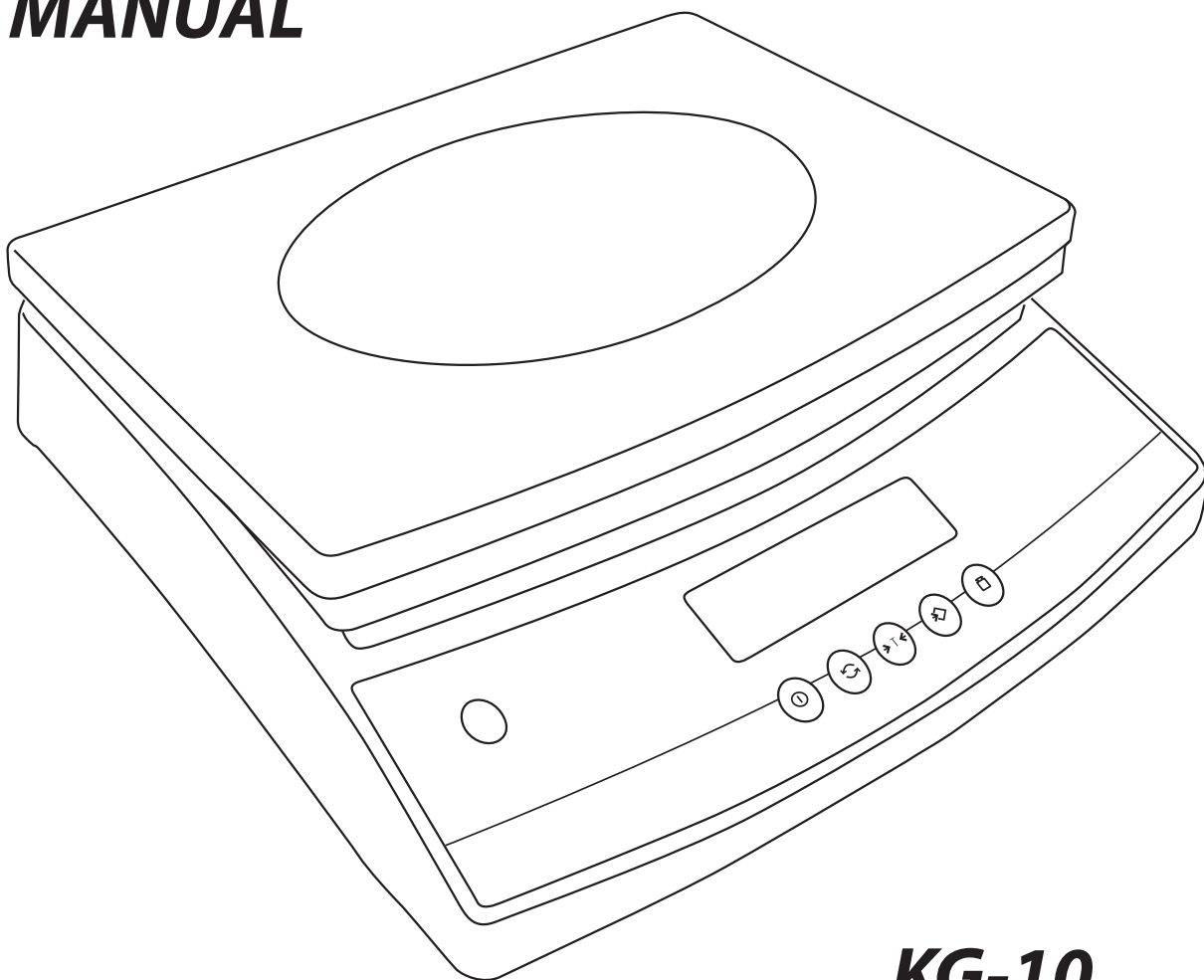




American
Weigh
Scales, Inc.

