



Compact Balances  
W3300 Series  
**Operating Manual**



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## **1. INTRODUCTION**

To ensure proper operation and performance from of your Accuris Compact balance, please read this manual in its entirety before use.

Accuris balances have been designed and developed with our scientific customers' requirements in mind. The Compact Balance range incorporates gold-plates capacitance technology, combined with mechanical engineering and software to provide the following features:

- Easy Operation.
- Easy to read, large LCD screen with a white backlight;
- Rapid weighing speed 10 times faster than mechanical balances;
- Capability to tare up to the maximum capacity of the balance ;
- Multiple weighing modes:
  - 1) Standard weighing
  - 2) Piece counting
  - 3) Percentage weighing
- Choice of weighing units: grams, carats, or ounces.
- RS-232 interface for connecting peripheral device such as a computer or a printer;
- Alarm to indicate malfunction
- Easy, in-lab calibration

## **2. INSTALLATION**

### **2-1 UNPACKING**

**CAUTION:** Always handle your Accuris balance with care. The internal, electromechanical components have been assembled and adjusted at our factory to ensure accurate performance, but mishandling and physical shock can damage the internal mechanisms.

Carefully remove the balance from the carton and then remove the foam protective pieces. Check the balance to make sure there has not been any damage during shipping. Check the contents of the package to make sure you have received all of the parts:

## Packing List

No.	Item	Quantity
1	Compact Balance Unit	1
2	Weigh Pan (top)	1
3	Pan Support (bottom)	1
4	Draft Shield Ring and Cover (models -120, -300, and -500 only)	1
5	AC power adapter	1
6	Operating Manual	1

**IMPORTANT:** It is recommended to save the cartons and packing materials for storing and transporting the balance or returning it for any required servicing.

## 2-2 SPECIFICATIONS

Model	W3300-120	W3300-300	W3300-500	W3300-1200	W3300-5K	W3300-10K
Capacity	120g	300g	500g	1200g	5000g	10,000g
Calibration	External					
Readability	0.01g			0.1g		
Repeatability	0.02g			0.2g		
Linearity (+/-)	0.02g			0.2g		
Stabilization	Approx. 2 sec.					
Operating temperature	10°C—30°C					
Pan size	11.5cm / 4.5 in.			16cm/6.3i	18cm/7in	18cm/7in
Draft Shield	Yes, Plastic Ring and Cover			No		
Dimensions (W x H x D)	18.8 x 28 x 8 cm / 7.5 x 11 x 3.1 in					
Power	AC 110 to 230V, 50/60 Hz					

## 2-3 ENVIRONMENTAL REQUIREMENTS

Your Accuris balance is a precision instrument, and requires an environment which is free from excessive air flow, dust, corrosive elements, vibration and temperature or humidity extremes. An unsuitable environment will adversely affect the performance of your balance.

- The area and environment where your balance is used should be kept clean and dry all time;
- The optimal operating temperature is 20°C (68°F) and 50% relative humidity;
- Always use a stable AC power source that meets the input specifications of the AC/DC power adapter.
- Do not situate the balance:
  - In direct sunshine;
  - Next to windows or doors where there can be excessive air movement or rapid temperature fluctuations;
  - Near a heater or air conditioner;
  - Near vibrating, rotating or reciprocating equipment;
  - Near magnetic field or equipment that generates a magnetic field;
  - On an unstable surface;
  - In areas where there are corrosive vapors;

## 2-4 SETTING UP YOUR BALANCE

**CAUTION:** Always allow the balance to warm up in its ambient environment for 2 hours prior to use.

1. If the balance is moved from a cold environment to a warmer environment, condensation may form on the internal components and external surfaces of the balance and this can cause operating and performance problems.
2. Place the balance on a stable and level surface;
3. Level the balance by turning the 2 adjustable front feet, checking the level indicator on the balance control panel, until the bubble appears in the center of the circle;
4. Carefully place the pan support and the pan into position on the weighing mechanism. These parts should be carefully put into place, no downward force is required;

