SERVICE MANUAL

VALOR™ 4000

VALOR™ 2000

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SERVICE MANUAL

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1.1 INTRODUCTION

This service manual contains the information needed to perform routine maintenance and service on the Ohaus Valor 2000/4000 Series scales. Familiarity with the scale's Instruction Manual is assumed. The contents of this manual are contained in five chapters:

Chapter 1 Getting Started – Contains information on service facilities, tools and test equipment, specifications, and the mechanical and electronic functions of the scale.

Chapter 2 Troubleshooting – Contains a diagnostic guide and error code table.

Chapter 3 Maintenance Procedures – Contains preventive maintenance procedures and disassembly, repair and replacement procedures.

Chapter 4 Testing – Contains a list of required test masses, an operational test, segment display test, performance tests and adjustments.

Chapter 5 Drawings and Parts Lists – Contains exploded views of Valor 2000/4000 scales identifying all serviceable components.

Appendix A Standard Calibration – Explains procedures for Standard Calibration, performed prior to using a scale, and after service.

Appendix B Service Calibration – Describes the Service Menu and sub-menus, which allow authorized service personnel to perform factory Linearity and Span calibrations (no pre-set limits), take Ramp readings, and to set the service menu units.

1.2 SERVICE FACILITIES

To service a scale, the service area should meet the following requirements:

- Should be temperature controlled and meet scale specifications for temperature environmental requirements.
- Must be free of vibrations such as fork lift trucks close by, large motors, air currents or drafts from air conditioning/heating ducts, open windows, people walking by, fans, etc.
- Area must be clean and free of excessive dust.
- Work surface must be stable and level.
- Scale must not be exposed to direct sunlight or radiating heat sources.
- Use an approved Electro-Static Device.

1.3 TOOLS AND TEST EQUIPMENT REQUIRED

The service shop should contain the following equipment:

1. Standard hand tools.
2. Digital Voltmeter (DVM).
3. Standard Electronics tool kit.
4. Grounding mat and clip.
5. Strain Gauge Simulator.

1.4 SPECIFICATIONS - Valor 4000

Complete specifications for the Ohaus Valor 4000 scales are listed in Table 1-1. When a scale has been serviced, it must meet the specifications listed in the table. Before servicing the scale, determine what specifications are not met.

TABLE 1-1. SPECIFICATIONS – Valor 4000

Model	V41PWE1501T V41XWE1501T	V41PWE3T V41XWE3T	V41PWE6T V41XWE6T	V41PWE15T V41XWE15T
Capacity	1.5 kg	3 kg	6 kg	15 kg
e(g)	0.5	1	2	5
d(g)	0.2	0.5	1	2
Resolution (based on gram)	7500	6000	6000	7500
Max Capacity (lb)	3	6	15	30
Readability (LFT OFF) (lb)	0.0005	0.001	0.002	0.005
Readability (LFT ON) (lb)	0.001	0.002	0.005	0.01
Resolution (LFT ON)	3000	3000	3000	3000
Linearity error (d or e)	±1	±1	±1	±1
Repeatability (d or e)	±1	±1	±1	±1
Hysteresis (d or e)	±1	±1	±1	±1
Off Center Load (d)	±1	±1	±1	±1
Creep (d or e)	0.5e (0-15min); 0.2e (15-10min)			
Stabilization Time (seconds)	0.5	0.5	0.5	0.5
Operating Temperature	-10°C to 40°C	-10°C to 40°C	-10°C to 40°C	-10°C to 40°C
Storage Temperature	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C
Pan Size	190 x 242 mm	190 x 242 mm	190 x 242 mm	190 x 242 mm

1.5 SPECIFICATIONS - Valor 2000

Complete specifications for the Ohaus Valor 2000 scales are listed in Table 1-2. When a scale has been serviced, it must meet the specifications listed in the table. Before servicing the scale, determine what specifications are not met.

TABLE 1-2. SPECIFICATIONS – Valor 2000

Model	V22PWE1501T V22XWE1501T	V22PWE3T V22XWE3T	V22PWE6T V22XWE6T	V22PWE15T V22XWE15T
Capacity	1.5 kg	3 kg	6 kg	15 kg
e(g)	0.5	1	2	5
d(g)	0.2	0.5	1	2
Resolution (based on gram)	7500	6000	6000	7500
Linearity error (d or e)	±1	±1	±1	±1
Repeatability (d or e)	±1	±1	±1	±1
Hysteresis (d or e)	±1	±1	±1	±1
Off Center Load (d)	±1	±1	±1	±1
Creep (d or e)	0.5e (0-15min); 0.2e (15-10min)			
Stabilization Time (seconds)	0.5	0.5	0.5	0.5
Operating Temperature	-10°C to 40°C	-10°C to 40°C	-10°C to 40°C	-10°C to 40°C
Storage Temperature	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C
Pan Size	190 x 242 mm	190 x 242 mm	190 x 242 mm	190 x 242 mm

1.6 SCALE OPERATION – VALOR 4000

This section contains information on the basic operation of the Valor 4000 scale.

1.6.1 OVERVIEW OF THE CONTROLS

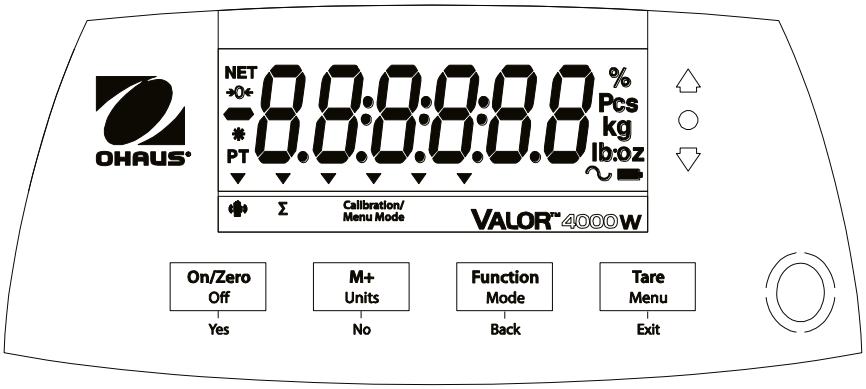


Figure 1-1. Valor 4000 Front Display with controls.

TABLE 1-3. Control functions Valor 4000

Button	Functions
On/Zero Off (Yes)	Short Press[1] (when on): Sets display to zero Long Press[2] (when off): Turns scale on (when on): Turns the scale off[3] Short Press (in Menu): Selects / accepts displayed setting
M+ Units (No)	Short Press: Accumulates the weight or displays the accumulated information at 0 load. Long Press: Toggles through active Units Short Press (in Menu): Toggles through available settings
Function Mode (Back)	Short Press: Initiates an application mode specific response Long Press: Selects active Mode Short Press (in Menu): returns to previous settings
Tare Menu (Exit)	Short Press: Enter / clear a Tare value Long Press: Enters User Menu Short Press (in Menu): Quickly exit User Menu
	IR Sensor[4] can be programmed to act as “touchless” button. See the User Menu section 4.3 for the available settings.

Notes:

1 Short Press: Press less than 2.5 seconds.

2 Long Press: Press and hold for more than 2.5 seconds.

3 Press and hold the **On/Zero Off** button until OFF is displayed, then release the button.

4 The IR sensor can be activated by a hand or other object that is placed at a specified height above the sensor location. The sensor activation distance will vary based on the reflective nature of the object. If unwanted activations occur due to unique situations the sensor can be turned off.

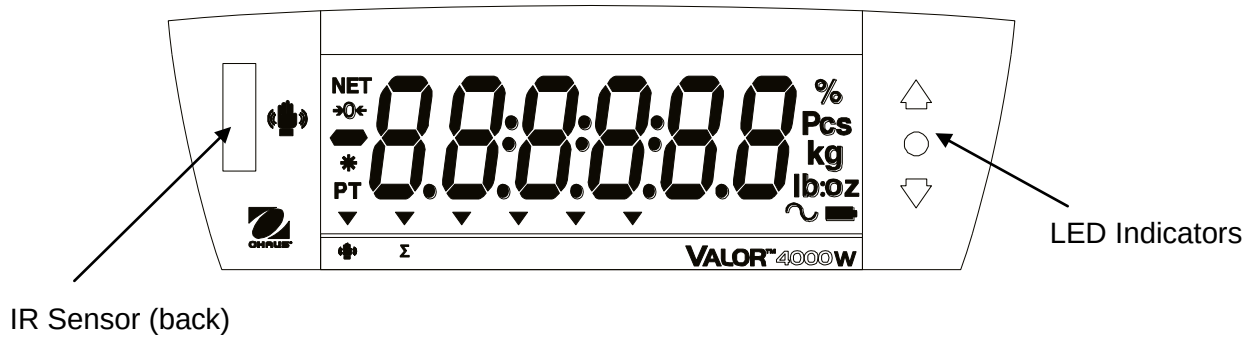


Figure 1-2. Valor 4000 Back Display.

1.6.2 Power ON/OFF

To turn the scale on, press and hold the **On/Zero Off** button for 2.5 second. The scale performs a display test, momentarily displays the software version, and then enters the active weighing mode.

To turn the scale off, press and hold the **On/Zero Off** button until OFF is displayed.

The scale can be used on AC power immediately. Allow the battery to charge for 12 hours before using the scale on battery power. The Scale will automatically switch to battery operation if there is a power failure or the power cord is removed. With AC power, the scale is constantly charging, so the battery charge indicator will remain lit. The scale can be operated during charging, and the battery is protected against overcharging.

For maximum operating time, the battery should be charged at room temperature.

During battery operation, the battery symbol indicates the battery charge level remaining. When charging, the symbol will blink slowly and when fully charged the symbol will stop blinking.

TABLE 1-4

Symbol	Charge Level
	Battery in use: Symbol displayed

Notes:
When battery symbol blinks fast, approximately 30 minutes working time is left.
When [Lo.bAt] is displayed, the scale will shut off.
Charging the scale must be performed in a dry environment.

CAUTION: Battery is to be replaced only by an authorized Ohaus service dealer. Risk of explosion can occur if the rechargeable battery is replaced with the wrong type or if it is not properly connected. Dispose of the lead acid battery according to local laws and regulations.

1.6.3 Menu Setup

Programmable features of the Valor 4000 scales are contained in menus which are accessed through the Display Panel's control switches. See the Instruction Manual for a full description of the menus and how to access them.

