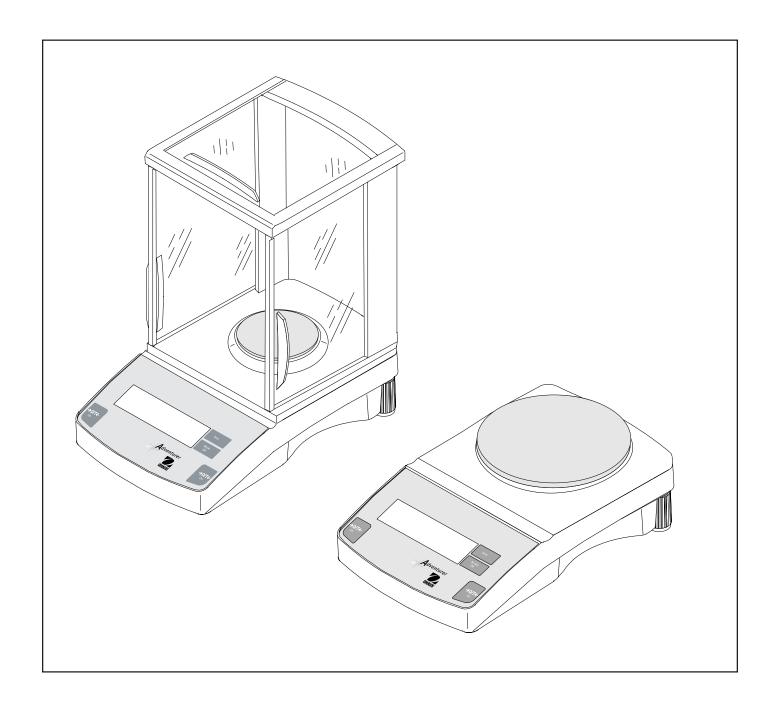


# INSTRUCTION MANUAL Adventurer™ Balances



**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 model (s) Adventurer Series

Marked with:	EC Directive (Including applicable amendments)	Standard					
CE	73/23/EC Electrical equipment for use within specified voltage limits	EN61010-1:1993 + A2: 1995 Safety requirements for Electrical Equipment for Measurement, Control Laboratory Use, Part 1: General Requirements					
	89/336/EC Electromagnetic compatibility	EN55011:1991 (class B) EMC Emissions, residential, commercial and light industry.					
		EN50082-2:1995 + A1:1998 (minimal requirements) EMC Immunity: Minimum test requirements.					
		EN61000-3-2:1995 + A1:1998 + A2: 1998; EN61000-3-3:1995  EMC Part 3 (for equipment rated input current < or=16A)  Limits- Section 2: Limits for harmonic current emissions  Limits- section 3: Limitation of voltage fluctuations and flicker in low voltage supply systems					
	Last two digits of the year in which the CE marking was affixed: 99						
	Additional Standards						
C US	CAN/CSA-C22.2 No. 1010.1-92; UL Std. No. 3101-1 Safety requirements for Electrical Equip. for measurement, Control and Laboratory Use, Part 1; General Requirements US						
FCC	FCC, Part 15, class A Emission						
C	AS/NZS2064-1/2 AS/NZS4252.1 Emission and Immunity						

**ISO 9001 Registration for Ohaus Corporation**. Ohaus Corporation, USA, was examined and evaluated in 1994 by the Bureau Veritas Quality International, BVQI, and was awarded ISO 9001 registration. This certifies that Ohaus Corporation, USA, has a quality system that conforms with 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.

Ted Xia President

Ohaus Corporation, Pine Brook, NJ USA

**FCC 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 DIGITAL APPARATUS DOES NOT EXCEED THE CLASS A LIMITS FOR RADIO NOISE EMISSIONS FROM DIGITAL APPARATUS AS SET OUT IN THE INTERFERENCE-CAUSING EQUIPMENT STANDARD ENTITLED "DIGITAL APPARATUS", ICES-003 OF THE DEPARTMENT OF COMMUNICATIONS CANADA.