5. If desired to use the draft shield ring (included with models W3300-120, W3300-300, W3300-500), place it carefully over the Weighing Pan. The bottom edge of the shield will fit on the outside of the 3 raised locating ridges.
6. Attach the included AC/DC Power Supply adapter to a suitable electrical outlet, and attached the DC plug end to the balance.
7. The front display should turn on, and the balance will run through a start up procedure.
8. Upon completion of the start-up procedure, the display will light up and the display will show 0.00.
9. It is recommended to wait 30 minutes to allow the balance to equilibrate to the room's temperature before use.
10. Note that the back light on the display will remain on when the balance is in use. If the balance is not in use, and there is not a sample on the weigh pan, the back light will turn off as an energy-saving feature. The W3300 balances do not have an on/off switch. The power cord can be detached if desired to turn off the power.

### 3. OPERATING YOUR BALANCE

It is always recommended to plug in and pre-warm your balance at least 30 minutes before use.

#### 3-1 Display and Control Panel



The display on the balance has a backlight, and an internal timer will turn off the backlight (power-save mode) if the balance is not used for a period of time. The default time delay for back light shut off is one minute, and this time is adjustable by following these instructions:

Hold the PRINT button and then simultaneously press the % PERCENT button.

This will put the display into the settings mode.

Press the TARE button repeatedly until the display shows “bLI9h7” which indicates Back LIGHT timer setting. Then press ENTER to choose it.

The display will show the current setting of delay for the backlight to remain on when the balance is inactive, before shutting off.

For example: “1 nln “ on the display means 1 minute.

Press TARE repeatedly to toggle through the choices of the delay time.

Press ENTER to choose the value. Now the backlight timer is set to the new value.

## Display Information

**OK:** Weight reading shown is stable.

**g:** Weight reading is shown in grams.

**Oz:** Weight reading is shown in ounces

**Ct:** Weight reading is shown in carats

**%:** Reading shown is given in as a percent weight (see Percent Deviation Mode)

**PCS:** Reading shown is given in number of pieces (see Count Mode)

**UNABLE:** Operational Error

**HHHHHH:** The weight exceeds the capacity of the balance.

**LLLLLL:** The pan is not properly seated or has been removed.

### 3-2 Basic weighing

1. Plug in the balance using the included power supply, the balance will turn on and go through the initial testing. Once completed, the display will read 0.00g
2. Place a weigh boat or weighing container on the weighing pan
3. Press the TARE key and wait for the display to show 0.00g

4. Place the sample onto the weighing container
5. The display will stabilize (display will show "OK") and the weight will be displayed

### **3-3 Count weighing**

This function is used to determine a total number of pieces of identical weights. A known number of pieces is weighed as a reference, and the average weight of each piece is automatically calculated by the balance. An unknown quantity of pieces can then be placed on the balance and the number of pieces will be calculated.

1. First set the sample quantity that will be used as the reference quantity weight. Press the COUNT/ENTER button to scroll through the available reference quantities, for example: QTY 10, QTY 25, etc. Once the chosen reference quantity is displayed, place the quantity of pieces onto the balance.
2. Press the METRIC button, and the display will indicate the chosen reference number of pieces.
3. Remove the pieces from the weigh pan, and the display should return to 0.
4. Place a quantity of pieces onto the pan to count, and the balance will calculate and display the number of the pieces.

### **3-4 Percent Deviation**

This mode is used to calculate the percentage of weight that a sample deviates from a reference weight.

1. Empty the weigh pan;
2. Press the METRIC key to enter the basic weighing mode;
3. Press the TARE key to zero the display;
4. Place the reference weight onto the weigh pan;
5. Press the % PERCENT key, and 100% will be displayed;
6. Remove the reference weight from the weigh pan, and 0.0 % will be displayed;
7. Place an object to be compared to the reference weight onto the weigh pan. A percentage value of the deviation between reference and the sample will be displayed.



