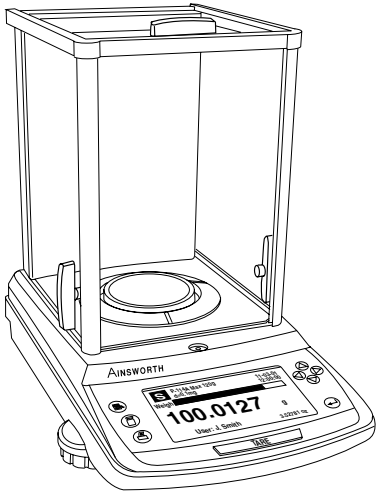

AINSWORTH

Precision weighing and measuring instruments since 1880

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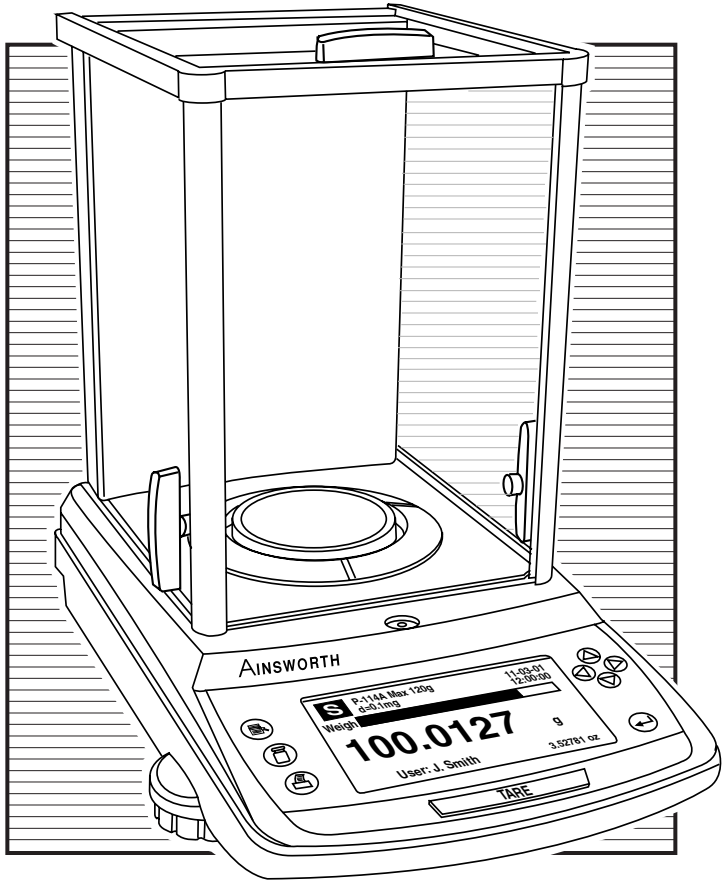
AINSWORTH

Pinnacle Series Analytical and Toploading Balances



Operation Manual

902394.1
Rev. A

Disclaimer

- Calibrate your balance using reference weights of the appropriate tolerance (class). An instrument can be no more accurate than the standard to which it has been compared. For assistance in the selection of reference weights, please contact Denver Instrument Company.
- Changes or modifications not expressly approved by the manufacturer could void the warranty.
- Use of this product in a manner not specified by the manufacturer may impair any safety protection provided by the equipment.
- Do not drop objects on the pan of the balance.
- Never lift balance by the weighing pan as this may cause damage to internal mechanism. Always lift and transport the balance by its base, including removal from packing materials.
- If load exceeds 15% of maximum capacity, damage to the balance may occur.

