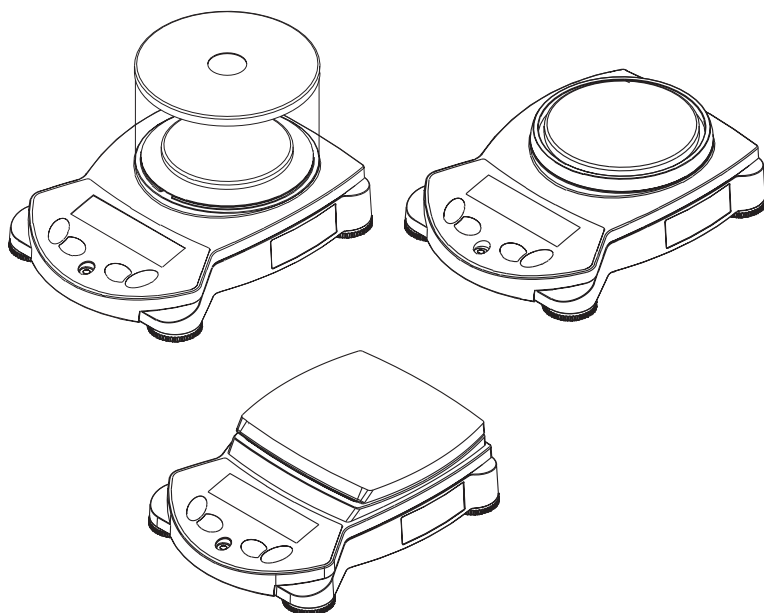




Adventurer Pro Balances Instruction Manual





Ohaus Corporation, 19A Chapin Road, P.O. Box 2033, Pine Brook, New Jersey, 07058, USA

Declaration of Conformity We, Ohaus Corporation, declare under our sole responsibility that the balance models listed below marked with "CE" - are in conformity with the directives and standards mentioned.

Balance Type Adventurer balance

AV53, AV53R, AV212, AV212R, AV412, AV412R, AV812, AV812R, AV2101, AV2101R, AV4101, AV4101R, AV8101, AV8101R

Marking		Directive	Standard
		73/23/EEC Electrical equipment for use within specified voltage limits	EN61010-1: 2001 Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements
		89/336/EEC Electromagnetic compatibility	EN61326-1: 1997 + A1: 1998 Class B Electrical equipment for measurement, control and laboratory use
	 Txxxx	90/384/EEC Non automatic weighing instruments xx = year CE affixed	EN45501: 1992 Metrological aspects of non- automatic weighing instruments





Johan Dierbach
General Manager Ohaus Europe
Greifensee, Switzerland
Date: March 6, 2003



Ted Xia
President
Ohaus Corporation, Pine Brook, NJ USA
Date: March 6, 2003

These products also comply with the following standards:

Mark	Standard
	AS/NZS4251.1 Emission; AS/NZS4252.1 Immunity
	CAN/CSA-C22.2 No. 1010.1-92; UL Std. No. 3101-1

Note: 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.

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada

ISO 9001 Certificate for Ohaus Corporation – Ohaus Corporation, USA was examined and evaluated in 1994 by the Bureau Veritas Quality International (BVQI) and was awarded the ISO 9001 certificate. This certifies that Ohaus Corporation, USA, has a quality system that conforms to the international standards for quality management and quality assurance (ISO 9000 series). Repeat audits are carried out by BVQI at intervals to check that the quality system is operated in the proper manner.

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1. INTRODUCTION

This manual contains installation, operation and maintenance instructions for the Adventurer Pro balances. Please read the manual completely before using the balance.

1.1 Description

The Adventurer Pro balances are precision weighing instruments that will provide you with years of service if properly cared for. The Adventurer Pro balances are available in capacities from 51 grams to 8100 grams.

1.2 Features

The Adventurer Pro balances include many standard features. These include:

- Battery or AC Adapter operation (AC Adapter included)
- Weighing, Counting, Percent, Check Weighing, Animal and Totalize application modes.
- In-use cover
- RS232 interface
- Integral security bracket
- Weigh below hook

The Adventurer Pro also offers several optional features

- Optional USB interface
- Optional second RS232 interface

1.3 Safety Precautions

Please follow these safety precautions:

- Verify that the input voltage printed on the AC Adapter matches the local AC power supply.
- Only use the balance in dry locations
- Do not operate the balance in hostile environments
- Do not drop loads on the platform
- Do not place the balance upside down, without first installing the cone cover
- Service should only be performed by authorized personnel

2. INSTALLATION

2.1 Unpacking

Remove the product from the packaging and verify that the following components have been included.

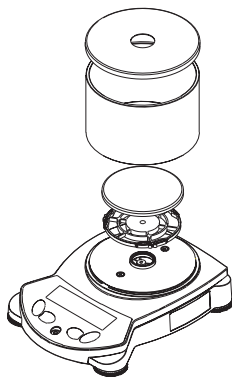
- Balance
- Sub-platform
- Platform
- AC Adapter
- In use cover
- Draft shield (51g model)
- Draft shield cover (51g model)
- Wind ring (210g models)
- Instruction Manual
- Warranty Card

Save the packaging to ensure safe transport of the product.

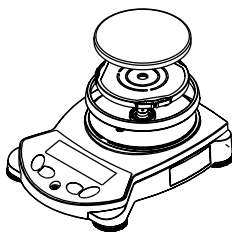
2.2 Installing Components

Remove the cone cover from the top of the balance and store it for future use.

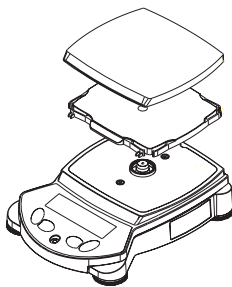
Refer to the illustrations below and install the appropriate components.



51g



210g

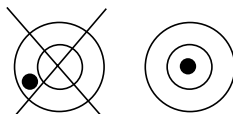


410g, 810g, 2100g,
4100g, 8100g

2.3 Selecting the Location

Locate the balance on a firm, steady surface. Avoid locations with excessive air current, vibrations, heat sources, or rapid temperature changes.

Level the balance by adjusting the leveling feet so the bubble is centered in the circle.



2.4 Connecting Power

2.4.1 AC Adapter

Connect the AC Adapter to the wall outlet. Connect the plug into the receptacle on the rear of the balance.



For use with CSA Certified (or equivalent approved) power source, which must have a limited circuit output.

2.4.2 Battery Installation

Install the cone cover to protect the load cell. Turn the balance upside down. Remove the battery cover. Install 4 AA (LR6) batteries in the compartment, aligning the batteries according to the + and - symbols.

2.4.3 Turning Power On and Off

Press the **On** button to turn power on.



...



Press and hold the **Off** button until OFF is displayed, then release the button to turn power off.



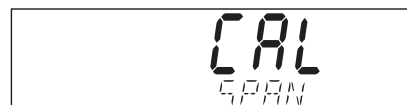
2.5 Initial Calibration

When the balance is first installed, it must be calibrated to ensure accurate weighing results. Be sure to have the appropriate calibration weights available before beginning calibration. Refer to Section 3.7.1.

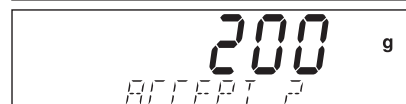
Press and hold the **Menu-Cal** button until MENU is displayed, then release the button. CALIBRATE (blinking) is displayed.



Press the **Yes** button to enter calibration menu. Press the **Yes** button to initiate span calibration. Press the **Exit** button at any time to abort calibration.



First the zero reading is taken. Next the primary display shows the default span calibration weight value. Press **No** to change to an alternate calibration weight. Press **Yes** when the desired calibration weight is displayed.