TABLE 1-5. Valor 4000 MENU STRUCTURE

Menu:	***C.A.L***	***S.E.t.U.P***	***r.E.A.d***	***M.O.d.E***	***U.n.i.t***	***L.O.C.k***	***E.n.d***
Menu Items:	*Span* *Lin* *GEO* *End*	*Reset* *Pwr.Un* *A.Tare* *Ir.Func* *Ir.Adj* *Accum* *End*	*Reset* *Stable* *Filter* *AZT* *Light* *Sleep* *A.Off* *End*	*Reset* *Percnt* *Check* *End*	*kg* *g* *oz* *lb* *lb:oz* *End*	*Reset* *L.Cal* *L.Setup* *L.Read* *L.Mode* *L.Unit* *End*	

1.6.4 Menu Navigation

Press and hold Menu until [MENU] (Menu) is displayed. When released the first sub-menu [CAL] (Cal) will be shown.
Press **Yes** to enter the displayed sub-menu or press **No** to advance to the next.
Selecting a sub-menu will display the first menu item. Press **Yes** to view the menu item setting or press **No** to move to the next menu item. When viewing the setting, press **Yes** to accept the setting, or press **No** to change the setting. When [End] is displayed, press **Yes** to return to the sub-menu selections or **No** to return to the first item in the current menu. **Bold** indicates factory default setting.

1.7 SCALE OPERATION – VALOR 2000

This section contains information on the basic operation of the Valor 2000 scale.

1.7.1 OVERVIEW OF THE CONTROLS

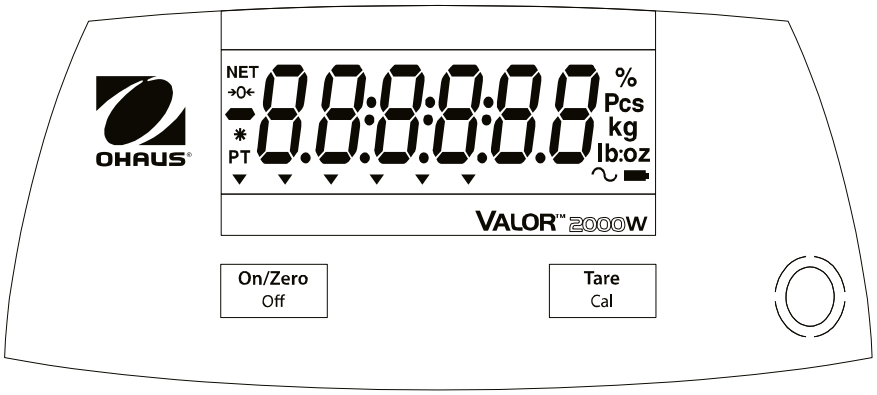


Figure 1-3. Valor 2000 Front Display with controls.

TABLE 1-6. Control functions Valor 2000

Button	Functions
On/Zero Off	Short Press[1] (when on): Sets display to zero Long Press[2] (when off): Turns scale on (when on): Turns the scale off Short Press (in Menu): Selects / accepts displayed setting
Tare Cal	Short Press: Enter / clear a Tare value Long Press: Initiates Calibration procedure Short Press (in Menu): Toggles through available settings Extended Press[3]: Enters user menu

Notes:

[1] Short Press: Press less than 2.5 seconds.

[2] Long Press: Press and hold for more than 2.5 seconds.

[3] Extended Press: Press and hold for more than 5 seconds.

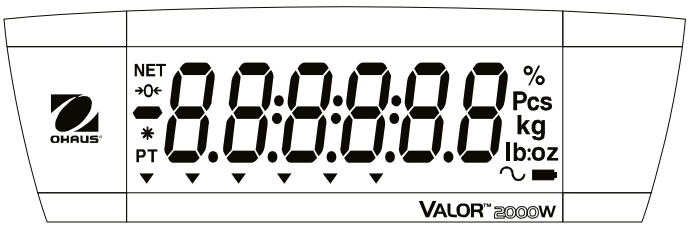


Figure 1-4. Valor 2000 Back Display.

1.7.2 Power ON/OFF

To turn the scale on, press and hold the **On/Zero Off** button for 2.5 seconds. The scale performs a display test, momentarily displays the software version, and then enters the active weighing mode.

To turn the scale off, press and hold the **On/Zero Off** button until OFF is displayed.

The scale can be used on AC power immediately. Allow the battery to charge for 12 hours before using the scale on battery power. The Scale will automatically switch to battery operation if there is a power failure or the power cord is removed. With AC power, the scale is constantly charging, so the battery charge indicator will remain lit. The scale can be operated during charging, and the battery is protected against overcharging.

For maximum operating time, the battery should be charged at room temperature.

During battery operation, the battery symbol indicates the battery charge level remaining. When charging, the symbol will blink slowly and when fully charged the symbol will stop blinking.

TABLE 1-7

Symbol	Charge Level
	Battery in use: Symbol displayed

Notes:
When battery symbol blinks fast, approximately 30 minutes working time is left.
When [Lo.bAt] is displayed, the scale will shut off.
Charging the scale must be performed in a dry environment.

CAUTION: Battery is to be replaced only by an authorized Ohaus service dealer. Risk of explosion can occur if the rechargeable battery is replaced with the wrong type or if it is not properly connected. Dispose of the lead acid battery according to local laws and regulations.

1.7.3 Menu Setup

Programmable features of the Valor 2000 scales are contained in menus which are accessed through the Display Panel's control switches. See the Instruction Manual for a full description of the menus and how to access them.

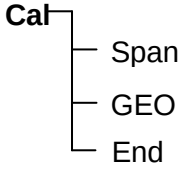


Figure 1-5. Menu structure

1.7.4 Menu Navigation

To enter the calibration menu, press and hold the **Cal** button for 5 seconds, [**SpaN**] will then be displayed. Press **Zero** key to perform span calibration or press **Cal** key to proceed to GEO settings. Press **Zero** key to enter GEO settings and then press **Cal** key to increase the value. Press **Zero** key to confirm, [**end**] will be displayed. Press Zero key to exit the menu and return to weighing mode.

1.8 LEGAL FOR TRADE

Note: This section applies to Valor 4000 only.

When the scale is used in trade or a legally controlled application it must be set up, verified and sealed in accordance with local weights and measures regulations. It is the responsibility of the purchaser to ensure that all pertinent legal requirements are met.
To Lock or Unlock the scale's Legal-For-Trade (LFT) settings, follow this procedure:

Caution: When accessing the bottom of the scale, avoid placing the scale upside down on the pan or sub-platform. Place the scale on its side.

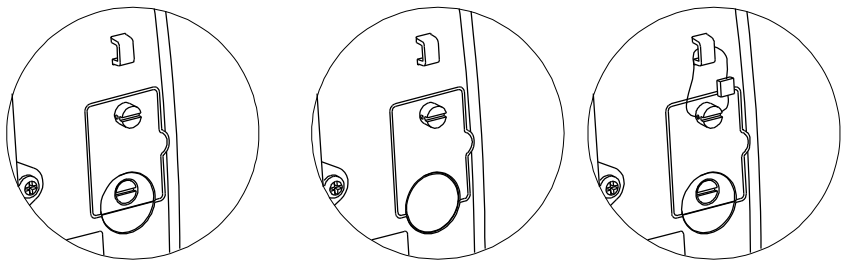
1. Turn the scale **OFF**.
2. Remove the Security Cover under the scale to access the two pins located in a slot. Short these pins (a slotted screwdriver may be used), while powering the scale **ON**. The scale will perform the start-up procedure, and then the display will show the current status [LFt OFF] (LFT OFF, unlocked) or [LFt On] (LFT ON, locked); press the 'No' key to change this setting, or press the 'Yes' key to confirm it.

Note: When Legal For Trade is set to On, the menu setting are affected as follows:
Calibration (C.A.L) menu is not accessible
Unit menu is locked at the current setting
Filter Menu is locked at current setting
IR function menu is locked at current setting
Stable Range setting is locked at 1d
Auto-Zero Tracking setting is locked at 0.5d

3. Replace the Security Cover.

1.8.1 Physical Seals

For jurisdictions that use the physical sealing method, the local weights and measures official or authorized service agent must apply a security seal to prevent tampering with the settings. Refer to the illustrations below for sealing methods.



Unlocked Locked

Figure 1-6. Sealing

2.1 TROUBLESHOOTING

This section of the manual contains troubleshooting information. Information is contained to isolate specific problems using Table 2-4, Diagnostic Guide. Follow all directions step by step. Make certain that the work area is clean. Handle balance components with care. Use appropriate Electro-Static Device.

2.2 DIAGNOSTIC GUIDE

Table 2-4 is a Diagnostic Guide designed to help locate the problem area quickly and easily. The probable causes are listed with the most common cause first. If the first remedy does not fix the problem, proceed to the next remedy. Before attempting to repair the balance, read all chapters of this manual to be familiar with the balance components and operation.

2.2.1 Diagnosis

1 Isolate and identify the symptom.

2 Refer to Table 2-4, Diagnostic Guide and locate the symptom.

3 Follow the suggested remedies in the order they appear.

4 Perform the indicated checks, or see the appropriate section of the manual.

5 Repair or replace the defective section of the balance.

NOTE:
If more than one symptom is observed, approach one area at a time, and remember that the symptoms may be interrelated.

If a problem arises that is not covered in this manual, contact Ohaus Corporation for further information.

2.2.2 Checking Load Cells for Trouble

1. **Perform a Resistance Test**, to determine if the Load Cell is severely damaged or a short circuit to the frame has occurred.

   Note: The Load Cell must be completely disconnected from the Printed Circuit Board and at no load when the resistance readings are taken.

   Using an ohm meter, measure and record resistance between each pair of wires from the Load Cell, as specified in Table 2-1. Compare the measured readings with the specified values in Table 2-1.

   If the resistance readings are in the range specified, skip to the next section. If they are outside the expected range, open circuit or short-circuit across any two wires, the Load Cell is defective: replace it. (See Chapter 3.)

TABLE 2-1. LOAD CELL RESISTANCE READINGS (in Ohms)

Model	Ex+ to Ex–	S+ to S–	Ex+ to S–	Ex+ to S+	Ex– to S+	Ex– to S–
All models	404 ± 10	350 ± 4	289 ± 10	289 ± 10	289 ± 10	289 ± 10

2. **Perform an Output Voltage Test**: Measure the no load, 50% load and full load output. The reading should meet the Load Cell specifications. The Load Cell output should be very close to linear over its capacity range.

   NOTE: The following steps involve power applied to the scale. Load Cell solder contacts can be used as measuring points. See Figure 2-1.

   The EXE+ and EXE– wires should be connected to the PCB, and the SIG+ and SIG– wires must be disconnected. Record the colors for each wire connection before disconnecting. (See Table 2-2 for typical color code for Valor 7000.)

TABLE 2-2. COLOR CODE FOR LOAD CELL WIRING*

	EXE–	EXE+	SIG+	SIG–
AMI	BLACK	GREEN	WHITE	RED
ZEMIC	BLACK	RED	GREEN	WHITE

*Color codes may vary.

   – Insert the Platform Support into the Load Cell Frame, place the Platform on top, and turn on power to the scale.

