Explorer™ Balances
Explorer Plus™ Balances
Service Manual

EXR Series

EXP Series

Version History

Date	Version	Description
2025/11/11	A	• Initial release

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1 GETTING STARTED

1.1 Introduction

This service manual contains the information needed to perform routine maintenance and service on the Ohaus Explorer (EXR) and Explore Plus (EXP) Series balances. Familiarity with the balance'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, specifications, and the mechanical and electronic functions of the balance.

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 weights, an operational test, display test, performance tests and adjustments.

Chapter 5 - Drawings and Parts Lists – Contains exploded views of EXR and EXP Series balances identifying all serviceable components.

Appendix A – Reset password – Clear and reset the password when the users forgot the Administration password.

Appendix B - Service Menu – Describes the Service Menu and sub-menus, which allow authorized service personnel to see Ramp readings and perform service calibrations and activities.

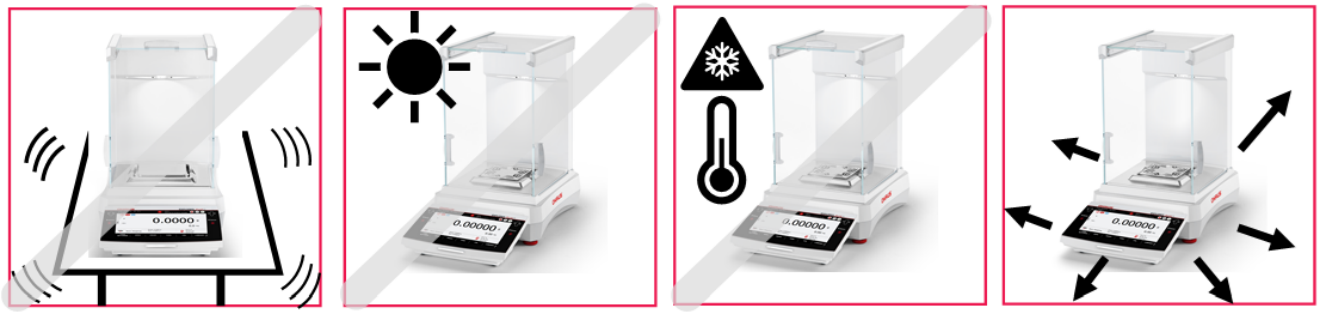
Appendix C - Service Tool – Diagnose the balance and re-configure the balance after replacing a Printed Circuit Board or Load Cell.

Appendix D - Software Upgrade via USB – Users can upgrade the balance software via USB flash drive.

1.2 Service Facilities

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

- Temperature should be controlled and meet balance 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.
- Balance must not be exposed to direct sunlight or radiating heat sources.
- Handle all electronic assemblies with appropriate Electro-Static protection.



1.3 Tools and Test Equipment Required

- Common hand tools are sufficient to disassemble the EXP and EXR series balances.
- A PC running Microsoft Win10 or later.
- Service Tool_Weighing V3.0.1.3 or later
- RS232 Cable – Balance to PC PN 80500525
- Digital voltmeter (DVM) with an input impedance of at least 10 meg-ohms at 1 volt DC.
- Weights as shown in Table 4-1.

1.4 Specifications

Specifications for the Ohaus EXR and EXP series Balances are listed in Table 1-1. When a balance has been serviced, it must meet the specifications listed in the table. Before servicing the balance, determine what specifications are not met.

Special Note regarding Approved balances:

The specifications for the approved balances below are only for initial testing. These balances must be tested according to the requirements of the local Weights and Measures authority. Before returning the balance to service an approved representative of the local Weights and Measures authority must certify the balance.

Ambient conditions

- Indoor use only
- Altitude: 2000 m
- Specified Temperature range: 10°C to 30°C. Operability is assured at ambient temperatures between 5°C and 40°C.
- Humidity: Maximum relative humidity 80% for temperatures up to 31 °C decreasing linearly to 50% relative humidity at 40°C.
- Electrical supply:
    - 12VDC, 1.5A. (For use with certified or approved power supply, which must have a SELV and limited energy output.). (For the models powered by external power adapter.)
    - 100 - 240V～, 0.5A, 50/60Hz. (For Explorer Plus High-Capacity models)
- Mains supply voltage fluctuations: up to ±10% of the nominal voltage
- Installation category II
- Pollution degree: 2

TABLE 1-1 SPECIFICATIONS

EXR

MODEL	EXR125D EXR125DM	EXR125 EXR125M	EXR225D EXR225DM	EXR225 EXR225M
Capacity (g)	82 g / 120 g	120 g	120 g / 220 g	220 g
Readability d, fine range (g)	0.01 mg	0.01 mg	0.01 mg	0.01 mg
Readability d, full range (g)	0.1 mg	0.01 mg	0.1 mg	0.01 mg
Verification interval, e (EXR…M.models only)	1 mg	1 mg	1 mg	1 mg
Approval Class (EXR…M.. models only)	Class I	Class I	Class I	Class I
Span Calibration Points	25g, 50g, 75g, **100g**	25g, 50g, 75g, **100g**	50g, 100g, 150g, **200g**	50g, 100g, 150g, **200g**