KG-Series
*High Capacity
Precision Balance*

INSTRUCTION MANUAL



***KG-10
KG-20***

TABLE OF CONTENTS

1.	INTRODUCTION	
1.1	KG-Series Balance Structure	p. 3
1.2	Technical Specifications	p. 4
2.	INSTALLATION	
2.1	Part List	p. 5
2.2	Unpacking	p. 5
2.3	Installation Instructions	p. 5
2.4	Turning on the Balance and Self-testing	p. 5
3.	OPERATION	
3.1	Sample Weighing	p. 6
3.2	Weighing with a Container	p. 6
3.3	Unit Switching	p. 6
3.4	Parts Counting	p. 6
3.5	Percent Weighing	p. 6
3.6	Calibrating the Balance	p. 7
3.7	Linear Calibration	p. 7
4.	APPENDIX	
4.1	RS232 Serial Data Communication	p. 8
4.2	Serial Number	p. 8
4.3	Commands	p. 8
4.4	Proper Care & Maintenance	p. 8
4.5	Troubleshooting	p. 9

1.1. KG-Series Balance Structure

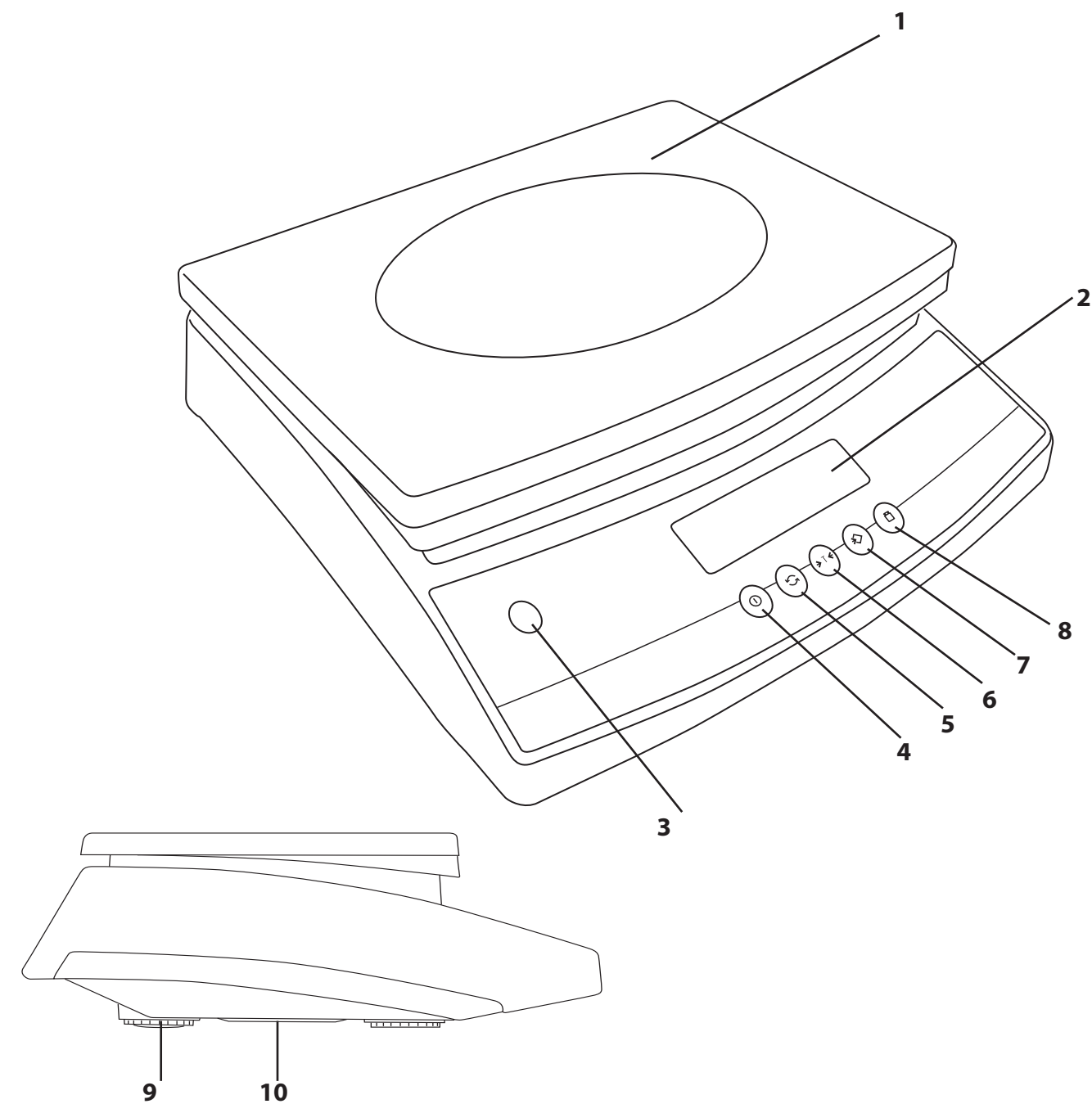


Figure 1.3

1	Weighing Pan
2	Weight Display
3	Bubble Level
4	ON/OFF Button

5	UNIT Button
6	TARE Button
7	MODE Button
8	CAL Button

9	Leveling Foot
10	Battery Compartment

1.2. Technical Specifications

Model	KG-10	KG-20
Max. Capacity	10,000g	20,000g
Readability	0.1g	0.1g
Repeatability	$\pm 1d$	
Linearity	$\pm 2d$	
Span Calibration Weight	5000g	10,000g
Linear Calibration Weights	5000g, 10000g	10,000g, 20,000g
Response Time	2~3 sec.	
Pan Size	12 x 9 inch	
Dimensions	12 x 12.5 x 7 inch	
Net Weight	6.4 lb	
Power Requirements	One 9V Battery or AC Adapter Input:120V 60hz / Output: 9V 200mA (included) Optional Rechargeable Battery (sold separate)	
Output Interface	Bi-directional RS232	

2. INSTALLATION

2.1. Part List

Balance	1 pc.
Weighing Pan	1 pc.