   – Using a voltmeter, measure and record the excitation voltage supplied to the PCB: with no load on the Platform, measure the voltage across points 4 and 1 of Load Cell connection on the PCB (+EXE and –EXE). This voltage must be approximately 4.6~4.7 Volts dc with the Load cell connected. If the voltage is lower, disconnect the Load Cell cable from the PCB and measure again. If the voltage is not 4.6~4.7 Volts dc, the Load Cell is defective and must be replaced. If the voltage remains low, the PCB is defective and must be replaced.

CAUTION:
IN THE NEXT STEP, DO NOT OVERLOAD THE SCALE BEYOND FULL CAPACITY RATING.

– Measure the voltages on +SIG and –SIG wires, disconnected from PCB. **Note:** Measurements must be made with these wires disconnected from the PCB. These measurements represent the output of the Load Cell. Record measurements at Zero Load, 50% and full scale capacities. See Table 2-3 for typical readings.

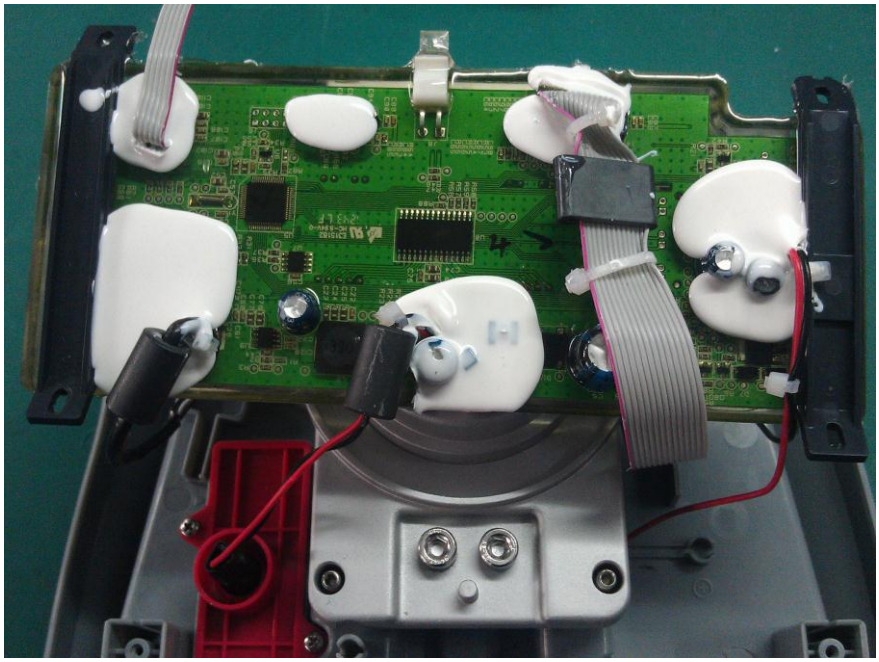


Figure 2-1. Top view of main PCB.

NOTE: Table 2-3 indicates typical readings. Actual values can vary, but should remain linear throughout the range. If readings are out of tolerance, replace the Load cell. (See Section 3.6.)

TABLE 2-3. LOAD CELL OUTPUT READINGS (in mV/V with 4.65 V Excitation)

Model/Capacity	Zero Load	50% Load	100% Load
V41xWE1501T / 1.5kg V22xWE1501T / 1.5kg	**0.739**	**1.489**	**2.239**
V41xWE3T / 3kg V22xWE3T / 3kg	**0.4434**	**1.3434**	**2.2434**
V41xWE6T / 6kg V22xWE6T / 6kg	**0.2217**	**1.1217**	**2.0217**
V41xWE15T / 15kg V22xWE15T / 15kg	**0.11085**	**1.23585**	**2.36085**

2.2.3 Testing the Printed Circuit Board (PCB)

The PCB can be tested by measuring voltages and by using a simulator. The simulator replaces the Load Cell during testing and is a useful tool for diagnosing problems.

PCB Voltage Measurements

Note: Prior to the voltage measurements, the battery should be fully charged and tested.

1. Disconnect power from the scale, and remove the Top housing. (See Section 3.3.1.)

CAUTION: Disconnect the power from the scale before opening the housing.

2. Connect the AC Adapter to the scale and turn the scale on.
3. Using a DVM, measure the excitation voltage (EXE+ and EXE– in Figure 2-1.) The reading should be 4.6~4.7 volts dc. This is the excitation voltage for the Load Cell
   and is regulated. If the voltage is lower, replace the PCB. (See Section 3.4.)
   Then perform Operational Tests. (See Chapter 4.)
4. Measure incoming power from the transformer connector shown in Figure 2-1. The voltage should read 0 volts with power off and above 12 Volts dc with power on.
5. Perform simulator testing.

Simulator Testing

To perform these tests, the use of a Simulator is required. The function of a Simulator is to simulate the output of a full bridge Load Cell, allowing the scale to be separated from the Load Cell for the purposes of troubleshooting and calibration. The Load Cell used in the scale is rated at 2mV/V output with a 4.6~4.7 Volt excitation voltage applied.

General Load Test

This test checks the Main PC Board circuitry by simulating accurate Load Cell voltages at zero load, 50% and 100% load capacities.

Disconnect power from the scale, and remove the Top housing. (See Section 3.3.1.) Leave the Mechanical Switch connected to the scale. Disconnect the battery.

1. Disconnect the Load Cell cable from the main PC Board.
2. With the Simulator set to zero, solder its cable leads to their counterparts on the PCB, using the Load Cell Cable solder points on the PCB. (See Figure 2-1.).
3. Connect a known good AC Adapter to the scale and connect to a power source.
4. Turn on the scale. An under load error may appear. This is normal.
5. Set the scale to indicate weight in kilograms (kg) and set the calibration value to maximum span value.
6. Adjust the Simulator to simulate 0% load, 50% load and 100% load for the capacity that the scale is rated for. (See Table 2.3 for values to use.) If the resulting readings are unstable, the Main PC Board is defective.
7. Use the Simulator to calibrate the scale in the next procedure to verify if the Main PC Board is good or bad.

Calibration Test

This test calibrates the scale using the simulator and can verify that the Main PC Board is functioning properly or improperly.

1. With the scale on, enter the scale menu and perform a span calibration. (See Appendix A.)
2. Follow the scale prompts. When the scale indicates a given weight to be placed on the scale, set the simulator to an equivalent value based on Table 2-3.
3. Upon completion of calibration, the PCB can be further checked using the Simulator to simulate various weight values. If simulator settings and weight readings on the scale agree, the PCB is functional. If the scale readings vary, or do not agree with readings in Table 2-3, the Main PC Board is defective and should be replaced. (See Chapter 3.)

2.2.4 Diagnostic Guide

TABLE 2-4. DIAGNOSTIC GUIDE

Symptom	Possible Cause	Remedy
Cannot turn on	No power to scale Battery discharged	Verify connections, power source and battery charge status.
Poor accuracy	Improper calibration Unstable environment	Perform calibration Move scale to suitable location
Cannot calibrate	Unstable environment Incorrect calibration weight	Move the scale to suitable location Use correct calibration weight
Cannot access mode	Mode not enabled	Enter menu and enable mode
Cannot access unit	Unit not enabled	Enter menu and enable unit
LO rEF	Reference weight is too low	Increase reference weight.
Err 3.0 CAL	Incorrect calibration weight	See section 2.4 for correct weights
Err 8.1 "LoAd"	Power on zero range exceeded	Clear pan
Err 8.2 _LoAd_	Power on zero under range	Install pan
Err 8.3 "LoAd"	Overload	Load exceeds scale maximum capacity
Err 8.4 _LoAd_	Under load	Reading below min. range – Re-install pan.
Err 8.5 "tArE"	Tare out of range	Tare value exceeds maximum.
Err 9 dAtA	Internal data error.	Contact an authorized service agent
Err 13 MEM	Fail to write EEPROM.	Contact an authorized service agent
Err 53 C.SuM	Invalid checksum data	Contact an authorized service agent
Lo.bAt	Battery is discharged	Connect the power and charge the battery
NO.ACC	The current gross / net value is not allowed to be accumulated	Change the value to net / gross value and then do the accumulation
Battery fails to charge fully	Battery is defective	Have battery replaced by OHAUS authorized service dealer.

3.1 PREVENTIVE MAINTENANCE

Ohaus scales are precision instruments and should be carefully handled, stored in a clean, dry, dust-free area, and cleaned periodically. Follow these precautionary steps:

- When a scale has had chemicals or liquids spilled on it, all exterior surfaces should be cleaned as soon as possible with warm water on a damp cloth.
- Do not leave a mass on the scale when the scale is not in use.
- Allow time for the scale to stabilize after moving it from an area which is at a different temperature than the area where it is to be operated. Allow one hour for each 5°F (2.7°C) temperature change before using the scale. After temperature stabilization, allow another 20 minutes after turning the scale on, for the scale electronics to stabilize.

3.1.1 Preventive Maintenance Checklist

The scale should be inspected and checked regularly, as follows:

1. Remove the Pan and Sub Pan to inspect and clean the area beneath the Pan.
2. Clean the outside of the scale using a damp cloth with warm water.

CAUTION
DO NOT USE CHEMICAL CLEANERS OR SOLVENTS OF ANY TYPE.
SOME CLEANERS ARE ABRASIVE AND MAY AFFECT THE SCALE'S FINISH.

3. Check the Power Cord for broken or damaged insulation.
4. If using the rechargeable battery and the scale malfunctions, first recharge the battery to see if this resolves the problem.
5. Make a visual inspection for faulty connectors, wiring, and loose hardware.

3.2 SERVICE STRATEGY

All parts of the Valor 2000/4000 are designed to be replaced rather than repaired. This includes the Main Printed Circuit Board (PCB) and Switches PCB, the Load Cell, and the cables. For an illustrated list of replaceable parts, see Chapter 5.

3.3 OPENING THE SCALE

Use these procedures in order to replace the Load Cell, any of the Printed Circuit Boards and/or LCD Displays.

3.3.1 Separating the Top and Bottom Housings

Common hand tools are sufficient to disassemble the Valor 2000/4000 scales. Turn the scale off and unplug the power cord before you begin.

1. Turn the scale over.
2. Remove the 4 screws of battery cover.
3. Take away the battery cover.
4. Disconnect the battery.
5. Remove the battery.
6. Remove the 2 screws of pan and take away the pan.
7. Remove the LFT cover screws.
8. Take away the LFT cover.
9. Remove the 5 screws.