Specifications

Precision Analytical Balances

Models	P-114A*	P-214A*	P-314A*
Capacity	110 g	210 g	310 g
Readability	0.1 mg	0.1 mg	0.1 mg
Taring Range	0 to 110 g	0 to 210 g	0 to 310 g
Repeatability, (s)	0.1 mg	0.1 mg	0.1 mg
Linearity	0.2 mg	0.2 mg	0.3 mg
Stabilization Time	3 seconds	3 seconds	3 seconds
Pan Size	3.1" dia. (79mm)	3.1" dia. (79mm)	3.1" dia. (79mm)

Precision Toploading Balances

Models	P-203A*	P-403A*	P-603DA*	P-402A*	P-602A*	P-2002A*
Capacity	200 g	400 g	100/600 g	400 g	600 g	2000g
Readability	0.001 g	0.001 g	0.001/0.01g	0.01g	0.01g	0.01 g
Taring Range	0 to 200 g	0 to 400 g	0 to 100/600 g	0 to 400 g	0 to 600 g	0 to 2000g
Repeatability, (s)	0.001 g	0.001 g	0.002/0.01 g	0.01 g	0.01 g	0.01 g
Linearity	0.002 g	0.002 g	0.003/0.02 g	0.02 g	0.02 g	0.02 g
Stabilization Time	3 seconds	3 seconds	4 seconds	3 seconds	3 seconds	3 seconds
Pan Size	4.5 " dia. (114mm)	4.5 " dia. (114mm)	4.5 " dia. (114mm)	4.5 " dia. (114mm)	4.5 " dia. (114mm)	7.0 x 7.0" (178 x 178mm)

Models	P-4002A*	P-4002DA*	P-8002DA	P-6001A*	P-8001A
Capacity	4000 g	400/4000 g	800/8000 g	6000 g	8000 g
Readability	0.01 g	0.01/0.1 g	0.01/0.1 g	0.1 g	0.1 g
Taring Range	0 to 4000 g	0 to 400/4000 g	0 to 800/8000 g	0 to 6000 g	0 to 8000 g
Repeatability, (s)	0.01 g	0.02/0.1 g	0.02/0.1 g	0.1 g	0.1 g
Linearity	0.02 g	0.03/0.2 g	0.03/0.2 g	0.2 g	0.2 g
Stabilization Time	3 seconds	4 seconds	4 seconds	3 seconds	3 seconds
Pan Size	7.0 x 7.0" (178 x 178mm)	7.0 x 7.0" (178 x 178mm)	7.0 x 7.0" (178 x 178mm)	7.0 x 7.0" (178 x 178mm)	7.0 x 7.0" (178 x 178mm)

Common Specifications

Dimensions (LxWxH) Analyticals: 14.6 x 9.4 x 13.3" (371 x 239 x 338mm)
Dimensions (LxWxH) Toploaders: 14.6 x 9.4 x 3.8" (371 x 239 x 97mm)
Weighing Chamber Dimensions: 8.3 x 8.0 x 9.8" (211 x 203 x 249mm)
Operating Temperature: 10° - 30°C (50° - 86°F)
Storage Temperature: -10° - 30°C
Humidity: < 90% RH
Net Weight (Analyticals): 15 lbs (6.80kg)
Net Weight (Toploaders): 10 lbs (4.54kg)
Electrical Requirements: AC: 115V 50/60Hz, other voltages available.
DC: +5V 2.5A
+15V 0.5A
-15V 0.3A

***PIA models with internal calibration.**

CAUTION!
Use AC adaptor supplied with unit only!
Contact Denver Instrument for replacement.

Accessories

Draft ring (for round pan toploaders only)	902228.1
Security Device: Under the counter mounted	36800110.1
Security Device: Chain and lock	400171.1
In Use Cover (analyticals and round pan models)	602619.1
In Use Cover (square pan models)	602620.1
Dot Matrix Printer	902224.1
Computer Software: BalanceTalk XL for direct download into Excel	902227.1
9-pin cable for balance	902225.1
Weigh Below Hanger	77000440.8

Calibration Weights - call your distributor for a complete list
Complete Operation Manual available at *www.denverinstrument.com*

Warranty Instructions

1. Please return the prepaid, pre-addressed Purchase Registration Card to Denver Instrument Company promptly upon your purchase of the Denver Instrument product. The return of the card is not a condition precedent to warranty coverage.
2. If you have any questions about a Denver Instrument product, please contact the nearest Denver Instrument office as listed below.
3. If it becomes necessary to return your Denver Instrument product for service, you must obtain a "Return Authorization Number". Please pack the product securely in its original approved packing carton or an other suitable container. Include your Return Authorization Number on the shipping label. Shipping charges must be fully prepaid.