MODEL	EXR124 EXR124M EXR124N	EXR224 EXR224M EXR224N	EXR324 EXR324M EXR324N
Capacity (g)	120 g	220 g	320 g
Readability d, full range (mg)	0.1 mg	0.1 mg	0.1 mg
Verification interval, e (EXR…M..models only)	1 mg	1 mg	1 mg
Approval Class (EXR…M.. models only)	Class I	Class I	Class I
Span Calibration Points (g)	25g, 50g, 75g, **100g**	50g, 100g, 150g, **200g**	100g, 150g, 200g, **300g**

MODEL	EXR223 EXR223M EXR223N	EXR423 EXR423M EXR423N	EXR623 EXR623M EXR623N	EXR1203 EXR1203M EXR1203N
Capacity (g)	220 g	420 g	620 g	1200 g
Readability d (mg)	1mg	1mg	1mg	1mg
Verification interval, e (EXR…M models and EXR…N models only)	10 mg	10 mg	10 mg	10 mg
Approval Class (EXR…M.. models and EXR..N..models only)	Class II	Class II	Class II	Class I
Span Calibration Points	50g, 100g, 150g, **200g**	100g, 200g, 300g, **400g**	300g, 400g, 500g, **600g**	400g, 600g, 800g, **1000g**

MODEL	EXR2202 EXR2202M EXR2202N	EXR4202 EXR4202M EXR4202N	EXR6202 EXR6202M EXR6202N	EXR8202 EXR8202M EXR8202N	EXR12202 EXR12202M EXR12202N
Capacity (g)	2200 g	4200 g	6200 g	8200 g	12200 g
Readability d, full range (g)	0.01 g	0.01 g	0.01 g	0.01 g	0.01 g
Verification interval, e (EXR…M.. models and EXR…N..models only)	0.1 g	0.1 g	0.1 g	0.1 g	0.1 g
Approval Class (EXR…M.. models and EXR…N..models only)	Class II	Class II	Class II	Class II	Class I
Span Calibration Points	500g, 1000g, 1500g, **2000g**	1000g, 2000g, 3000g, **4000g**	2000g, 3000g, 4000g, 5000g, **6000g**	2000g, 4000g, 6000g, **8000g**	6000g, 8000g, 10000g, **12000g**

MODEL	EXR6201 EXR6201M* EXR6201N*	EXR8201 EXR8201M* EXR8201N*	EXR10201 EXR10201M* EXR10201N*
Capacity (g)	6200 g	8200 g	10200 g
Readability d, full range (g)	0.1 g	0.1 g	0.1 g
Verification interval, e (EXR…M..models and EXR…N..models only)	0.1 g	0.1 g	0.1 g
Approval Class (EXR…M.. models and EXR…N..models only)	Class II	Class II	Class I
Span Calibration Points (g)	2000g, 3000g, 4000g, **6000g**	2000g, 4000g, 6000g, **8000g**	2500g, 5000g, 7500g, **10000g**

MODEL	EXP24001 EXP24001M* EXP24001N*	EXP35001 EXP35001M* EXP35001N*	EXP65001 EXP65001M* EXP65001N*
Capacity (g)	24000	35000	65000
Readability d, full range (g)	0.1 g	0.1 g	0.1 g
Verification interval, e (EXP…M models and EXP…N..models only)	1 g	1 g	1 g
Approval Class (EXP…M.. models and EXP..N..models only)	Class II	Class II	Class II
Span Calibration Points (g)	10000g, 15000g, 20000g, **24000g**	10000g, 20000g, 30000g, **35000g**	20000g, 40000g, 60000g, **65000g**

EXP

MODEL	EXP125D/AD EXP125DM/AD	EXP125/AD EXP125M/AD	EXP225D/AD EXP225DM/AD	EXP225/AD EXP225M/AD
Capacity (g)	82 g / 120 g	120 g	120 g / 220 g	220 g
Readability d, fine range (g)	0.01 mg	0.01 mg	0.01 mg	0.01 mg
Readability d, full range (g)	0.1 mg	0.01 mg	0.1 mg	0.01 mg
Verification interval, e (EXP…M.models only)	1 mg	1 mg	1 mg	1 mg
Approval Class (EXP…M.. models only)	Class I	Class I	Class I	Class I
Span Calibration Points	25g, 50g, 75g, **100g**	25g, 50g, 75g, **100g**	50g, 100g, 150g, **200**g	50g, 100g, 150g, **200**g

MODEL	EXP124/AD EXP124M/AD EXP124N/AD	EXP224/AD EXP224M/AD EXP224N/AD	EXP324/AD EXP324M/AD EXP324N/AD
Capacity (g)	120 g	220 g	320 g
Readability d, full range (mg)	0.1 mg	0.1 mg	0.1 mg
Verification interval, e (EXP…M..models only)	1 mg	1 mg	1 mg
Approval Class (EXP…M.. models only)	Class I	Class I	Class I
Span Calibration Points (g)	25g, 50g, 75g, **100g**	50g, 100g, 150g, **200g**	100g, 150g, 200g, **300g**

MODEL	EXP223/AD EXP223M/AD EXP223N/AD	EXP423/AD EXP423M/AD EXP423N/AD	EXP623/AD EXP623M/AD EXP623N/AD	EXP1203/AD EXP1203M/AD EXP1203N/AD
Capacity (g)	220 g	420 g	620 g	1200 g
Readability d (mg)	1mg	1mg	1mg	1mg
Verification interval, e (EXP…M models and EXP…N models only)	10 mg	10 mg	10 mg	10 mg
Approval Class	Class II	Class II	Class II	Class I