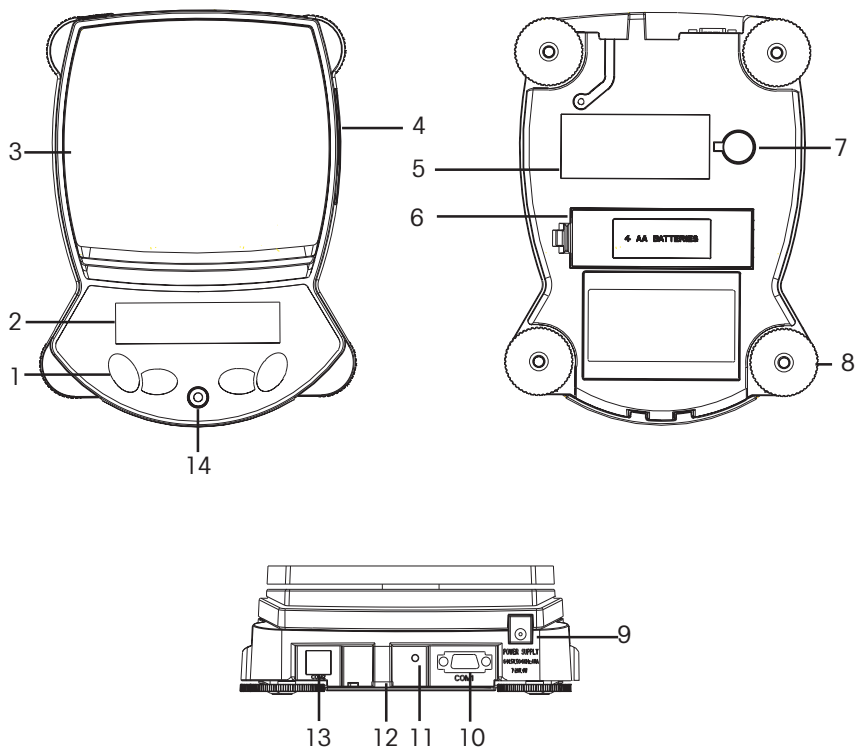


Place the specified calibration weight on the platform. After calibration, remove the weight from the pan.



3. OPERATION

3.1 Overview of Controls

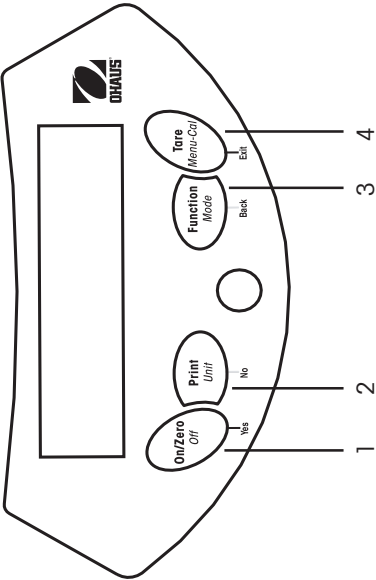


No.	Function
1	Buttons
2	Display
3	Platform
4	Type Label
5	Data Label
6	Battery compartment
7	Weigh below opening

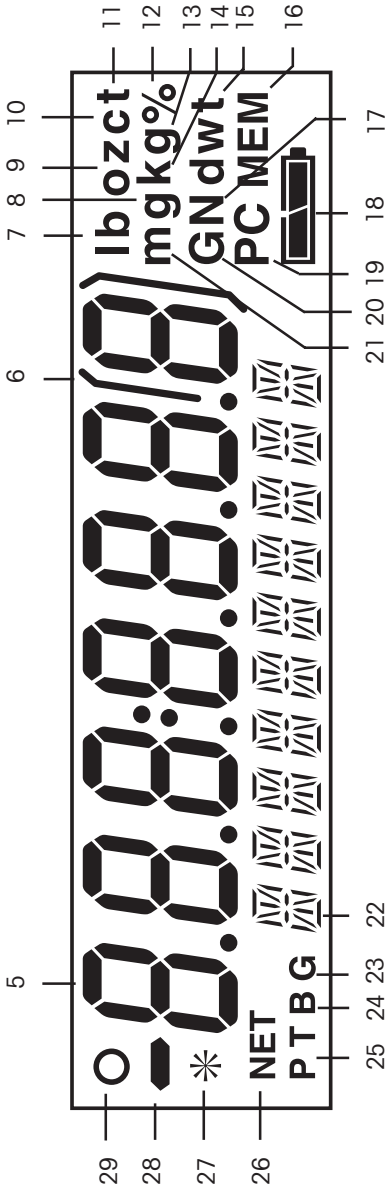
No.	Function
8	Leveling feet
9	Power connector
10	COM1 port
11	Lock release button
12	Security bracket
13	COM2 port (optional)
14	Level Bubble

3.1 Overview of Controls (Cont.)

No.	Description
1	OnZero Off- Yes button
2	Print Unit- No button
3	Function Mode- Back button
4	Tare Menu-Cal - Exit button
5	7-segment display
6	Brackets
7	Pound indicator
8	Gram indicator
8 & 21	Milligram indicator
9	Ounce indicator
10 & 11	Carat indicator
11	Tael, Tola, Tical unit indicator
12	Percent indicator
13 & 14	Kilogram indication
15	Pennyweight indicator

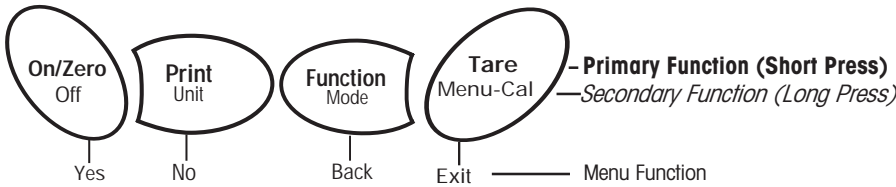


No.	Description
16	Memory indicator
17	Newton indicator
17 & 20	Grain indicator
18	Battery charge indicator
19	Pieces indicator
21	Momme, Mesghal unit indicator
22	14-segment display
23	Gross indicator
24	Brutto indicator
25	Preset Tare indicator
26	Net indicator
27	Stability indicator
28	Minus indicator
29	Center of zero indicator



3.2 Control Functions

Four multifunction buttons provide the necessary functions to operate the balance.



Primary Function	On/Zero <ul style="list-style-type: none">• If balance is off, turns balance on.• If balance is on, sets zero.	Print <ul style="list-style-type: none">• Sends current display value to the serial interface.	Function <ul style="list-style-type: none">• Operation is dependent on the application mode.	Tare <ul style="list-style-type: none">• Performs tare operation.
Secondary Function	<i>Off</i> <ul style="list-style-type: none">• Turns balance off.	<i>Unit</i> <ul style="list-style-type: none">• Change weighing unit.	<i>Mode</i> <ul style="list-style-type: none">• Change application mode.	<i>Menu-Cal</i> <ul style="list-style-type: none">• Enter the User menu. Calibration is the first sub-menu.
Menu Function	Yes <ul style="list-style-type: none">• Accepts the current (blinking) setting on the display.	No <ul style="list-style-type: none">• Rejects the current (blinking) setting on the display.• Increments a value being entered.	Back <ul style="list-style-type: none">• Reverts back to previous menu item.• Decrements a value being entered.	Exit <ul style="list-style-type: none">• Immediately exits menu mode.• Aborts a calibration in progress.

3.3 Basic Operation

3.3.1 Zeroing

Remove the load from the pan and press the **Zero** button to set the display to zero. The Center of Zero indicator turns on when the measurement is within $\pm 1/4$ d of the zero setting.

3.3.2 Taring

- **Tare** button - Place the container on the pan and press the **Tare** button. Net weight is displayed. To clear the Tare value, remove the container from the pan and press the **Tare** button.
- Auto Tare - Set Auto Tare to ON in the Setup sub-menu. The secondary display shows PLACE CONTAINER (blinking). When the container is placed on the pan, it is automatically tared and Net weight is displayed. The Tare value is cleared automatically when the container is removed from the pan.
- Preset Tare - A preset tare value may be entered using the xT command in the command table. To clear the Tare value, enter a value of 0.0.

3.3.3 Changing Units of Measure

Press and hold the **Unit** button, release it when the desired unit is displayed.

