

FW SERIES

PLATFORM SCALES

INSTRUCTION MANUAL

HIGH RESOLUTION PLATFORM SCALES

MODELS: FW-10KA2
FW-15KA2
FW-31KA2
FW-60KA2
FW-100KA1
FW-150KA1
FW-300KA4
FW-600KA4
FW-600KA3
FW-1200KA3



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Compliance with FCC Rules

Please note that this equipment generates, uses and can radiate radio frequency energy. This equipment has been tested and has been found to comply with the limits of a Class A computing device pursuant to Subpart J of Part 15 of FCC rules. These rules are designed to provide reasonable protection against interference when equipment is operated in a commercial environment. If this unit is operated in a residential area it might cause some interference and under these circumstances the user would be required to take, at his own expense, whatever measures are necessary to eliminate the interference.

(FCC = Federal Communications Commission in the U.S.A.)



Introduction & Features

*Thank You for Your **AND** Purchase!*

The FW series of high resolution multi-function platform scales are the product of years of research, design, development and in-field testing. They incorporate the latest advances in electronic and mechanical engineering and offer increased features and increased functions all at a reduced cost. Every care has been taken during the manufacturing process of this scale to ensure that it will perform accurately and reliably for many years.

- Battery operation permits the scale to be operated anywhere. The FW scale may be operated on six UM2 ('C' type) 1.5V dry batteries. Continuous operation will be possible for between 70 to 100 hours on one set of batteries at 20°C/68°F.
- The FW scales use a sharp, 17mm high LCD display. You can make sure that all the display segments are working properly by pressing the **ON/OFF** key.
- The Display Pod viewing angle is adjustable, and it (and the Display Arm) can be removed for use as a desk top, or wall mounted weighing indicator (with optional adapter kits).
- Models FW-150KA1, FW-15KA2 and FW-1200KA3 have an automatic dual range in pound mode (also FW-31KA2, FW-300KA4 in kg), so the resolution is higher when weighing below 2/3 of capacity (below 200 lb and 20 lb respectively).
- The weighing platform is of a rugged washdown stainless steel type, and the Display Pod enclosure also permits washdown.
- The scale's unit conversions are from decimal pounds to kilograms and vice versa. There is also a percentage function and a counting function for counting up to 10,000 pieces.
- The TARE range is from ZERO to maximum capacity.
- The check weighing display has "HI", "GO", and "LO" (LCD type annunciators), with two setpoints available for setting "HI" and "LO" limits. When the optional RS-232C Interface is installed a comparator buzzer can be heard and relay output control becomes possible via the 1st, 2nd, 4th and 6th pins of the 7-pin DIN output connector.
- The A/D converter is highly accurate and there is complete RFI shielding for the analog section.



Installation

- MODELS: FW-150KA1, FW-100KA1, FW-60KA2, FW-31KA2, FW-15KA2, FW-10KA2, FW-300KA4, FW-600KA4, FW-600KA3, FW-1200KA3.
- Unpack the assembled or unassembled scale carefully and keep the packing material if you are likely to want to transport the scale later.
- In the carton you should find this manual, assembly instructions plus:
 - Weighing Platform Base.
 - [FW-600 & 300KA4 ONLY] Four M5 screws to tighten the weighing pan.
 - Four screw-type adjustable feet.
 - [FW-1200 & 600KA3 ONLY] Open-end Wrench for the adjustable feet.
 - Weighing Pan.
 - Display Arm.
 - Display Pod.
 - Six UM-2/'C' size Batteries.
 - Display Pod Waterproof Cover.
 - Four Hex screws & a Hex Wrench (unless scale is assembled).
 - Two black self-adhesive plastic cable clips for Display Arm.
 - Assorted lock screws and sealing plates for Display Pod
 - Mini 2-channel jack plug for remote tare and zero.
- Place the assembled scale on a firm weighing table, or flat floor and turn the adjustable feet until the bubble level shows that the scale is level [FW-1200 & 600KA3 don't have a bubble level]. Install the pan on the scale, insert the batteries or plug in the AC/DC adaptor. The AC input requirements could be 100, 120, 220 or 240 Volts (50/60Hz) depending on the area in the world so please check that the optional adaptor is correct. The DC output should be 9 Volts (please note that an alternative 9V DC power supply might not be stable enough.)



Options

- OP-01 ... Wall Mounting Kit (tilting bracket).
- OP-02 ... 5m/16.4ft Display Pod extension cable.
- OP-03 ... RS-232C Interface and comparator buzzer/relay board.
- OP-05 ... AC adaptor AC100~120V. "A" type plug (2-pin/flat).
- OP-06 ... AC adaptor AC200~240V. "C" type plug (2-pin/round).
- OP-07 ... AC adaptor AC200~240V. "BF" type plug (3-pin/square).
- OP-08 ... AC adaptor AC200~240V. Without any plug.
- OP-09 ... AD-8117 cable & Display Pod mounting attachment.
- OP-10 ... AC adaptor AC200~240V. "S" type plug (3-pin/flat).
- OP-13 ... Conveyor Belt Attachment – FW-150 / FW-100KA1.
- OP-14 ... Conveyor Belt Attachment – FW-60KA2.
- OP-15 ... Display Stand.
- OP-16-3.. Weighing Platform Casters for 600KA3 / 1200KA3.
- OP-16-4.. Weighing Platform Casters for 300KA4 / 600KA4.
- OP-17 ... Platform cover - stainless steel for 600KA3 / 1200KA3.
- OP-18-3.. Roller conveyer for 600KA3 / 1200KA3.
- OP-18-4.. Roller conveyer for 300KA4 / 600KA4.

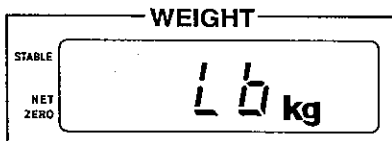


Best Conditions for Weighing

- ❑ The Scale must be level (check the bubble level under the pan)
[FW-1200 & 600KA3 don't have a bubble level].
- ❑ Best temperature is about 20°C/68°F at about 50% Relative Humidity.
- ❑ The weighing table should be of a solid construction.
- ❑ Corners of rooms are best as they are less prone to vibrations.
- ❑ Don't install the scale in direct sunshine.
- ❑ Try to ensure a stable AC power supply when using an adaptor.
- ❑ Clean the scale with mild soap and water (don't use solvents).

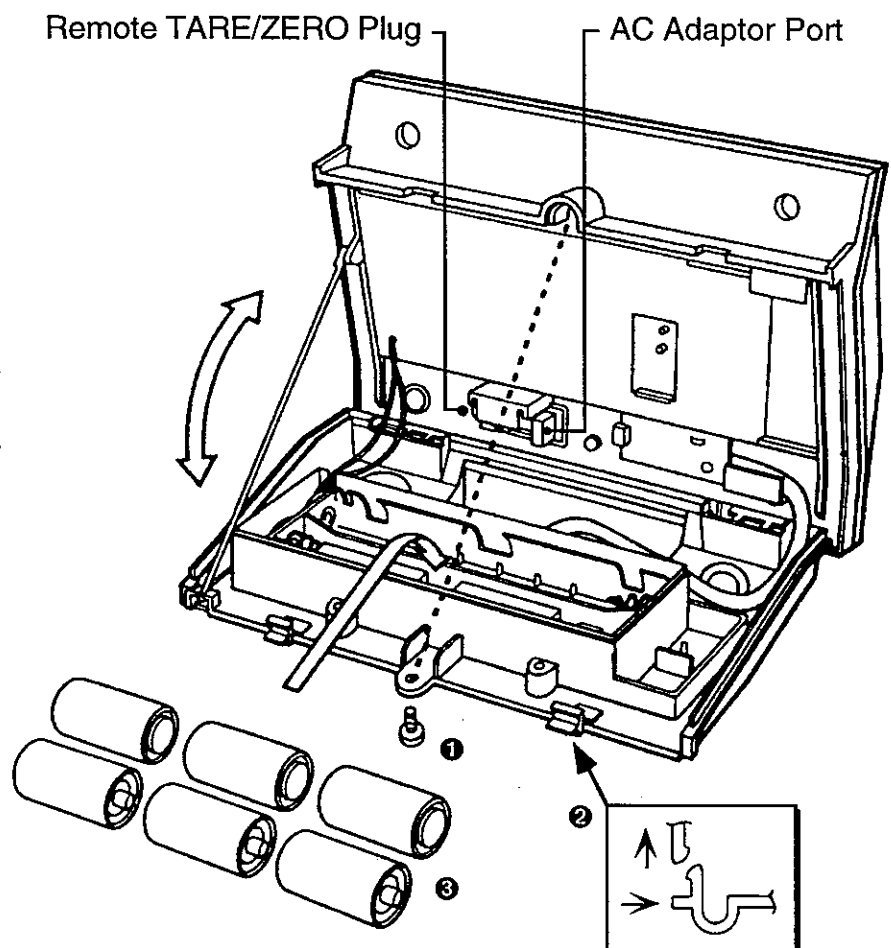


Replacing the Batteries



⚠ "Lb" will be displayed on the main display if the power in the batteries is too low for reliable weighing.