(EXP…M.. models and EXP..N..models only)				
Span Calibration Points	50g, 100g, 150g, **200g**	100g, 200g, 300g, **400g**	300g, 400g, **500g**, 600g	400g, 600g, 800g, **1000g**

MODEL	**EXP2202** **EXP2202M** **EXP2202N**	**EXP4202** **EXP4202M** **EXP4202N**	**EXP6202** **EXP6202M** **EXP6202N**	**EXP8202** **EXP8202M** **EXP8202N**	**EXP12202** **EXP12202M** **EXP12202N**
Capacity (g)	2200 g	4200 g	6200 g	8200 g	12200 g
Readability d, full range (g)	0.01 g	0.01 g	0.01 g	0.01 g	0.01 g
Verification interval, e (EXP…M.. models and EXP…N..models only)	0.1 g	0.1 g	0.1 g	0.1 g	0.1 g
Approval Class (EXP…M.. models and EXP…N..models only)	Class II	Class II	Class II	Class II	Class I
Span Calibration Points	500g, 1000g, 1500g, **2000g**	1000g, 2000g, 3000g, **4000g**	2000g, 3000g, 4000g, 5000g, **6000g**	2000g, 4000g, 6000g, **8000g**	6000g, 8000g, 10000g, **12000g**

MODEL	**EXP6201** **EXP6201M*** **EXP6201N***	**EXP8201** **EXP8201M*** **EXP8201N***	**EXP10201** **EXP10201M*** **EXP10201N***
Capacity (g)	6200 g	8200 g	10200 g
Readability d, full range (g)	0.1 g	0.1 g	0.1 g
Verification interval, e (EXP…M..models and EXP…N..models only)	0.1 g	0.1 g	0.1 g
Approval Class (EXP…M.. models and EXP…N..models only)	Class II	Class II	Class I
Span Calibration Points (g)	2000g, 3000g, 4000g, **6000g**	2000g, 4000g, 6000g, **8000g**	2500g, 5000g, 7500g, **10000g**

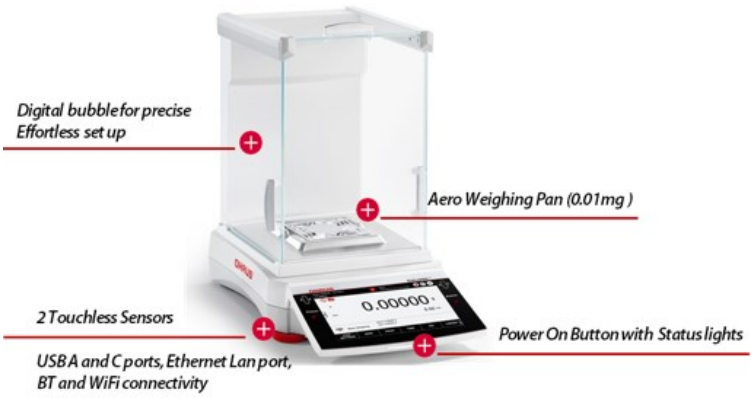
EXP High Capacity

MODEL	**EXP24001** **EXP24001M*** **EXP24001N***	**EXP35001** **EXP35001M*** **EXP35001N***	**EXP65001** **EXP65001M*** **EXP65001N***
Capacity (g)	24000	35000	65000
Readability d, full range (g)	0.1 g	0.1 g	0.1 g
Verification interval, e (EXP…M models and EXP…N..models only)	1 g	1 g	1 g
Approval Class (EXP…M.. models and EXP..N..models only)	Class II	Class II	Class II
Span Calibration Points (g)	10000g, 15000g, 20000g, **24000g**	10000g, 20000g, 30000g, **35000g**	20000g, 40000g, 60000g, **65000g**

1.5 Balance Features

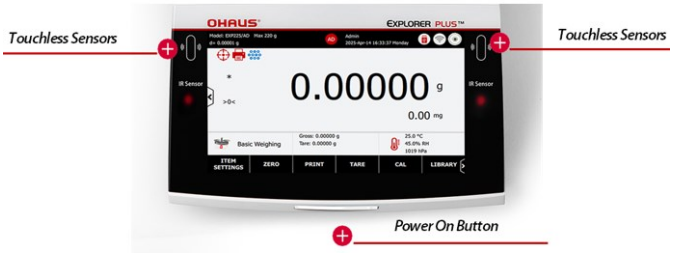
1.5.1 Overview of Parts and Features

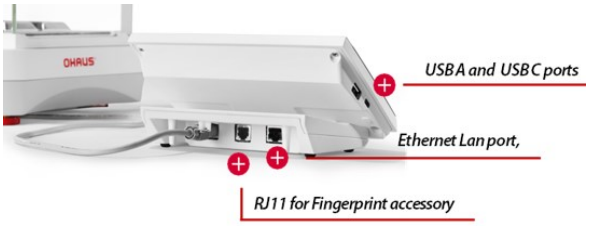
EXR Draft Shield Models



EXR Non-Draft Shield Models

EXP Terminal





EXP Draft Shield Models

EXP Non-Draft Shield Models

EXP High-Capacity Models

1.5.2 Main Screen Features

The EXR and EXP series balances have built a 7-inch display features vibrant colors and a glass panel that is easy to clean and protect chemical spills.