Note: If the desired unit is not displayed, it must be turned on in the Unit menu.

3.3.4 Changing Application Modes

Press and hold the **Mode** button, release it when the desired mode is shown on the secondary display.

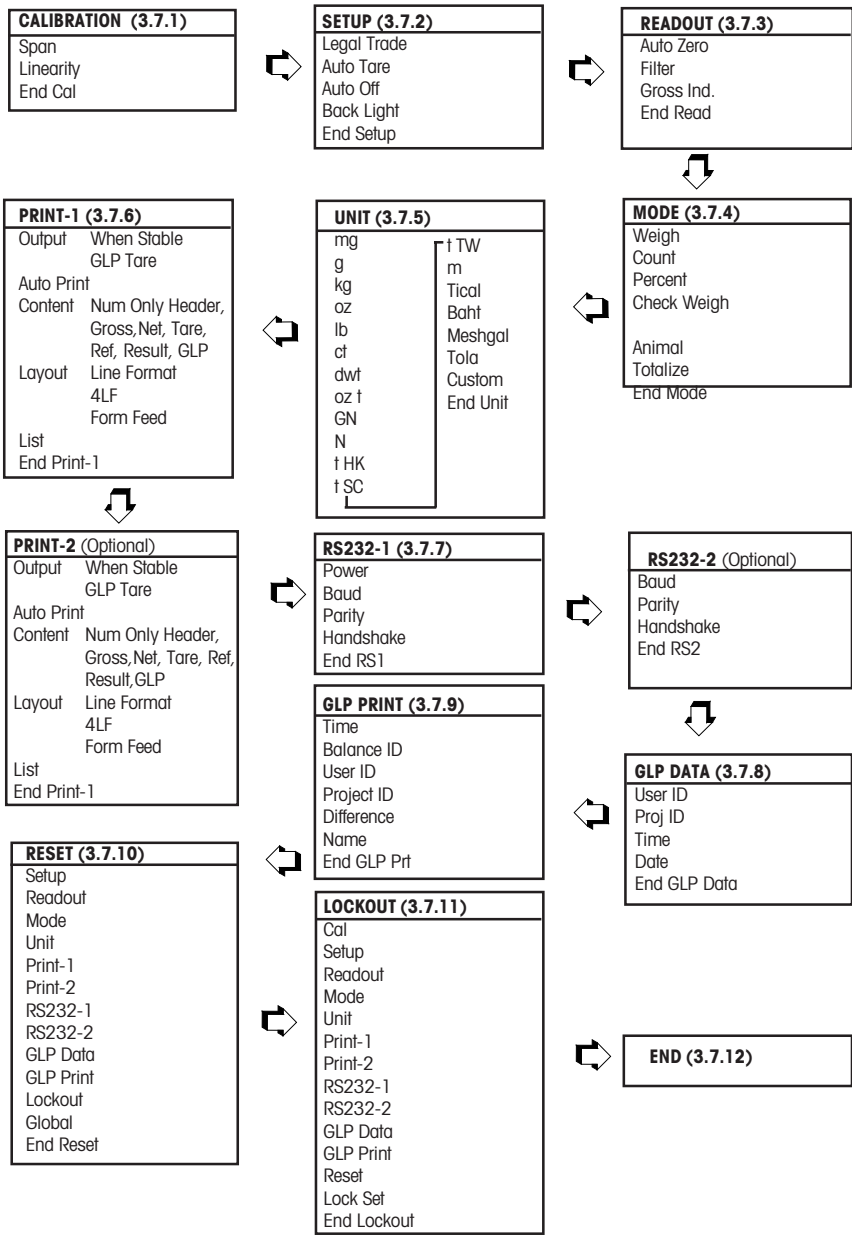
Note: If the desired mode is not displayed, it must be turned on in the Mode menu.

3.3.5 Printing Data

Press the **Print** button to send the displayed value to the COM port. The port must have Auto Print set to OFF.

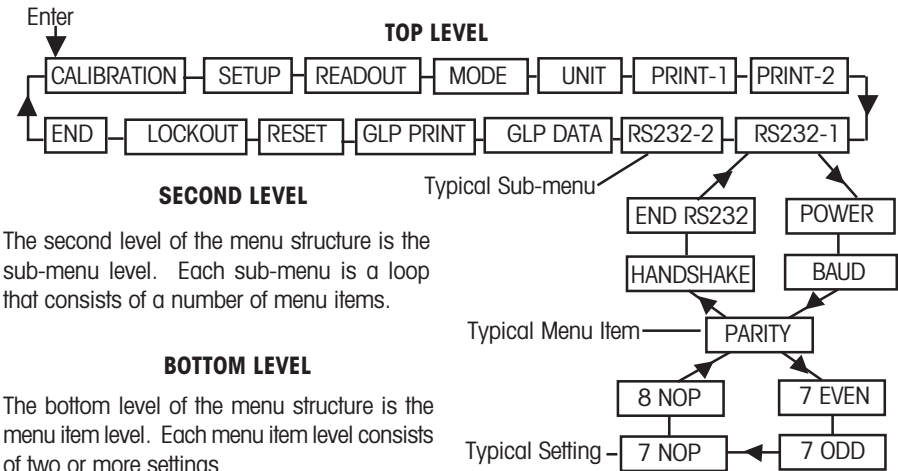
3.4 Menu

3.4.1 Menu Structure



3.4.2 Navigation

The Adventurer Pro menu structure consists of three levels. The top level is the main menu which consists of a number of sub-menus.



The second level of the menu structure is the sub-menu level. Each sub-menu is a loop that consists of a number of menu items.

The bottom level of the menu structure is the menu item level. Each menu item level consists of two or more settings

3.4.3 Changing Settings

To change a menu setting, perform the following steps:

ENTER THE MENU

Press and hold the **Menu** button until MENU appears on the primary display. Release the button and the first sub-menu appears on the secondary display (blinking). Note: A blinking display in the menu indicates a choice must be made using the **Yes**, **No** or **Back** buttons.

SELECT THE SUB-MENU

Press the **No** button to select the next sub-menu or the **Back** button to select the previous sub-menu in the loop. Press the **Yes** button to select the sub-menu that appears on the secondary display (blinking). The sub-menu name now appears on the primary display and the first menu item in the sub-menu now appears on the secondary display (blinking).

SELECT THE MENU ITEM

Press the **No** button to select the next setting or the **Back** button to select the previous setting in the loop. Press the **Yes** button to select and save the setting on the secondary display (blinking) as the new menu item setting.

EXITING THE MENU

Press the **Exit** button at any time to quickly exit the menu or select END sub-menu and press the **Yes** button.

3.5 Application Modes

The Adventurer Pro balance incorporates Weighing, Parts Counting, Percent Weighing, Check Weighing, Animal Weighing and Totalize application modes. The default setting has the weighing mode turned on and all other application modes turned off. Before using any other application modes, they must be turned on in the Mode menu.

3.5.1 Weighing

Use this mode to determine the weight of items in the selected unit of measure. The Adventurer Pro is shipped with grams enabled. Before using any other units of measure, they must be turned on in the Unit menu.

USE

Zero the balance

Place objects to be weighed on the pan. Example shows a 200 gram weight on a 200 gram balance.



3.5.2 Parts Counting

Enter this mode to count samples of uniform weight. Refer to paragraph 3.3.4 to enable Parts Counting.

USE

The primary display shows COUNT and the secondary display shows CLEAR APW? (blinking) if an APW is stored in memory. Press **No** to use the stored APW and begin parts counting. If CLEAR APW? is chosen or if no APW is stored in memory, an APW must be established.



Establishing an Average Piece Weight (APW)

The current weight is shown on the primary display and the default sample size is shown on the secondary display.



To change the sample size, Press and hold the **No** button to increment the sample size through the range of 1 to 100. Release the button when the desired sample size appears on the secondary display.

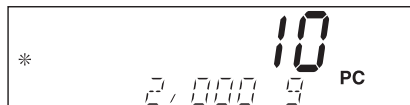


3.5.2 Parts Counting (Cont.)

Place the specified number of parts on the pan. Press the **Function** button to accept. The primary display will now indicate the number of parts. The weight is shown on the secondary display.