Stainless Steel Shroud	1 pc.
AC Adapter	1 pc.
Instruction Manual	1 pc.
Warranty Card	1 pc.

2.2. Unpacking

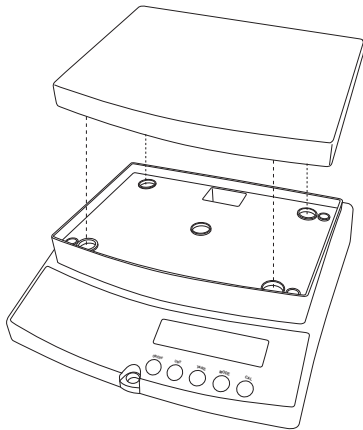
Carefully unpack the balance and remove it from its styrofoam supports. You may want to keep the original box and packing materials for storing the balance when not in use.

If the balance is damaged contact the supplier immediately. Keep all packing materials as they were when you received them.

2.3. Setting Up the Balance

Remove the balance from its styrofoam supports. Place the balance on a level surface, free of vibration. Carefully set the scale platform into place. You may want to keep the original box and packing materials for storing the balance when not in use.

If the balance is damaged contact the supplier immediately. Keep all packing materials as they were when you received them.



2.4. Turning on the Balance and Self-testing

- 1. Connect the power cord to the balance and plug the AC adapter into an available wall socket.
- 2. Press the ON / OFF key to turn the scale on. A display test will be performed (5 seconds).
- 3. Once the display shows “0.0g” the balance is ready to use.
- 4. To turn the scale off, press the ON / OFF key.

NOTE: You should let the balance warm up for 20 ~ 30 minutes before use for best results.

3. OPERATION

3.1. Sample Weighing

1. Press TARE / ZERO to make the balance return to zero.
2. Load the sample onto the scale pan.
3. The weight is stable when g (depending on weighing unit is active) appears on the display.