▶ Replace as shown.





About Your FW Scale



How does the Scale work?

When you put an object on the weighing pan it is pulled downwards under the action of gravity. This scale operates using a highly accurate and sensitive Load Cell. Load Cells work by detecting stress in the cell (a carefully machined metal bar) by means of strain gauge transducers bonded to the upper and lower surfaces. As the Load Cell bends, the analog output signal from the strain gauge varies. This signal is amplified and used as the input signal for an analog to digital converter. The final digital signal is used to calculate the weight for the display. In future we will call the object a "mass" and the measurement of its massiveness on Earth its "weight" (weight = mass x acceleration due to "g").



What is Gravity?

Gravity is a force of attraction between material objects in space. The Earth is a large material object (mass) in space and things on its surface at sea level, in a vacuum, accelerate towards its center at a speed of about 9.80665m/s^2 (32.174ft/s^2). Fortunately they don't get there because the surface of the Earth stops them. Unfortunately, this "g" value varies from location to location by about $\pm 0.3\%$ because the force decreases with altitude above sea level or, more correctly, the distance from the center of the Earth ("g" is inversely proportional to the square of the distance between masses). The North and South poles are closer to the center of the Earth than the equator so "g" is greater at the poles and changes with latitude. The sun and the moon have an inconsistent effect with regards to gravity. Air buoyancy acts against gravity by making a mass float upwards at a rate of $\approx 0.0012\text{g}$ ($\pm 10\%$ @ 20°C) per cm^3 of air displaced, but this also varies.



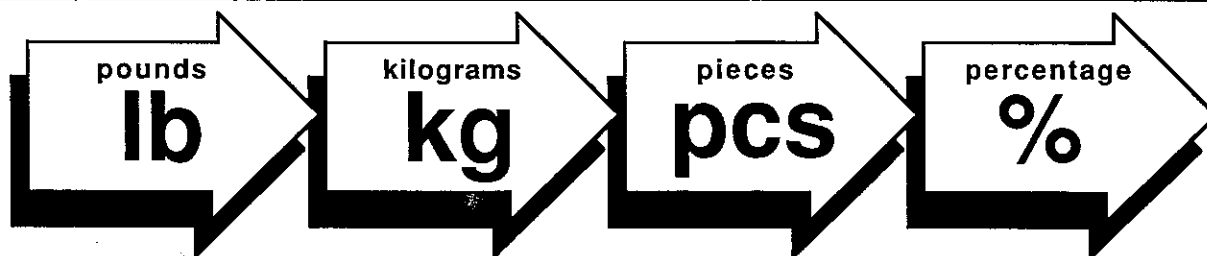
What is Calibration?

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 30 lb might display 30.00 lb in one location and 30.08 lb in another (ie: "g" may have changed by $+0.267\%$. $w = m \times g$).

There are two main types of calibration, Zero and Span. Zero calibration is simply telling the scale what is zero: no weight acting on the weighing pan. Span calibration tells the scale what an accurate mass (say 30 lb) weighs: "this is what 30 lb weighs at this location so please display 30.00 lb" - this is calibration.

Note: If this scale is used as a commercial scale, then the end user may not be permitted to calibrate it. In this case, calibration would be carried out by the responsible authorities, and the calibration settings would then be sealed. Recalibration should be carried out every six months, or if the scale is moved a substantial distance. Contact your A&D dealer for more information.

About Weighing Units & Modes



lb • Decimal Pounds

Decimal pounds are a relatively modern invention since pounds (avoirdupois) are traditionally divided by units of 16 rather than 10. The pound can be traced back to Roman times when it was known as the "libra" weight unit and the "lb" abbreviation comes from this ancient unit. The lb is based on the average weight of 7000 grains of English corn (wheat not maize) and one "grain" unit equals 0.06479891 grams. 10 lb is the weight of 1 imperial gallon of water at 62°F. One pound has been defined as being equal to 0.45359237 kg so this is the conversion factor used to convert from kilograms to a decimal pound display or vice versa. Decimal pounds are used in various industries because of simple decimal arithmetic.

kg • Kilograms

The kilogram (1,000 grams) is the SI base unit of mass and is the mass of a platinum-iridium cylinder at BIPM, Paris. It is almost but not quite, the weight of one cubic decimeter of water at 4°C. In fact, one liter of water (one kilogram) occupies a volume of 1.000028dm³ at standard atmospheric pressure of 1.01325 X 10⁵ N/m². The FW platform scale can be calibrated for span at maximum capacity (or 2/3 of maximum capacity) in kilograms or pounds (avoir).

'pcs' or Counting

The counting weighing mode permits you to use the scale as a pieces/parts counter in areas such as stock control departments. The scale does this by dividing a sample of 5, 10, 20, 50 or 100 pieces by the corresponding number of pieces (5, 10, 20, 50 or 100) to arrive at the average unit weight of each piece. See page 19 for more information.

% or Percentage

The "%" weighing mode permits you to use the scale as a check weigher. If you use the % mode you must enter in a sample weight to tell the scale that the sample weight is the 100% ideal target weight. Subsequently, any items placed on the scale will show their deviation from the reference weight in terms of a positive or negative percentage display. See page 23 for more information.

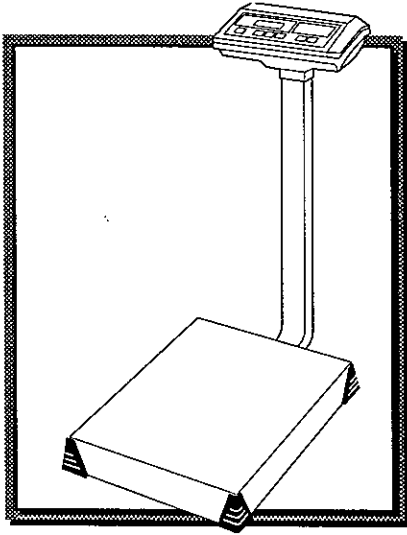


Specifications

MODEL	FW-1200K3	FW-600KA3	FW-600KA4	FW-300KA4	FW-31KA2
Capacity and resolution kg	1200 x 0.2 kg	600 x 0.01 kg	600 x 0.01 kg	300 x 0.1 kg 199.95 x 0.05 kg	31 x 0.01 kg 19.995 x 0.005 kg
Capacity and resolution lb	3000 x 1 lb 1999.5 x 0.5 lb	1200 x 0.2 lb	1200 x 0.2 lb	600 x 0.1 lb	60 x 0.01 lb
Calibration weight kg	1200 or 800 kg	600 or 400 kg	600 or 400 kg	300 or 200 kg	30 or 20 kg
Calibration weight lb	3000 or 2000 lb	1200 or 800 lb	1200 or 800 lb	600 or 400 lb	60 or 40 lb
Min. unit weight (counting)	0.2kg	0.1kg	0.1kg	0.05kg	0.005kg
Max. count pieces	6,000	6,000	6,000	6,000	6,000
Min. 100% value	20kg	10kg	10kg	5kg	0.5kg
Pan size mm	1000 x 1000 mm		600 x 700 mm		326 x 420 mm
Pan size inches	39.3 x 39.3 in.		23.6 x 27.5 in.		12.8 x 16.5 in.
Weight	approx. 110kg/242 lb		approx. 50kg/110 lb		approx. 11.5kg/25.3 lb
Power	9V DC from 6 x UM2/ 'C' size batteries or optional AC adaptor				
Battery life	approx. 70 hours		approx. 100 hours		
Operating temperature	-5°C~-35°C/23°F~95°F				
Sample size	5,10,20,50,100 pieces (set at 5, selectable with HI/LO key)				
Check weight	Two setpoints with "HI", "GO", "LO" liquid crystal annunciators				

MODEL	FW-150KA1	FW-100KA1	FW-60KA2	FW-15KA2	FW-10KA2
Capacity and resolution kg	150 x 0.02 kg	100 x 0.01 kg	60 x 0.01 kg	15 x 0.002 kg	10 x 0.001 kg
Capacity and resolution lb	300 x 0.1 lb 199.95 x 0.05 lb	199.98 x 0.02 lb	120 x 0.02 lb	30 x 0.01 lb 19.995 x 0.005 lb	19.998 x 0.002 lb
Calibration weight kg	150 or 100 kg	100 or 60 kg	60 or 40 kg	15 or 10 kg	10 or 6 kg
Calibration weight lb	300 or 200 lb	200 or 150 lb	120 or 80 lb	30 or 20 lb	20 or 15 lb
Min. unit weight (counting)	20g	10g	10g	2g	1g
Max. count pieces	7,500	10,000	6,000	7,500	10,000
Min. 100% value	2kg	1kg	1kg	0.2kg	0.1kg
Pan size mm	390 x 530 mm	390 x 530 mm	326 x 420 mm	326 x 420 mm	326 x 420 mm
Pan size inches	15.4 x 20.8 in.	15.4 x 20.8 in.	12.8 x 16.5 in.	12.8 x 16.5 in.	12.8 x 16.5 in.
Weight	approx. 17.5kg/38.5 lb		approx. 11.5kg/25.3 lb		
Power	9V DC from 6 x UM2/ 'C' size batteries or optional AC adaptor				
Battery life	Approx. 70-100 hours with manganese type cells/200 hours with alkaline, at 20°C/68°F				
Operating temperature	-5°C~-35°C/23°F~95°F				
Sample size	5,10,20,50,100 pieces (set at 5, selectable with HI/LO key)				
Check weight	Two setpoints with "HI", "GO", "LO" liquid crystal annunciators				

Specifications subject to change for Improvement without notice.

