SALTER Brecknell

ESA SERIES

ELECTRONIC BALANCE

Declarations of compliance

United States

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canada

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Classe A prescrites dans le Règlement sur le brouillage radioélectrique edicté par le ministère des Communications du Canada.

EMC compliance

The following warning may be applicable to your machine.

WARNING: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

CE

Declaration of Conformity

Manufacturer	Salter Brecknell
Type	ESA
Corresponds to the requirements of the following EC directives:-	
Electro Magnetic Compatibility Low Voltage Directive:	EMC 89/336/EEC LVD 2006/95/EC
The application harmonised standards are:	EN60950-1: 2002, EN61000-6-3: 2001 EN61000-6-1:2007

A copy of the original signed Declaration of Conformity is available on request.

ESA Series Precision Balance

Thank you for purchasing the Model ESA precision balance. Please read all operating instructions carefully before using and note the following items to ensure accurate readings.

1.0 Description

- The ESA balances use a high precision load cell and microcomputer for simple operation with accurate, stable weight readings displayed on the large liquid crystal display.
- This balance is an excellent choice for laboratory use and educational applications, however, it is not recommended for use in production lines, food preparation areas or any other environment where high heat, cold, humidity or vibration are present.
- Do not overload the balance. This will damage the load cell and void the warranty.
- Inspect the platter, draft shield, housing and AC adapter regularly for damage.
- Refer to the troubleshooting chart at the end of this manual for more details.
- Do not attempt to repair the balance if you have a problem. Contact your local Salter Brecknell representative.

2.0 Unpacking

Please check the contents of this box carefully. Your ESA balance should come with one of each of the following:

- Electronic Balance
- Stainless Steel Weighing Platform
- 6V AC Power Adapter
- User Manual

3.0 Installation

- Place the balance on a stable, level surface.
- Level the balance using the adjustable feet and level bubble.
- Remove the protective film from the stainless steel platform.
- Gently place the weighing platform on the mounting posts on the top of the base of the balance. The base's posts should fit easily into the holes on the bottom of the platform and the platform should be flat and level.

Note: Do not force the platform as this can damage the balance.

- Connect the AC adapter to the receptacle at the rear of the balance.
- Connect the AC adapter to an appropriate power outlet.

Note: You can also operate this unit using batteries instead of the supplied AC adapter. Batteries are not included with the unit.

4.0 Key Functions

The following figure shows the front panel with six push buttons Each key function is explained on the next page..

On/Off	Turns the balance on or off or returns balance to normal weighing mode.
Count	Places the balance in piece count mode.
Cal	(stands for Calibrate) Enters calibration mode.
Tare	Used to tare off, up to 100% of balance capacity, an empty container and to reset the balance to zero. Use of tare with a weight or container reduces the scale's capacity by the tare value stored. Also works like **Enter** in some modes.
Mode	Toggles the backlight on or off. To extend battery life, turn backlight off. Also toggles between options in calibration mode.
Units	Allows you to scroll through and select from the available units (g, oz, ozt, dwt, lb) as well as count (ct) and percentage (%).

5.0 Scale Operation

This section covers the scale operations of weighing and counting.

Note: Always make sure that the balance is on a clean, dry, level and solid surface.

Simple Weighing

1. Turn the balance on. The balance will go through a series of tests and then display all zeroes (0's).
2. Press the **Units** key until the desired unit of measure is displayed on the far right of the display.
3. Press the **Tare** key if the display no longer reads zero.
4. Place item(s) to be weighed on the weighing platform. The weight will be displayed with the appropriate unit of measure next to it.
5. Remove the item(s) from the balance and repeat steps 2 - 5 to continue weighing.

Tare Weighing

If you want to do net weighing, such as weighing objects in a container, follow these steps.

1. Turn the balance on. The balance will go through a series of tests and then display all zeroes (0's).
2. Press the **Units** key until the desired unit of measure is displayed on the far right of the display.
3. Place the container to be tared on the weighing platform and press the **Tare** key. The display should return to zero.
4. Place item(s) to be weighed in the container. The weight will be displayed with the appropriate unit of measure next to it. The weight displayed is the net weight and does not include the weight of the container.
5. Remove the item(s) from the container and repeat steps 3 - 5 to continue weighing with the same container.

*Note: If you remove the container, the balance will show a negative weight. Press the **Tare** key to return the balance to zero.*

General Counting Function

The ESA series will count parts based on the weight of a reference sample of 5, 10, 20, 30, 40 or 50 pieces. For best results, the pieces used should be of equal weight. Also, the larger the sample, the more accurate your counts will be. Once you have created this reference sample, it will remain in memory until a new sample is recorded, even when the balance if turned off. This section explains the counting function in further detail.

1. Turn the balance on and allow it to come to zero.
2. Press the **Count** button. The balance will display “CON pcs”.

Note: If you are using a container to hold the pieces, place the empty container on the weighing platform at this point.