Pressing the **Function** button momentarily displays the APW on the secondary display. The example shows an APW of 2.000g.



Clearing the APW

Press and hold the **Mode** button until COUNT is shown on the secondary display.

ADJUSTMENTS

The only adjustment for Parts Counting is APW Optimization. APW Optimization is set On or Off in the Mode menu when Parts Counting is turned On. When APW Optimization is set on, the APW is automatically optimized which results in more accurate parts counting. The factory default is on.

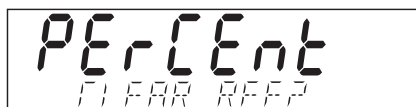
When a new APW has been established, APW Optimization occurs when the number of pieces added to the pan are at least one but not greater than three times the number already on the pan. The secondary display will momentarily indicate APW OPT.

3.5.3 Percent Weighing

Enter this mode to measure the weight of a sample as a percentage of a pre-established reference weight. Refer to paragraph 3.3.4 to enable Percent Weighing.

USE

The primary display shows PERCent and the secondary display shows CLEAR REF? (blinking) if a Reference Weight is stored in memory. Press **No** to use the stored reference weight and begin Percent Weighing. If CLEAR REF? is chosen or if no Reference Weight is stored in memory, a Reference Weight must be established.



Establishing a Reference Weight

If no reference weight is stored, the secondary display shows PUT SAMPLE. The current weight is shown on the primary display.



3.5.3 Percent Weighing (Cont.)

Place the sample on the pan and press the **Function** button. The example illustrates 50 grams as the reference weight.



Remove the reference weight and place the item to be compared on the pan. The balance indicates the actual percentage on the primary display. The secondary display indicates the weight in the selected measuring unit.

Pressing the **Function** button momentarily displays the reference weight on the secondary display.

Clearing the Reference Weight

Press and hold the **Mode** button until PERCENT is shown on the secondary display.

3.5.4 Check Weighing

Enter this mode to compare the weight of a sample against target limits. Refer to paragraph 3.4.3 to enable Check Weighing.

USE

The secondary display shows EDIT REF? (blinking) when limits exist. Press **No** to use existing limits and begin Check Weighing. If no limits are stored, or if EDIT REF is chosen, Under and Over limits must be set.



Setting Under and Over Limits

The primary display shows UNDER or OVER indicating which limit is being entered. The secondary display shows the previous setting or all zeros if no limit was stored (blinking). Press the **Yes** button to accept this setting. Press the **No** button to edit this setting. The Under limit is the first to be edited, followed by the Over limit.

3.5.4 Check Weighing (Cont.)

Editing Limits

The limits are edited one digit at a time. The digit being edited is blinking. Its value can be incremented by pressing the **No** button or decremented by pressing the **Back** button. When the desired value is displayed, press the **Yes** button to accept the value and proceed to the next digit. When all digits have been edited, the new limit value is shown (blinking) on the secondary display. Press the **Yes** button to accept the new limit value or the **No** button to edit the limit value. When editing of the Over limit is complete, Check Weighing begins.

The display shows the word "Under" in large characters. Below it, the secondary display shows "0000, 00 g".

The display shows the word "Under" in large characters. Below it, the secondary display shows "0049, 00 g".

The display shows the word "Over" in large characters. Below it, the secondary display shows "0051, 00 g".

Checkweighing

Place the sample on the pan. The UNDER/ACCEPT/OVER status is shown on the primary display while the actual weight of the item is shown on the secondary display.

The display shows the word "ACCEPT" in large characters. To the left of the word is a small asterisk (*). Below it, the secondary display shows "50, 00 g".

3.5.5 Animal Weighing

Enter this mode to weigh unstable loads such as a moving animal. Refer to paragraph 3.4.3 to enable Animal Weighing.

USE

The balance alternately shows READY and ANIMAL on the secondary display.

The display shows "0.00" in large characters with a small "g" to the right. To the left of the "0.00" is a small circle (○) and an asterisk (*). Below the "0.00", the secondary display shows "READY".

Start Animal Cycle

Automatic and Semi-Automatic Mode

The animal cycle begins when an animal is placed on the pan.

Manual Mode

The animal cycle begins when the **Function** button is pressed.

During Animal Cycle

The primary display shows the countdown from the level setting (5, 10 or 15 seconds) to AWO. The secondary display alternately shows ANIMAL and BUSY.

The display shows "AWO" in large characters. Below it, the secondary display shows "BUSY".

3.5.5 Animal Weighing (Cont.)

Completed Animal Cycle

The primary display shows the weight of the animal and the secondary display alternates between ANIMAL and HOLD.

Automatic Mode

The balance returns to the Ready condition when the animal is removed from the pan. If the

Function button is pressed before the animal is removed from the pan, the primary display shows the actual weight and the secondary display alternates between ANIMAL and CLEAR PAN until the animal is removed from the pan. The balance then returns to the Ready condition.

Semiautomatic and Manual Modes

Remove the animal from the pan and press the Function button to return to the Ready condition.

If the Function button is pressed while the animal is on the pan, the primary display shows the actual weight and the secondary display alternates between ANIMAL and CLEAR PAN. The balance returns to the Ready condition when the animal is removed from the pan.

ADJUSTMENTS

The Animal Weigh level and mode settings are made in the Mode menu.

3.5.6 Totalize

Enter this mode to measure the total weight of multiple items. Refer to paragraph 3.4.3 to enable totalizing.

USE

The primary display shows the current weight. The secondary display alternates between TOTALIZE and the current totalized weight.



Adding Weight to the Total

Automatic Mode

Place the item on the weighing pan. The weight of the item is shown on the primary display. The weight of the item is added automatically to the total weight and the new total is shown on the secondary display. Remove the item from the weighing pan, then add the next item.



3.5.6 Totalize (Cont.)

Manual Mode

Place the item on the weighing pan. The weight of the item is shown on the primary display. Press the **Function** button to add the weight of the item to the total. The new total is shown on the secondary display.

Remove the item from the weighing pan, then add the next item.



Clearing the Totalized Weight

Press and hold the **Mode** button until TOTALIZE is shown on the secondary display.

3.6 Additional Features

3.6.1 Weigh Below

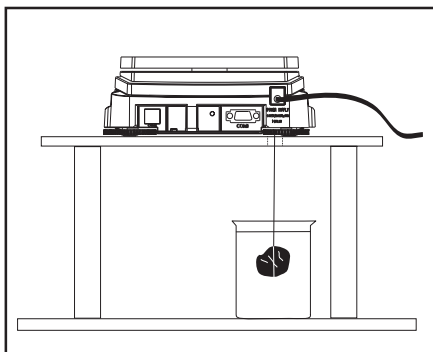
The Adventurer Pro balance is equipped with a weigh below hook.

NOTE:

Before turning the balance over, install the cone cover to prevent damage to the loadcell.

To use this feature, remove power from the balance and remove the protective cover for the weigh below opening.





The balance can be supported using lab jacks or any other convenient method. Make sure the balance is level and secure. Use a string or wire to attach items to be weighed.



3.6.2 Battery Operation

The Adventurer Pro is capable of operating on battery power when AC power is not available. Use 4 AA size batteries. If batteries are installed and AC power is not present, the balance operation is affected as follows:

- The Power setting for COM 1 is set to OFF. If COM 1 operation is required, change Power setting to ON in the RS232-1 menu.
- The LCD backlight is normally off to conserve power. The backlight turns on when the display becomes unstable or when a button is pressed. The backlight turns off 5 seconds after the display becomes stable or after 5 seconds with no button presses. The backlight is always off if the Backlight menu setting is OFF.
- Auto Off is set to 5 minutes. If continuous operation is desired, change the Auto Off menu setting to Off.
- The battery charge level is annunciated by means of a three segment battery symbol on the display as follows:

Full charge	
2/3 charge	
1/3 charge	
Replace batteries	 (Flashing)

3.7 Balance Settings

Refer to section 3.4.2 Navigation for information on how to enter and navigate the menus.

