



CALIBRATION

Attention



In territories where the FW scale is registered for commercial use, the end-user should not be given this information, as he will not be permitted to break the seals to carry out span calibration for himself. In this case, calibration would be carried out by the responsible authorities, and the calibration settings would then be sealed. Also, the comparator buzzer dip-switch settings on the optional RS-232C output board must also be set by the dealer/authorities. The scale must be shipped to the end-user in a fully assembled form for commercial use.

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Calibration Introduction

Calibration of the scale is required when it is initially installed, if the scale is moved a substantial distance, or in accordance with local regulations. It is necessary because the weight of a mass in one location is not necessarily the same in another location. Also, with time and use, mechanical deviations can occur. "Weight" equals mass times acceleration due to Earth's field of gravity. The internationally adopted value for gravitational acceleration is 9.80665 m/s^2 (32.174 ft/s^2) in a vacuum. However, this varies by about ± 0.3 percent depending on how far you are from the Earth's center of mass. Mass distorts space in such a way that the gravitational power of attraction is inversely proportional to the square of the distance between material objects (if non-gravitational forces are ignored). So, gravitational acceleration is greatest at the poles, least at the equator and decreases with altitude.

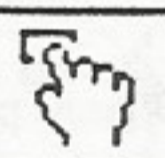
When we weigh a mass we are trying to find its weight expressed as pounds or kilograms. Because "g" and other factors vary from location to location, we must calibrate the scale whenever we move it otherwise a mass of 30kg might display 30.00kg in one location and 30.08kg in another (i.e.: "g" may have changed by +0.267%. $w=m \times g$). This would be an error but it can be prevented by placing an accurate mass on the scale (say 30kg) and then telling the scale, in effect, "this is what 30kg weighs at this location so please display 30.00kg"..... this is calibration.

The FW series is also equipped with a gravity compensation function which means that it can be calibrated in one location and then adjusted to match the acceleration of gravity at another location. We call this "setting the value of 'g'". If you wish to take advantage of this feature, please read the GRAVITY COMPENSATION FUNCTION section.



Please Note

You will need to recalibrate and reset the value of "g" (if for different location use) after a memory loss, Load Cell change, or a new main circuit board.



Simple Zero Calibration

For the End User, User's Instruction Manual

Although the end user may not be permitted to carry out span calibration, he may carry out zero calibration by following the procedure below.

WHEN Zero calibration is needed if "----" is displayed when the power is turned on, or when the **ZERO** key will not set the display to zero.

Step 1. Remove all objects from the Weighing Pan and turn the display ON.

Step 2. Press the **MODE** key and **ZERO** key simultaneously.

DISPLAY "CAL 0" will be displayed.

Step 3. Press the **ZERO** key and the zero point will be entered.

DISPLAY The display will then return to normal weighing mode.

END End of SIMPLE ZERO CALIBRATION procedure, continue with normal weighing.