Return to authorized distributor or :

Ainsworth Company
6542 Fig Street
Arvada, Colorado 80004
1-800-321-1135
Tel: 303-431-7255
Fax: 303-423-4831

Cleaning and Maintenance

Repairs
Repair work must be performed by qualified factory-trained personnel only.

Note
This unit contains no user serviceable parts.
All replacement parts should be obtained from the manufacturer. Please refer to the inside front cover of this manual for the phone number of your sales and service representative.

Warning!
Never lift balance by the weighing pan as this may cause damage to internal mechanisms.
Always lift and transport the balance by its base.

Cleaning
Caution! Disconnect the balance AC adapter from power source prior to cleaning. Make sure that no liquids enter the balance housing. Do not use aggressive cleaning agents such as cleansers. A mild detergent is recommended. Disassemble the Pan Assembly and clean the floor pan, breeze ring, pan support and cover pan separately, then reassemble. Clean the balance with a piece of cloth. After cleaning, wipe the balance down with a dry, soft cloth. Recalibration of the balance is recommended after cleaning.

Warning!
If there are any indications that safe operation of the balance is no longer warranted, turn off power and disconnect from AC power source immediately.

Safety Inspection
Safe operation of the balance is no longer assured if there is visible damage to the AC adapter or cord, the AC adapter no longer functions properly or the AC adapter has been stored for a long period under unfavorable conditions.

Installation Instructions

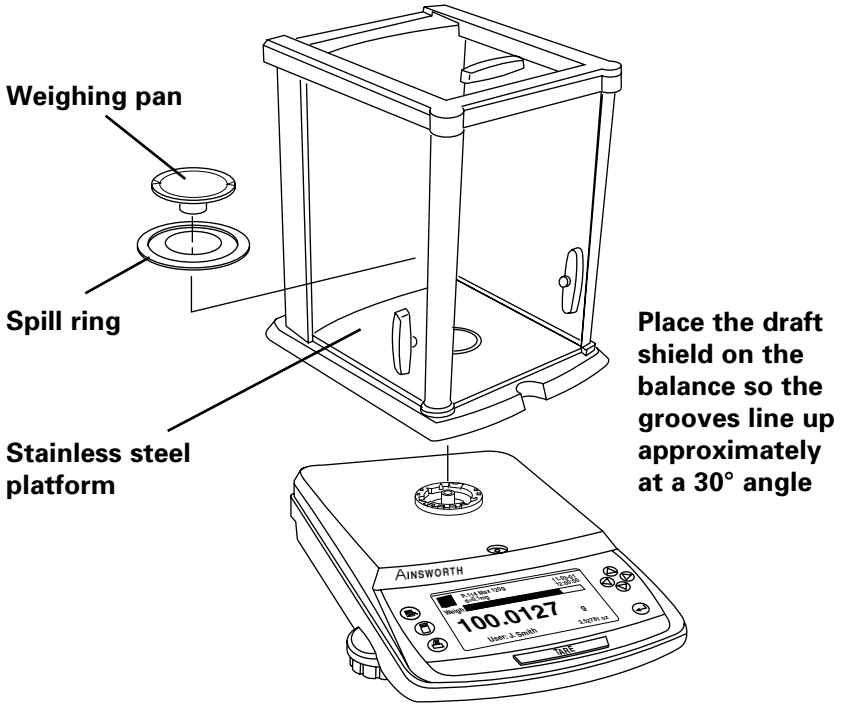
When choosing a location to set up your new balance, observe the following conditions to optimize ease and speed of use:

- Set up the balance on a stable, rigid and level surface.
- Avoid locations subject to extremes in heat or direct exposure to sunlight.
- Room temperatures above 86°F (30°C) or below 50°F (10°C) could affect balance operation and accuracy.
- Protect the balance from direct exposure to drafts.
- Protect the balance from aggressive chemical vapors.
- Avoid strong magnetic fields present from other devices.
- Avoid locations subject to vibration.
- Avoid exposing the balance to excessive moisture for extended periods.
- For best results, allow the balance to adjust to room temperature before connecting to power source, for at least two hours.
- Line voltage to the balance should be reasonable constant and free from fluctuations.

Pan Assembly
Please observe the following precautions when handling the weigh pans:

- Do not apply manual pressure to the weigh pan at any time.
- Do not bump the pan.
- Do not drop objects onto the pan.
- Do not attempt to clean or vigorously wipe the pan while it is installed on the balance.
- When removing the pan, pull the pan straight up (pulling the pan at an angle could result in mechanical breakage).

To avoid damage to your precision balance during shipping, the pan assembly components were packed separately.



Analytical Balances and Draft Shield

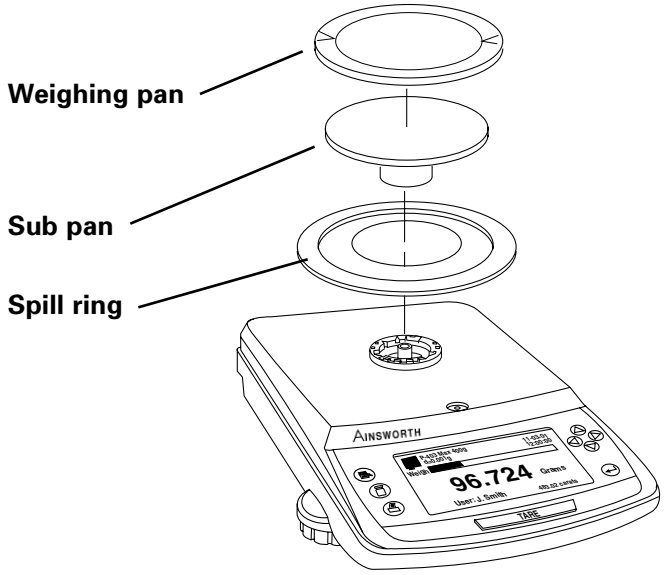
To attach draft shield, place it upon the balance so the grooves line up when the draft shield is approximately at a 30° angle. Pull the pin at the rear of the draft shield and turn clockwise until it is in line with the balance. Release the pin. Place the components listed below inside the chamber in the order given:

- Stainless steel platform
- Spill Ring
- Weighing Pan

Menu				
	Print	Mode	Manually Stable Interval	
		Format	Type 1 Type 2 Type 3 Type 4 Type 5 Type 6 Type 7 Type 8	
	Environmental	Filter	Low Normal High	
		Stablility	Fine Normal Coarse Very Coarse	
		Auto Zero	On Off	
	System	Security	Password	
		RS232	Baud Rate	300 600 1200 2400 4800 9600 19200 38400 57600 115200
			Bits/Parity	8, N, 1 8, E, 1 8, O, 1 7, E, 1 7, O, 1
			Echo	On Off
		Speaker	On Off	
		Defaults	Factory	
		Software		
		Platform		
		Internal Cal	On Off	
		Display	Contrast Backlight	
	Standby			