3.7.1 Calibration

AdventurerPro balances can be calibrated in two ways: Span calibration or Linearity calibration. Span calibration resets the balance's weighing range using two weight values: zero and a weight value between 25% and 100% of the balance's capacity. Linearity calibration minimizes deviation between actual and displayed weights within the balance's weighing range. Three weight values are used: zero, a weight value at or near the midpoint of the balance's weighing range and a weight at or near the balance's specified capacity.

Calibration Masses

Before beginning calibration, make sure masses are available. Masses required for calibration are listed in the table.

Model	Linearity Cal Points	Span Calibration Points (1)
AV53	25g / 50g	30g, 40g, 50g
AV212	100g / 200g	50g, 100g, 150g, 200g
AV412	200g / 400g	100g, 200g , 300g, 400g
AV812	400g / 800g	200g, 300g, 400g, 500g , 600g, 700g, 800g
AV2101	1000g / 2000g	500g, 1000g, 1500g, 2000g
AV4101	2000g / 4000g	1000g, 2000g , 3000g, 4000g
AV8101	4000g / 8000g	2000g, 3000g, 4000g, 5000g , 6000g, 7000g, 8000g

Note 1: The default Span Cal Point is shown in Bold print.

Span Calibration

Refer to 2.5 for span calibration.

Linearity Calibration

WARNING

Only required if the linearity error exceeds tolerance in specification table.

Select LINEARITY from the CAL sub-menu.

Press the **Yes** button and follow screen instructions. Use the weight values shown on the primary display.



After calibration, remove weight from pan.



3.7.2 Setup

SETUP	
Legal Trade	On/Off
Auto Tare	On/Off
Auto Off	Off, 1, 2, 5 min.
Back Light	On/Off
End Setup	

Legal Trade

When set On, the balance operates in compliance with Weights and Measures regulations.

Auto Tare

When set On, the balance will automatically tare the first item placed on the pan.

Auto Off

When set to 1, 2 or 5 minutes, the balance will turn off in the selected time interval if there has been no activity. Set to OFF for continuous operation.

Back Light

Used to set the display back light on or off.

End Setup

Press the **Yes** button, to advance to the Readout submenu. Press the **No** button to return to the LEGAL TRADE menu item.

3.7.3 Readout

READOUT	
Auto Zero	Off, .5d , 1d, 2d, 5d
Filter	Low, Medium , High
Gross Ind.	G, B, Off
End Read	

Auto Zero

Allows setting the balance auto zero level setting: .5, 1, 2 or 5 divisions. Balance maintains zero until threshold is exceeded.

Filter

Allows setting the balance filter level: Low, Medium, High. Compensates for vibration or excessive air currents.

Gross Ind.

Allows setting the gross indicator to G (gross), B (brutto) or Off.

End Read

Press the **Yes** button to advance to the Mode submenu. Press **No** to return to Auto Zero.

3.7.4 Mode

The Mode submenu is used to turn the application modes On or Off.

MODE	
Weigh	On/Off
Count	On/Off
	L Apw Optimize On/Off
Percent	On/Off
Check Weigh	On/Off
Animal	Auto, Semi, Man, Off
	Level sec. 5, 10, 15
Totalize	On/Off
End Mode	

Weigh

Allows setting the weighing mode On or Off.

Count

Allows setting the counting mode On or Off. If Count is set On, APW optimize can be set On or Off.

Percent

Allows setting the percent weighing mode On or Off.

Check Weigh

Allows setting the check weighing mode On or Off.

Animal

Allows setting the animal weighing mode to: Auto, Semi, Manual or Off. If set to Auto, Semi or Manual, level (averaging period) can be set to 5, 10 or 15 seconds.

Totalize

Allows setting the totalize mode to Auto, Manual or Off.

End Mode

Press the **Yes** button to advance to the Unit submenu. Press **No** to return to Weigh.

3.7.5 Unit

The Unit submenu is used to turn measuring units On or Off. Available measuring units vary by model.

UNIT			
mg	On/Off	† TW	On/Off
g	On/Off	m	On/Off
kg	On/Off	Tical	On/Off
oz	On/Off	Baht	On/Off
lb	On/Off	Meshgal	On/Off
ct	On/Off	Tola	On/Off
dwt	On/Off	Custom	On/Off
ozt	On/Off	End Unit	
GN	On/Off		
N	On/Off		
† HK	On/Off		
† SC	On/Off		

3.7.5 Unit (Cont.)

Defining Custom Unit

Set Custom to ON in the Unit menu to enable and define the Custom Unit. The custom unit is defined by a conversion factor and a least Significant Digit (LSD). The conversion factor is used by the balance to convert grams to the custom weighing unit and is defined by entering a factor and an exponent. The factor is a value between 0.1000000 and 1.999999 inclusive. The exponent moves the decimal point of the factor to the right for positive values or to the left for negative values.

Enter the Factor, following the instructions for Editing Limits in Section 3.5.4. Enter the Exponent and LSD using the **Yes No** buttons.

Factor	Exponent (+3 to -3)	Conversion Factor
.1234	3	123.4
.1234	2	12.34
.1234	1	1.234
.1234	0	.1234
.1234	-1	.01234
.1234	-2	.001234
.1234	-3	.0001234

Custom Unit = Conversion Factor x Grams.

The LSD is the value by which the displayed weight is incremented or decremented.

LSD	Result
.5	Adds one decimal place Display counts by 5
1	Display counts by 1
2	Display counts by 2
5	Display counts by 5
10	Display counts by 10
100	Display counts by 100

End Unit

Press the **Yes** button to advance to the Print-1 submenu. Press **No** to return to the first available unit.

3.7.6 Print-1 and Print-2

The Print-1 submenu is used to set printing parameters for an external printer or computer.

Print-2 contains an identical menu and is used when the optional COM2 port is installed.

PRINT-1

Output

When Stable

On/Off

GLP Tare

On/Off

Auto Print

Off, Cont., Interval, When Stable

1 -3600 seconds

Stable- Load, Load & Zero

Content

Num Only-Off, all others

On-Header,Gross,Net, Tare, Ref, Result, GLP

Layout

Line Format -Multi, Single

4LF-Yes/No

Form Feed-Yes/No

List

Yes/No

End Print-1

Output

Set When Stable to On to print only stable values. Set When Stable to Off to print stable or unstable values.

Set GLP Tare to On to print GLP data once after a tare operation. Set GLP Tare to Off to disable this feature.

Auto Print

When set to Continuous, the displayed value is printed continuously. When set to Interval, the displayed value is printed at the user specified time interval (1 to 3600 seconds). If set to When Stable, the balance will automatically print the displayed value when stability is achieved. An additional setting must be made to determine if only stable non-zero values will be printed (load setting) or if stable zero and non-zero values will be printed (Load & Zero). When set to Off, the Auto print feature is disabled.

Content

All of these features can be set On or Off. Numeric data only, Header, Gross, Net, Tare, Reference, Result, GLP. (See sample printout 3.10)

Layout

Determines the format of data output to a printer or computer. If Line Format is set to Multi, a multi-line printout is generated. If it is set to Single, a single line printout is generated. If 4 LF is set to yes, 4 line feeds are appended to the printout. If Form feed is set to Yes, a form feed is appended to the printout. This is useful for printing to page printers.

List

When Yes is selected, a printout of balance settings is generated.

End Print-1

Press the **Yes** button to advance to the next menu, Print-2 if COM2 is installed or RS232-1 if COM2 is not installed. Pressing **No** returns to Output menu item.

3.7.7 RS232-1 and RS232-2

The RS232-1 submenu is used to set communication parameters for an external printer or computer.

RS232-2 contains an identical menu and is available when the optional COM2 port is installed.

RS232-1	
Power	On/Off
Baud	600.. 2400 ...19200
Parity	7 Even, 7 Odd, 7 No Par , 8 No Parity
Handshake	Off, XONXOFF Hardware
End RS1	

Power

This menu item allows setting the Power On or Off for COM1. It is not available for COM2. When the balance is operated from the AC Adapter, this menu item is hidden and the setting is On.