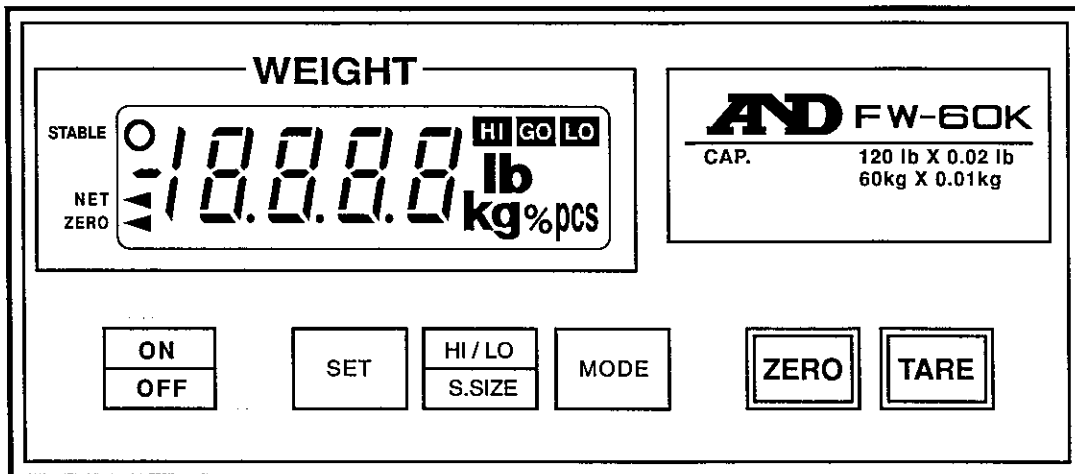


FW Series

Display and Keyboard

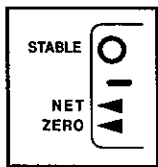


About the Display & Keyboard



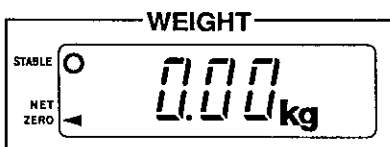
The ON/OFF Key

Press the **ON/OFF** key and you will see all display segments appear for a second or two. (Note: In some countries "lb" or "pcs" are not available).



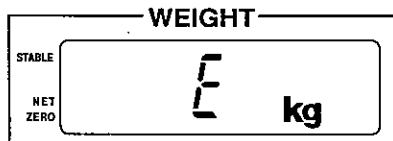
- Starting at the left end of the display you will see a circular stability indicator, a minus weight display symbol, a triangular NET indicator and ZERO indicator. Next you can see the main display "18.8.8.8".

- On the upper right you will see the abbreviations "HI", "GO", "LO" for the comparator. Below those "lb", "kg", "pcs" and "%" are shown.

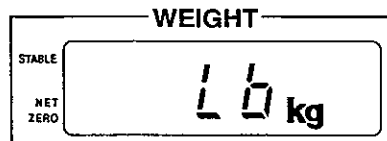


- After a few moments the circular stability indicator, zero indicator, main display (reading zero) and a unit ("lb", "kg", "pcs" or "%") will remain.

- The scale will switch off automatically if the display remains at zero for three minutes, but this function can be deactivated.



- Also, "E" (lb, kg, pcs or %) will be displayed if the scale is overloaded.



- And, "Lb" will be displayed on the main display if the power in the batteries is too low for reliable weighing.



The SET Key

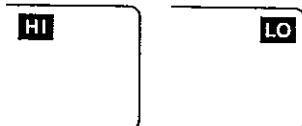
To the right of the **ON/OFF** key is the **SET** key. The **SET** key has three different uses:

- 1** In the Weighing Mode, it is pressed to activate or deactivate the comparator function (If the comparator has been deactivated, it will not be possible to access the high and low setpoint values with the **MODE** key).
- 2** In the Counting Mode ("pcs"), it is pressed to register the unit weight of the sample (5, 10, 20, 50 or 100 pieces) in non-volatile memory.
- 3** In the Percentage Mode, it registers the 100% sample size into memory.



The HI/LO-S.SIZE Key

Next to the **SET** key is the **HI/LO / S.SIZE** key, it has two different uses:

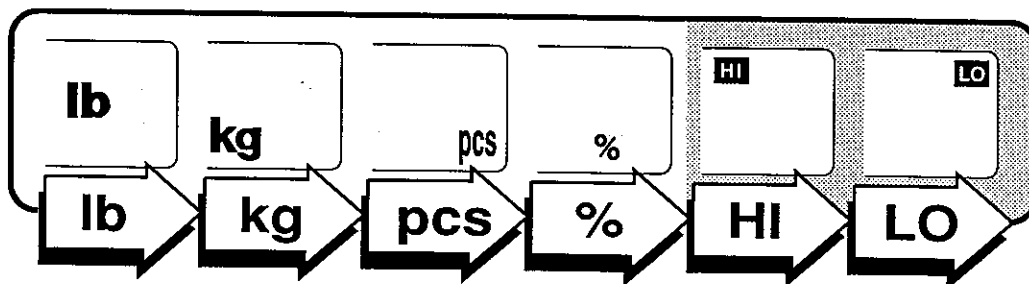
- 1** In the Comparator Mode, it is used to input setpoint values in conjunction with the **SET** key. 
- 2** In the Counting Mode the sample size is normally 5, but by pressing the **HI/LO / S.SIZE** key you may select a sample size of 10, 20, 50 or 100 pieces.



The MODE Key

Next, the **MODE** key also has two different functions:

- 1** The **MODE** key can be used to change the units as shown. *Note: HI and LO are displayed only when the Comparator function is on (they are for setting the high/low setpoint limits when the scale is acting as a check weigher).*



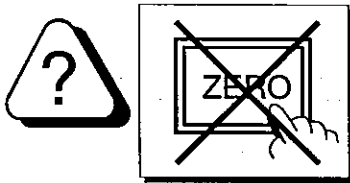
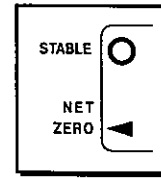
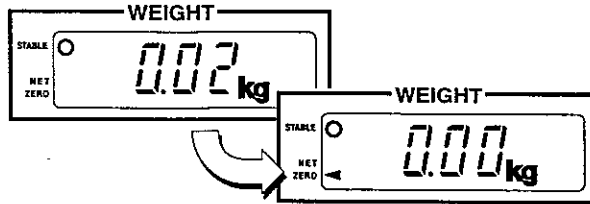
- 2** When the Comparator function is on (HI and LO) the **MODE** key can be used to set the values of these settings.



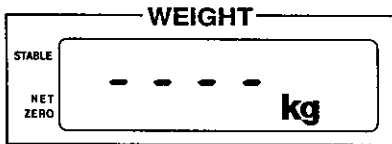
The ZERO Key

The **ZERO** key returns the scale to the center of zero when the weighing pan is empty, and should not be confused with the **TARE** key which re-zero's the display and places the scale in NET mode

- ▶ When the display shows a small deviation from zero and the weighing pan is empty (and the tare function is not being used), then press the **ZERO** key to return the display to "0.00".



- ⚠ If the **ZERO** key will not return display to "0.00":
 - Check that the scale isn't in NET mode. If it is, clear the tare before re-zeroing.
 - Check that the weighing pan is empty and nothing is touching it.
 - If nothing else works try carrying out ZERO CALIBRATION (see page 14).

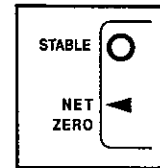


- ⚠ If "----" is displayed when the power is turned on, and the **ZERO** key will not return the display to zero, then you should carry out ZERO CALIBRATION (page 14).