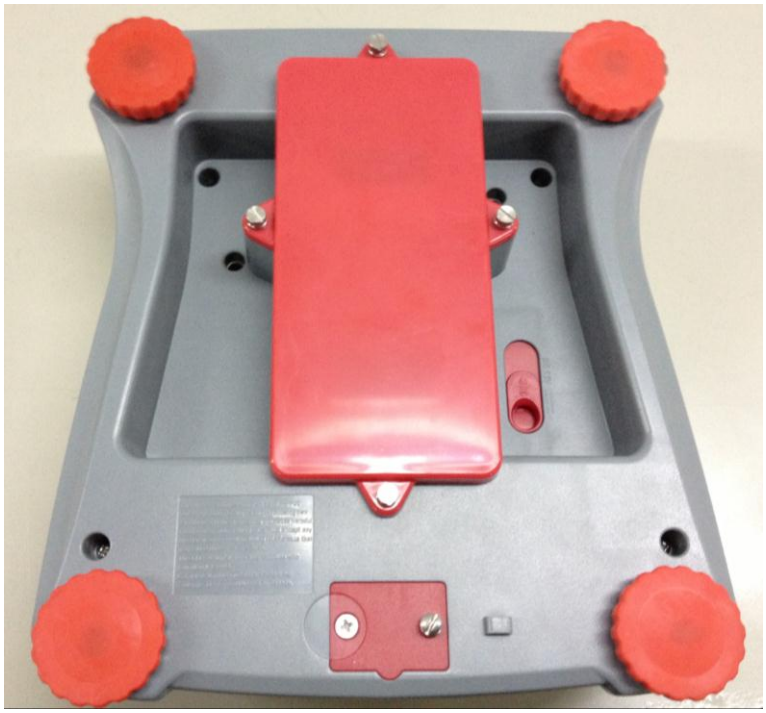


Figure 3-1. Screws that secure the housing.

10. Turn the scale over and move the top housing a little bit backward and then raise and remove the top housing.

11. Separate Top Housing from Bottom Housing. Avoid straining the cables that connect the Main PCB to the parts in the Bottom Housing. (Lay the two housings close to each other, so cable is not strained.)

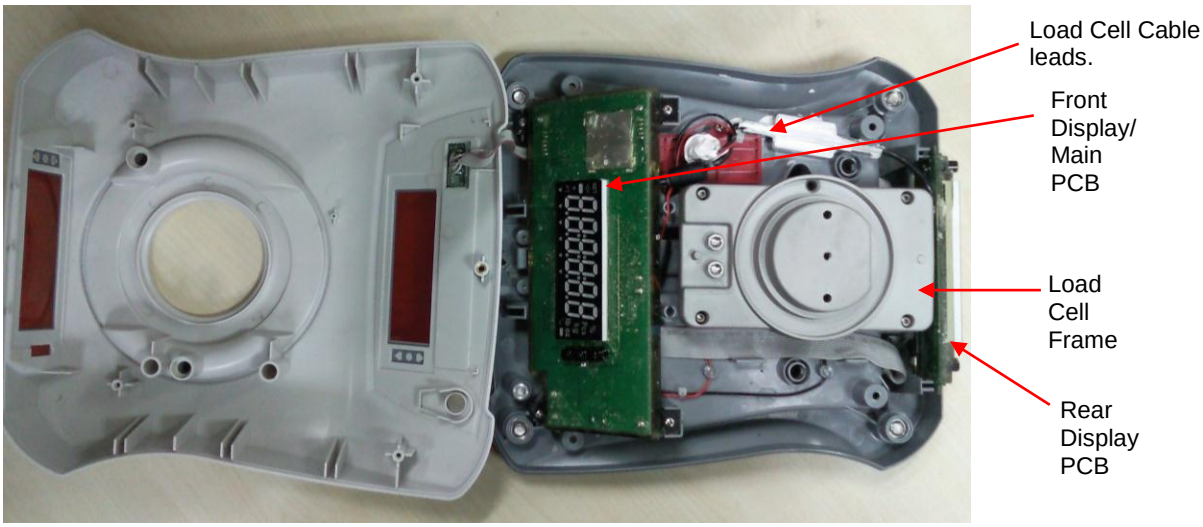


Figure 3-2. Top and Bottom Housings

3.4 Removing/Replacing the Main PCB and Display PCB

If the PCBs are suspected of being faulty, they should be replaced, as follows:

1. Disconnect the Cable connecting the Main PCB to the scale's power system. (See Figure 3-2.)
2. Remove the four screws that secure the PCB to the bottom housing.
3. Remove the white glue on the PCB that secures the load cell connector.
4. If either the Main PCB or the Load Cell is to be replaced, note the order of the wire colors and then disconnect the Load Cell Cable from the Main PCB.

   (See Figure 3-2.)

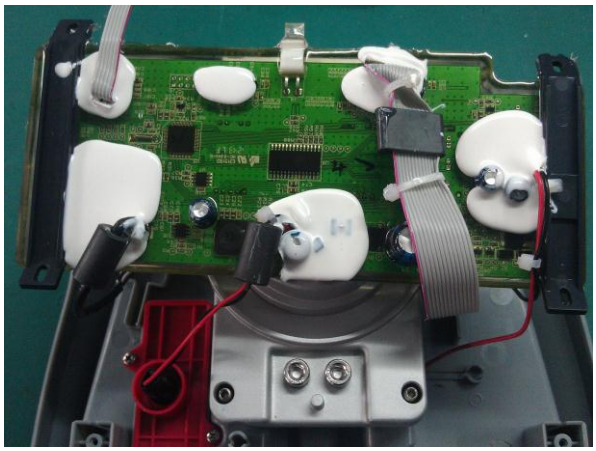


Figure 3-3. Main Printed Circuit Board.

3.5 Removing/Replacing the Load Cell

A Load Cell that is even slightly bent or corroded should be replaced. The Load Cell may also need to be replaced because of instability, or because the scale does not calibrate or repeat.

Note: The Load Cell is sold separately. (See Chapter 5.)

1. Unplug the cable leads connecting the Load Cell to the PCB. (See Figure 3-2.)

Remove the bolts that hold the Load Cell Frame to the Load Cell. Use a high-leverage Allen wrench.

Note: There is a shim between the Load Cell Frame and the Load Cell. Be careful not to lose it. (Applies to AMI-3.5kg and all Zemic load cells.)

2. Turn the scale over and remove the bolts and washers that hold the Load Cell to the Bottom Housing.

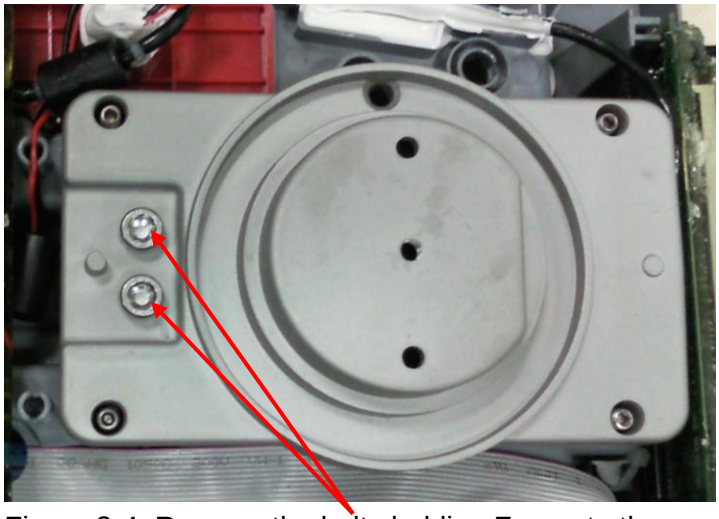


Figure 3-4. Remove the bolts holding Frame to the Load Cell.

3. When installing the replacement Load Cell place the new load cell on the Bottom Housing's cavity where the two Load Cell bolts are inserted. Insert the small cover screws and tighten them.
4. Position the shim and Load Cell Frame on top of the Load Cell. Insert the bolts and and tighten them. (See Table 3-1 for torque settings.)
5. Connect the Load Cell cables to the PCB. (See Figure 3-2.)
6. Use glue to seal the connector.

TABLE 3-1. MOUNTING BOLT TORQUE SETTINGS

MODEL	TORQUE SETTING
V41xWE1501T V22xWE1501T	6N to 8N
V41xWE3T V22xWE3T	6N to 8N
V41xWE6T V22xWE6T	6N to 8N
V41xWE15T V22xWE15T	6N to 8N

7. Set Overload Stops as shown in Section 3.6.

3.6 Setting the Overload Stops

The Overload Stop gaps must be checked and reset if the Load Cell is replaced. This procedure requires test masses equal to the scale's capacity. (See Table 3-2.)

There are four Overload Stop Bolts. (See Figure 3-5.)

Adjust the Overload Stops, per Table 3-2:

1. Adjust the Overload Stop Bolt so that the gap between the Load Cell Frame and the Overload Stop Nut is equal to the specification in Table 3-2. (The gap can be tested by applying 100% load, one corner at a time, at each corner stop. If the gap is right, the Load Cell Frame will just touch the Overload Stop Nut.)

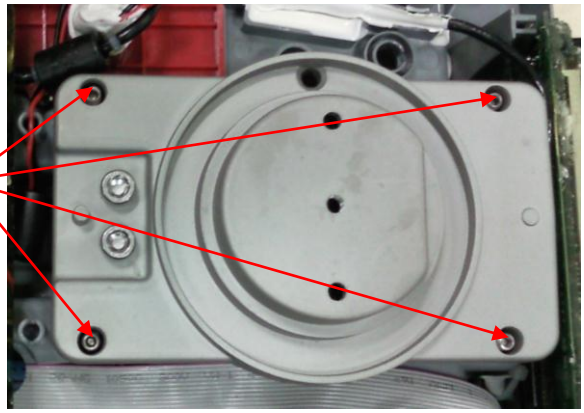


Figure 3-5. Overload Stops.

Note: Be careful not to overload the Load Cell, which would damage it.

2. Repeat this for all four corners.

3. Test the scale to see if full capacity can be achieved.

TABLE 3-2. VALOR 2000/4000 OVERLOAD STOP GAP SETTINGS

Model	Max. Capacity		Overload Stop Gap	
	Scale	Load Cell	A/B mm	C/D mm
V41xWE1501T V22xWE1501T	1.5kg	3kg	1.1	0.9
V41xWE3T V22xWE3T	3kg	5kg	1.2	0.8
V41xWE6T V22xWE6T	6kg	10kg	1	0.7
V41xWE15T V22xWE15T	15kg	20kg	1	0.7

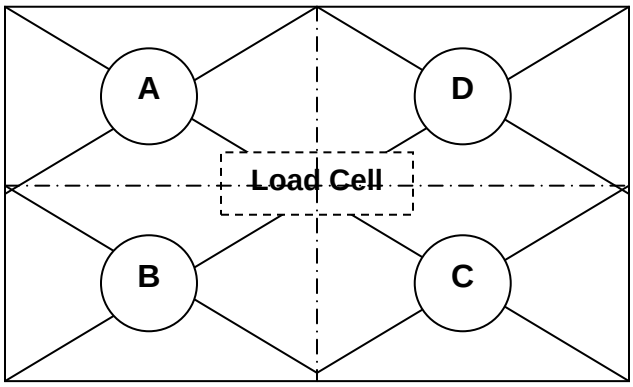
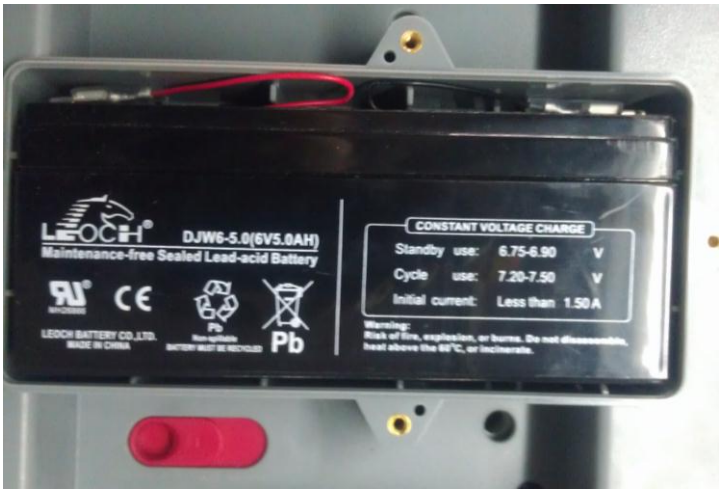


Figure 3-6. Gap position of corners A, B, C, D. (A & B represent the front of the scale.)