Menu Tree

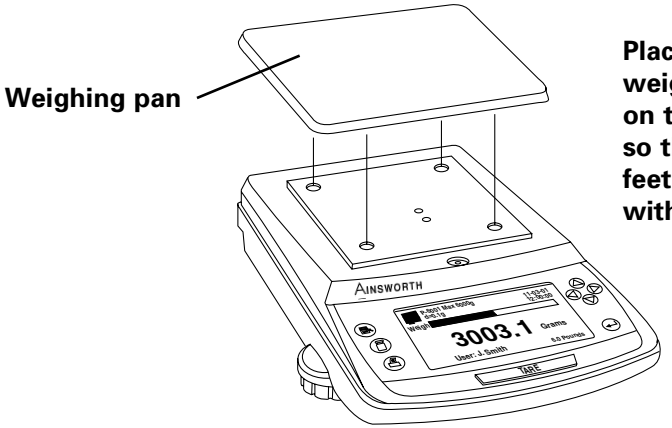
Menu	Applications		
		Count Mode	5 10 20 50 100 Custom
		Check Weigh	High limit Low Limit Enable
		Animal Mode	
		Target Weigh	
		Statistics	Enable Print Calculate Clear
		Formulation	
		Normal Mode	
	GLP/ISO	User Date (MM-DD-YY) Time (HH:MM:SS) Sample ID Number Header	On/Off
	Units	Primary Secondary	Grams Kilograms Milligrams Ounces Troy Ounces Pounds Grains Pennyweights Carats Taels-HK Taels-Singapore Taels-Taiwanese Mommes Drams Baht Tola



Toploading Balances with Round Pan

Place the components listed below on the balance in the order given:

- Spill Ring
- Sub Pan
- Weighing Pan
- Draft Ring (Optional)
- Draft Ring Cover (Optional)

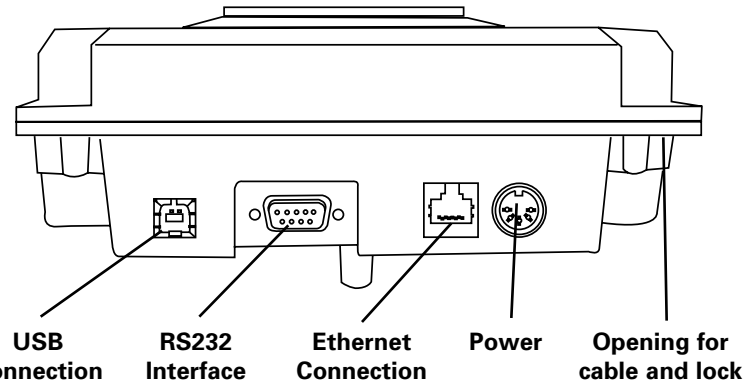


Place the weighing pan on the balance so the rubber feet line up with the holes

Toploading Balances with Square Pan

- Weighing Pan

Connecting the Balance to AC Power
When your balance has reached room temperature, simply plug the AC adapter into the rear of the balance and plug into an appropriate AC outlet. The balance will turn on automatically. To avoid extended warm-up periods, the balance should be left plugged in and "on" at all times.



Back Panel

Leveling your Balance
It is necessary to level the balance whenever the balance is moved.
Make sure that all feet are touching the countertop.
Adjust the leveling feet until the bubble is centered in the level vial.
The number of feet varies on each model:
Analytical models: 2 front feet
Toploading models with round pan: 2 front feet
Toploading models with square pan: 4 feet, one in each corner

Print

This balance has a bi-directional RS232 port as well as a USB port which enables communication with other serial devices such as a printer or computer.

Environmental Settings

Your balance can be set up for optimized weighing to compensate for varying conditions including vibration and drafts.

System

Customize your balance with features in the system menu. Set a password, change the beep, reset factory defaults or adjust your RS232 settings to match your computer or printer.

Restore Factory Defaults

To restore all settings to the factory defaults:
1. Press the **Menu** key.
2. Press ▼ until "System" is highlighted, press ▶ .
3. Press ▼ until "Defaults" is highlighted, press ▶ .

Troubleshooting

– – – HIGH	The load exceeds the balance capacity.	Unload the balance or look for obstruction.
	Display capacity is exceeded.	Decrease weight on balance.
– – – LOW	The load is too low.	Check pan position. Unload pan and cycle power.
CAL **ADD WEIGHT**	Calibration is entered without weight on pan.	Add weight and press CAL key again.
CAL **OUT OF RANGE**	Weight cannot be recognized.	Clear pan and add appropriate weight.
Other errors	Error has occured.	Cycle Power. Call technician for further assistance.