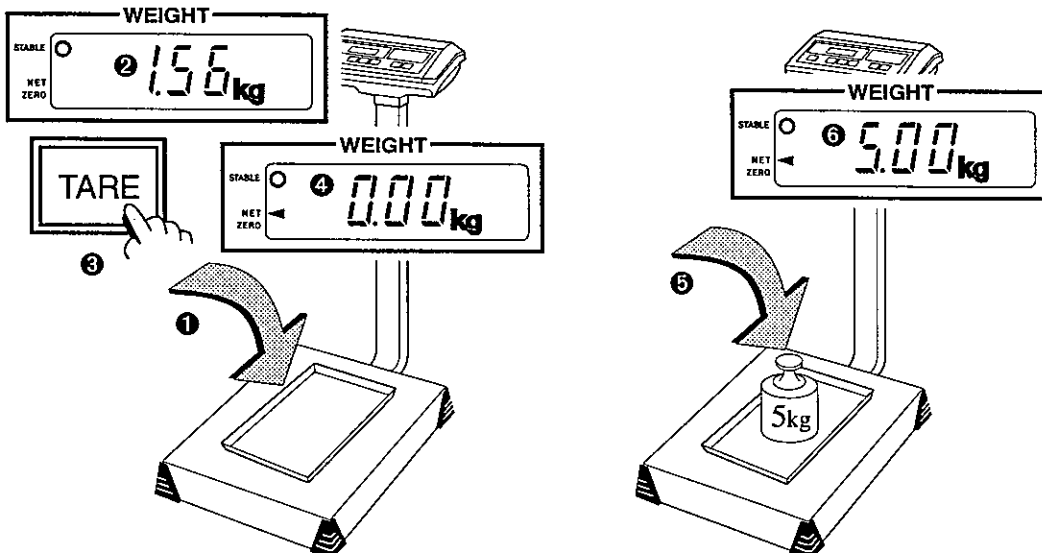
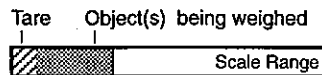


The TARE Key

The **TARE** key re-zero's the display up to the maximum capacity of the scale, places the scale in NET mode, and should not be confused with The **ZERO** key which returns the scale to the center of ZERO when the weighing pan is empty (see above).



The TARE weight (container weight) subtracts from the range of the scale.





Automatic Power OFF Function





The FW scale comes with an *automatic power-off function* which turns the main display OFF after three minutes to conserve battery power. It only works if the display shows "0.00" - any other reading and the scale will remain on. You can temporarily override this function by:

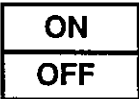


- Placing an object on the weighing pan,
- Setting the Tare function so the display shows a negative number when an object is removed from the weighing pan (after the object's weight is set as a Tare).


You can also turn **OFF** the Automatic Power-Off Function using the software. By doing this, the scale will always remain on until it is turned off using the **ON/OFF** key. You can reactivate this function at any time.

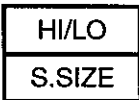

▶ To turn the Automatic Power-Off Function **OFF** or **ON** (depending on how it was set last):



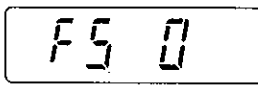
1 ▶ Start with the display **OFF**. 

2   ▶ Press and hold the **MODE** key.

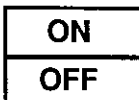

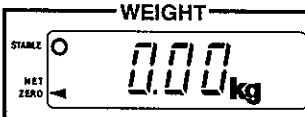
3   ▶ While holding the **MODE** key, press the **ON/OFF** key. 

- "F0 1" may be displayed, which means the display will cut **OFF** after three minutes - *or* - "F0 0" may be displayed, which means the automatic power-off function is disabled. 

4   ▶ Use the **HI/LO / S.SIZE** key to rotate between the settings, stopping at the setting desired.

5   ▶ Press the **ZERO** key to enter the setting. 

○ "F5 0" will be displayed ("F5 1" or "F5 2" may be alternatively displayed).

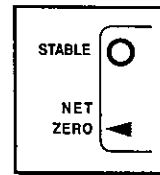
6   ▶ Press the **ON/OFF** key twice to return to normal weighing mode. 



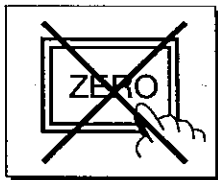
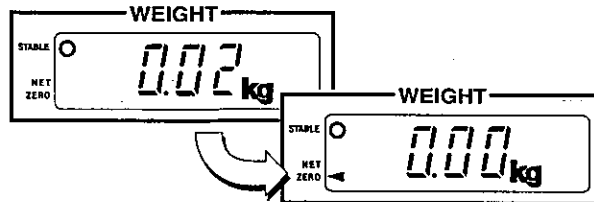
Zero Calibration



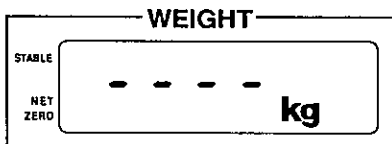
The center of zero is reset by the **ZERO** key when the weighing pan is empty, and should not be confused with the NET mode which must be cleared (or returned to zero) by using the **TARE** key which erases the tare value when the weighing pan is empty.



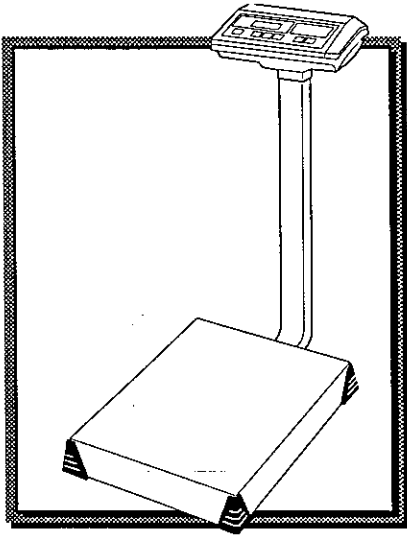
- ▶ When the display shows a small deviation from zero and the weighing pan is empty (and the tare function is not being used), then press the **ZERO** key to return the display to "0.00".



- ⚠ If the **ZERO** key will not return display to "0.00":
 - Check that the scale isn't in NET mode. If it is, clear the tare before re-zeroing.
 - Check that the weighing pan is empty and nothing is touching it.
 - If nothing else works, try carrying out CALIBRATION.



- ⚠ If "----" is displayed when the power is turned on, and the **ZERO** key will not return the display to zero, then you should carry out CALIBRATION.



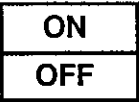

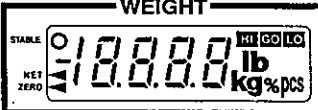
FW Series



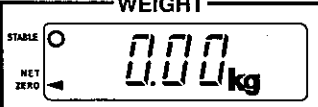
Weighing Mode

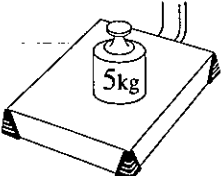
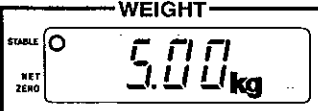
lb
kg

Weighing

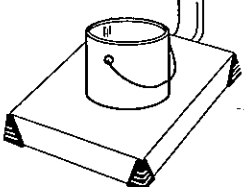
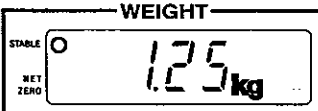
Simple Weighing



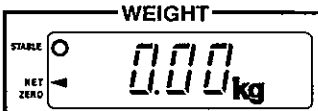
1   ▶ Press the **ON/OFF** key to turn the display ON. 

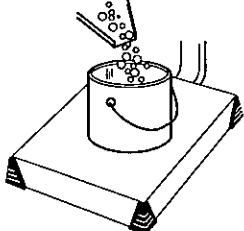
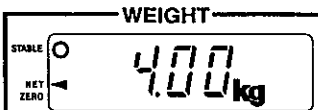
  ? If you would like a different weighing unit or mode, use the **MODE** key to move to it. 

2  ▶ Place object(s) on the weighing pan and read the weight when stable. 

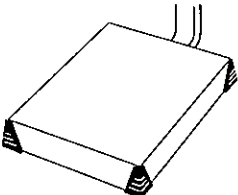

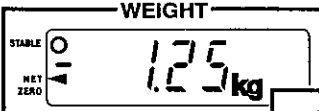
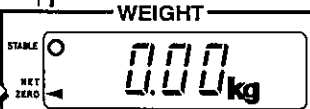
Using TARE, Weighing Into A Container

1  ▶ Place a container on the weighing pan 

2   ▶ Press the **TARE** key to cancel the weight. 

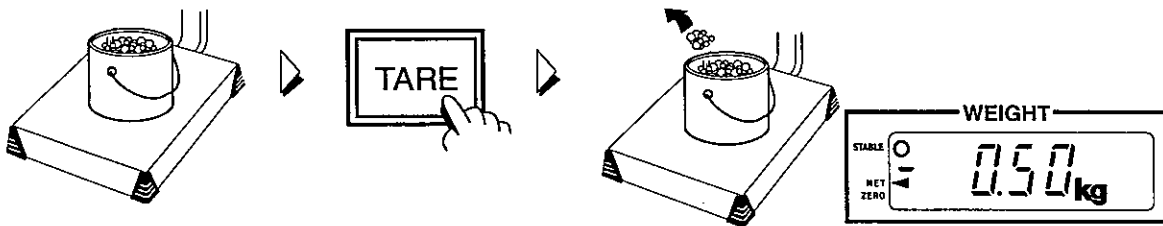
3  ▶ Fill the container until the target weight is reached. When adding multiple ingredients to a container, press the **TARE** key after adding each one. 