EXR Screen Features

Upper Left (Shortcut buttons)

- ✓ Leveling
- ✓ Batch Print

Top Line

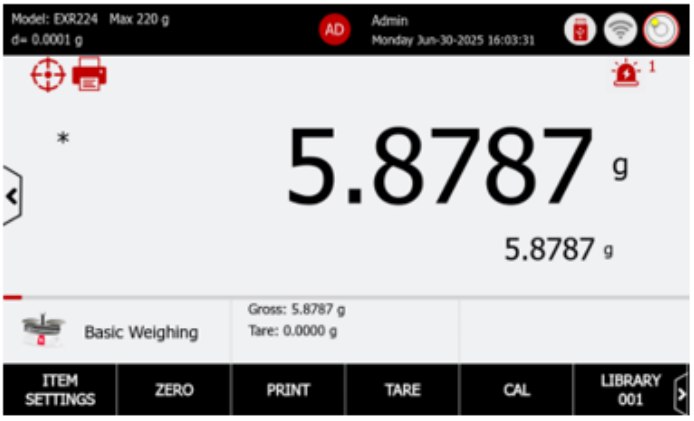
- ✓ Display the essential balance information, such as model name, the max capacity, d value and e value.
- ✓ User Name and Date/Time

Upper Right

- ✓ Peripherals Icons connected to balance
- ✓ Real time leveling bubble
- ✓ Warning Sign

Press the trapezoidal key to switch between main menus.

- ✓ Quick Setup
- ✓ Calibration
- ✓ Balance Setup
- ✓ User Management
- ✓ Application Modes
- ✓ Weighing Units
- ✓ Communication
- ✓ Library
- ✓ Maintenance
- ✓ Factory Reset
- ✓ Log Off
- ✓ Power Off



Main Display Area

- ✓ Click "g" to switch an alternative unit
- ✓ Display the parameter for the current application on the reference field

Press the "Basic Weighing" key to switch weighing application modes

Hotkeys

- ✓ Item Settings, Zero, Print, Tare, Calibration, Library/Method, Sensors, and press "ADD+" key to add customized hotkeys

ADD+

- ✓ 1d/10
- ✓ Digital Leveling
- ✓ Repeatability Test

EXP Screen Features

Upper Left (Shortcut buttons)

- ✓ Motorized Leveling
- ✓ Batch Print
- ✓ Ionizer

Top Line

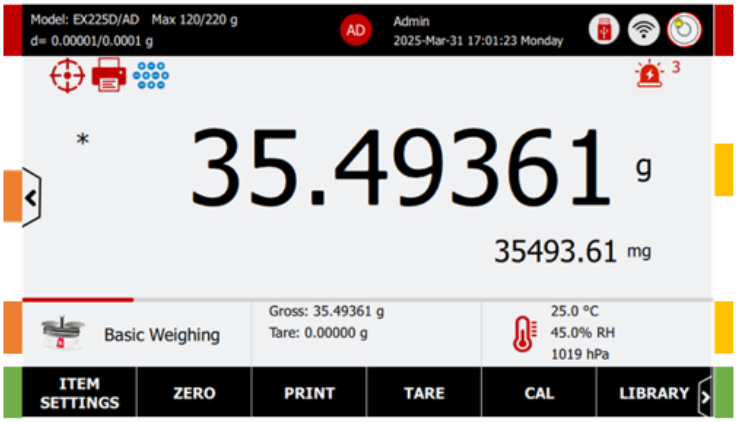
- ✓ Display the essential balance information, such as model name, the max capacity, d value and e value.
- ✓ User Name and Date/Time

Upper Right

- ✓ Peripherals Icons connected to balance
- ✓ Real time leveling bubble
- ✓ Warning Sign

Press the trapezoidal key to switch between main menus.

- ✓ Quick Setup
- ✓ Calibration
- ✓ Balance Setup
- ✓ User Management
- ✓ Application Modes
- ✓ Weighing Units
- ✓ Communication
- ✓ Library
- ✓ Maintenance
- ✓ Factory Reset
- ✓ Log Off
- ✓ Power Off



Main Display Area

- ✓ Click "g" to switch an alternative unit
- ✓ Display the parameter for the current application on the reference field
- ✓ Digital loadcell Environmental Sensor

Press the "Basic Weighing" key to switch weighing application modes

Hotkeys

- ✓ Item Settings, Zero, Print, Tare, Calibration, Library/Method, Sensors, and press "ADD+" key to add customized hotkeys

ADD+

- ✓ 1d/10, Open Left Door, Open Right Door Open, Motorized Leveling, Repeatability Test

1.6 Menu Settings

Programmable features of the EXR and EXP series are accessed through a graphical interface using the Display Touch Panel. By touching an item on the display, a further set of options will appear.

