gauge loaded at full compressive load and start the timer.
 - 2.8. After 30 seconds:
 - If reading is within half of the acceptable limit proceed to step 2.9 below
 - Anything else, wait for an additional 2 minutes

After 2 ½ minutes:

 - If reading is within the acceptable limit, record the reading and proceed to step 2.9 below.
 - If not within the acceptable limits, follow procedure in NOTE 2.
 - 2.9. Remove the load but retain the fixtures. Record the zero reading and start the timer.
 - 2.10. After 30 seconds:
 - If reading is within half of the acceptable limit, the new calibration has been successful.
 - Anything else, wait for an additional 2 minutes.

After 2 ½ minutes:

 - If reading is within the acceptable limit, record the reading and the new calibration has been successful.
 - If not within acceptable limits, follow procedure in NOTE 2.

APPENDIX A – DFS/DFT PERMISSIBLE ACCURACY

The tables below detail the permissible accuracy and limits, taking account of the gauges' displayed resolution.

All DFS models have an accuracy of $\pm 0.2\%$ of F.S.D.

All DFT models have an accuracy of $\pm 0.1\%$ of F.S.D.

5 N loadcell

Loadcell :	5 N
DFS Permissible Accuracy:	± 0.01 N
DFT Permissible Accuracy:	± 0.005 N

Applied Load		Lower	Upper	Lower	Upper
		DFS		DFT	
0% of F.S.D =	0 N	-0.01 N	0.01 N	-0.005 N	0.005 N
20% of F.S.D =	1 N	0.99 N	1.01 N	0.995 N	1.005 N
40% of F.S.D =	2 N	1.99 N	2.01 N	1.995 N	2.005 N
60% of F.S.D =	3 N	2.99 N	3.01 N	2.995 N	3.005 N
80% of F.S.D =	4 N	3.99 N	4.01 N	3.995 N	4.005 N
100% of F.S.D =	5 N	4.99 N	5.01 N	4.995 N	5.005 N

10 N loadcell

Loadcell :	10 N
DFS Permissible Accuracy:	± 0.02 N
DFT Permissible Accuracy:	± 0.010 N

Applied Load		Lower	Upper	Lower	Upper
		DFS		DFT	
0% of F.S.D =	0 N	-0.02 N	0.02 N	-0.010 N	0.010 N
20% of F.S.D =	2 N	1.98 N	2.02 N	1.990 N	2.010 N
40% of F.S.D =	4 N	3.98 N	4.02 N	3.990 N	4.010 N
60% of F.S.D =	6 N	5.98 N	6.02 N	5.990 N	6.010 N
80% of F.S.D =	8 N	7.98 N	8.02 N	7.990 N	8.010 N
100% of F.S.D =	10 N	9.98 N	10.02 N	9.990 N	10.010 N

20 N loadcell

Loadcell :	20 N
DFS Permissible Accuracy:	± 0.04 N
DFT Permissible Accuracy:	± 0.02 N

Applied Load		Lower	Upper	Lower	Upper
		DFS		DFT	
0% of F.S.D =	0 N	-0.05 N	0.05 N	-0.025 N	0.025 N
20% of F.S.D =	5 N	4.95 N	5.05 N	4.975 N	5.025 N
40% of F.S.D =	10 N	9.95 N	10.05 N	9.975 N	10.025 N
60% of F.S.D =	15 N	14.95 N	15.05 N	14.975 N	15.025 N
80% of F.S.D =	20 N	19.95 N	20.05 N	19.975 N	20.025 N
100% of F.S.D =	25 N	24.95 N	25.05 N	24.975 N	25.025 N

50 N loadcell

Loadcell :	50 N
DFS Permissible Accuracy:	± 0.1 N
DFT Permissible Accuracy:	± 0.05 N

Applied Load		Lower	Upper	Lower	Upper
		DFS		DFT	
0% of F.S.D =	0 N	-0.1 N	0.1 N	-0.05 N	0.05 N
20% of F.S.D =	10 N	9.9 N	10.1 N	9.95 N	10.05 N
40% of F.S.D =	20 N	19.9 N	20.1 N	19.95 N	20.05 N
60% of F.S.D =	30 N	29.9 N	30.1 N	29.95 N	30.05 N
80% of F.S.D =	40 N	39.9 N	40.1 N	39.95 N	40.05 N
100% of F.S.D =	50 N	49.9 N	50.1 N	49.95 N	50.05 N

100 N loadcell

Loadcell :	100 N
D FS Permissible Accuracy:	± 0.2 N
D FT Permissible Accuracy:	± 0.10 N

Applied Load		Lower	Upper	Lower	Upper
		DFS		DFT	
0% of F.S.D =	0 N	-0.2 N	0.2 N	-0.10 N	0.10 N
20% of F.S.D =	20 N	19.8 N	20.2 N	19.90 N	20.10 N
40% of F.S.D =	40 N	39.8 N	40.2 N	39.90 N	40.10 N
60% of F.S.D =	60 N	59.8 N	60.2 N	59.90 N	60.10 N
80% of F.S.D =	80 N	79.8 N	80.2 N	79.90 N	80.10 N
100% of F.S.D =	100 N	99.8 N	100.2 N	99.90 N	100.10 N

200 N loadcell

Loadcell :	200 N
DFS Permissible Accuracy:	± 0.4 N
DFT Permissible Accuracy:	± 0.2 N

Applied Load		Lower	Upper	Lower	Upper
		DFS		DFT	
0% of F.S.D =	0 N	-0.5 N	0.5 N	-0.25 N	0.25 N
20% of F.S.D =	50 N	49.5 N	50.5 N	49.75 N	50.25 N
40% of F.S.D =	100 N	99.5 N	100.5 N	99.75 N	100.25 N
60% of F.S.D =	150 N	149.5 N	150.5 N	149.75 N	150.25 N
80% of F.S.D =	200 N	199.5 N	200.5 N	199.75 N	200.25 N
100% of F.S.D =	250 N	249.5 N	250.5 N	249.75 N	250.25 N

500 N loadcell

Loadcell :	500 N
DFS Permissible Accuracy:	±1.0 N
DFT Permissible Accuracy:	±0.5 N

Applied Load		Lower	Upper	Lower	Upper
		DFS		DFT	
0% of F.S.D =	0 N	-1.0 N	1.0 N	-0.5 N	0.5 N
20% of F.S.D =	100 N	99.0 N	101.0 N	99.5 N	100.5 N
40% of F.S.D =	200 N	199.0 N	201.0 N	199.5 N	200.5 N
60% of F.S.D =	300 N	299.0 N	301.0 N	299.5 N	300.5 N
80% of F.S.D =	400 N	399.0 N	401.0 N	399.5 N	400.5 N
100% of F.S.D =	500 N	499.0 N	501.0 N	499.5 N	500.5 N

1000 N loadcell

Loadcell :	1000 N
DFS Permissible Accuracy:	±2.0 N
DFT Permissible Accuracy:	±1.0 N

Applied Load		Lower	Upper	Lower	Upper
		DFS		DFT	
0% of F.S.D =	0 N	-2.0 N	2.0 N	-1.0 N	1.0 N
20% of F.S.D =	200 N	198.0 N	200.0 N	199.0 N	201.0 N
40% of F.S.D =	400 N	398.0 N	402.0 N	399.0 N	401.0 N
60% of F.S.D =	600 N	598.0 N	602.0 N	599.0 N	601.0 N
80% of F.S.D =	800 N	798.0 N	802.0 N	799.0 N	801.0 N
100% of F.S.D =	1000 N	998.0 N	1002.0 N	999.0 N	1001.0 N