Clearing the TARE

 ▶   ▶ 

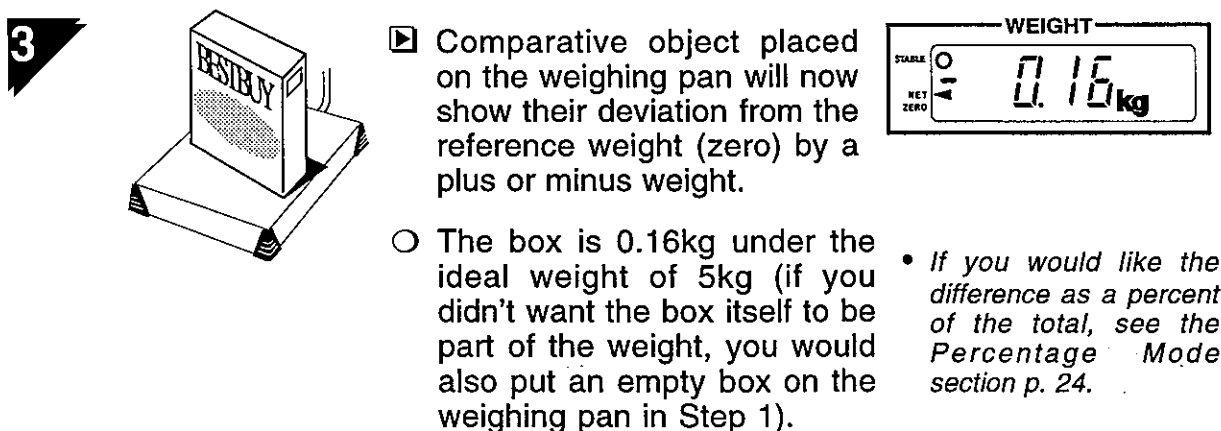
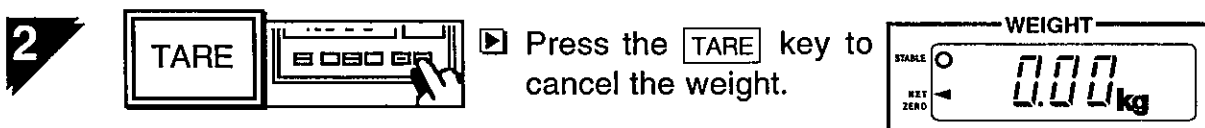
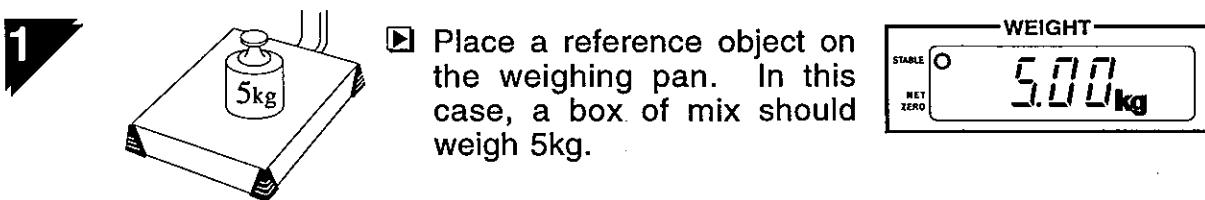
▶ With the weighing pan empty, press the **TARE** key and you will clear the NET mode and the ZERO indicator should come ON (see p. 12).

Subtraction, Weighing out of a Container

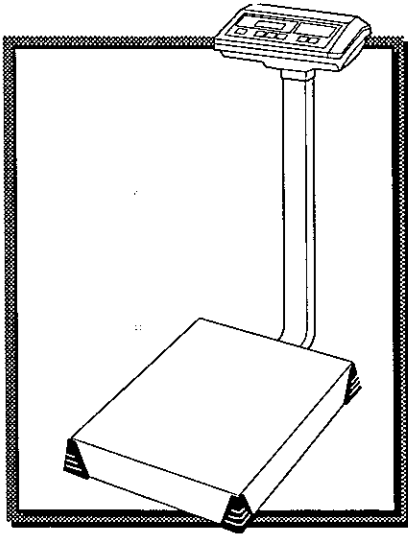


- ▶ Place the full container on the weighing pan. Press the **TARE** key to cancel the weight. Scoop out the amount of material you need. The display will show the amount in a negative number.
- When subtracting multiple batches from a container, press the **TARE** key after removing each.

Weighing Difference from an Ideal



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FW Series

Counting Mode

pcs



'pcs' Counting Mode



By knowing the weight of an item, the FW can easily count many of them when placed on the weighing pan. First you must let the scale determine the unit weight by giving it a sample to go by. Please see the table below for the minimum weight that one piece to be counted can weigh, and the maximum number of pieces the scale can count (at min. weight) (also see NOTE 1).

Model	Min. Piece Weight		Max. Pieces
FW-10KA2	0.001kg (1g)	0.0022 lb (0.035 oz)	10,000
FW-15KA2	0.002kg (2g)	0.0044 lb (0.071 oz)	7,500
FW-31KA2	0.005kg (5g)	0.011 lb (0.176 oz)	6,200
FW-60KA2	0.01kg (10g)	0.022 lb (0.35 oz)	6,000
FW-100KA1	0.01kg (10g)	0.022 lb (0.35 oz)	10,000
FW-150KA1	0.02kg (20g)	0.044 lb (0.7 oz)	7,500
FW-300KA4	0.05kg (50g)	0.11 lb (1.76 oz)	6,000
FW-600KA3/4	0.10kg (100g)	0.22 lb (3.5 oz)	6,000
FW-1200K3	0.20kg (200g)	0.44 lb (7 oz)	6,000



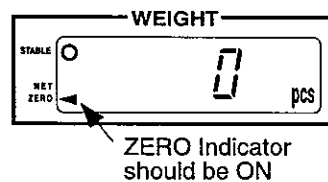
Setting Sample Weight

1



▶ Press the **MODE** key to select pieces 'pcs'.

⚠ If the **ZERO** indicator is not ON, press the **ZERO** key to zero the display.

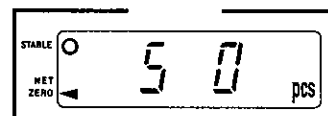


2

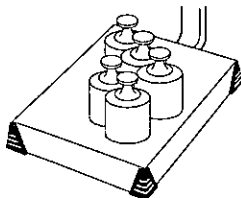


▶ Press the **SET** key and "5 0 pcs" will be displayed (see NOTE 2).

⚠ If "5 - pcs" is displayed, press the **ZERO** key to display "5 0 pcs".

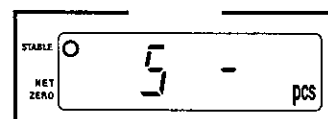


3



▶ Place 5 sample pieces on the weighing pan (the pieces must be of the same weight).

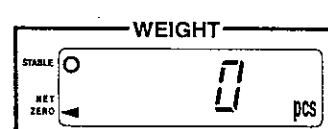
○ "5 - pcs" will be displayed.



4



▶ Press the **SET** key again, and remove the sample. You may now count (if you would like to use a container, see Note 4). **TV**



If "Lo" is displayed, see Note 3



NOTE 1

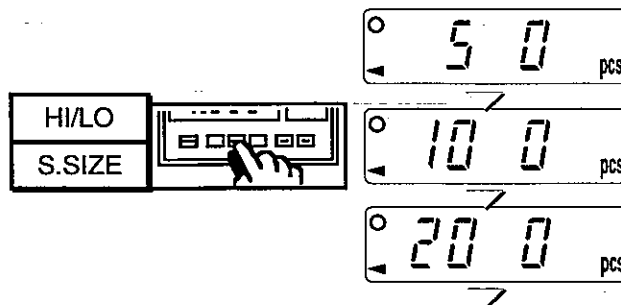
As a test, you may weigh one unit of what is to be counted. If it is too small for the scale to detect ("0" stays displayed) then it is also too small to use with Counting Mode*. In this case, you could use 10 units and count them as one "pcs". So, a sample size of 5 pcs would actually be 50 pieces.

* With the FW-10KA2 and the FW-15KA2, you may count pieces below the WEIGHT display's capacity. If you are counting MINIMUM PIECE WEIGHT items with these scales, please use the 10 pieces sample size as shown in NOTE 2.

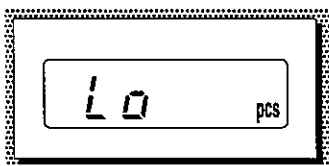


NOTE 2

At this point (Step 2), you can also use the **HI/LO / S.SIZE** key to display 10, 20, 50 or 100 pieces as a sample. As a rule, the higher the sample size, the more accurate the count, so use the largest sample size that is convenient for you.



NOTE 3

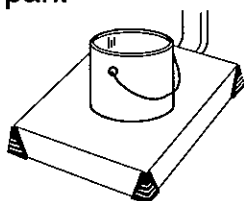


If the unit weight is too small, the display will show "Lo" when you press the **SET** key in Step 4. This means that the unit weight is less than the scale can detect. You may try increasing the sample size for more accuracy as described in NOTE 2 or see NOTE 1 for a different method.