1.6.1 Menu Navigation

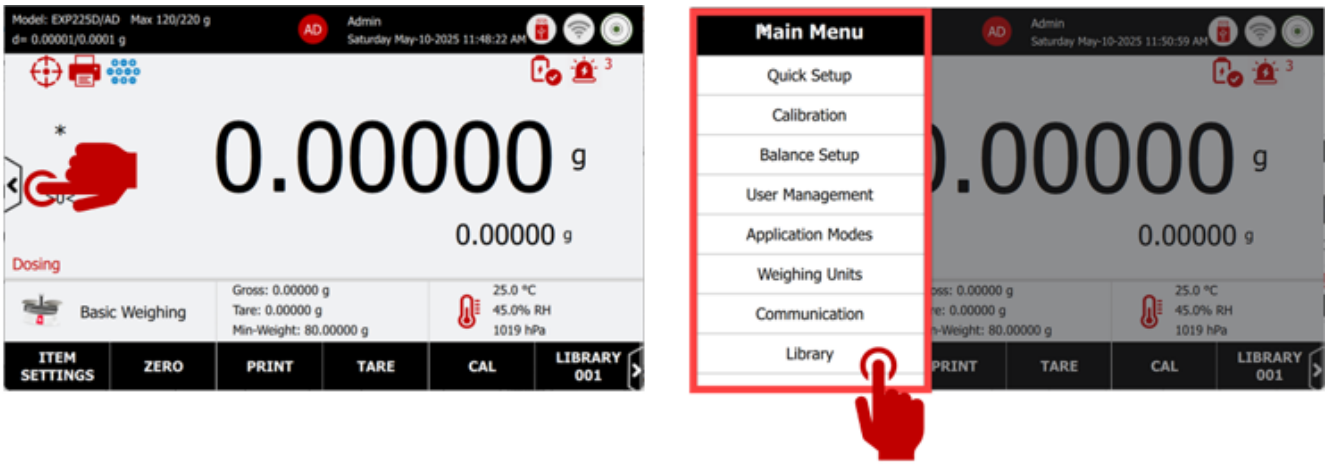
To change the menu setting, navigate to that setting using the following steps:

Enter the Menu

The main menu button is hidden on the middle-left side. Press the button to reveal the menu.

Select the Sub-Menu

Locate the item on the Main Menu List and touch it. The display will highlight the item in red for about 1 second, after which the sub-menu will appear.



1.6.2 Menu Structure

EXR Menu Structure

Quick Setup	Calibration	Balance Setup	User Management	Application Modes	Weighing Units	Communication	Library	Maintenance	Factory Reset	Log Off	Power Off
Language	Internal Calibration	Language	User Management	Basic Weighing	Gram	RS232	Library List	Diagnostics Menu	Reset All		
Time Synchronization	Automatic Calibration	Time Synchronization	Group User Permissions	Parts Counting	Milligram	USB	Delete Library	Software Upgrade	Quick Setup		
Time Zone: (UTC)	Span Calibration	Time Zone: (UTC)	Password Policy	Check Counting	Carat	ETHERNET	Import Library	Serice Log	Calibration		
Date and Time	Perform Internal Calibration	Date and Time		Percent Weighing	Grain	WI-FI&BLUETOOTH	Export Library	Service Menu	Balance Setup		
Automatic Calibration	Perform Span External Calibration	Balance Name		Check Weighing	Pennyweight				Application Modes		
User Management	Calibration History	Change Password		Dynamic Weighing	Momme				Weighing Units		
System Log		Fingerprint		Totalization	Mesghal				Communication		
Balance Info		Fingerprint Setting		Formulation	Tical				Library		
Digital Leveling		Stability Indicator Range		Differential	Tola						
Repeatability Test		Filter Level		Density Determination	Baht						
		Auto Zero Tracking		Peak Hold							
		Gross Indicator									
		Graduation									
		Ionizer									
		Approved Mode									
		Auto Doors									
		Sensor									
		System Log									
		ECO									

EXP Menu Structure

Quick Setup	Calibration	Balance Setup	User Management	Application Modes	Weighing Units	Communication	Library	Maintenance	Factory Reset	Log Off	Power Off
Language	Internal Calibration	Language	User Management	Basic Weighing	Gram	RS232	Library List	Diagnostics Menu	Reset All		
Time Synchronization	Automatic Calibration	Time Synchronization	Group User Permissions	Parts Counting	Milligram	USB	Delete Library	Software Upgrade	Quick Setup		
Time Zone: (UTC)	Span Calibration	Time Zone: (UTC)	Password Policy	Check Counting	Carat	ETHERNET	Import Library	Serice Log	Calibration		
Date and Time	Perform Internal Calibration	Date and Time		Percent Weighing	Grain	WI-FI&BLUETOOTH	Export Library	Service Menu	Balance Setup		
Automatic Calibration	Perform Span External Calibration	Balance Name		Check Weighing	Pennyweight				Application Modes		
User Management	Calibration History	Change Password		Dynamic Weighing	Momme				Weighing Units		
System Log		Fingerprint		Totalization	Mesghal				Communication		
Balance Info		Fingerprint Setting		Formulation	Tical				Library		
Motorized Leveling		Stability Indicator Range		Differential	Tola						
Repeatability Test		Filter Level		Density Determination	Baht						
		Auto Zero Tracking		Peak Hold							
		Gross Indicator		Pipette Adjustment							
		Graduation		SQC							
		Ionizer		Fill Weight Variation							
		Approved Mode		Flow Rate Control							
		Auto Doors									
		Sensor									
		System Log									
		ECO									

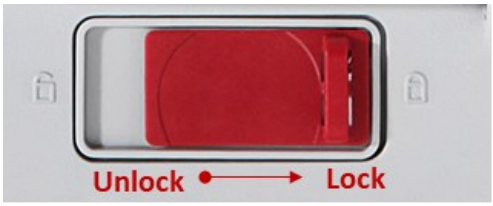
Note: Refer to Appendix B for Service Calibration.

1.7 Legal for Trade Setting

Before verification and sealing, perform the following steps in Order:

- Verify that the menu settings meet the local weights and measures regulations.
- Weighing Unit menu should be reviewed. Verify the units turned ON to meet the local weights and measures regulations.
- Perform a calibration.
- Set the position of the Legal for Trade Switch to the locked position.