NOTE: For accurate weight results, it is important to load the sample to be weighed, onto the center of the platform.

3.2. Weighing with a container

Sometimes it is necessary to weigh an object (such as a liquid) using a container. To display just the weight of the contents (net weight) and not the whole combined weight (gross weight), the TARE button is used.

1. Place an empty container on the weighing pan.
2. Once the weight stabilizes, press the TARE / ZERO key briefly. The display will return to zero.
3. Add the sample to the container.
4. The weight is stable when g (depending on weighing unit is active) appears on the display.

3.3. Unit Switching

This balance has 10 possible weighing units. They are gram (g), carat (ct), pound (lb), ounce (oz), troy ounce (oz), grain (GN), pennyweight (dwt), Newton (N), Tola (T), and T/A/R. Follow these instructions to change the weighing unit:

1. Press the UNIT button.
2. The weighing unit will cycle between the different weighing units with each press of the button.

Notes: The balance will default to the last unit used when turned on the next time.

3.4. Parts Counting

With items of uniform weight (ie. all the pieces are of equal weight value) it is possible to use this scales parts counting feature to quickly and accurately obtain a piece count. To use the parts counting feature, follow these instructions:

1. Press the MODE key until the display shows "pcs" to indicate parts counting mode.
2. The display will show "10 pcs" to indicate that you should place a sample quantity of 10 pieces onto the platform. You may change the sample size by pressing the "CAL" button. Possible sample sizes are 10, 20, 50, 100, 150, 200, 250, and 500.
3. Press MODE again once you have selected the proper sample quantity.
4. You can now add any number of pieces to the platform (or container) and the display will show a count.
5. To exit counting mode press the MODE key.

Notes: The larger the sample size used, the more accurate the count will be. Tare can be used in this mode. The reference sample is not stored upon exiting parts counting mode.

3.5. Percent Weiging

The Percent Weighing function can be used to measure relative weight of an unknown sample when compared to a reference sample. To use the percent weighing function, follow these instructions:

1. Place the reference sample that corresponds to 100% onto the weighing platform.

2. Press the UNIT key until the display shows “%” to indicate percent weighing mode.
3. The display will show “100.00%” with the reference sample on the scale. You may now remove the reference sample and add the unknown sample to determine its relative weight. Press UNIT to exit.

Note: The reference sample value is erased upon exiting Percent Weighing mode.

3.5. Calibrating The Balance

The balance may need to be calibrated in certain situations such as:

- Before weighing for the first time
 - After the balance has not been used for some time
 - If the balance location has changed
 - If ambient temperatures have changed greatly
1. Prepare the calibration weight (see pg. 4 for required calibration weights).
 2. Clean the weighing pan and press TARE to re-zero the balance.
 3. When the balance is stabilized, press and hold the CAL button for 5 seconds.
 4. The display will show “-CAL-”, then the required calibration weight will flash on the display.
 5. Place the calibration weight onto the **center** of the platform and wait for the display to stop flashing.
 6. You may now remove the weight. The scale will return to normal weighing mode

3.6. Linear Calibration

Linear calibration adjusts the balance at two or more points, rather than just one. To enter linear calibration, follow these steps:

1. Prepare the calibration weights (see pg. 4 for required calibration weights).
2. Clean the weighing pan and press TARE to re-zero the balance.
3. When the balance is stabilized, press and hold the CAL button for 5 seconds.
4. The display will show “-CAL-”, then flash the first required weight for span calibration.
5. At this point, press and hold the MODE button for 5 seconds. The display will flash the first required calibration weight for linear calibration.
6. Place the required weight onto the **center** of the platform.
7. When the display stops flashing, you may remove the weight.
8. Once the weight is removed, the next required weight for linear calibration will flash.
9. Repeat steps 6 and 7 until the display returns to zero when the weight is removed - indicating that linear calibration is complete.