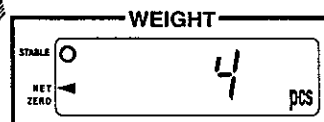
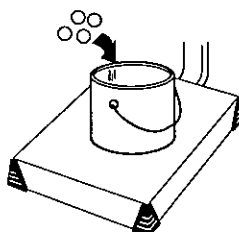
NOTE 4 - Using a Container

1 Go to a weighing mode (kg, lb) and
2 put the container on the weighing pan.

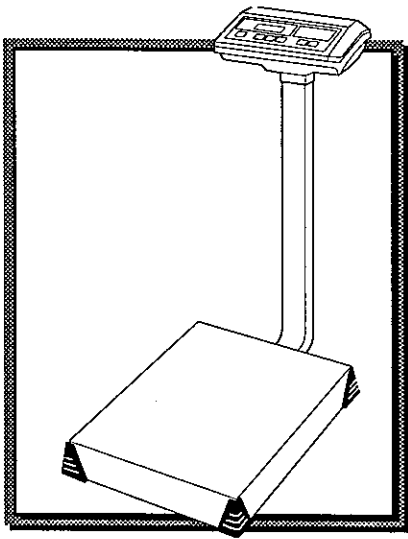


3 Use the **TARE** key to cancel the weight, 4 then go back to 'pcs' counting mode.

5 You may now count items in the container.



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FW Series

Percentage
Mode

%



'%' Percentage Mode



By knowing the weight of an item, the FW can easily tell you what percentage another similar item varies from it. First you must let the scale know the 100% ideal weight by giving it a sample to go by. Please see the table below for the minimum weight that the 100% sample may weigh.

Model	Min. 100% Value		Model	Min. 100% Value	
FW-10KA2	0.10kg (100g)	0.22 lb (3.5 oz)	FW-150KA1	2kg	4.4 lb
FW-15KA2	0.20kg (200g)	0.44 lb (7 oz)	FW-300KA4	5kg	11 lb
FW-31KA2	0.5kg	1.1 lb	FW-600KA3/4	10kg	22 lb
FW-60KA2	1kg	2.2 lb	FW-1200K3	20kg	44 lb
FW-100KA1	1kg	2.2 lb			

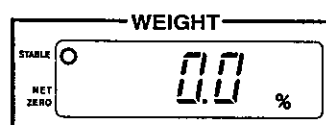


Setting Sample Weight

1



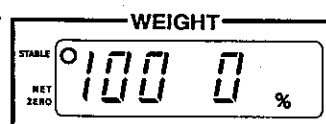
▶ Press the **MODE** key to select percent '%'.
○ "Lo" will be displayed.



2

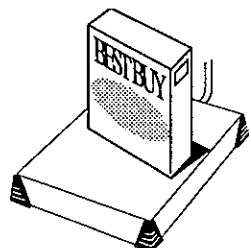


▶ Press the **SET** key and "100 0 %" is displayed.
○ "Lo" will be displayed.

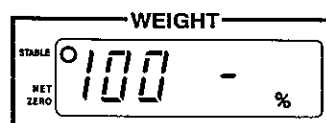


⚠ If "100 - %" appears, press the **ZERO** key to display "100 0".

3



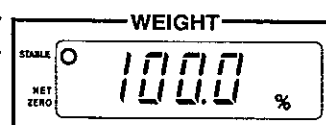
▶ Place the ideal 100% sample item on the weighing pan, and wait for the "O" stability indicator to come ON (if you want to use a container, see NOTE 2).
○ "100 - %" will be displayed.



4

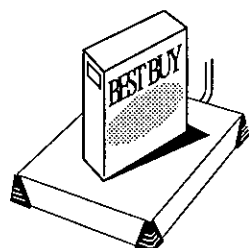


▶ Press the **SET** key again, and "100.0%" will be displayed. Remove the sample.
○ "Lo" will be displayed.



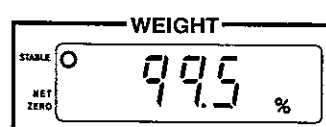
If "Lo" is displayed, see Note 3

5



▶ Place the item you want to compare and read the difference.
○ "Lo" will be displayed.

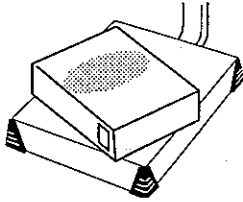
○ In this case, the box weighs "99.5%" of the ideal, or it's 0.5% lighter. **IV**





NOTE 1 - Using a Container (from Step 3)

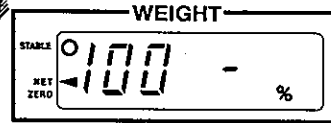
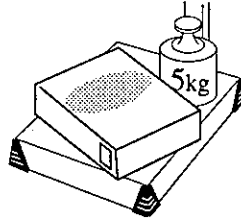
① Place the container on the weighing pan, in this case an empty box.



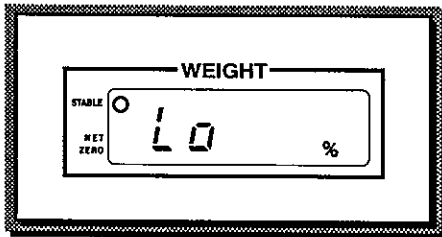
② Wait for the "O" stability indicator to come ON.

③ Press the **TARE** key to cancel the weight.

④ Place the 100% ideal weight on the weighing pan with the container. In this case, a 5kg mass, the amount of mix that the box should contain. Continue at Step 4.

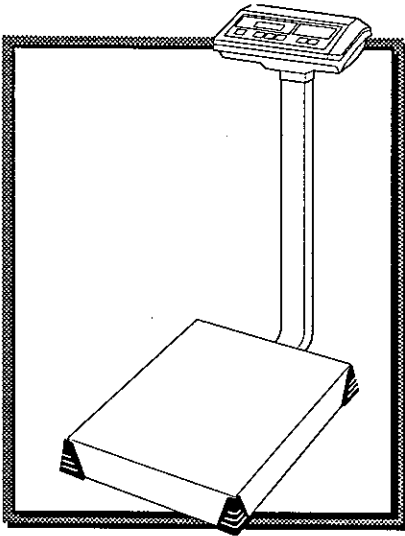


NOTE 2



If "Lo" is displayed when you press the **SET** key in Step 4, it means that the ideal weight is less than the scale can handle. See the table at the beginning of this section. **LV**

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FW Series

Comparator

HI GO LO



Comparator Mode



The comparator function checks the amount on the weighing pan against set acceptable weight setpoints so that $LO \leq GO \leq HI$

- ▶ When HI and LO Limits are set and the scale is in comparator mode, **HI**, **GO** or **LO** will be displayed when an item is weighed. The Comparator Mode can be used with "lb", "kg", "pcs" or "%".



Turning the Comparator OFF and ON

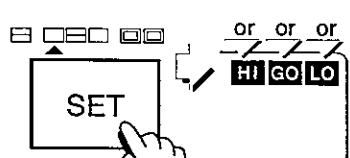
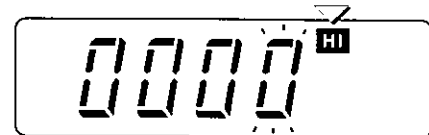
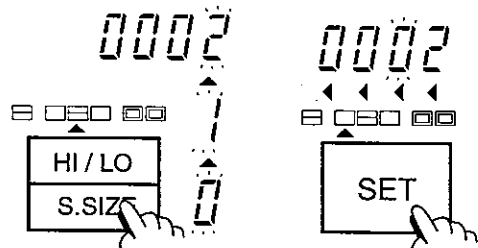
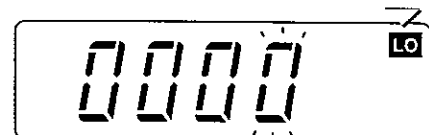


- ▶ In the Weighing Mode, the **SET** key is pressed to turn the comparator function ON or OFF (If the comparator is OFF, **HI**, **GO**, or **LO** will not appear on the display).

- ⚠ Normally the comparator will go OFF when the scale is turned OFF. If you would like the comparator to come back ON automatically when the scale is turned ON, see how to on page 38.



To Set the Comparator

<p>1</p>  <p>▶ Press the SET key while in the weighing mode ("kg" or "lb"). HI, GO or LO will be displayed, depending on the last setting.</p>	<p>2</p>  <p>▶ Use the MODE key to move through the units ("lb", "kg", "pcs", "%") until HI appears and the display reads "0000" with the last "0" flashing</p>
<p>3</p>  <p>▶ Use the HI/LO and S.SIZE keys to display the high limit value.</p> <p>• Use the HI/LO key to increase the displayed flashing digit.</p> <p>• Use the SET key to move the flashing digit one place to the left.</p>	<p>4</p>  <p>▶ After the high limit number has been entered, press the MODE key again and LO will appear. Use the HI/LO and SET keys again to display the lower limit.</p> <p>▶ After the low limit value has been entered, use the MODE key to move to the desired unit of measurement ("lb", "kg", "pcs", "%") and you are ready to use the comparator.</p>

⚠ No decimal point or weighing unit will be displayed and previously set limits will appear instead of '0000' shown above. The limits set are good for all weighing modes, including 'pcs'.