● Legal for Trade Switch:

	EXR EXP Analytical and Precision Balance	EXP High-Capacity Balance
Position	 	
Lock/ Unlock		

Set Legal for Trade to ON in the Balance Setup menu

- OFF = standard operation.
- ON = operation complies with Weights and Measures regulations.

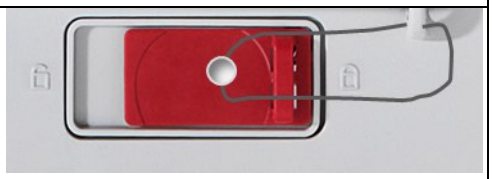
● Sealing

After the Balance has been verified, it must be sealed to prevent undetected access to the legally controlled settings. Before sealing the device, ensure that the security switch is in the Locked position and the Legal for Trade setting in the Balance Setup menu has been set to ON.

If using a wire seal, pass the sealing wire through the holes in the security switch and Bottom Housing as shown.

If using a paper seal, place the seal over the security switch and Bottom Housing as shown.

- EXR EXP Semi-Micro, Analytical and Precision Balance

Un-Locked	Locked with Paper Seal	Locked with Wire Seal
		

- EXP High Capacity Balance

Un-Locked	Locked with Paper Seal	Locked with Wire Seal
		

2 DIAGNOSTIC GUIDE

This section of the manual contains troubleshooting information. Information is contained to isolate specific problems using Table 2-1, 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 protection devices to prevent damage to the sensitive electronic components.

2.1 Troubleshooting

General procedures for Troubleshooting:

1. Do the most obvious, user-level remedies.
2. Visual Check:
   - Check that the internal parts are clean and free from debris.
   - Examine the balance for damage or signs of abuse, replace any damaged items.
3. Use the error code table for solutions for specific codes.
4. Use the Diagnostic Guide; locate the symptom then follow the suggested remedies in order.

Note: Allow equipment to warm up for 60 minutes on precision models for optimal weighing performance. Allow 4 hours for analytical models to stabilize.

2.2 Software

In most cases understanding the customer's problem with the balance is easy. Physical damage, error code, failure to power up and obvious poor performance can usually be repaired by following the instructions in the following sections.

Some balance issues may be software related. New releases of the software may correct these issues. The EXR and EXP series Balance has upgradable software in the Terminal and the Base modules. The software revision in the balance can be seen when the balance is powered up. The software version is displayed in the lower right-hand corner of the screen.

The balance software can also be retrieved by sending a "PV" command via the RS232 or other interface.

See **Appendix D** for the software upgrade procedure.

Check the Service Bulletins on the Ohaus DMX site for information on software upgrades.

2.3 Diagnostic Guide

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.

Diagnosis:

1. Isolate and identify the symptoms.
2. Refer to Diagnostic Guide tables and locate the symptoms.
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.

TABLE 2-1 DIAGNOSTIC GUIDE

Symptom	Possible Cause	Remedy
Cannot turn on	No power to the Adapter	Verify input voltage to the Power Adapter
	Bad Power Adapter	Verify the Power Adapter output voltage using a DVM
	Input Jack or internal wiring is defective.	Verify 12VAC at the Power Jack wire connection to the PCB
	Bad connection between terminal and base (EXP)	Re-connect base and terminal
	Poor cable connection	Check cable connection
	Defective Base Main PCB (EXP)	Replace base Main PCB
	Defective (Terminal) Main PCB	Replace (Terminal) Main PCB
Touch Panel controls do not respond	System Error	Cycle the power off then on
	Touch Panel defective	Re-connect the display cables Replace the Display
	Defective (Terminal) Main PCB	Replace (Terminal) Main PCB
Incorrect weight reading	Unstable environment- vibration, air currents or changing temperature	Move balance to suitable location, allow balance to stabilize its temperature
	Improper calibration	Perform span calibration
	Poor linearity performance	Perform linearity calibration
	Unstable environment- vibration, air currents or changing temperature	Move balance to suitable location, allow balance to stabilize its temperature
	Internal mechanical interference	Verify the pan Support is not contacting the top housing
	Bad load cell	Replace load cell

Symptom	Possible Cause	Remedy
Poor repeatability	Unstable environment- vibration, air currents or changing temperature	Move balance to suitable location, allow balance to stabilize its temperature
	Warm up insufficiently	Warm up for 1 hour on precision models, 4 hours for analytical models for the optimal weighing performance
	Internal mechanical interference	Verify the pan Support is not contacting the top housing
	Bad load cell	Replace load cell
Cannot calibrate	LFT set to ON	Turn LFT off
	Unstable environment- vibration, air currents or changing temperature	Move balance to suitable location, allow balance to stabilize its temperature
	External Calibration mode- incorrect calibration weights used	Use correct weight value as shown on the scale or enter the known weight value as instructed on the scale.
	Incorrect weight reading or poor repeatability	See Incorrect weight reading and Poor repeatability
Cannot Internal Calibrate	Internal weight Data lost	Implement internal weight calibration
	Bad loadcell	Replace the Loadcell
Cannot change menu settings	LFT set to on	Turn LFT off
Cannot access an application Mode	Desired Application Mode not enabled	Check the user permissions Enable the applications
RS232, USB or Ethernet interface not working	Balance communication settings do not match with the settings in the connected computer	See User Manual for proper settings
	Poor Cable connection	Check cable connection
	Defective Interface or cable	Replace the related parts
Low Reference weight	Reference weight is too small	Increase reference weight or continue with less accurate results.
	Parts counting– average piece weight is too small.	Shows error – returns to re-establish the APW.
Invalid Piece Weight	Weight reading not stable	See above - Incorrect weight reading
Operation Timeout ------	Busy (tare, zero)	Retry after completion
Pressing “Print” or command “P” do not work immediately	RS232, USB or Ethernet interface not working	see above – RS232, USB or Ethernet interface not working
	Print settings enable the stable print, but there is unstable environment- vibration, air currents or changing temperature	Move balance to suitable location, allow balance to stabilize its temperature; **or** Disable ‘Stable Only”
Overload	Weight on pan exceeds capacity	Remove weight from pan and re-zero Implement service calibration