3.7 Removing/Replacing the Rechargeable Battery

The Valor 2000/4000 has a rechargeable battery.
If it fails to recharge, replace it as follows:



1. Lift the battery's front end enough to access the quick-connect tabs holding the wire leads.

Note: Be careful not to short-circuit the battery leads.

2. Pull the quick-connect tabs free of the battery posts, and lift out the battery.

3. Position the replacement battery in the compartment on an angle sufficient to access the battery posts. Make sure that the red harness connect to the red post; and black harness connect to the black post.

4. Insert the quick-connect tabs on their respective posts, and place the battery fully in the battery compartment.

3.8 Replacing the Function Label

The Function Label may need to be replaced. (See Chapter 5 for parts information.)
Use a broad knife to remove the label. Clean the glue residue from the Housing surface.
Then carefully place the new label where the old one was.

4.1 TESTING

Before and after servicing a Valor 2000/4000 scale, an operational test and various performance tests should be made to confirm that the scale meets specifications. Turn the scale on and allow it to warm up for at least one hour before performing these tests.

NOTE:
Make sure the test area is free from drafts and that the scale rests on a level and vibration-free surface.

4.1.1 TEST MASSES REQUIRED

The masses required to test the Ohaus Valor 2000/4000 scales must meet the requirements of ASTM Class 4 or OIML F2 Tolerance. The mass values are listed in Table 4-1.

TABLE 4-1. TEST MASS VALUES

Model	Weight (g)
V41xWE1501T V21xWE1501T	1kg,500g,200g
V41xWE3T V21xWE3T	1kg,500g
V41xWE6T V21xWE6T	2kg,1kg,500g
V41xWE15T V21xWE15T	10kg,5kg,2kg

4.2 Operational Test

1. Connect a functioning Power cord to the back of the scale.
2. Plug the Power Cord into a suitable power source, or power the scale on using battery power. (Assure that the battery is charged beforehand.)

4.3 Segment Display Test

Turn the scale on, and ensure that all segments are enabled and displayed briefly and followed by a software revision number.

4.4 Performance Tests

Accurate performance of the Valor 2000/4000 scale is determined by a series of four performance tests. The displayed readings are compared with the tolerances listed for each test in Table
1-2. Tolerance values are expressed in counts. A one-count difference is shown in the last digit on the scale display.

NOTE:

The following performance tests are used to evaluate scale operation before and after repairs. The scale must meet the requirements specified in each test as well as the other specifications listed in Table 1-1. Before proceeding with the following tests, the scale should be calibrated. (See Appendix A and B.)

4.4.1 Precision Test

The Precision Test measures the Standard Deviation of a set of similar weight readings, which should match the specification for each model, listed in Table 1-1.

1. Power on the balance. The reading on the display should be 0g.

2. Select a mass weighing near the maximum capacity of the balance, and place it on the center of the Pan. Observe and record the reading.

3. Remove the mass. The reading should return to 0g ±2 count.

4. Repeat this test three times. The reading should be within ±2 count of the reading recorded. If so, the balance passes the Precision Test.

5. If the deviation for any set of readings (using the same mass placed on the center of the Pan) is greater than ±2 d, the balance does not meet the precision specification. Inspect and correct the following areas:

   – Check for mechanical obstructions. Any foreign object touching any part of the moving assemblies will cause a balance to fail the Precision Test. Inspect and correct as necessary.

   – If the scale does not meet specifications, move it to a suitable location, ensure that it is level, and try again. If it still does not meet specifications, perform a service calibration, and try again. (See Appendix B for Service Calibration.)

4.4.2 Repeatability Test

Repeatability is the Standard Deviation of a set of similar weight readings.

Requirements:

- To perform this test a single mass must be used for all readings.
- The test mass should be approximately ½ of the capacity of the instrument.
- Wear gloves when handling the mass.

Before starting a repeatability test, set up the instrument as follows:

Set Up:

Follow the steps in Appendix A, Section A-2, Setup and Calibration.

Record Settings:

Zero Tracking Setting = _____

Displayed Units = _____

Mass Used = _____

TEST PROCEDURE:

1. Zero the instrument, if it does not read zero.
2. Using a test mass approximately half the capacity of the instrument, place the mass on the center of platform. Record the reading on the worksheet provided.
3. Remove the mass from the platform.
4. Repeat this test starting at Step 1 until you record a total of ten readings

Fill in the worksheet (Table 4-2) with the ten (10) readings.

TABLE 4-2. REPEATABILITY WORKSHEET

n	Reading	Delta = Reading – Mean	Delta x Delta
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
n = number of Reading		Mean = Sum of readings / 10	Delta = Reading – Mean
Standard Deviation = Square Root of (sum of (Delta x Delta) / 9)			

5. Add the ten readings and divide the total by 10 to find the Mean (average).
6. Mean = (Reading 1 + Reading 2 + Reading 3 + Reading 4 + Reading 5
7. + Reading 6 + Reading 7+ Reading 8 + Reading 9 + Reading 10) / 10

   Mean =_____

6. Calculate the Delta for each reading and record in the work sheet.

   Delta = Reading – Mean

7. Calculate the Delta x Delta for each reading and record in worksheet.
8. Add the ten Delta x Delta values and divide by 9
9. Calculate the Standard Deviation by applying the square root of the result from step 8.

   Standard Deviation =_____

   Note: If the balance does not meet specifications, move it to a suitable location, ensure that it is level, and try again.

4.4.3 Linearity Test

This test is used to determine the linearity of the unit throughout its operating range.
The masses used to perform this test can be utility masses

NOTE:
The scale must pass the Precision and Repeatability Tests, and be calibrated before the Linearity Test may be performed.

TABLE 4-3. LINEARITY TEST MASSES

Capacity (g)	1500 x 0.2 g	3000 x 0.5g	6000 x 0.1g	15000 x 2g
Reference Wt.	500g	500g	1kg	2kg
Load 1	200g	1000g	2kg	5kg
Load 2	500g	1000g	1kg	5kg
Load 3	200g	500g	2kg	2kg

NOTE:
All masses are nominal values. Use the same reference mass throughout the procedure.

1. Place the test mass on the Scale, record the weight and remove.
2. Place Load 1 on the Scale and press **ON/ Zero - Off**.
3. Place the test mass on the Scale, record the weight and remove.
4. Place Load 2 on the Scale and press **ON/ Zero - Off**.
5. Place the test mass on the Scale, record the weight and remove.
6. Place Load 3 on the Scale and press **ON/ Zero - Off**.
7. Place the test mass on the Scale and record the weight.
8. The difference in the weights of the test mass should be within ±2 d, as specified in the Tables 1-1 and 1-2. If not, calibrate (see Appendix A.1) and repeat the test.
9. If the Scale remains out of tolerance, the Load Cell may need to be replaced.

4.4.4 Off-Center Load Test

The Off-Center Load Test is used to determine whether displayed weight values are affected by moving the sample to different areas of the Pan.

1. Place half of the scale's capacity in the center of the Pan.
2. Note the reading.
3. Move the mass halfway (between the center and the edge) to the front of the Pan. Note any differences in the displayed weight reading.
4. Repeat the test for the back, left, and right position of the Pan.

5. Maximum allowable change in displayed weight readings for each of the four positions can be found in Tables 1-1 (Specifications, page 1-2).
   If this maximum is exceeded, follow procedures in Section 4.4.5, Adjusting Off Center Load.

4.4.5 Adjusting Off Center Load

If the Off Center Load (OCL) is excessive, perform adjustment as follows:

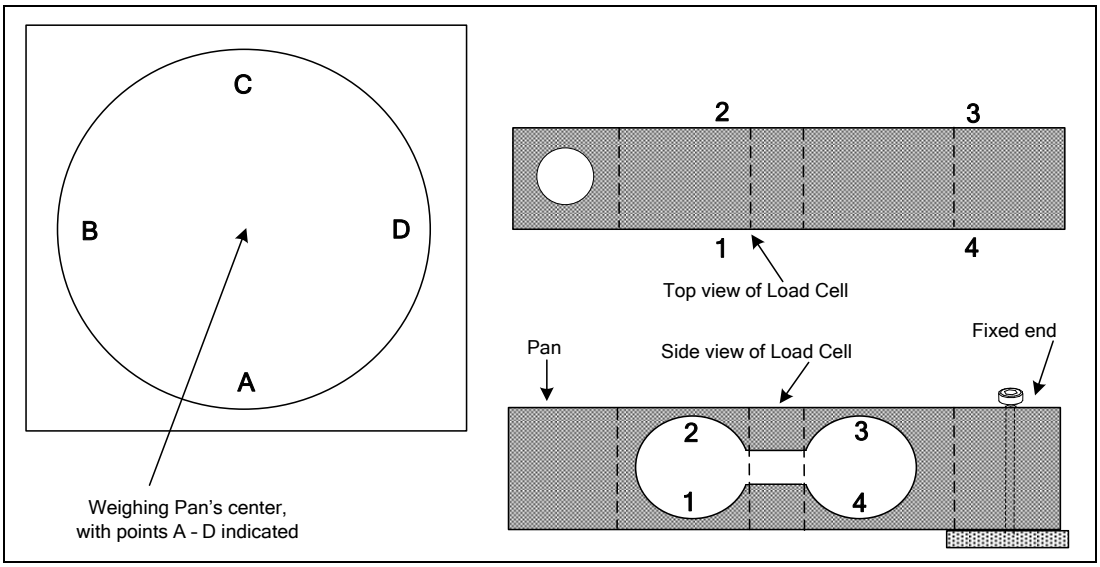


Figure 4-1. Scale drawing of Valor 4000 Load Cell and Weighing Pan.