When the balance is operated from batteries, the menu item is available and the default setting is Off. To enable COM1, Power must be turned On.

Baud

Baud rates of 600, 1200, 2400, 4800, 9600 and 19,200 are available.

Parity

Parity settings of 7 even, 7 Odd, 7 No Parity and 8 No Parity are available.

Handshake

Settings of Off, XONXOFF and (for RS232-1 only) Hardware are available.

End RS1 (RS2)

Pressing the **Yes** button will advance to the RS232-2 (or GLP Data) submenu. Pressing **No** returns to the Power (or Baud) menu item.

3.7.8 GLP Data

GLP DATA	
User ID	Set...
Proj ID	Set...
Time	Type- 12hr , 24hr, Set..., Adj-60, +60
Date	Type mdydym Set...
End GLP Data	

User ID

Used to enter a User ID up to 10 characters.

Project ID

Used to enter a Project ID up to 10 characters.

Entering a User ID or Project ID

Enter the user or Project ID one character at a time. The character to be entered is highlighted by a blinking cursor (underscore). Press the **No** button repeatedly to scroll through the list of available characters. ((space), -, 0 through 9, A through Z). Press the **Yes** button to select the displayed character and move the cursor one position to the right. After the tenth character is entered, the ten character ID will blink. Press the **No** button to change the displayed ID or the **Yes** button to accept the ID and proceed to the next menu item.

Time

Type

Set the type to 12 hours or 24 hours.

Set

Set the current time using the format selected in the type menu item.

Adjust

Enter an adjustment value from -60 to + 60 seconds per day.

Date

Set the date type: M/D/Y, D/M/Y, Y/M/D, M/Y/D, Y/D/M, D/Y/M and the actual date.

End GLP Data

Press the **Yes** button to advance to the GLP Print submenu. Press the **No** button to return to User ID.

3.7.9 GLP Print

Select GLP items to be printed by setting them to On.

GLP PRINT	
Time	On/Off
Balance ID	On/Off
User ID	On/Off
Project ID	On/Off
Difference	On/Off
Name	On/Off
End GLP Prt	

End GLP Print

Press the **Yes** button to advance to the reset submenu. Press the **No** button to return to Time.

3.7.10 Reset

RESET	
Setup	RESET?
Readout	RESET?
Mode	RESET?
Unit	RESET?
Print-1	RESET?
Print-2	RESET?
RS232-1	RESET?
RS232-2	RESET?
GLP Data	RESET?
GLP Print	RESET?
Lockout	RESET?
Global	RESET?
End Reset	

Setup

Select Yes to return all Setup menu items to their factory settings.

Readout

Select Yes to return all Readout menu items to their factory settings.

Mode

Select Yes to return all Mode menu items to their factory settings.

Unit

Select Yes to return all Unit menu items to their factory settings.

Print-1

Select Yes to return all Print-1 menu items to their factory settings.

Print-2 (If COM2 is installed)

Select Yes to return all print-2 menu items to their factory settings.

RS232-1

Select Yes to return all RS232-1 menu items to their factory settings.

RS232-2 (If COM2 is installed)

Select Yes to return all RS232-2 menu items to their factory settings.

GLP Data

Select Yes to return all GLP Data menu items to their factory settings.

GLP Print

Select Yes to return all GLP Print menu items to their factory settings.

Lockout

Select Yes to return all Lockout menu items to their factory settings.

Global

Select Yes to return the menu items in all sub-menus to their factory settings.

End Reset

Press the **Yes** button to advance to the Lockout menu. Press the **No** button to return to Setup.

3.7.11 Lockout

Use this submenu to prevent unauthorized changes to menu settings. If a submenu is locked, its menu item settings can be viewed but not changed.

LOCKOUT	
Cal	On/ Off
Setup	On/ Off
Readout	On/ Off
Mode	On/ Off
Unit	On/ Off
Print-1	On/ Off
Print-2	On/ Off
RS232-1	On/ Off
RS232-2	On/ Off
GLP Data	On/ Off
GLP Print	On/ Off
Reset	On/ Off
Lock Set	On/ Off
End Lockout	

Cal

Set On to lock and hide the Calibration Menu.

Setup

Set On to lock the Setup Menu.

Readout

Set On to lock the Readout Menu.

Mode

Set On to lock the Mode Menu.

Unit

Set On to lock the Unit Menu.

Print-1/2

Set On to lock the Print-1/2 Menu.

RS232-1/2

Set On to lock the RS232-1/2 Menu.

GLP Data

Set On to lock the GLP Data Menu.

GLP Print

Set On to lock the GLP Print Menu.

Reset

Set On to lock the Reset Menu.

Lock Set

Set On to lock all submenu lock settings. When set Off, the lock settings for all menus are accessible. To turn Lock Set off, refer to section 3.7.13.

End Lockout

Press the **Yes** button to advance to the End menu. Press the **No** button to return to the Cal menu.

3.7.12 End

The End menu is used to exit the menus and return to previous application

3.8 Legal for Trade (LFT)

Specific Adventurer Pro models have been designed to comply with OIML, EEC, NTEP and Measurement Canada weights and measures regulations. These approvals are pending; so contact Ohaus for further details about availability.

When the LEGAL TRADE menu item setting is set to ON, the following conditions apply:

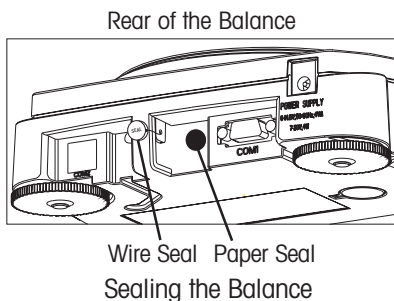
- The CALIBRATION menu is hidden.
- The LEGAL TRADE menu item is hidden.
- The AUTO ZERO menu item setting is set to 0.5d and locked.
- The OutPut WHENSTABLE menu item setting is set to ON and locked.
- The CONTINUOUS setting in the AUTO PRINT menu item is hidden.

3.9 Sealing Access to the Balance Settings

When used in conjunction with the Lockout menu, the balance may be sealed to prevent or detect unauthorized changes to the balance settings. For legal for trade applications, the balance must be sealed to prevent access to the metrological parameters.

To seal the balance, cover the Lock switch access hole at the rear of the balance. A paper seal, and a wire seal may be installed as shown.

To regain access to the locked balance settings, break the seal and press the Lock switch while OHAUS is displayed during power up.



3.10 Printing Data

Printing data to an external computer or printer requires that the communication parameters in the RS232-1 and/or RS232-2 submenus be set to match external device communication parameters.

04/01/03 12:30 PM	// If GLP SET> Time is ON
Bal ID 1234567	// If GLP SET> Balance ID is ON
USER ID ABCDEFGHIJ	// If GLP SET> User ID is ON
PROJ ID 1234567890	// If GLP SET> Proj ID is ON
Name.....	// If GLP SET > Name is ON
	// If a tare value is entered, these three items are printed if selected in the definition string.
0.0200kg G	// Gross ON - G, B or [space] as determined in Readout submenu.
0.0200kg T	// Tare ON
0.0000kg NET	// Net ON
	// Otherwise, gross is printed if selected in the definition string.
0.0200kg G	// Gross ON - G, B or [space] as determined in Readout submenu.

4. MAINTENANCE

4.1 Calibration

Periodically verify calibration by placing an accurate weight on the balance and if calibration is required, refer to section 3.7.1.

4.2 Cleaning

If cleaning is required, use a soft cloth dampened with water and a mild detergent. Do not allow liquids to enter the balance. Do not use harsh chemicals to clean the balance, as the finish may be damaged.

4.3 Troubleshooting

The following table lists common problems, possible causes and remedies. If the problem persists, contact Ohaus or your authorized Ohaus dealer.