3. Press **Tare**. The balance will display the message “Add 5”.
4. Press **Mode** until the number of pieces in your sample is displayed. You can choose from 5, 10, 20, 30, 40 or 50.
5. Place your sample on the platform and press **Tare**.
6. There will be a short pause and then the balance will show the number of the sample on the screen.

Note: If the balance displays the message “PC Err”, the sample size was too small for the balance and a larger sample will be required.

7. Remove the sample from the balance. The balance is now ready to count.
8. Add pieces to the balance / container. The balance will show the number of pieces on the display.
9. Press the **Units** key to exit piece counting and return to normal weighing. You can return to piece counting by pressing the **Units** key until “pcs” is displayed.

6.0 Calibration

Occasionally, you may need to calibrate your balance with an appropriate weight. There are two types of calibration possible: sensitivity calibration and linear calibration. Linear calibration should only be attempted by a qualified service technician with correct weights. This section explains how to perform each type of calibration.

Sensitivity Calibration

1. With the scale in regular weighing mode, press the **Tare** button to zero the balance.
2. Press the **Cal** button.The balance will show “Scale”.
3. Press the **Tare** button. The balance will display one of the accepted calibration weights.

Note: The balance can only be calibrated in grams.

4. Press the **Mode** key to toggle between available calibration weights.
5. Press **Tare**. The balance will flash “0” briefly and then flash the calibration weight.
6. Place the correct amount of weight (in grams) on the platform and press the **Tare** button.
7. The calibration weight will continue to flash briefly and then become stable.
8. Once the weight is stable, remove the weight from the balance. The scale has now been calibrated and is in regular weigh mode.
9. Press the **Tare** key if the scale does not return to zero.

Linear Calibration

1. In regular weighing mode, press the **Tare** button to zero the balance.
2. Press the **Cal** button. The balance will show “Scale”.
3. Press the **Mode** button. The balance will show “Line”
4. Press **Tare**. The balance will flash “0” briefly and then flash the first calibration weight.
5. Place the correct amount of weight (in grams) on the platform and press the **Tare** button.
6. The balance will flash the next calibration weight.
7. Place the appropriate amount of weight on the weighing platter and press **Tare**.
8. The calibration weight will continue to flash briefly and then become stable.
9. Once the weight is stable, remove the weight from the balance. The scale has now been calibrated and is in regular weigh mode.
10. Press the **Tare** key if the scale does not return to zero.

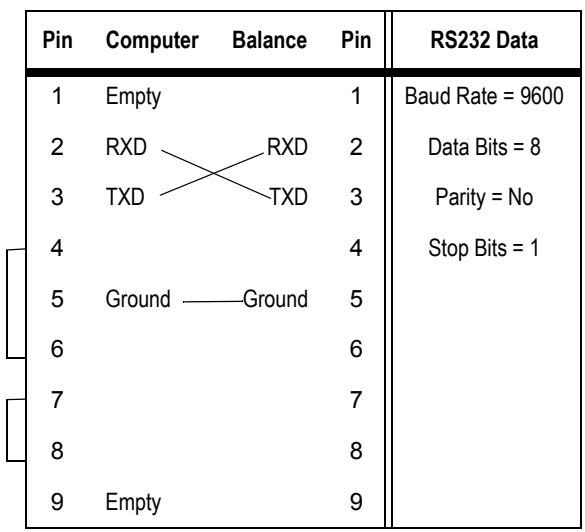
7.0 Print and Communications

The ESA balances can be connected to a PC or appropriate printer using a null modem cable (not supplied). The balance will transmit the gross or net weight and unit or the number of pieces if you are using the piece counting function.

Connecting to PC

1. Connect the appropriate cable to the 9 pin D connector on the balance.
2. Connect the other end to an available COM port on your PC.
3. Start HyperTerminal or similar utility.

The following diagram shows the wiring / pinouts of the cable and RS232 data.



Change Print Setting

You can select either Continuous Print or Print When Stable, depending on your needs.

1. Remove all weight (except platter) and power the balance off.
2. Power the balance on.
3. During countdown (*9999.99, 8888.88, 7777.77*), press the **Mode** key. The balance displays *F1 A2T.*
4. Press the Mode key. The balance displays *F2 PRT*.
5. Press the Tare key.
6. Press the Mode key to toggle between *P2TS* (print when stable) and *PCON* (continuous print).
7. Press the **On/Off** key when finished. The balance powers off and the changes are saved.
8. Connect the balance to the printer or other device.
9. Power the balance on.

Care and Maintenance

Your precision balance does not require a lot of maintenance, however, there are a few things you can do to keep your balance operating properly.

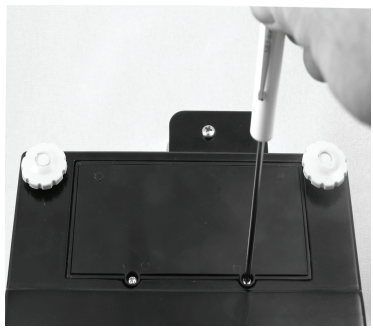
1. Keep the balance housing and weighing platform clean and free of debris. Clean with a soft cloth dampened with detergent as necessary.
2. Unplug the AC adapter when not in use.
3. Remove batteries for long term storage. (See the section on battery replacement.)