CET APPAREIL NUMERIQUE RESPECTE LES LIMITES DE BRUITS RADIOELECTRIQUES APPLICABLES AUX APPAREILS NUMERIQUES DE CLASSE A PRESCRITES DANS LA NORME SUR LE MATERIEL BROUILLEUR: "APPAREILS NUMERIQUES", NMB-003 EDICTEE PAR LE MINISTRE DES COMMUNICATIONS.

Unauthorized changes or modifications to this equipment are not permitted.

## **EC - DECLARATION OF CONFORMITY**

Adventurer	
AR0640	ARRV70
AR1140	ARA520
AR2140	ARB120
AR1530	ARC120
AR2130	ARRW60
AR3130	ARD110

New Jersey, 07058, USA September, 2002 Ted Xia President Ohaus Corporation, Pine Brook, NJ USA



## INTRODUCTION

This manual covers installation, operation and troubleshooting for the OHAUS® Adventurer™ Balances. To ensure proper operation of your balance, please read this manual completely.

#### DESCRIPTION

The Ohaus Adventurer™ balances are precision weighing instruments, designed to provide years of service with virtually no maintenance. Nine models are available with capacities from 65 to 4100g. The 65g through 310g balances include a draft shield. Weigh below operation is made possible with a built-in weigh below hook.

The Adventurer™ balances are constructed with a durable housing, leveling feet, built-in leveling bubble, and a large custom LCD. Control buttons are clearly marked as to their function, with large Tare buttons located on either side of the front panel.

All Adventurer™ balances are initially factory set to measure in grams and can be set to measure in \*kilograms, milligrams, carats, Newtons, pounds, ounces, troy ounces, grains, pennyweight, mommes, mesghals, Hong Kong Taels, Singapore Taels, Taiwan Taels, Ticals, and Parts Counting. Simple three button operation allows for the selection of measuring units, calibration and printing parameters. A standard RS232 interface permits communication to an external printer or computer. \*See specifications for measuring units which are available.

Power is supplied through an AC adapter. Accessories include: an in-use cover, security device, calibration masses, printer, and scoops. See accessory section.

Behind your instrument stands OHAUS Corporation, a leading manufacturer of precision weighing equipment. An Aftermarket Department with trained instrument technicians is dedicated to provide you with the fastest service possible in the event your instrument requires servicing. OHAUS Corporation also has a Customer Service Department to answer any inquiries regarding applications and accessories.

## **MENUS**

Adventurer<sup>TM</sup> balances contain four display menus which enable you to select measuring units, calibrate the balance, turn on a tone signal which operates with each key stroke, and set up communication/print parameters.

- UNITS Menu Allows up to 16 measuring units to be selected plus parts counting.
   LIN Calibration Menu Allows the balance to be calibrated by using linearity calibration methods. Two masses are required.
- □ **SYS** Menu Enables tone signal with each keystroke.
- □ PRINT Menu Allows communication parameters to be set which include Baud rate, Parity, Data and Stop bits. A Reset function permits returning the communication parameters to factory settings.
- MENU END When selected, balance returns to weigh mode.

## UNPACKING

All Adventurer<sup>™</sup> balances are supplied with a weighing platform, AC power adapter, built-in weigh below hook, instruction manual and warranty card. Draft shields are supplied with 65g through 310g balances.

Carefully unpack all items.

- □Check the instrument for transport damage. Immediately inform your Ohaus dealer if you have complaints or if parts are missing.
- Store all parts of the packaging. This packaging guarantees the best possible protection for the transport of your instrument.

## INSTALLATION Selecting the Location

The balance should be used indoors only and in an environment which is free from excessive air currents, corrosives, vibration, and temperature or humidity extremes (Max. 85%). Maximum altitude not to exceed 4000 m above sea level. These factors will affect displayed weight readings.

DO NOT install the balance:

- Next to open windows or doors causing drafts or rapid temperature changes.
- · Near air conditioning or heater vents.
- Near vibrating, rotating or reciprocating equipment.
- Near magnetic fields or equipment that generates magnetic fields.
- On an unlevel or unstable work surface.

**NOTE**: Manufacturer cannot guarantee the safety of the product if it is not used according to the instructions.

## Setting Up and Leveling the Balance

Exact horizontal positioning and stable installation are prerequisites for repeatable results. To compensate for small irregularities or inclinations at the location, the instrument can be leveled.

For exact horizontal positioning, the balance is equipped with a level indicator and two leveling feet located at the rear of the balance.