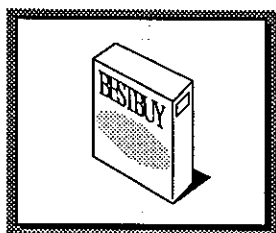
▶ If you are going to use the Comparator in Counting Mode, first enter the unit weight as explained in the Counting section - then switch to weighing mode to set the Comparator, and finally switch back to the Counting ("pcs") Mode.

□ If the OP-03 Serial Interface is installed, comparator relay output is also available.



If the optional RS-232C output board is installed, a buzzer will sound when the HI/LO limits are exceeded. Relay control will be possible through the same 7-pin DIN output connector used for the RS-232C Interface (see page 37).

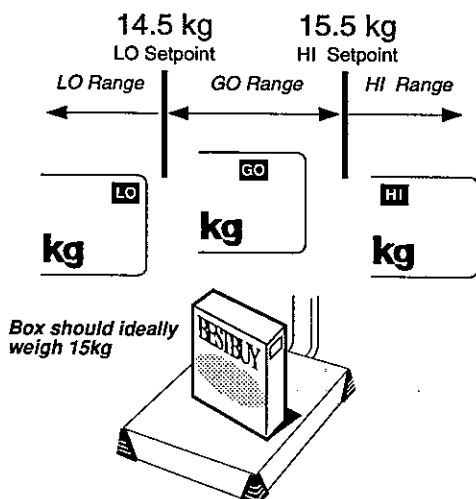
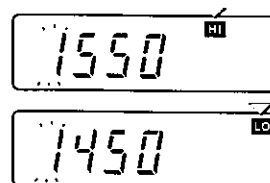
Comparator Use Example



Boxes of Mix

Let's say a box of mix has an ideal weight of 15.00kg. When weighing, you wish to reject any box that contains more than 15.50kg of mix or less than 14.50kg:

You would set the **HI** limit at 15.50kg
and the
Lo limit at 14.50kg



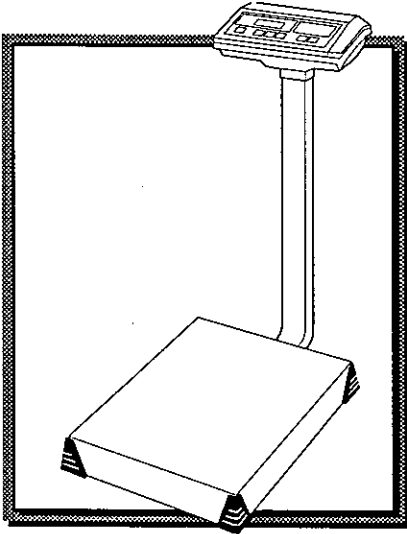
The scale has now been set so that when a box of mix containing more than 15.50kg is placed on the pan, the display will show the weight and the **HI** will appear. If a box contains less than 14.50kg, the **LO** will appear. For every box within the correct range the display will show **GO**.

$$\mathbf{LO} \leq \mathbf{GO} \leq \mathbf{HI}$$

$$14.50\text{kg} \leq \mathbf{GO} \leq 15.50\text{kg}$$

$$\mathbf{LO} < 14.50\text{kg}$$

$$15.50\text{kg} < \mathbf{HI}$$



FW Series

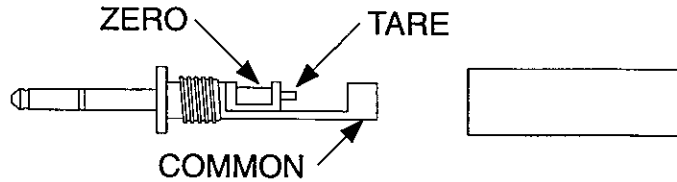
Installing Remote Switch, Options 1 & 2

Wall Mounting Kit & Display Pod Extension Cable



Installing the Remote Switch

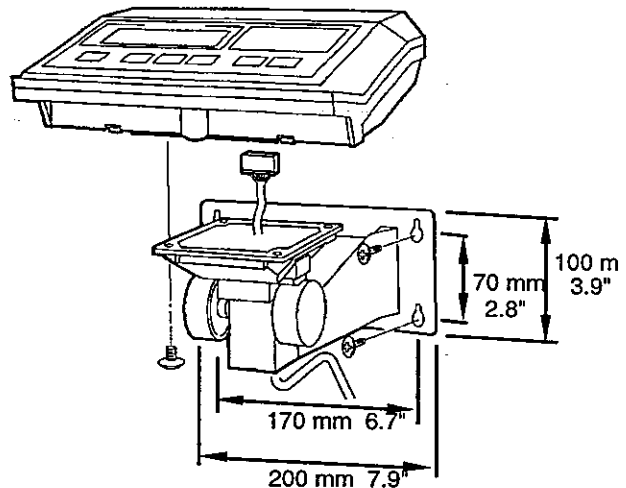
If you wish to use a remote **TARE** key and/or **ZERO** key switch, please connect one or two normally open switches to the remote jack plug provided with the Platform Scale.



OP-01 Wall Mounting Kit

1

Attach the Wall Mounting Bracket to a wall (or other supportive surface) with self-tapping screws. In some wall surfaces, you will need to drill holes and use "Rawl plugs" (wall plugs) to provide a key for the screws.



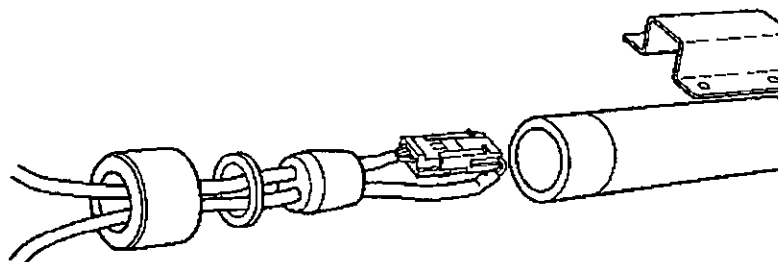
2

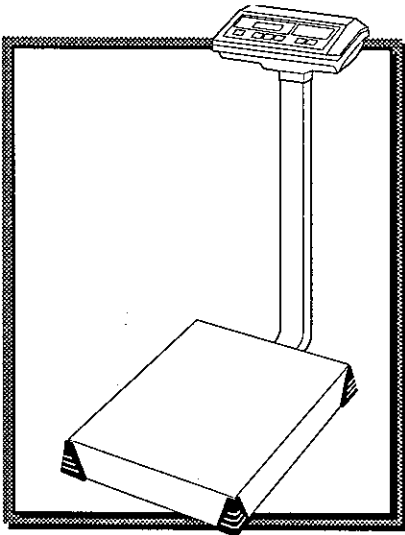
Attach the Display Pod to the Wall Mounting Bracket.



OP-02 Display Pod Extension Cable

If the Display Pod is to be used in a position remote from the platform, as a desk-top or wall mounted unit, then the standard Load Cell cable can be extended by 5 meters through the addition of this cable. The scale must be recalibrated for Zero and Span (see **ZERO CALIBRATION** section, and your dealer for Span Calibration) if this extension cable is used. A waterproof cover has been provided to protect the male/female connectors from splash - but a waterproof junction box may be required for some installations. Commercial scales will need to have the junction box sealed by the authorities.





FW Series

Option OP-03
RS-232C Serial
Interface &
Comparator
Board

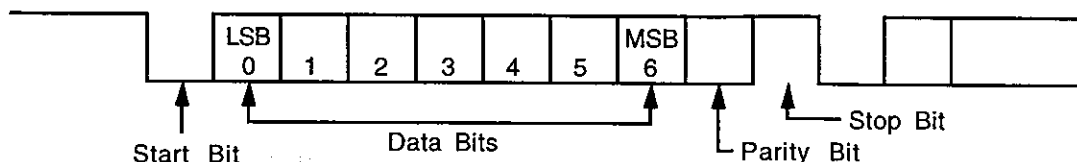


RS-232C Serial Interface



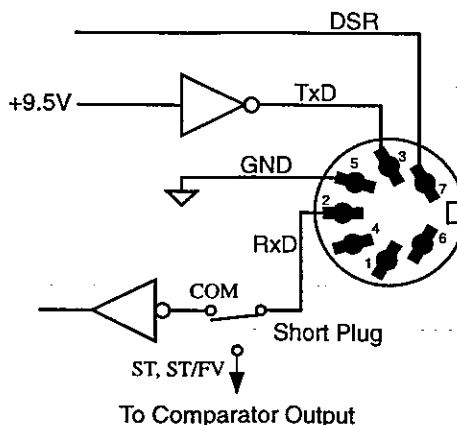
Specifications

Type EIA-RS-232C
Method Asynchronous Transmission.
Format Baud rate: 2400
 Data bit: 7 Stop bit: 1
 Parity bit: 1 Even Code: ASCII



RS-232C	
1	= -5V → -15V
0	= +5V → +15V

RTS and CTS should be interconnected →



Data Format

▣ Six types of output **HEADER** are transmitted:

- OL - Overload/Underload (E, E)
- ST - Display is Stable in %, kg, or lb
- US - Display is Unstable (in motion)
- QT - Display is Stable in counting mode
- HI - Hi Limit Setting
- LO - Low Limit Setting

▣ Data samples are transmitted by ASCII, including these codes:

- D (HEX) "-" (minus)
- B (HEX) "+" (plus)
- E (HEX) "." (decimal point)
- 5 (HEX) "E" (exponent)

- Example data string: "ST , + 000.00 k g C_R L_F"
- Terminator will always be <CR> <LF> for transmission data.
- Data is always transmitted as 7 digits, including ±000.00.
- Overload will be transmitted with "OL" as header and then "±999.99".
- There are four types of units "lb", "kg", "pcs" and "%".