Battery replacement

You can expect approximately 15 hours of use when powering the balance with batteries. Use only alkaline batteries of the correct size and pay close attention to the markings (+ or -) inside the battery compartment.

Your balance should look similar to one of the two pictured below. Detailed instructions are for models using screws to hold the lid in place only.

1. Remove the two screws holding the battery compartment lid on the bottom of the scale.



2. Gently pry up the battery cover and remove.
3. Insert the correct number of batteries.
4. Replace cover and tighten screws.
5. Return balance to upright position and press the **On/Off** button to turn the scale on and resume normal weighing or counting functions.

Error Codes and Troubleshooting

If the scale shows something unexpected, you may be able to resolve it yourself. Many times, the error can be resolved by powering the scale off and then back on again. The table on the next page shows some basic troubleshooting tips to try before calling for service.

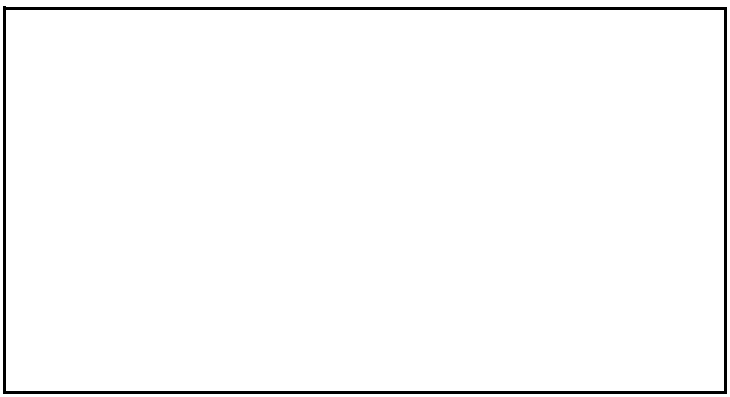
Table 1: Error Codes and Troubleshooting

Problem	Cause(s)	Solution(s)
Err 0	This typically indicates that the platform is too light.	Ensure that the stainless steel cover is properly in place. Turn the scale off and remove the platform. Replace the platform and reapply power. If error persists, the weight sensor or circuit board may be faulty and you should contact your distributor.
Err 1	Overweight error. The sample being weighed is too heavy for the balance.	Remove some of the sample. If sample is within the balance capacity, balance may need to be calibrated.
Err 2	Underweight error. This error is similar to Err 0 as it indicates that the platform is not properly installed.	Power off the balance and re-seat the platform before reapplying power to the balance. The balance may need to be calibrated.
Err 3	Non-zero error. This indicates that there was weight on the balance during power up.	Remove any weight(s) from the platform, turn the balance off and back on.
F1 AZT	A button was pressed during power up.	Turn the balance off and back on again.
F2 Cnt	A button was pressed during power up.	Turn the balance off and back on again.
Incorrect Weight Reading	Balance was not set to zero or was not calibrated.	Press Tare to zero the balance. Calibrate the balance as necessary.
No Display	Power adapter not properly connected or batteries are dead.	Reconnect power adapter or replace batteries.

8.0 Specifications

Table 2: Specifications

MODEL	ESA-150 ESA-300	ESA-600	ESA-1200	ESA-3000	ESA-6000
Capacity & Resolution	150 x 0.005 g 300 x 0.005 g	600 x 0.01 g	1200 x 0.02 g	3000 x 0.05 g	6000 x 0.1 g
STD Deviation (e)	1				
Linearity (e)	1				
Corner Deviation (e)	1				
Tare Range	100%				
Overload Capacity	Maximum Capacity+9e				
Stabilization Time (s)	3 seconds				
Applicable Temperature Range	10° - 35° C 50° - 95° F				
Power Source	AC Adapter (included)or 6 AA Batteries (not included)		AC Adapter(included) or 8 AA Batteries Batteries are not included.		
Pan Size	120 mm diameter (approx. 4.7 in.)		172 mm x 172 mm (approx. 6.8 in x 6.8 in)		
Housing Dimensions	251 (L) x 172 (W) x 58 (H) mm (approx. 9.9 x 6.8 x 2.3 in)				
Net Weight	832 g 1.8 lbs		1560 g 3.4 lbs		



UK and EUROPE

Salter Brecknell Weighing
P.O. Box 9533
Smethwick
West Midlands B66 2 TE
Tel: +44 (0) 870 444 6132
Fax: +44 (0) 870 010 2241
Email: sales@salterbrecknell.co.uk
Web Site: www.averyweigh-tronix.com

USA

Salter Brecknell Weighing Products USA
1000 Armstrong Drive
Fairmont, MN 56031
Toll Free: 800-637-0529
Tel: 507-238-8702
Fax: 507-238-8271
Email: sales@salterbrecknell.com
Web: www.salterbrecknell.com

PN AWT35-500064 AC October 2008