Position the balance in the intended operating location. Adjust the leveling feet at the rear of the balance until the air bubble in the indicator is centered.

NOTE: The instrument should be leveled each time its location is changed.

BUBBLE LEVEL

LEVELING FEET (2)



## **Connecting Power**



#### NOTICE:

The socket/outlet must be installed near the equipment and shall be easily accessible.

Connect the AC Adapter cord to the connector located at the rear of the balance and to a suitable power source.

## Pan Installation

Place the pan support and pan on the balance. The balance is now ready for operation. Balances with a draft shield do not have a pan support.

## **Weigh Below Hook**

For below balance weighing applications (eg. density determination), a weigh below hook is installed at the bottom of the balance and is part of the balance. To use, remove the protective plug cover located at the bottom of the balance. The balance should then be supported on an elevated level surface which allows access to the weigh below hook. The balance should be releveled. Measurements are made by the use of a fine wire attached to the internal weigh below hook.

#### **CAUTION:**

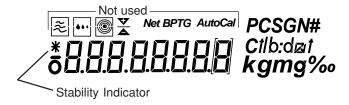
Do not attempt to remove the weigh below hook from the balance as the balance may be damaged.

## **Security Bracket**

A security bracket which is cast in the lower housing is provided at the rear of the balance under the leveling bubble. This bracket allows the balance to be secured by an optional cable and lock accessory.

## OPERATION Turning the Balance ON

Press >O/T<, all segments will appear briefly followed by a soft-ware revision number (when plugged in first time) or after a power interruption and then \*0.00g. Allow 20 minutes warm-up time. When the balance is first turned on, it can be used to weigh in grams or tare items *without* setting the menus.



## **Turning the Balance OFF**

To turn the balance OFF, press and hold **Mode Off** until the display indicates **OFF** then release.

## Weighing

With the balance turned ON, it is ready to weigh in grams.

1. If other measuring units are desired, refer to Menu Section for setup procedure.

- 2. If it is necessary to rezero the display, momentarily press >O/T<.
- Place item(s) to be weighed on the pan and read the weight on the display. The stability indicator \* appears when the reading is stable.

## Taring

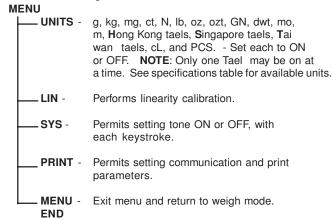
When weighing items that must be held in a container, taring subtracts the container's weight from the total weight on the pan.

- With an empty container on the pan, press >O/T< to zero the display.
- As material is added to the container, the net weight is displayed. Tared weight remains in balance memory until >O/T< is pressed again.</li>

#### MENU

The setup menu permits you to activate available weighing units, parts counting, linearity calibration, keystroke tone and print parameters. To enter the menu, the balance must first be turned off. Press and hold the>O/T< until MENU is displayed then release. To advance through the menus, press Mode Off. To enter a selected menu, press >O/T<. After you make selections in any menu, you may continue to make additional changes in other menus before exiting and saving. To exit a menu and return to weigh mode without saving settings, press and hold Mode Off until full display appears, then release.

**NOTE:** Selecting **END** in the **UNITS**, **SYS** and **PRINT** menus will save the settings for each menu.



## **Activating Units and Parts Counting (PCS)**

- 1. With the balance OFF, press and hold >O/T< until MENU is displayed, then release, UNITS is displayed.
- 2. Press >O/T<, On g is displayed. To turn this unit of measure ON or OFF, press Mode Off to select ON or OFF condition.
- 3. To advance through all of the measuring units including parts counting and to set each ON or OFF, press >O/T< to advance to next unit then press Mode Off to select ON or OFF. You must continue until END appears. NOTE: Only one Tael can be activated at a time.
- 4. When **END** is displayed, press >O/T< to store unit selections.
- To exit the menu, repeatedly press Mode Off until MENU END is displayed, then press >O/T<. Balance returns to a weighing mode.