Communication Modes

▣ There are two communication modes: **STREAM** and **COMMAND**:

STREAM mode: Data is transmitted continuously at the display update speed rate (Factory Setting).

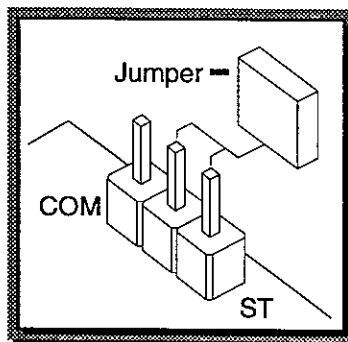
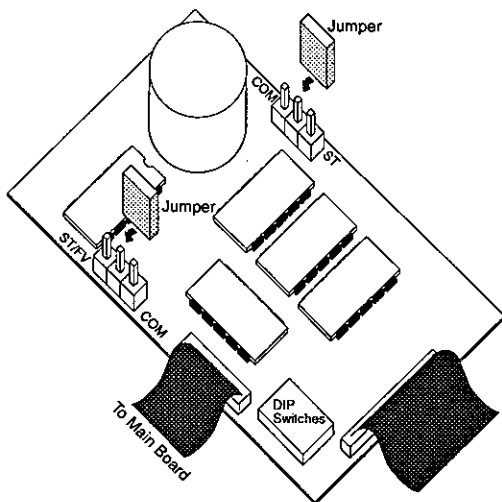
COMMAND mode: The scale is controlled by four commands from the external instrument:





- Sends Data
- Returns scale to center of ZERO
- RE-ZERO's the Display
- Changes the Units

▣ When the **COMMAND** mode is used, two jumpers on the interface must be set by your dealer as follows:

ST: For **STREAM** mode. The comparator relay output control is available.

COM: For **STREAM** and **COMMAND** mode. The comparator relay output control is not available.



Jumper Setting	Operation
COM  ST ST/FV  COM	STREAM mode only, and relay output is available <i>Factory Setting</i>
COM  ST ST/FV  COM	COMMAND and STREAM mode can be used, but relay output is not available



Command Format

Four types of COMMANDS transmitted:

- Q <term>: Sends data. When the HI or LO limit is displayed, it sends the limit value.
 - Z <term>: Returns the scale to center of ZERO.
 - T <term>: RE-ZERO's the display.
 - U <term>: Changes the Units.
- <term> is the terminator, <CR> or <CR> + <LF> is accepted by setting the communication mode.
 - There must be a delay time of more than 500 milliseconds between two continuous commands.



Setting the Communications Mode

- This software setting should match the Communication Mode as it is set on the previous page (mainly when using the COMMAND mode)

"F5 0": STREAM mode. (Factory Setting) This mode is the required setting when connecting the AD-8116 / AD-8117 printer.

- When using COMMAND, you can set the terminator as follows:

"F5 1": COMMAND mode. The terminator is <CR>+<LF>.

"F5 2": COMMAND mode. The terminator is <CR>.

1



- With the display **OFF**: Press and hold the **MODE** key.

2



- While holding the **MODE** key, press the **ON/OFF** key.
- "F0 1"- or - "F0 0" will be displayed.

F0 1

3



- Press the **MODE** key.
- "F5 0" will be displayed - or F5 '1' or '2', depending on the last setting.

F5 0

4



- Use the **HI/LO / S.SISE** key to rotate between the settings, stopping at the setting desired (see listing above).

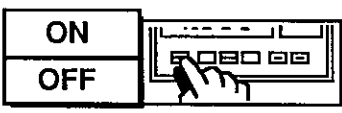
5



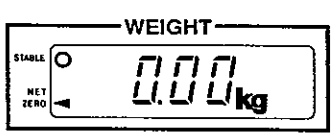
- Press the **ZERO** key.
- "F6 0" or F6 '1', '2', or '3' will be displayed.

F6 0

6



▶ Press the **ON/OFF** key twice to return to normal weighing mode. **TV**





Comparator



When the RS-232C interface is installed, you will also gain a comparator buzzer and (if you don't use the RS-232C COMMAND mode) a comparator relay output control through the same 7-pin DIN connector used to transmit serial data to the AD-8116/AD-8117 compact printer, or to a computer.

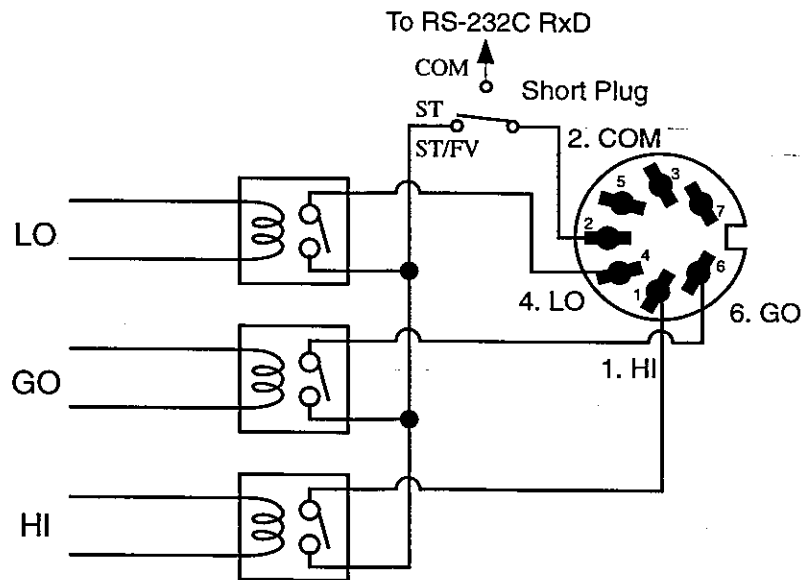
⚠ When using the relay output, the jumpers must be set for STREAM mode (Factory Setting, see p. 35).



Specifications

- Specifications for the relay are:

50V DC Max.
100 mA Max.



- There are three kinds of output signal: "HI", "GO" and "LO".
- There are two transmission conditions:
Transmit only when the scale is stable.
Transmit when the scale is stable or unstable.
- The buzzer can be activated in the Comparator Mode with "HI", "GO" or "LO" signal. The following switches must be set by your dealer.

Comparator DIP Switch Settings		
1	OFF	Transmit when stable.
	ON	Transmit when stable, or unstable.
2	OFF	For "LO" signal buzzer OFF.
	ON	For "LO" signal buzzer ON.
3	OFF	For "GO" signal buzzer OFF.
	ON	For "GO" signal buzzer ON.
4	OFF	For "HI" signal buzzer OFF.
	ON	For "HI" signal buzzer ON.



Comparator Mode Environment Settings

Setting	Comparator function is ON or OFF when scale is powered ON	Comparator Buzzer and Relay Output
f6_0	OFF	Always
f6_1	OFF	Prohibited near Zero*
f6_2	ON	Always
f6_3	ON	Prohibited near Zero*

* Near Zero = -4 to +4 weight display divisions (see Resolution on Specifications Table)

1



- ▶ With the display **OFF**: Press and hold the **MODE** key.

2



- ▶ While holding the **MODE** key, press the **ON/OFF** key.
- "F0 1"- or - "F0 0" will be displayed.

F0 1

3



- ▶ Press the **MODE** key.
- "F5 0" -or- F5 '1' or '2', will be displayed.

F5 0

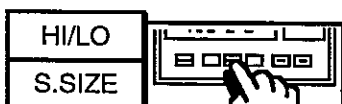
4



- ▶ Press the **MODE** key.
- "F6 0" -or- F6 '1', '2' or '3', will be displayed, depending on the last setting.

F6 0

5



- ▶ Use the **HI/LO / S.SIZE** key to rotate between the settings, stopping at the setting desired (see table above).

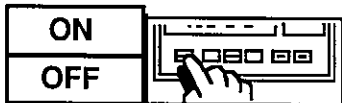
6



- ▶ Press the **ZERO** key.
- "End" will be displayed.

End

7



- ▶ Press the **ON/OFF** key twice to return to normal weighing mode. **VI**