Counting Mode

In counting mode, you can determine the number of parts, each having approximately the same weight. A reference weight is determined for the reference quantity and the balance weighs and counts similar pieces. The balance will display both the piece count and the combined weight in units set as the primary units.

Target/Percent Weighing Mode

This application allows you to obtain weight readout in percent proportional to a reference weight. The balance will display both the percentage and the total weight in units set as the primary units.

Check Weighing Mode

This application allows you to obtain plain-language limit responses to your weight based off of limits which are defined by the user.

Animal Weighing

Animal weigh mode makes it easy to weigh animals that are continuously moving as the weight is taken. This feature can also be used for measurements taken in environments with extreme vibrations and/or drafts.

Formulation

This feature allows you to weigh out several different components in one container. Simply place your container on the pan and press the TARE key. Add each component followed by the ENTER key. The weight of the individual component will be shown as well as the total weight as the secondary weight.

Statistics

Your balance has an internal memory of 250 data points. You can calculate and print statistics including: number of points, minimum weight, maximum weight, range, average, standard deviation and total weight.

GLP/ISO

Your balance has a number of features that will allow customization for various reporting requirements pertaining to GLP and ISO requirements. When selected, GLP/ISO header will print with every data points.

Calibration

Your balance was calibrated at the factory; however, it is necessary to re-calibrate upon setup and on a regular basis thereafter. The factory recommendation for calibration is once per week using a permissible weight standard. Reasons for more frequent calibration include:

- Moving the balance
- Significant temperature changes
- Removing the balance from AC power
- Procedures to meet ISO/GLP procedures

External Calibration Procedure

1. Remove all items from the balance.
2. Press **TARE**.
3. Gently place the weight in the center of the pan.
4. Press the **Calibration** key.
5. The unit will display "**CAL**" and the calibration weight.
6. When calibration is complete the reading of the weight will be displayed and the unit will return to measurement mode.

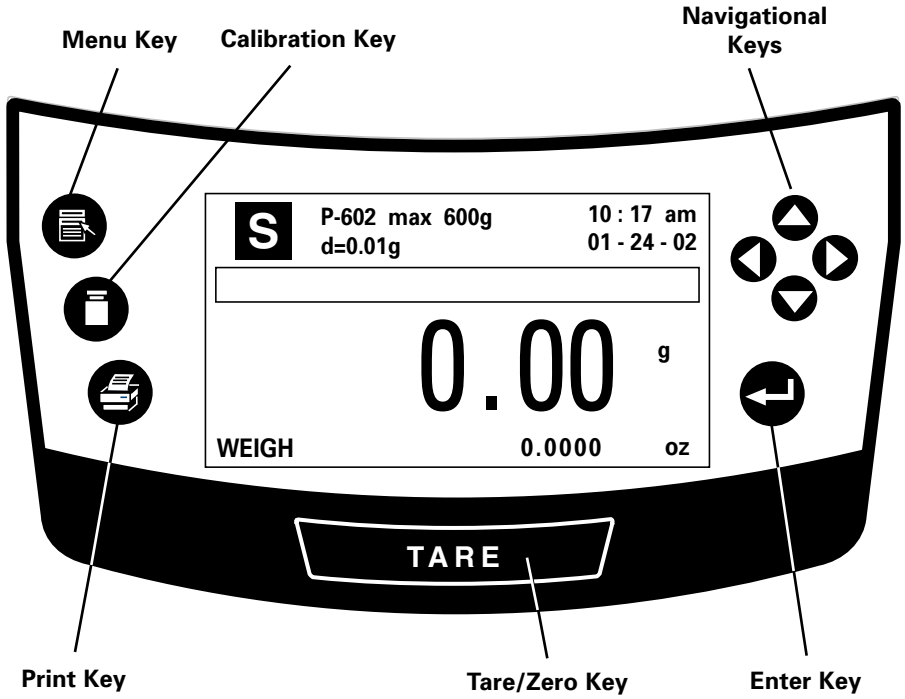
Internal Calibration Procedure (PI models only)

1. Remove all items from the balance.
2. Press **TARE**.
3. Press the **Calibration** key.
4. The unit will display "CAL internal" and perform calibration.
5. When calibration is complete, the unit willl return to measurement mode.