4. APPENDIX

4.1. RS232 Serial Data Communication

This balance has a Bi-Directional RS232 port for communication with a PC. When connected to a computer, the weight value can be sent to the computer and commands can be sent to the balance

Transfer Format: Asynchronous

Communication Protocol: 1 start bit, 8 data bits, 1 stop bit

Baud Rate: 9600

Parity: None

Flow Control: Xon/Xoff

When sending the weight request command to the scale, the scale's serial port will reply with the current weight in ASCII format with the following structure:

1	2	3	4	5	6	7	8	9	10	11	12	13
Weight Data									Unit			

Example String: " 0 0 0 1 2 3 . 4 5 c t "

Hex Output: 11h 20h 30h 30h 30h 31h 32h 33h 34h 35h 63h 74h 20h 20h 13h

Meaning: 123.45ct (carats)

When sending a command to the scale such as Tare, the scale's serial port will reply with <ACK>

NOTE: The CD included with the balance is meant for demonstration purposes only. To install, simply copy the program files to your computer and launch Weight Display.exe. By default, the program listens for weight data on serial port1.

4.2. Serial Number

When communicating with the balance from a PC, a serial number (from 1-100) is used to identify the balance. By default, the serial number is 001. To change the serial number, press and hold the UNIT and MODE buttons together until the display shows "No - ###" (### stands for the serial number). Tap the CAL button to change the serial number from 1-100. Press the MODE button when you are finished.

4.3. Commands

The following commands can be sent to the balance:

Command	Function	Example	
serial no. (hex) + s	Request weight data	example: 01h s	hex: 01:73
serial no. (hex) + v	Enter Calibration Mode	example: 01h v	hex: 01:76
serial no. (hex) + c	Enter Counting Mode	example: 01h c	hex: 01:63
serial no. (hex) + u	Change weighing unit	example: 01h u	hex: 01:75
serial no. (hex) + t	Tare the balance (zero)	example: 01h t	hex: 01:74

NOTE: Hex values are notated by a lowercase h after the hex pair (ie. 01h represents the hex pair 01)

4.4. Care & Maintenance

Please read all operating instructions carefully before use. Scales are precision instruments and should always be handled with proper care. To ensure years of reliable service, keep these simple tips in mind:

- Do not exceed the scales maximum capacity. Overloading your scale can permanently damage it!
- Avoid exposure to extreme heat or cold. Scales perform best at normal room temperature. If temperatures have changed dramatically, recalibration may be necessary.
- Allow your scale to warm up for three hours before performing initial calibration.
- Store your scale in a clean, dry location. Dust, dirt, and moisture can accumulate on the weighing sensors and electronics causing inaccuracy or malfunction.
- Avoid static electricity sources, as they can have an adverse effect on the weighing sensors.
- Always weigh on a flat and level surface, free from vibrations and drafts. The corner of a room is usually the most stable.
- Gently apply all items to be weighed. Do not drop items onto the weighing platform.
- Avoid dropping your scale. The warranty does not cover damage due to rough treatment or overload.
- Keep the weighing pan clean using a soft cloth. Do not use harsh chemicals.

4.5. Troubleshooting

Problem: The display shows "F - - -"

Solution:

1. The weight on the scale is in excess of the rated capacity. Remove the excess weight.
2. The balance may be improperly calibrated. Try recalibration (Section 3.7)

Problem: The display fluctuates.

Solution:

1. Vibration or wind is interfering with the measurement. Try using the balance in a more stable location.
2. Electronic balances can be affected by static electricity and radio waves. Make sure the area is static free and away from any radio wave emitting devices such as cordless phones and computers.
3. The item on the platform is in motion. Wait for it to stabilize or try supporting it with whatever means is convenient.

Problem: The scale is weighing inaccurately.

Solution:

1. The scale requires recalibration. Follow the steps in Section 3.7.
2. The TARE feature has been used improperly. Remove the items and try again.
3. The balance is not level. Adjust the leveling feet until the bubble level is centered.
4. Battery power may be low (the "☐" symbol will appear). Replace the batteries.