## **Setting Tone Signal On or Off**

- With the balance OFF, press and hold >O/T< until MENU is displayed, release it and UNITS is displayed.
- 2. Press Mode Off until SYS is displayed.
- 3. Press >O/T<, BEEP ON is displayed.
- 4 Press Mode Off to select ON or OFF.
- 5. To store, press >O/T<, END is displayed, then press >O/T<.
- To exit the menu, press Mode Off until MENU END is displayed, then press >O/T<. Balance returns to a weighing mode.</li>

## Resetting Communication and Printing Parameters to Factory Defaults

Factory defaults are: Baud Rate= 2400, Parity = No, Data = 7, Stop Bit = 2, Stbl = ON, Auto = OFF.

- With the balance OFF, press and hold >O/T< until MENU is displayed, release it and UNITS is displayed.
- 2. Press Mode Off repeatedly until PRINT is displayed.
- Press >O/T<, RESET n is displayed (n=no). Select y=yes by pressing Mode Off.
- 4. Repeately press >O/T< until **MENU END** is displayed, then press >O/T<. The balance displays all of the communication settings as you advance through the menu. Balance returns to a weighing mode.

## **Setting Communication and Print Parameters**

Bolded setting shown below are the factory settings.

- To enter the Print Menu, with the balance OFF, press and hold >O/T< until MENU is displayed, release it and UNITS is displayed.</li>
- Press Mode Off repeatedly until PRINT is displayed.

## **Setting Baud Rate**

Press >O/T<, until **bd 2400** is displayed. Using the **Mode Off** button, you can select baud rates of 600, 1200, **2400**, 4800 or 9600. Once you have selected the proper baud rate for your system, press >O/T<, the display advances to **PAR no** (parity).

## **Setting Parity**

Repeatedly press **Mode Off**, to select either **no**, odd or E for even. Once the desired parameter is selected, press **>O/T**<, the display advances to **DATA 7**.

## **Setting Data**

Pressing the **Mode Off** button allows the selection of **DATA 7** or DATA 8. Once the desired parameter is selected, press >**O/T**<, the display advances to **STOP 2**.

#### **Setting Stop Bit**

Pressing **Mode Off**, you can select **STOP** 1 or **2**. Press **>O/T<**, the display advances to **STBL ON**.

## **Setting Print Modes**

The Adventurer™ balance offers a choice of manually printing only stable or all data (STBL ON/OFF) at any time by pressing the Print button or printing stable readings automatically (AUTO ON/OFF). The default setting for automatic stable readings is OFF. Only one of these may be set on at a time.

#### Stable Data On or Off

When **STBL ON** is displayed, press **Mode Off** to select **ON** or OFF, then press **>O/T<**, **AUTO OFF** is displayed.

#### **Auto Print On or Off**

With **Auto Print ON**, the balance automatically prints stable data when the display changes by at least five counts. Press **Mode Off** and select ON or **OFF**, then press **>O/T<**, **END** is displayed. To save settings, press **>O/T<**. **MENU END** is displayed. Press **>O/T<** to return to weigh mode.

## **Parts Counting**

To use Parts Counting, it must first be activated in the Menu. Refer to Menu section to activate parts counting. The balance will count parts based on the weight of a reference sample of 5, 10, 20, 50 or 100 parts. For optimum results, the parts should be uniform in weight.

- 1. Place a container on the pan and press >0/T< to tare it.
- 2. With the balance ON, press and hold >O/T< until SEt PCS is displayed, then release it. The display shows SEt XX, where XX is the last used counting sample. To change the sample size, repeatedly press Mode Off and stop at the desired sample number. Choices are 5, 10, 20, 50 or 100 pieces.</p>
- 3. Add the selected number of parts to the container, then press >O/T<. The display shows the number of parts added.
- 4. Add parts as desired and read the quantity on the display.
- 5. To read the weight of the parts, press Mode Off to change to any of the activated weighing units. You can return to parts counting at any time by repeatedly pressing Mode Off until the parts counting indicator is displayed. Sample weight is retained as long as the balance remains plugged in or you change it by the procedure above.
- To exit to weighing mode, press Mode Off until desired unit is displayed. Press >O/T< to tare the balance.</li>

#### **CALIBRATION**

Adventurer<sup>TM</sup> balances are calibrated before shipment, however, calibration can be affected by changes in location, temperature, or rough handling. Adventurer<sup>TM</sup> 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 at or near 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 within the balance's weighing range and a weight value at or near the balance's specified capacity.