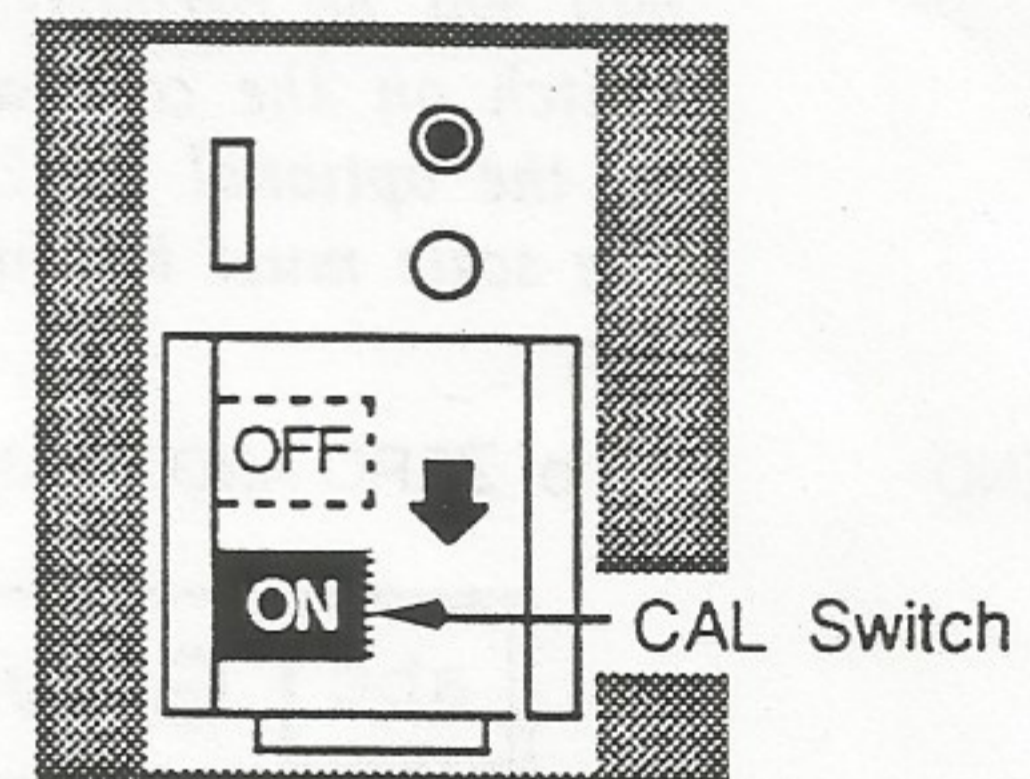
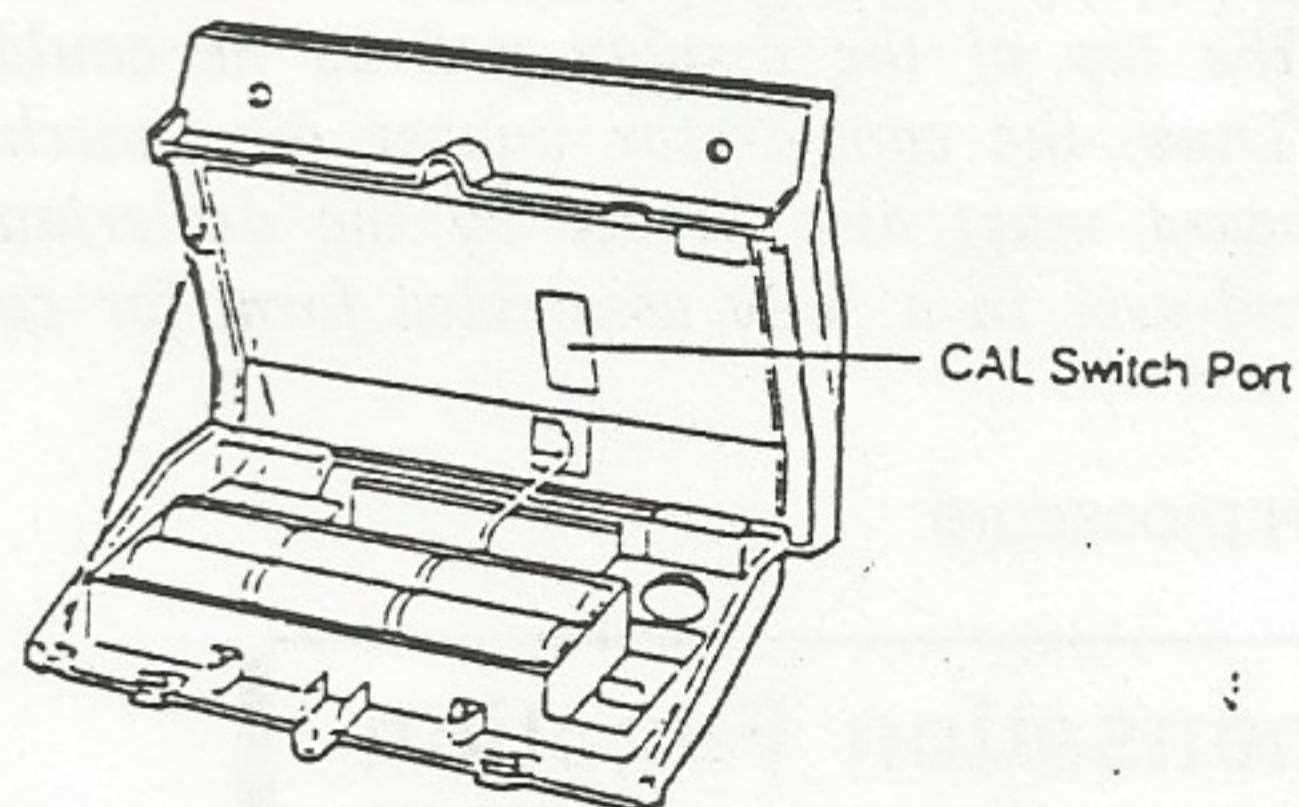
Zero and Span Calibration

The FW platform scale uses a calibration system called "FDC™" for Full Digital Calibration. This means that the zero point and maximum capacity points are entered digitally through the keyboard, and it makes the calibration method very easy to remember. FW scales can be calibrated using "lb" (pound avoirdupois) or "kg" (kilogram) calibration weights at maximum capacity or at $\frac{2}{3}$ of maximum capacity. Maximum capacity calibration is preferred, if possible, to reduce the risk of span errors at weights above $\frac{2}{3}$ of the full scale point.