Symptom	Possible Cause	Remedy
Underload	Pan is removed during weighing	Install pan and re-zero Implement service calibration
Over initial zero range	Pan has load during power on	Remove weight from pan and re-zero Implement service calibration Replace the loadcell
Under initial zero range	Pan was removed prior to power on	Install pan and re-zero Implement service calibration Replace the loadcell
IDNR error	Type data error	Contact the authorized dealer Config via PCB replacement in service tool
Does not retain the correct time and date.	Battery backup for the real time clock has lost its charge.	Replace the real time clock battery on the (EXP) Base Main PCBA, (EXR) Main PCB
	Time sync OFF	Enable Time sync and connect internet
No weighing value	Base connection failed	Re-connect base and terminal
	Loadcell (DWC) connection failed	Re-connect loadcell cable
	Balance data lost	Config the balance via service tool
Auto door failed	Draft shield installed improperly	Re-install the draft shield
	Motor PCB defective	Check the motor and POGO cables to motor PCB Replace the motor PCB
	Base PCB defective	Check the POGO cable to base PCB Replace the base PCB
	Sensor defective	Replace the main (terminal) PCB
	Auto door motor defective	Replace the Motor
Ionizer failed	Motor PCB defective	Check the Ionizer and POGO cables to motor PCB Replace the motor PCB
	Base PCB defective	Check the POGO cable to base PCB Replace the base PCB
	Sensor defective	Replace the main (terminal) PCB
	Ionizer defective	Replace the Ionizer
Light failed	Light PCB defective	Replace the Light PCB
	Motor PCB defective	Check the Light PCB and POGO cables to motor PCB Replace the motor PCB
	Base PCB defective	Check the POGO cable to base PCB Replace the base PCB
	Sensor defective	Replace the main (terminal) PCB
Auto leveling failed	Feet motor stuck	Turn the red feet clockwise and counterclockwise to loosen mechanical parts Place the balance on a level table, then power on to initialize the motor feet for 2~3 times Adjust the motor feet up and down for 10 times in service menu Re-install the motor feet
	Feet motor defective	Replace the motor feet kit

3 MAINTENANCE / REPAIR PROCEDURES

3.1 Preventive Maintenance

Ohaus balances 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 balance 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 weight on the balance when the balance is not in use.
- Allow time for the balance 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 balance. After temperature stabilization, allow an additional 60 minutes after turning the balance on, for the balance electronics to stabilize.

Preventive Maintenance Checklist

The balance 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 balance using a damp cloth with warm water.
3. Check the Power Cord for broken or damaged insulation.
4. Make a visual inspection for faulty connectors, wiring, and loose hardware.

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

Preventive Measures

Common hand tools are sufficient to disassemble the EXP and EXR series products.
Turn the Balance off and unplug the power cord before you begin.

Use electrostatic protection when servicing!

Electrostatic damage is difficult to detect, because the faults it causes are not clear-cut. MOS switching transistors with electrostatic damage have substantially higher, thermically unstable leakage currents. As a result, the Balance drifts more and the display can fluctuate similar to when there is a draft.

To avoid electrostatic damage during production, conducting floors, controlled air humidity, and EMC mats are used. When servicing the unit it is also advisable – as soon as the instrument is opened – to neutralize electrostatic charges.

Before working with the exposed PCBs appropriate ESD protection must be taken to prevent damage to the sensitive electronic components. It is recommended that a conductive mat with wrist straps be used when working with electronic components.

3.2 Safety Precautions

Intended Use

This instrument is intended for use in laboratories, pharmacies, schools, businesses and light industry. It must only be used for measuring the parameters described in these operating instructions. Any other type of use and operation beyond the limits of technical specifications, without written consent from OHAUS, is considered as not intended. This instrument complies with current industry standards and the recognized safety regulations; however, it can constitute a hazard in use. If the instrument is not used according to these operating instructions, the intended protection provided by the instrument may be impaired.

Definition of Signal Warnings and Symbols

Safety notes are marked with signal words and warning symbols. These show safety issues and warnings. Ignoring the safety notes may lead to personal injury, damage to the instrument, malfunctions and false results.

WARNING	For a hazardous situation with medium risk, possibly resulting in severe injuries or death if not avoided.
CAUTION	For a hazardous situation with low risk, resulting in damage to the device or the property or in loss of data, or minor or medium injuries if not avoided.
ATTENTION	For important information about the product. May lead to equipment damage if not avoided.
NOTE	For useful information about the product.

Warning Symbols


General hazard


Explosion hazard


Electrical shock hazard

Safety Notes

CAUTION: Read all safety warnings before installing, making connections, or servicing this equipment. Failure to comply with these warnings could result in personal injury and/or property damage. Retain all instructions for future reference.