## 4. CALIBRATION

The following calibration procedure can be used to calibrate the balance to a known calibration weight standard. Before proceeding, the balance must be located in a stable environment, equilibrated to the ambient temperature. The leveling bubble indicator should show that the balance is level and the weighing pan should be empty and clean.

1. Press the CAL key, then press TARE to scroll through available calibration weight options (for example 500, 200, 100).
2. When a suitable calibration weight is displayed, wait for "OK" to be displayed. This indicates that the balance is stable.
3. Press "CAL" again, the display will show "ACAL" to indicate that balance is ready for calibration.
4. Place the appropriate calibration weight onto the weighing pan and wait for "OK" to display.
5. The calibrated value (for example 100.00 g) will be displayed when the calibration is complete.
6. Remove the weight, and the display should return to 0.00.
7. The balance is calibrated.

## 5. Print Setups

There are three print types:

STABLE Print: print a stable reading when it is attained.

INSTANT Print: print immediately after press the Printkey.

INTERVAL Print: print at predetermined time intervals.

The number of line feeds also is set for label printing.

Note:

The print function is separate from the line feed setup, i.e, set the print function first then set the number of line feeds.

To set the print type, use the following procedure:

1. Press and hold PRINT key and also press the % PERCENT key, the balance reads "PrInT"

2. Press the COUNT/ENTER key, the balance reads "STAbLE" , which indicates stable print as the default.
3. Press the TARE key to choose the print type and press COUNT/ENTER to confirm.
4. Press the TARE key until "InTER" is displayed, press COUNT/ENTER and "SEC" is displayed.
5. Press the TARE key repeatedly to scroll through the available time interval and press COUNT/ENTER to confirm. "O SEC" indicates continuous print.
6. Press the COUNT/ENTER key to return to the weighing mode.
7. After entering print setup, press Tare key repeatedly to choose line feed setup "LinEFd"
8. Press Tare key repeatedly to see predetermined line feeds (1-18). Choose the proper line feeds, press Count/Enter key to return to weighing mode.

### **Setting the Baud Rate**

1. Press and hold PRINT key and also press the % PERCENT key, the balance reads "PrInT"
2. Press TARE key, the balance reads "bAud"
3. Press COUNT/ENTER key, the balance reads " 300"
4. Press the TARE key repeatedly, the balance display the other buad rates. Choose the proper rate and press COUNT/ENTER to confirm.
5. The balance reads "ParITy" and begins parity check.
6. Press the COUNT/ENTER key, the balance reads "nOnE" (no check) for the first.
7. Press Tare key, it reads the other check types, " Odd" indicates odd check and "EvEn " indicates even check. Choose the proper check type and press COUNT/ENTER to confirm, the balance now returns to weighing mode.

### **Enabling Units of Measure**

The units function can be programmed to turn certain weighing units on or off  
To enable or disable certain units of measure, perform the following procedure:

1. Press and hold PRINT key and also press the % PERCENT key, the balance reads "PrInT"

2. Press the TARE key repeatedly until the display reads "unIT"
3. Press the COUNT/ENTER key, the display reads "G yes " which means g (grams) is available for use.
4. Press COUNT/ENTER to confirm. To disable g as the unit, press TARE key, the display reads " G no " , press Count/Enter key to confirm.
5. Follow the steps above to enable or disable Oz, Ct or dwt as the unit of measure.

### **Restoring the Factory Default Setup**

1. Press and hold PRINT key and also press the % PERCENT key, the balance reads "PrInT"
2. Press TARE key repeatedly until it reads "InITIA"
3. Press COUNT/ENTER key to confirm, the display reads "BUSY" and then returns to weighing mode. Factory default setup is finished.

## 6. Communication with a Computer

The basic keyboard functions can be accessed via the RS232 interface. The following commands are available:

U : Unit ..... units conversion  
T : Tare ..... deduct the tare weight  
C : Cal ..... calibration with external standard weight  
P : Print ..... print function  
% : % ..... percent function  
# : # ..... instant print  
M : Count..... counting function

When a balance is connected to a computer, it is suggested that immediate print (#) be used. In response to this command the balance will transmit whatever number or message appears on the balance display.