Symptom	Possible Cause	Remedy
Balance will not turn on	<ul style="list-style-type: none"> AC power not connected Batteries discharged 	<ul style="list-style-type: none"> Connect AC adapter Replace batteries
Battery indicator is flashing	<ul style="list-style-type: none"> Batteries are weak 	<ul style="list-style-type: none"> Replace batteries
Balance does not display accurately	<ul style="list-style-type: none"> Improper calibration Unstable environment 	<ul style="list-style-type: none"> Perform calibration Move balance to a suitable location
Cannot calibrate the balance	<ul style="list-style-type: none"> Calibration menu locked LFT set to on 	<ul style="list-style-type: none"> Turn Calibration menu lock off Turn LFT off
Cannot change Menu settings	<ul style="list-style-type: none"> Submenu locked LFT set to on 	<ul style="list-style-type: none"> Unlock submenu Turn LFT off
Error code is displayed	<ul style="list-style-type: none"> Causes vary 	<ul style="list-style-type: none"> Refer to the Error Code table and take appropriate action

4.4 Error Code List

Error Code	Meaning
Error 8.1	Weight reading exceeds Power On Zero limit.
Error 8.2	Weight reading below Power On Zero limit.
Error 8.3	Weight reading exceeds Zero overload limit.
Error 8.4	Weight reading below Zero overload limit.
Error 9	Internal fault. See section 4.5
Ref Wt Err	Reference Weight too small. The weight on the pan is too small to define a valid reference weight.

4.5 Service Information

If the Troubleshooting sections or Error Code List does not resolve or describe your problem, you will need to contact an authorized Ohaus Service Agent. For Service assistance in the United States, please call Aftermarket, Ohaus Corporation toll-free at (800) 526-0659. An Ohaus Product Service Specialist will be available to help you.

4.6 Parts

<u>Description</u>	<u>Ohaus Part Number</u>
AC adapters	
Output: 12 VAC 500 mA	
• US 120V/60Hz	12102320
• Euro 230V/50Hz	12102321
• UK 230V/50Hz	12102322
• Australia 230V/50Hz	12102323
Output: 9 VDC 500 mA	
• Japan 100V/50Hz	12102324
In-Use Cover Kit	12103980

4.7 Accessories

Security device	76288-01
RS232 Cables	
• Cable, DB9M-DB9F	80500525
• Cable, DB9M-DB25F	80500524
• Cable, DB9M-SF42 Printer	80500571
• Cable, DB9M-Apple	80500562
SF42 Printer	SF42
Calibration Weights (ASTM Class 2)	
• 50g	49054-12
• 100g	49015-12
• 200g	49025-12
• 400g	49045-12
• 1000g	49016-12
• 2000g	49026-12
• 4000g	49046-12

5. TECHNICAL DATA

Ambient conditions

The technical data are valid under the following ambient conditions:

- Ambient temperature: 10 °C to 30 °C
- Relative humidity: 15 % to 80 % at 31 °C non-condensing, decreasing linearly to 50 % at 40 °C
- Height above sea level: Up to 2000 m

Operability is assured at ambient temperatures between 5 and 40 °C

Power

- AC adapter - To national standard as per list in Section 4.6. Balance power input 6-14.5 VAC, 50/60Hz 4VA or 7-20VDC, 4W
- Batteries - 4 x AA (LR6) 1.5 V (not included), typical 20 h with alkaline batteries.

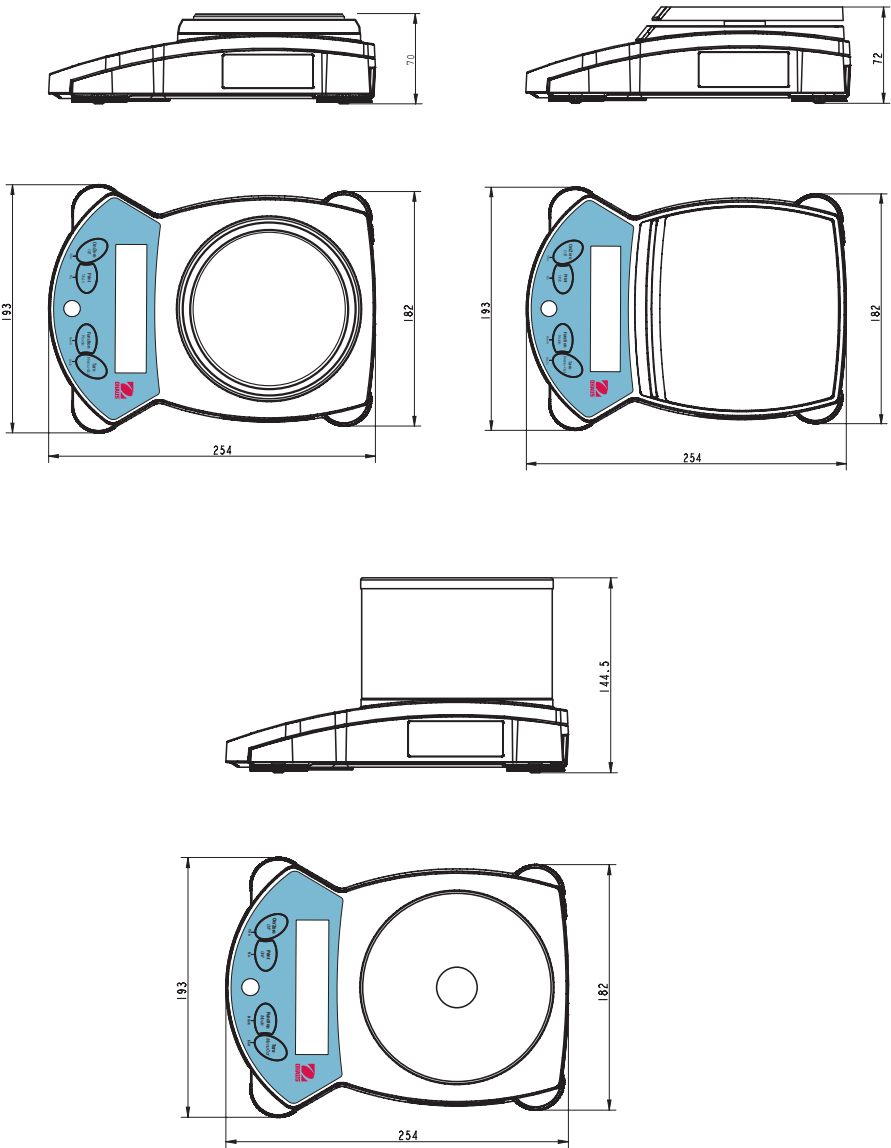
Materials

- Housing base: plastic (ABS/PC)
- Top Housing: plastic (ABS/PC)
- Platform: 18/10 stainless steel

Protection

- Protected against dust and water
- Pollution degree: 2
- Installation category: Class II
- EMC: see declaration of conformity

5.1 Drawings



5. TECHNICAL DATA

5.2 Specifications

Item Number	AV53 AV53R	AV212 AV212R	AV412 AV412R	AV812 AV812R	AV2101 AV2101R	AV4101 AV4101R	AV8101 AV8101R
Capacity (g)	51	210	410	810	2100	4100	8100
Readability (g)	0.001	0.01	0.01	0.01	0.1	0.1	0.1
e (g) AV...A Models only	---	---	---	---	---	---	---
Repeatability (Std.dev.)(g)	0.001	0.01	0.01	0.01	0.1	0.1	0.1
Linearity (g)	± 0.002	± 0.02	± 0.02	± 0.02	± 0.2	± 0.2	± 0.3
Weighing Units	Milligram, Gram, Kilogram, Ounce, Pound, Carat, Pennyweight, Ounce Troy, Grain, Newton, Hong Kong Tael, Singapore Tael, Taiwan Tael, Momme, Tical, Baht, Mesghal, Tola, Custom						
Application Modes	Weighing, Animal Weighing, Parts Counting, Percent Weighing, Check Weighing, Totalize						
Tare Range	To Capacity by Subtraction						
Stabilization Time (s)	2.5	1.5	3	3	2	2	2
Power Requirements	AC Adapter (Included) or 4 AA Batteries (Not Included)						
Calibration	Digital with External Weight						
Display Type	2-Line LCD w/Backlight						
Display Size (in/mm)	4 x 1/100 x 25						
Pan Size (in/mm)	3.9/100	4.7/120	5.8 x 6.3/149 x 162				
Dimensions W x D x H (in/mm)	7.6 x 10 x 5.7/ 193 X 254 X 144	7.6 X 10 X 2.8/ 193 X 254 X 70	7.6 X 10 X 2.8/193 X 254 X 72				
Net Weight (lb/kg)	3.1/1.4	2.7/1.2	3.3/1.5				

NOTE:

AV...R models are equipped with a second RS232 port.