In the menu, if "Internal Cal" is turned "Off" the balance will only allow external calibration.

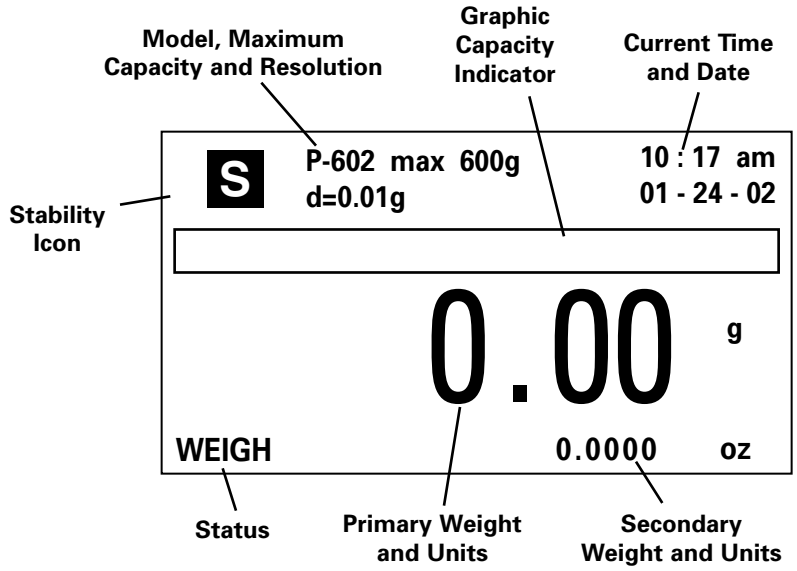
Error message will be displayed if calibration cannot be completed. See Troubleshooting Guide for more information.

Operation



Warm-up Time
To deliver accurate results, the balance must warm-up (be attached to AC power) for at least 2 hours. Only after this time will the balance have reached the required operating temperature. It is advised to leave the unit plugged in so that all components are warm and the balance is ready to weigh.

Taring the Balance
1. Place a container on the weighing pan. The balance will register the weight of the container.
2. Press the **TARE** key.
3. "TARING" displayed on the screen indicates that the balance is being tared.
4. The balance will read 0.0000 grams (or selected units to the designated resolution) after successful taring.
5. When the reading is stable, the stability icon appears in the top, left of the display. When unstable, a "**U**" appears.



The following features/applications are available in your balance:
- Calibration
- Target/Percent Weighing
- Animal Weighing
- GLP/ISO
- Counting Mode
- Check Weighing Mode
- Statistics
- Formulation

To access:
1. Press the **Menu** key.
2. Press the ▼ until the correct category is highlighted.
3. Press ▶ or **ENTER** key.
4. Press ▼ until the desired feature is highlighted.
5. Using the navigational arrows, continue to make appropriate selections.
6. Press the **ENTER** key to accept.

Note: Pressing the TARE key will exit from any menu without saving changes.

In alphanumeric fields:
1. Use the navigational keys to enter the correct field.
2. When the cursor is in the text box, press ▼ to go to the first letter in alphabet and the ▲ key to scroll through the numbers.
3. Press the ▶ key to go to the next character(s).
4. Repeat this process until the desired digits are selected.
5. Press the **ENTER** keyto accept and return to the main menu.

Note: Pressing the ◀ key will return you to the previous character for editing. You can hold any navigational key down to quickly scroll.