1. Place the test weight in the center of the Weighing Pan.
2. Tare the balance.
3. Move the weight to point A and record the reading.
4. Move the weight to point B and record the reading.
5. Move the weight to point C and record the reading.
6. Move the weight to point D and record the reading.
7. If the reading at point A is negative, file at points 1 and 4 AT AN ANGLE.
8. If the reading at point B is negative, file at points 1 and 2 STRAIGHT ACROSS.
9. If the reading at point C is negative, file at points 2 and 3 AT AN ANGLE.
10. If the reading at point D is negative, file at points 3 and 4 STRAIGHT ACROSS.

Note: It is not recommended that you try to adjust more than –5 counts if the beam has been filed already. If the beam has not been filed previously, you can adjust –10 counts. Remember, when filing you are weakening the beam. File a little at a time.

This section of the manual contains exploded views of the Valor 2000/4000 scale. The exploded view drawings are designed to identify the parts which can be serviced on the scale in the field.

NOTE:
In all cases where a part is replaced, the scale must be thoroughly checked after the replacement is made. The scale **MUST** meet the parameters of all applicable specifications in this manual.

If further technical information is needed, please contact your local Ohaus distributor, or:

www.ohaus.com

Ohaus Corporation,
7 Campus Drive
Suite 310
Parsippany, NJ 07054 USA

Tel: 973-377-9000
Fax: 973-593-0359

In the United States call toll free, 800-526-0659 between 8:00 a.m. and 6:00 p.m. EST.

5.1 Valor 4000PW SCALES: PARTS

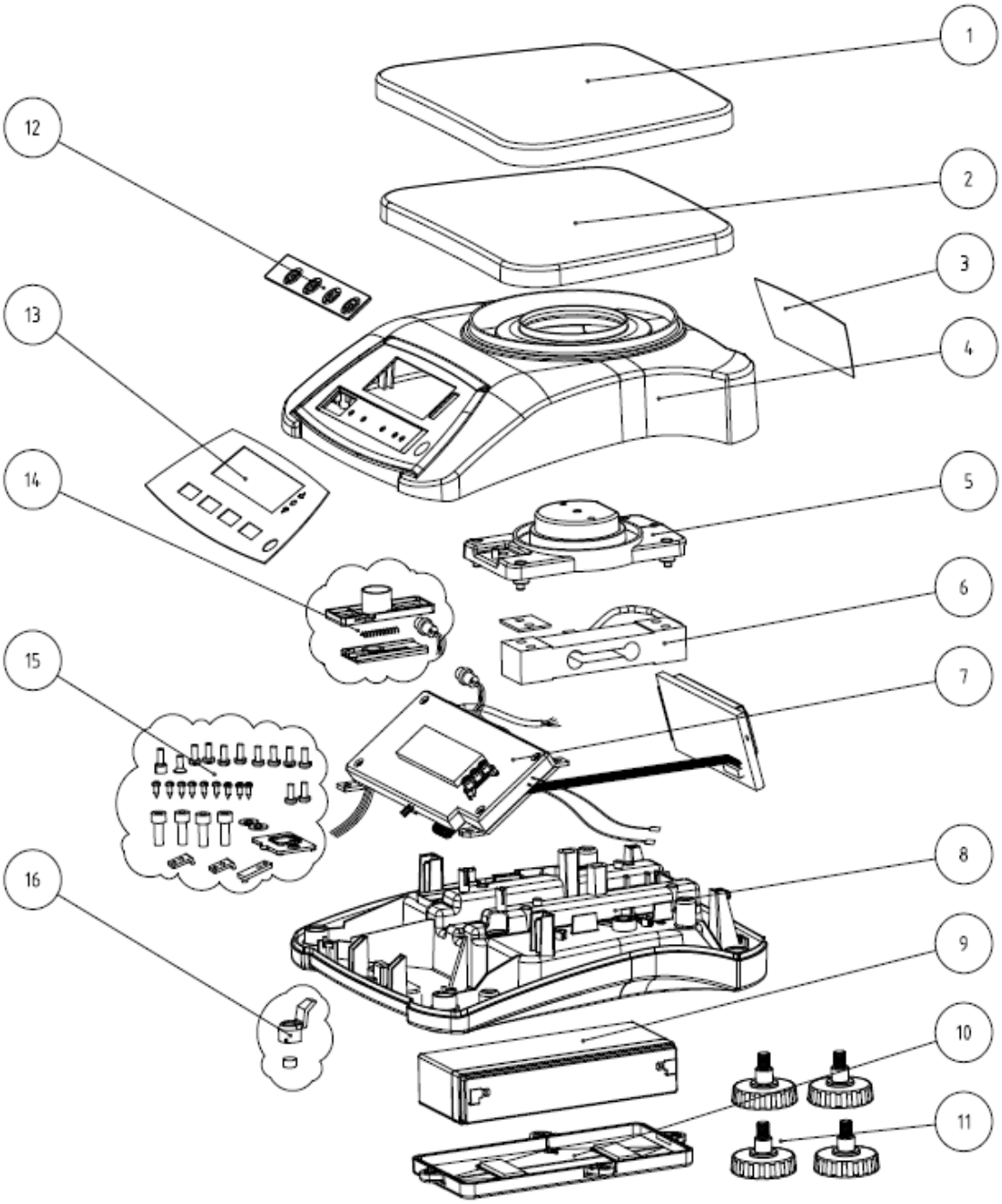


Figure 5-1. Valor 4000PW Scales: Parts.

TABLE 5-1. Valor 4000PW SCALES: PARTS

Drawing Item	Part Number	Description
1	30035595	SP Pan SST V22 V41
2	30035592	SP Pan Plastic V22 V41
3	30028583	Overlay rear EN V41PW
3	30035622	Overlay rear JP V41PW
4	30035590	SP Housing Module Top V22PW V41PW
5	30035594	SP Spider V22 V41
6	30035600	SP Load Cell V41XWE1501T
6	30035601	SP Load Cell V41XWE3T
6	30035602	SP Load Cell V41 V41XWE6T
6	30035603	SP Load Cell V41XWE15T
7	30035609	SP PCB Module V41
8	30035591	SP Housing Bottom V22PW V41PW
9	72198198	SP Lead Acid Battery 6V 5AH
10	30035597	SP Cover Batt V22 V41
11	30035606	SP Feet Kit R21 R31 V71 V22 V41
12	30035634	SP Mech 4-Key Module V41
13	30028582	Function Label Front EN V41
13	30035621	Function Label Front JP V41
13	30035623	Function Label Front KR V41
13	30035625	Function Label Front RU V41
14	30035598	SP Power Socket Kit V22 V41
15	30035611	SP Hardware Kit V22 V41
16	30035599	SP Level Bubble kit V22 V41
NA	46001802	SP Power Adapter body
NA	46001780	SP Power Adapter (all plugs)
NA	30035630	Manual Instr JP V41
NA	30035631	Manual Instr RU V41
NA	30035624	Manual Instr KR V41
NA	30026168	Manual EN ES FR DE IT V41
NA	30035604	SP Packaging Box V22 V41
NA	30035605	SP Packaging complete V22PW V41PW

Note: For parts numbers, see your local Ohaus distributor, or visit www.ohaus.com.

5.2 Valor 4000XW SCALES: PARTS

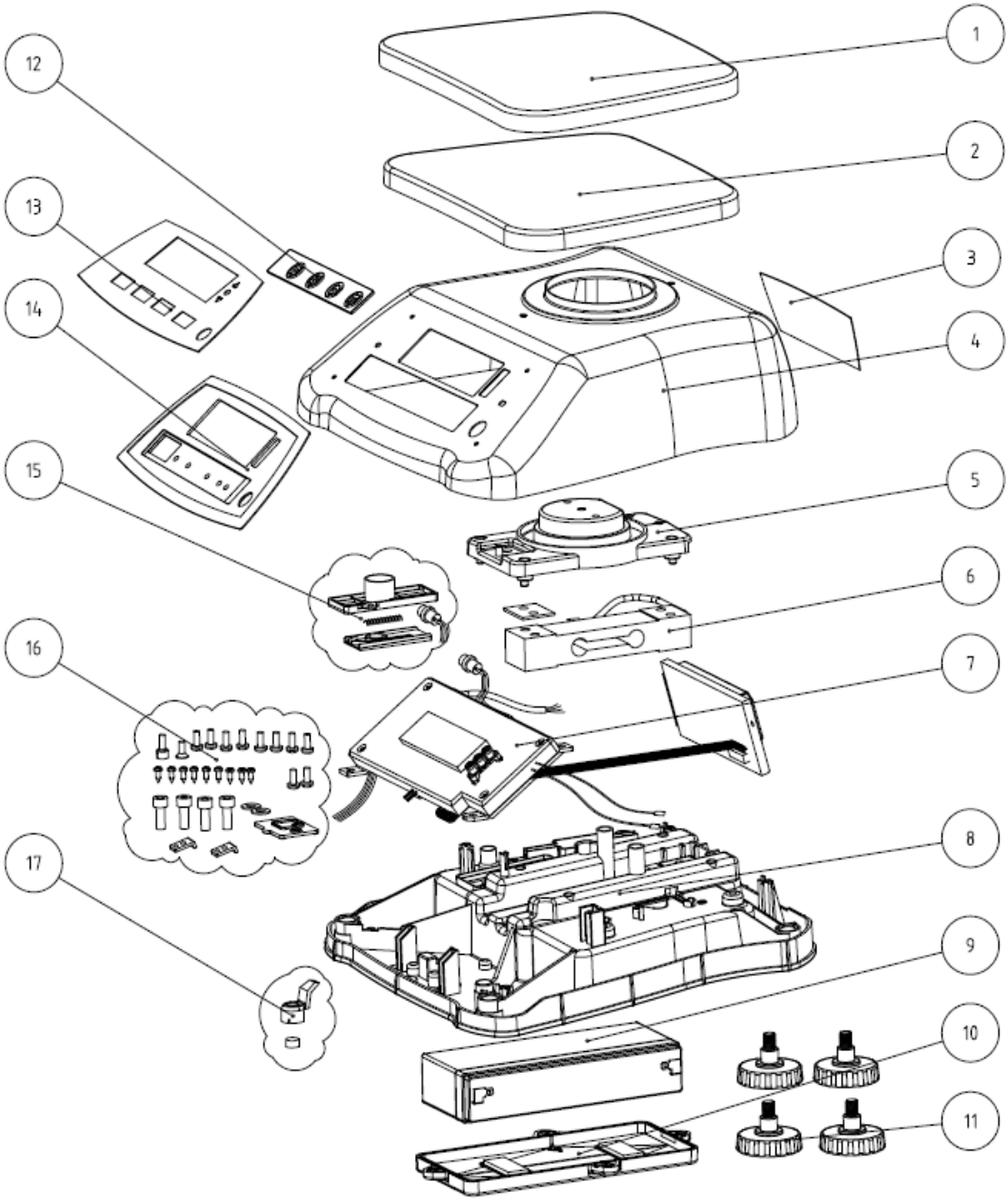


Figure 5-2. Valor 4000XW Scales: Parts.