## **CALIBRATION (Cont.)**

## **Calibration Masses**

Before beginning calibration, make sure masses are available. If you begin calibration and realize calibration masses are not available, exit the exit the procedure by pressing and holding **Mode Off** until balance returns to weigh mode. The balance will retain previously stored calibration data. Calibration should be performed as necessary to ensure accurate weighing. Masses required to perform the procedures are listed in the following table.

#### **CALIBRATION MASSES**

CAPACITY	LINEARITY MASSES	SPAN ONLY MASSES
65g	20g/50g	50g
110g	50g/100g	100g
150g	100g/150g	150g
210g	100g/200g	200g
310g	100g/300g	300g
510g	300g/500g	500g
1500g	500g/1500g	1500g
3100g	1000g/3000g	3000g
4100g	2000g/4000g	4000g

Masses must meet or exceed ASTM Class 1 Tolerance. Calibration masses are available as accessories.

## **Span Calibration**

- With the balance turned ON, press and hold >O/T< until CAL is displayed.</li>
- 2. Release >O/T< , -C- is momentarily displayed followed by the value of the calibration mass which is to be placed on the pan.

Do not disturb the balance when -C- is displayed. Incorrect calibration may result.

- 3. Place the indicated span calibration mass on the pan.
- Press >O/T<, -C- is momentarily displayed, then the weight of the mass on the pan is displayed.
- 5. Remove the calibration mass from the pan. The balance is now calibrated and returns to the weighing mode.

## **Linearity Calibration**

- With the balance OFF, press and hold >O/T< until MENU is displayed, then release it and UNITS is displayed. Press Mode Off, LIN is displayed.
- 2. Press >O/T<, -C- is displayed followed by the value of the first mass which must be placed on the pan.
- Place the required mass on the pan and momentarily press >O/T<, -C- is displayed followed by the value of the next mass to be placed on the pan.</li>

Do not disturb the balance while -C- is displayed.

- 4. Place the second required mass on the pan and momentarily press >O/T<, -C- is displayed. When the weight on the pan is displayed with the stability indicator, the balance is calibrated and returns to the weighing mode.
- 5. Remove the calibration masses from the pan.

## **CARE AND MAINTENANCE**

To keep the balance operating properly, keep the housing and platform clean. If necessary, a cloth dampened with a mild detergent may be used. Keep calibration masses in a safe dry place.

## **RS232 COMMAND DATA TABLE**

Command Character	Description
Р	Print command
Т	Tare command
?	Displays current mode
XS	X=0 (zero) Stable off
XS	X=S Stable on (default setting in balance)
XS	X=A Auto print on stabilty

**NOTE**: Print commands entered through the computer are temporary. When the balance is turned off, it will return to balance menu settings when turned on again.

- 1 N/C
- 2 Data Out (TXD)
- 3 Data In (RXD)
- 4 N/C
- 5 Connected to pin 8
- 6 N/C
- 7 Ground
- 8 Connected to pin 5
- 9 N/C



## TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	REMEDY		
No Display.	Power Adapter not connected.	Connect AC Adapter.		
Incorrect weight reading.	Balance out of calibration.	Calibrate the bal- ance.		
	Balance was not rezeroed before weighing.	Press > 0/T< with no weight on the pan, then weigh item.		
Calibration procedure does not work.	Incorrect calibration masses being used.	Use correct masses.		
Unable to display weight in a particular weighing unit.	Weighing unit not activated in menu.	Use Units menu to set desired units ON (see menu).		
Balance won't store selections made in menu.	END selection was not used to exit menu.	You must use END to exit each menu and save selections.		



When a problem occurs using the balance, the display will indicate an error code. Review the listed codes and follow instructions to correct the problem.