5.3 Capacity x Readability

Unit	AV53 AV53R	AV212 AV212R	AV412 AV412R	AV812 AV812R	AV2101 AV2101R
baht	3.3553 x 0.0001	13.816 x 0.001	26.974 x 0.001	53.289 x 0.001	138.16 x 0.01
carat	255.000 x 0.005	1050.00 x 0.05	2050.00 x 0.05	4050.00 x 0.05	10500.0 x 0.5
grain	787.06 x 0.02	3240.8 x 0.2	6327.4 x 0.2	12500.2 x 0.2	32408 x 2
gram	51.000 x 0.001	210.00 x 0.01	410.00 x 0.01	810.0 x 0.1	2100.0 x 0.1
kilogram		0.21000 x 0.00001	0.41000 x 0.00001	0.81000 x 0.00001	2.1000 x 0.0001
mesghal	11.0670 x 0.0005	45.570 x 0.005	88.970 x 0.005	175.770 x 0.005	455.70 x 0.05
milligram	51000 x 1				
momme	13.6000 x 0.0005	56.000 x 0.005	109.335 x 0.005	216.000 x 0.005	560.00 x 0.05
Newton	0.50014 x 0.00001	2.0594 x 0.0001	4.0207 x 0.0001	7.9434 x 0.0001	20.594 x 0.001
ounce	1.79895 x 0.00005	7.4075 x 0.0005	14.4625 x 0.0005	28.5720 x 0.0005	74.075 x 0.005
ounce troy	1.63970 x 0.00005	6.7515 x 0.0005	13.1820 x 0.0005	26.0420 x 0.0005	67.515 x 0.005
pennyweight	32.794 x 0.001	135.03 x 0.01	263.64 x 0.01	520.84 x 0.01	1350.3 x 0.1
pound		0.46295 x 0.00005	0.90390 x 0.00005	1.78575 x 0.00005	4.6295 x 0.0005
tael (Hong Kong)	1.36260 x 0.00005	5.6105 x 0.0005	10.9540 x 0.0005	21.6410 x 0.0005	56.105 x 0.005
tael (Singapore)	1.34925 x 0.00005	5.5555 x 0.0005	10.8465 x 0.0005	21.4290 x 0.0005	55.555 x 0.005
tael (Taiwan)	1.36000 x 0.00005	5.6000 x 0.0005	10.9335 x 0.0005	21.6000 x 0.0005	56.000 x 0.005
fical	3.1232 x 0.0001	12.860 x 0.001	25.108 x 0.001	49.604 x 0.001	128.60 x 0.01
tola	4.3724 x 0.0001	18.004 x 0.001	35.151 x 0.001	69.444 x 0.001	180.04 x 0.01

5.3 Capacity x Readability (Cont.)

Unit	AV4101A AV4101R	AV8101 AV8101R
baht	269.74 x 0.01	532.89 x 0.01
carat	20500.0 x 0.5	40500.0 x 0.5
grain	63274 x 2	125002 x 2
gram	4100.0 x 0.1	8100.0 x 0.1
kilogram	4.1000 x 0.0001	8.1000 x 0.0001
mesghal	889.70 x 0.05	1757.70 x 0.05
milligram		
momme	1093.35 x 0.05	2160.00 x 0.05
Newton	40.207 x 0.001	79.434 x 0.001
ounce	144.625 x 0.005	285.720 x 0.005
ounce troy	131.820 x 0.005	260.420 x 0.005
pennyweight	2636.4 x 0.1	5208.4 x 0.1
pound	9.0390 x 0.0005	17.8575 x 0.0005
tael (Hong Kong)	109.540 x 0.005	216.410 x 0.005
tael (Singapore)	108.465 x 0.005	214.290 x 0.005
tael (Taiwan)	109.335 x 0.005	216.000 x 0.005
tical	251.08 x 0.01	496.04 x 0.01
tola	351.51 x 0.01	694.44 x 0.01

5.4 Communication

The balance is equipped with an RS232 interface (COM1). Some models are also equipped with a second RS232 interface (COM2). Connecting the balance to a computer enables you to operate the balance from the computer, as well as receive data such as displayed weight.

5.4.1 Commands

Commands listed in the following table will be acknowledged by the balance. The balance will return "ES" for invalid commands.

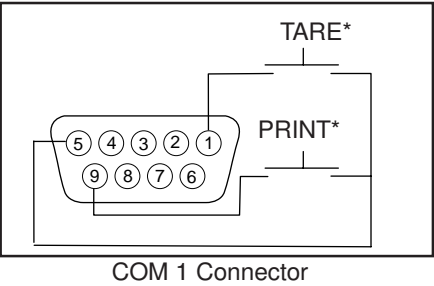
Command	Function
IP	Immediate Print of displayed weight (stable or unstable).
P	Print displayed weight (stable or unstable).
CP	Continuous Print.
SP	Print displayed stable weight.
SLP	Auto Print stable non-zero displayed weight.
SLZP	Auto Print stable non-zero weight and stable zero reading.
xP	Interval Print x = Print Interval (1-3600 seconds)
H	Enter Print Header Lines
Z	Same as pressing Zero Key
T	Same as pressing Tare Key.
xT	Establish a preset Tare value in grams. X= PRESET TARE VALUE IN GRAMS.
PT	Prints Tare weight stored in memory.
PM	Print current mode (weighing mode).
M	Scroll to the next enabled mode.
PU	Print current weighing unit.
U	Scroll to the next enabled unit.
OFF	Turns balance OFF.
PSN	Print Serial Number.
PV	Print Version: name, software revision and LFT ON (if LFT is set ON).

5.4.2 Connections

RS232 Interface

Hardware

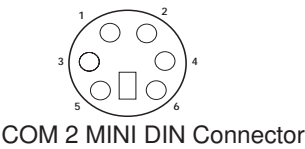
On the rear of the balance, the 9-pin female subminiature "D" connector COM 1, is provided for interfacing to other devices. The pin connections are shown in the illustration below.



COM1 Pin Connections	
1	Remote Tare
2	TxD
3	RxD
4	DSR
5	Ground
6	DTR
7	CTS
8	RTS
9	Remote Print

* External PRINT and/or TARE switches may be installed as shown in the diagram. Momentary contact switches must be used. To enable this feature, contact Ohaus Aftermarket.

A 6-pin Mini DIN connector is available when the optional RS232 is installed.



COM2 Pin Connections	
1	TxD
2	RxD
3	Ground
4	Vout
5	reserved for future use
6	No connection

LIMITED WARRANTY

Ohaus products are warranted against defects in materials and workmanship from the date of delivery through the duration of the warranty period. During the warranty period Ohaus will repair, or, at its option, replace any component(s) that proves to be defective at no charge, provided that the product is returned, freight prepaid, to Ohaus.

This warranty does not apply if the product has been damaged by accident or misuse, exposed to radioactive or corrosive materials, has foreign material penetrating to the inside of the product, or as a result of service or modification by other than Ohaus. In lieu of a properly returned warranty registration card, the warranty period shall begin on the date of shipment to the authorized dealer. No other express or implied warranty is given by Ohaus Corporation. Ohaus Corporation shall not be liable for any consequential damages.

As warranty legislation differs from state to state and country to country, please contact Ohaus or your local Ohaus dealer for further details.



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