TABLE 5-2. Valor 4000XW SCALES: PARTS

Drawing Item	Part Number	Description
1	30035595	SP SST Pan V22PW V41P(X)W
2	30035592	SP Plastic Pan V22PW V41P(X)W
3	30043147	Overlay Back EN V41XW
	30035633	Overlay Back JP V41XW
4	30035612	SP Housing Top No Labels V41XW
5	30035594	SP Spider V22PW V41P(X)W
6	30035600	SP Load Cell V41XWE1501T
	30035601	SP Load Cell V41XWE3T
	30035602	SP Load Cell V41XWE6T
	30035603	SP Load Cell V41XWE15T
7	30035609	SP PCB Module V41P(X)W
8	30035614	SP Housing Bottom V41XW
9	72198198	SP Lead Acid Battery 6V 5AH
10	30035597	SP Battery Cover V22PW V41P(X)W
11	30035606	SP Feet Kit R21 R31 V71 V22 V41
12	30035634	SP Mech 4-Key Module V41P(X)W
13	30028582	Function Label Front EN V41P(X)W
	30035621	Function Label Front JP V41P(X)W
	30035623	Function Label Front KR V41P(X)W
	30035625	Function Label Front RU V41P(X)W
14	30035613	SP Front Module V41XW
15	30035598	SP Power Socket Kit V22PW V41P(X)W
16	30035611	SP Hardware Kit V22PW V41P(X)W
17	30035599	SP Level Bubble kit V22PW V41P(X)W
NA	30035630	Manual Instr JP V41P(X)W
NA	30035631	Manual Instr RU V41P(X)W
NA	30035624	Manual Instr KR V41P(X)W
NA	30026168	Manual EN ES FR DE IT V41P(X)W
NA	46001802	SP Power Adapter body
NA	46001780	SP Power Adapter (all plugs)
NA	30035604	SP Packaging Box Carton V22PW V41P(X)W
NA	30035605	SP Packaging complete V22PW V41PW

Note: For parts numbers, see your local Ohaus distributor, or visit www.ohaus.com.

5.3 Valor 2000PW SCALES: PARTS

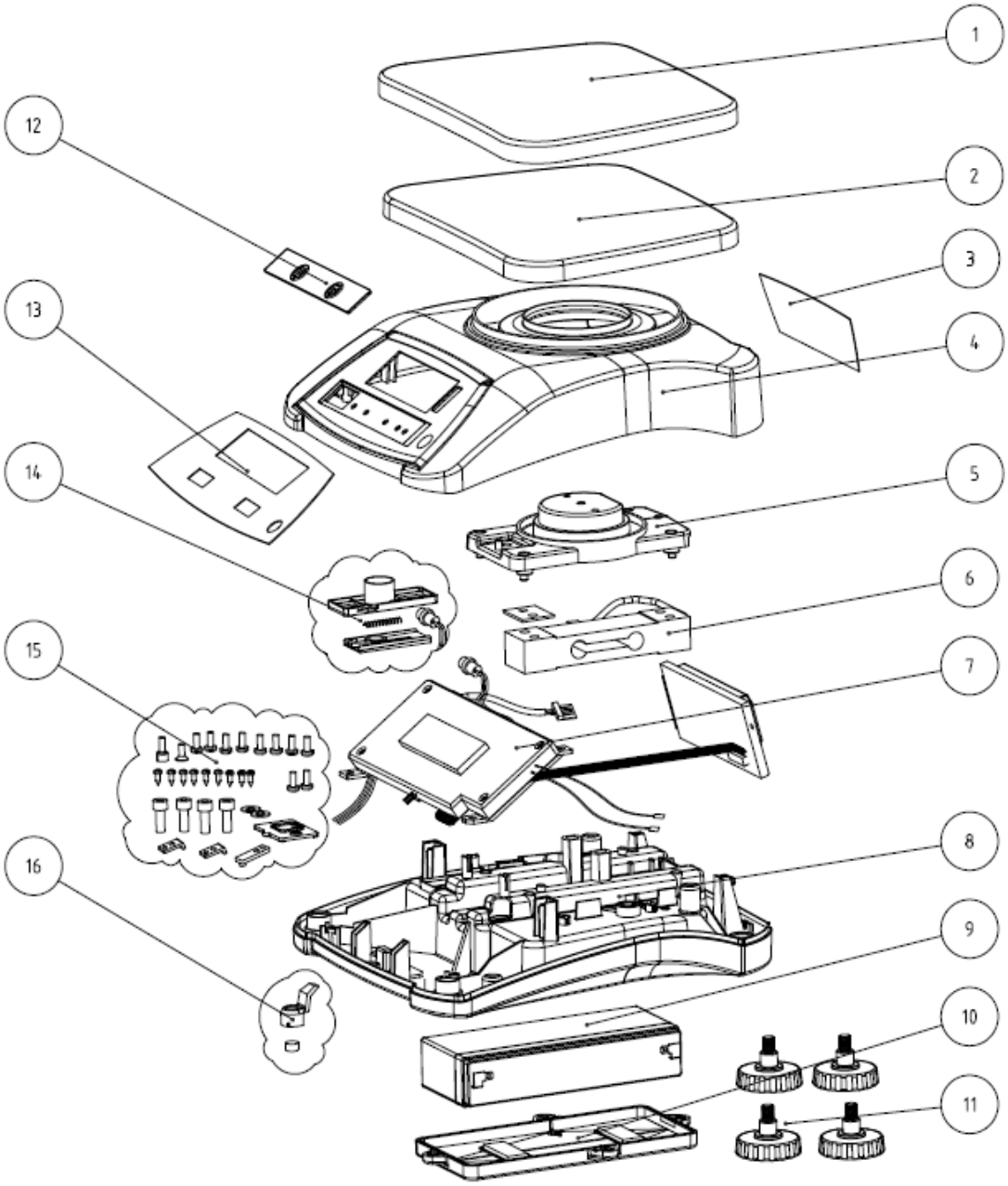


Figure 5-3. Valor 2000PW Scales: Parts.

TABLE 5-3. Valor 2000PW SCALES: PARTS

Drawing Item	Part Number	Description
1	30035595	SP Pan SST V22 V41
2	30035592	SP Pan Plastic V22 V41
3	30035618	Overlay Back EN V22PW
	30035610	Overlay Back JP V22PW
4	30035590	SP Housing Module Top V22PW V41PW
5	30035594	SP Spider V22 V41
6	30035636	SP Load Cell V22PWE1501T, V22PWE1501TZH
	30035637	SP Load Cell V22PWE3T, V22PWE3TZH
	30035638	SP Load Cell V22PWE6T,V22PWE6TZH
	30035639	SP Load Cell V22PWE15T,V22PWE15TZH
7	30035607	SP PCB Module V22
8	30035591	SP Housing Bottom V22PW V41PW
9	72198198	SP Lead Acid Battery 6V 5AH
10	30035597	SP Cover Batt V22 V41
11	30035606	SP Feet Kit R21 R31 V71 V22 V41
12	30035635	SP Mech 2-Key Module V22
13	30035617	Function Label Front V22PW Chinese
	30043179	Function Label Front V22 English
	30035627	Function Label Front V22 Korea
	30035628	Function Label Front V22 Japan
14	30035598	SP Power Socket Kit V22 V41
15	30035611	SP Hardware Kit V22 V41
16	30035599	SP Level Bubble kit V22 V41
NA	30035767	Manual EN ES FR DE IT V22
NA	30035629	Manual Instr CN V22PW
NA	30035593	Manual Instr JP V22
NA	30035615	Manual Instr RU V22
NA	30035616	Manual Instr KR V22
NA	30035604	SP Packaging Box Carton V22 V41
NA	30035605	SP Packaging complete V22PW V41PW
NA	46001802	SP Power Adapter body
NA	46001780	SP Power Adapter (all plugs)

Note: For parts numbers, see your local Ohaus distributor, or visit www.ohaus.com.

5.4 Valor 2000XW SCALES: PARTS

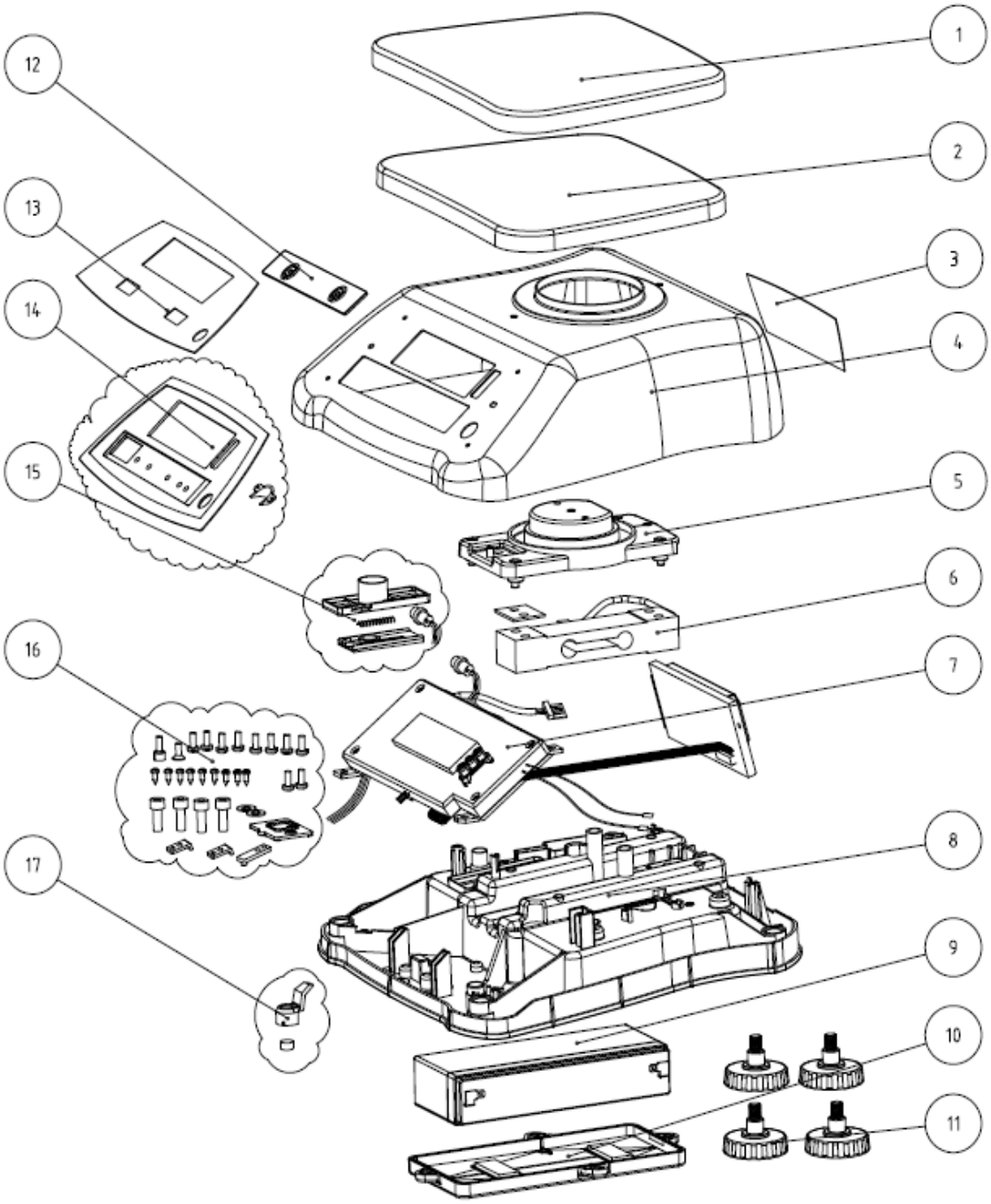


Figure 5-3. Valor 2000XW Scales: Parts.