- Err 2.0 Stability error. Check if balance is located near vibrating equipment or if air currents are affecting it.
- Err 3.0 Calibration error (wrong mass). Incorrect or no calibration mass used when performing calibration procedure. Error will flash momentarily, then balance will use previous calibration data. Recalibrate correctly.
- **Err 4** Invalid data checksum in type or adjust data. Return balance for servicing.
- Err 6.0 Parts counting error Average piece weight is less than 1d. Balance shows error then exits parts counting.
- Err 8.4 Over or under load. Sample being weighed exceeds the capacity of the balance. If error occurs when the sample is within the balance capacity, balance may be incorrectly calibrated. An underload such as the pan off of the balance could also display Err 8.4. Recalibrate the balance.
- Err 9 Internal data error. Return balance for servicing.
- **Err 9.8** Invalid checksum in calibration or setup data. The balance may need recalibration, particularly linearity calibration. If the error persists after recalibration, the balance must be serviced.

#### PARTS INFORMATION

If you require replacement parts or would like to purchase accessories, inside the U.S., please call Ohaus Corporation toll-free at (800) 526-0659 and from outside the U.S., (973) 377-9000. An Ohaus Product Parts Specialist will be available to help you.

## REPLACEMENT PARTS

	Part No.
AC Adapters:	
US/Japan 100 V	11103743
US 100-120V	11103741
Europe 220-240V	11103740
UK 220-240V	11103742
Table version 220-240V Reqs. sep. line cord, Aus.	11103745
Line cord for above	76199-01
Table version 220-240V Reqs. sep. line cord, US	11103745
Line cord for above	6569-00
Euro/Germany, Belgium, France 220-240V	11103744
Pan for 65g, 110g, 210g 3.5" (9cm) dia.	12106739
Pan for 150g, 310g, 3.9" (10cm) dia.	12105372
Pan for 510 to 4100g, 7.1" (18cm)	12105370

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## **ACCESSORIES**

	Part No.
20g Calibration Mass	49024-11
50g Calibration Mass	49054-11
100g Calibration Mass	49015-11
200g Calibration Mass	49025-11
500g Calibration Mass	49055-11
1kg Calibration Mass	49016-11
2kg Calibration Mass	49026-11
Security Device	76288-01
Impact printer	SF42
In-Use Cover	400302-010

## **SPECIFICATIONS**

Capacity	65g (1)	110g (1)	210g <sup>(1)</sup>	150g <sup>(1)</sup>	310g <sup>(1)</sup>	510g	1500g	3100g	4100g
Readability		0.1mg	9	С	).001g		0.01g	0.1g	
Weighing units/modes		g, kg, mg, ct, N, lb, oz, ozt, gn, dwt, momme, mesghal, 3 taels, ticals, Parts Countil					unting		
Repeatability (Std. Dev.)		0.1mg	9	0.00	)1g		0.01g		0.1g
Linearity	±0.2ı	mg	±0.3mg	±0.0	002g	±0.01g	±	0.02g	±0.1g
Tare Range				Full	capacity by	subtraction			
Stabilization Time (seconds)					3 Secor	nds			
Sensitivity Drift		4ppm/°C				10ppm/°C			
Operating Temp Range	50° to 86° F/10° to 30° C								
Power Requirements	8 - 14.5V 50/60Hz 6VA or 9.5 - 20V 6W								
Calibration	External Digital								
Display (in/cm)	LCD (1.2/3 high)								
Pan Size (in/cm)		3.5/9 dia. 3.9/10 dia.			7.1/18 dia.				
Draft shield clearance height above pan (in/cm)		9.3/23.	6	6.8/	/17.25				
Dimensions (WxHxD) (in/cm)	8.5x14.3x13.5/21.7x36.3x34.3 8.5x12.3x13.5/21.7x31x34.3 8.5x4.3x13.5/21.7x11x34.3								
Net Wt (lb/kg)	12.5/5.7 10/4.5 8.5/3.9								
Shipping Wt (lb/kg)		21/9.5		16/7.3		14/6.4			
Item No.	AR0640	AR1140	AR2140	AR1530	AR3130	AR5120	ARA520	ARC120	ARD110



## Admissible ambient conditions

Use only in closed rooms

Temperature range: 50°F to 86°F / 10°C to 30°C

Atmospheric humidity: 80% rh @ to 30°C

Voltage fluctuations: -15% +10%

Installation category: II Pollution degree: 2

Power supply voltage: 8-14V ac, 50/60 Hz, 6VA or 9.5-20V dc, 6W

Power Adapter: AP3405 120V, 60Hz 10W

AP3405E 230V, 50Hz 80mA AP3405B 240V, 50Hz 80mA

## 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.