The string format output is shown below:

A B C D E F G H I J K L M

A : +/- signs field; usually no display as a space when it is a positive number, - is displayed when it is a negative number.

B~G : number and decimal field; spaces are used when there are less than six digits.

H~I : spaces field

J : unit field; it describes the units of the number being transmitted. Your balance will transmit G for grams, O for ounces, C for carats.

K : stable character; it corresponds to the "OK" indicator on the display. S means the reading is stable, space means the reading is not stable.

L : return character

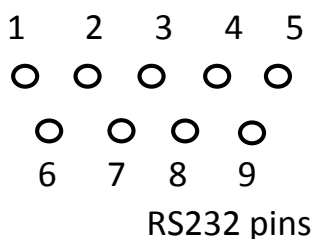
M : line feeds character; it indicates the line feeds.

### 7-1 The RS232 Interface Hardware:

This balance adopts the transmit and receive lines of standard RS232.

The data format is 1 start bit / 8 data bits include parity / 1 stop bit

The instruction to connect the balance to external device is as follows



#### PIN      DESCRIPTION

2 : TXD---- scale transmits data

3 : RXD---- scale receives data

5 : GRD---- signal ground

#### Notice:

- “handshake” signals, such as “clear to send” (CTS) are not used. The peripheral must have a minimum buffer (15 characters).
- It is suggested that the maximum recommended cable length is 15 meters; the load impedance of the device connected should be between 3000 and 7000 ohms with no more than 2500 pf shunt capacitance.

## TROUBLE SHOOTING

Problem	Possible Cause	Solution
No Display	<ul style="list-style-type: none"> <li>· No power</li> <li>· AC/DC Power Adapter not functioning, or incorrect specifications</li> </ul>	<ul style="list-style-type: none"> <li>· Plug in the AC/DC adapter</li> <li>· Replace the adapter</li> <li>· Contact the Service Department</li> </ul>
Displayed weight value is unstable	<ul style="list-style-type: none"> <li>· Unsuitable environment <ul style="list-style-type: none"> <li>• Draft shield door is not closed properly</li> </ul> </li> <li>· There is an object under the weigh pan</li> </ul>	<ul style="list-style-type: none"> <li>· Install the balance in a suitable location, avoid vibration, air movement, temperature fluctuations</li> </ul>

	<ul style="list-style-type: none"> <li>· Unstable power supply exceeds the limit</li> <li>· The object weighed is unstable (evaporation or absorption of moisture)</li> </ul>	<ul style="list-style-type: none"> <li>· Close the door properly</li> <li>· Remove any objects or materials that may obstruct the pan</li> </ul>
Weighing value is not accurate	<ul style="list-style-type: none"> <li>· The balance is not calibrated</li> <li>· The display is not tared before weighing</li> <li>· The balance is not properly leveled</li> </ul>	<ul style="list-style-type: none"> <li>· Calibrate the balance</li> <li>· Press TARE key to zero the display</li> <li>· Level the balance by turning the adjusting feet</li> </ul>

## 8. CARE AND MAINTENANCE

The Accururis Analytical Balance is a high precision instrument that must be handled carefully and properly maintained.

- Do not use sharp objects (such as a pen or pencil) on the keypad.
- Do not let objects fall on the weighing pan, otherwise the weighing system can be damaged;
- Do not expose the balance to high temperatures or dust;
- Do not disassemble the balance without proper training or instructions;
- It is recommended to cover the balance when not in use;
- Keep the balance clean and dry.

### 8-1 Cleaning

- Unplug the AC adapter before cleaning;
- Do not use any aggressive cleaning agents such as solvents or alcohols;
- Use a damp, soft cloth with mild detergent such as soap;
- Do not allow any liquids to enter the balance;
- After cleaning, wipe dry the balance with a piece of soft and dry cloth.



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