Table A. Load Cell List & Calibration Mass

Scale	Display Pod & Load Cell	Platform & Load Cell	Load Cell	Calibration Mass
FW-1200KA3		FW-1200KB3	AD:LC4204K600M2	1200kg or 800kg 300lb or 200lb
FW-600KA3		FW-600KB3	AD:LC4204K600M2	600kg or 400kg 300lb or 200lb
FW-600KA4		FW-600KB4	AD:LC4204K600M1	600kg or 400kg 120lb or 80lb
FW-300KA4		FW-300KB4	AD:LC4204K600M1	300kg or 200kg 60lb or 40lb
FW-150KA1	FW-150KK1		LC:106-150K	150kg or 100kg 30lb or 20lb
FW-100KA1	FW-100KK1	FW-100KB1	LC:106-100K	100kg or 60kg 20lb or 15lb
FW-60KA2	FW-60KK2		LC:106-60K	60kg or 40kg 12lb or 8lb
FW-31KA2			LC:106-30K	30kg or 20kg 6lb or 4lb
FW-15KA2	FW-15KK2	FW-15KB2	LC:106-15K	15kg or 10kg 3lb or 2lb
FW-10KA2	FW-10KK2	FW-10KB2	LC:106-10K	10kg or 6kg 2lb or 1.5lb

- Step 1. Warm up the scale for at least 10 minutes before making adjustments. You must be careful of the auto-off function, which turns off the display after three minutes. This can be avoided by:
- Placing an object on the weighing pan,
 - Setting the Tare function so the display shows a negative number after the container weight is set and the container removed,
 - Disable the auto-off function.
- Step 2. With the display ON, remove the calibration plate - Slide CAL switch ON↓.



DISPLAY You will now see a display of "9.798" or "9.XXX" (X denoting any other three numbers already set into memory). This is the value of "g", or gravity.

	<ul style="list-style-type: none"> • Use the MODE key to view settings, move through the settings, and escape a setting if you have made a mistake.
	<ul style="list-style-type: none"> • The ZERO key enters the zero point, and enters settings into memory.

Step 3. Press **MODE**.

DISPLAY You should now see a display of "CAL 0", with the circular stability indicator on, if not, please turn off the scale and restart at the beginning of this section.

Step 2. Press **ZERO** to enter the zero point.

DISPLAY You will now see a display of "CAL 1".

Step 3. Select the desired "CAL 1", "CAL 2", "CAL 3" or "CAL 4" by pressing the **MODE** key to move between them.

Table B. Calibration Capacity Settings. (Refer to Table A.)

CAL 1	Means span calibration at maximum capacity in kilograms.
CAL 2	Means span calibration at 2/3 of maximum capacity in kilograms.
CAL 3	Means span calibration at maximum capacity in pounds.
CAL 4	Means span calibration at 2/3 of maximum capacity in pounds.

Step 4. Place the correct calibration weight on the weighing pan.

Step 5. After the circular stability indicator comes on, press **ZERO** to enter the setting.

NOTE: If "-CAL E" is displayed when you press **ZERO**, the scale cannot enter the maximum capacity (or 2/3) value because the calibration mass is under-weight (minus Calibration Error). Check everything is correctly set.

DISPLAY "End" will be displayed.

Step 6. Slide the calibration switch OFF while "END" is displayed, and turn off the scale.

- If you are going to set the value of gravity ("g") for a customer at a different geographical location (see the GRAVITY COMPENSATION FUNCTION section), please go to Step 2., SETTING THE VALUE OF "g" section.



Please Note Before customer delivery:

In areas where the FW scale is registered for commercial use, the calibration port cover and the load cell connector cover must be sealed (which extends to deny access to one of the screws which holds the top of the display pod on). Also, the end-user will not be permitted to remove the top of the display pod as he could thereby switch on the calibration switch. Thus, the comparator buzzer dip-switch settings on the optional RS-232C output board must also be set by the dealer/authorities. The scale must be shipped to the end-user in a fully assembled form for commercial use.

END End of ZERO AND SPAN CALIBRATION procedure.

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Gravity Compensation Function

This scale is equipped with a gravity compensation function which means that it can be calibrated in one location and then adjusted to match the acceleration of gravity at another location.

Dealers and Weights & Measures authorities may find this function useful as it will save them having to transport up to 300lb or 150kg in calibration weights to the end-user's location during scale installation. It is solely for this use (when the scale is to be transported to a different geographical area), and not intended, or needed for local or on-sight calibration.