TABLE 5-3. Valor 2000XW SCALES: PARTS

Drawing Item	Part Number	Description
1	30035595	SP Pan SST V22 V41
2	30035592	SP Pan Plastic V22 V41
3	30035619	Overlay rear V22XW
	30035620	Overlay rear JP V22XW
4	30035612	SP Housing Top V22XW V41XW
5	30035594	SP Spider V22 V41
6	30035636	SP Load Cell V22 1.5kg
	30035637	SP Load Cell V22 3kg
	30035638	SP Load Cell V22 6kg
	30035639	SP Load Cell V22 15kg
7	30035607	SP PCB Module V22
8	30035614	SP Housing Bottom V22XW V41XW
9	72198198	SP Lead Acid Battery 6V 5AH
10	30035597	SP Cover Batt V22 V41
11	30035606	SP Feet Kit R21 R31 V71 V22 V41
12	30035635	SP Mech 2-Key Module V22PW
13	30043179	Function Label Front EN V22
	30035628	Function Label Front JP V22
	30035627	Function Label Front KR V22
	30035626	Function Label Front RU V22XW
14	30035613	SP Front Module V22XW V41XW
15	30035598	SP Power Socket Kit V22 V41
16	30035611	SP Hardware Kit V22 V41
17	30035599	SP Level Bubble kit V22 V41
NA	30035767	Manual EN ES FR DE IT V22
NA	30035593	Manual Instr JP V22
NA	30035615	Manual Instr RU V22
NA	30035616	Manual Instr KR V22
NA	30035604	SP Packaging Box Carton V22 V41
NA	30035605	SP Packaging complete V22PW V41PW
NA	46001802	SP Power Adapter body
NA	46001780	SP Power Adapter (all plugs)

Note: For parts numbers, see your local Ohaus distributor, or visit www.ohaus.com.

APPENDIX A. STANDARD CALIBRATION & SETUP

A.1 CALIBRATION

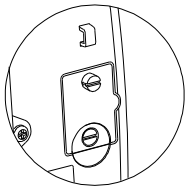
Standard calibration should be performed prior to using a scale, and after service.

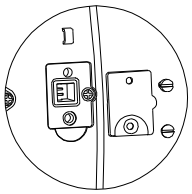
CAUTION:

Be careful not to touch the scale or the table while calibration is in progress, as it will cause the process to fail.

Preliminary Steps:

1. Be sure the scale is level and stable during the entire calibration process.
2. Allow the scale to warm up for approximately five minutes after stabilizing to room temperature.
3. To abort calibration, press **Exit** key or turn the scale off anytime during the calibration process.
4. Before performing the calibration, be sure to have the appropriate calibration weights as listed in table A-1(Valor 4000) and table A-2(Valor 2000).
5. Ensure that the LFT PINs lock is set to unlocked positions.





6. Or adjust the GEO setting according to your location (see instruction manual).

Table A-1. Span Calibration Mass for Valor 4000

Span Calibration Mass (sold separately)	
Max	**Mass**[1]
1500g	1.5kg / 3lb
3000g	3kg / 6lb
6000g	6kg / 15lb
15000g	15kg / 30lb

Table A-2. Span Calibration Mass for Valor 2000

Span Calibration Mass (sold separately)			
Max	**Mass**	**Max**	**Mass**
1500 g	1 kg	6000 g	5 kg
3000 g	2 kg	15000 g	10 kg

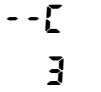
A.2 SETUP AND CALIBRATION

Note: Be sure units are set to **kg** before starting calibration.

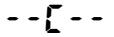
1. Turn on the scale. Press and hold **Menu (CAL** on Valor 2000**)** until [MENU] (Menu) is displayed. When the button is released, the display will show [CAL].

2. Press **Yes** to accept. [SPAN] will then be shown. Press **Yes** to begin the span calibration. [0 kg] will be displayed.

3. Press **Yes** to accept. [--C--] will be displayed while zero reading is stored. Next, the display shows the calibration weight value (e.g. 3).



4. Place the specified calibration mass on the pan. Press **Yes** to accept the weight or **No** to select an alternate weight. [--C--] will be displayed while the reading is stored.



5. The display will show [donE] if the calibration was successful. The scale returns to the previous application mode and is ready for use.

APPENDIX B. SERVICE CALIBRATION

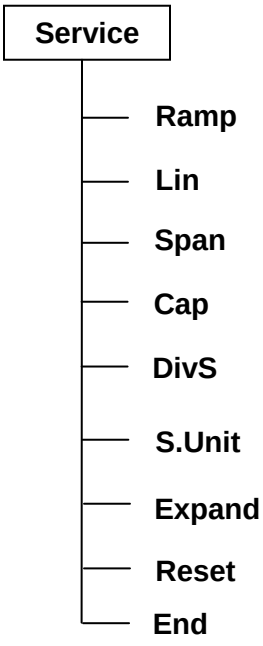
This section describes the Service Menu and sub-menus, which allow authorized service personnel to perform factory Linearity and Span calibrations (no pre-set limits).

The service menu is not accessible if LFT mode is enabled.

CAUTION:

Be careful not to touch the scale or the surface it rests on while calibration is in progress, as it will cause the process to fail.

B.1 Service Menu Structure



B.2 Entering the Service Menu

Turn the scale off.

Press and hold the **On/Zero** and **Tare** keys simultaneously for 8 seconds until **rAMP** is displayed.

B.3 Ramp Menu

When rAMP appears, press **YES** to accept the Ramp menu, or **No** to advance to the Expand menu item.

The Ramp value is displayed as a percent of the A/D range.
Press **YES** to advance to the Service Linearity Calibration menu item.

to

Note: Ramp is used to troubleshoot load cell problems. 0% represents no signal from the A/D, 100% reflects the upper signal range of the A/D.

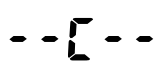
B.4 Service Linearity Calibration

This calibration method uses three points. The full-calibration point is established with a weight on the scale. The mid-calibration point is established with a weight equal to half of the full calibration weight on the scale. The zero calibration point is established with no weight on the scale. The mid-calibration points cannot be altered by the user during the calibration procedure.

When L in appears, press YES to accept the Service Linearity Calibration menu, or No to advance to the Ramp menu item.

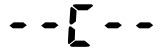
0 flashes. The **kg** LED is lit to indicate the calibration unit.
With no weight on the pan, press **Yes** to establish the zero point.
(Outlined characters represent a flashing display.)

- - C - - flashes while the zero point is established.

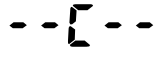


The mid calibration point value flashes. The **kg** LED is lit to indicate the calibration unit. (The example shows the mid calibration point value for a Scale Capacity of 3 kg.)
Place the specified calibration weight on the pan and press **Yes**.

- - C - - flashes while the mid point is established.



- - C - - flashes while the full point is established.



If linearity calibration was successful, the scale will exit the service menu and enter weighing mode.
(The example shows a 3 kg span weight on the pan.)

If linearity calibration was successful, SPAN appears.
Press **YES** to enter the Service Span Calibration menu or
or **NO** to advance to the next menu item.

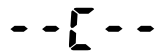
NOTE: If calibration fails, ensure that the test area is free from drafts and the surface the scale rests on is level and free of vibrations. Then try to calibrate again. If it continues to fail, there may be an internal problem. To resolve internal problems, follow procedures in Chapter 3.

B.5 Service Span Calibration

When **SPAN** appears, press **YES** to accept the Service Span Calibration menu or **No** to advance to the Service Linearity Calibration menu.

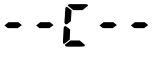
0 flashes. With no weight on the pan, press **Yes** to establish the zero point. (Outlined characters represent a flashing display.)

- - [- - flashes while the zero point is established.



Service Span Calibration point flashes.
(The example shows the value for a Scale Capacity of 3 kg.)
Place the specified calibration weight on the pan and press **Yes**.

- - [- - flashes while the span point is established.



If span calibration was successful, the actual weight reading appears for three seconds, followed by the Capacity menu item.
(The example shows a 3 kg span weight on the pan.)

B.6 Capacity Menu

When **CAP** appears, press **YES** to accept the Capacity menu item, or press **NO** to advance to the next menu item.

The current Capacity Setting is displayed, blinking.
(Outlined characters represent a flashing display.)

Note: The default setting is 3

Press **YES** to accept the setting and move to the Service Grad menu item.

Press **NO** to enter another value using the numeric keypad and then press **YES** to store the new value.

B.7 DivS

When **d IUS** appears, press **YES** to accept the DivS menu item, or press **NO** to advance to the next menu item.

Set the division to either HI or Low.

HIGH = 6000 / 7500 resolution

LOW = 3000 resolution

Note: This is only for non-LFT mode. For LFT mode the resolution will be set to 3000 e automatically.

B.8 S.Unit

When **Un it** appears, press **YES** to accept the Unit menu item, or press **NO** to advance to the next menu item.

The available units are: kg, g, lb, oz, lb:oz.

Press YES to set the displayed unit or NO to advance to the next unit.

Each unit can be set to either ON or OFF.

ON = enabled

OFF = disabled

Note: For Valor 2000, when changing unit, first set the current unit to OFF then set the desired unit to ON.

B.9 Expand Menu

When *E.PAnd* appears, press **YES** to accept the Expand menu, or **No** to advance to the Reset menu item.

OFF = disabled

ON = enabled

Note: Expand is required for various performance tests.

B.10 Reset Menu

When *rESEt* appears, press **YES** to accept the Reset menu, or **No** to advance to the End menu item

YES = Reset the Service menu to factory defaults.

NO = keep current setting

B.11 End Menu

When *E.n.d* appears, press **YES** to return to exit the service menu, or **No** to advance to the CAP menu.