- Before connecting power, verify that the AC adapter's input voltage range and plug type are compatible with the local AC mains power supply.
- Only connect the power cord to a compatible grounded electrical outlet. (For Explorer Plus High-Capacity models only)
- Do not position the equipment such that it is difficult to reach the power connection.
- Make sure that the power cord does not pose a potential obstacle or tripping hazard.
- Operate the equipment only under ambient conditions specified in these instructions.
- This equipment is for indoor use only.
- Do not operate the equipment in wet, hazardous or unstable environments.

- Do not allow liquids to enter the equipment.
- Do not load the equipment above its rated capacity.
- Do not drop loads on the platform.
- Do not place the equipment upside down on the platform.
- Use only approved accessories and peripherals.
- Disconnect the equipment from the power supply when cleaning.
- Service should only be performed by authorized personnel.
- When shipping or transporting this product, follow the applicable regulations for equipment containing lithium-ion batteries.

WARNING: Never work in an environment subject to explosion hazards! The housing of the instrument is not gas tight. (Explosion hazard due to spark formation, corrosion caused by the ingress of gases).

WARNING: Electrical shock hazards exist within the housing! The housing should only be opened by authorized and qualified personnel. Remove all power connections to the unit before opening.

CAUTION: The protection provided by the unit may be impaired if used with accessories not provided or recommended by the manufacturer, or used in a manner not specified by the manufacturer.

WARNING: ELECTRICAL SHOCK HAZARD

Avoid pressing two carbon brushes while the Ionizer is turned on.

3.3 Open the Balance

Opening the EXP EXR balance varies slightly according to the specific model, as detailed below. Use these procedures in order to replace the Load Cell, the Printed Circuit Board or other components.

Common hand tools are sufficient to disassemble the EXP EXR balances.

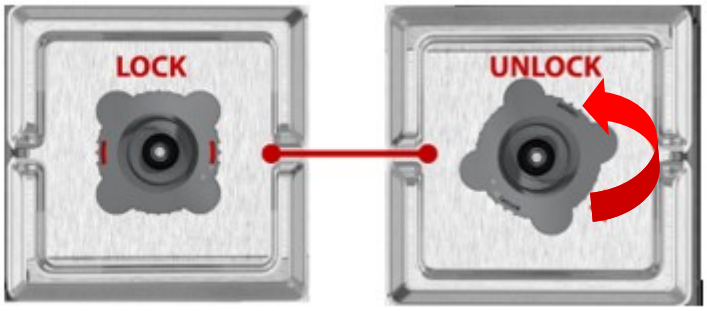
3.3.1 Preparation for Opening EXP EXR Models

1. Turn the balance off and unplug the power cord before you begin.
2. Disconnect any communication or other option cables.
3. Remove the parts from the top housing.

Draft shield models

Remove the weighing pan, EMC plate and draft shield from the base

i. Remove the weighing pan and unlock the draft shield fixed ring.



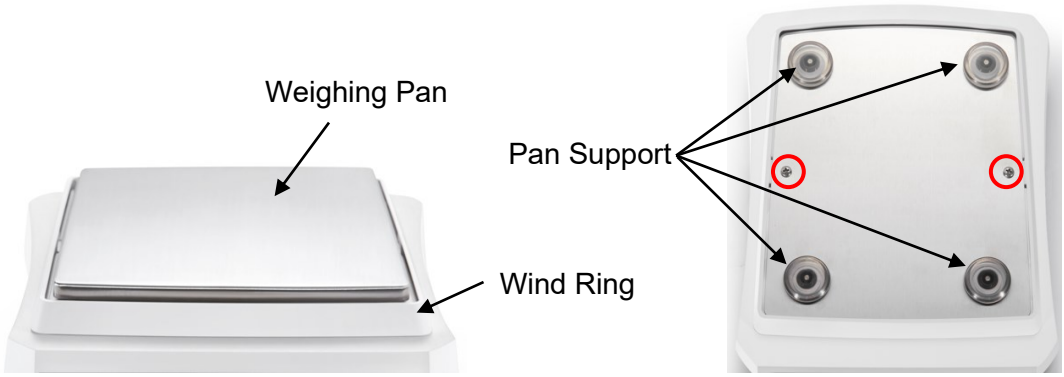
ii. Remove the EMC plate and take out the 4 screws beneath it. Raise the draft shield vertically.

Non-Draft shield models

Remove the wind-ring, pan and EMC plate from the base

i. Remove the wing ring, weighing pan and pan supports.

ii. Remove the 2 screws and take out the EMC plate.



High Capacity

Remove the weighing pan and pan support from the base.

i. Remove the weighing pan.

ii. Remove the 2 screws and take out the pan support.

4. Disconnect the terminal from the base for EXP models.

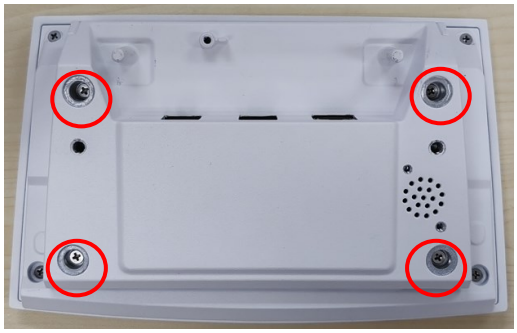
   i. Simply lift the terminal straight up for the regular models; remove the 2 screws for the tower mount models.

   ii. Remove the screw of cable holder and disconnect the terminal cable.

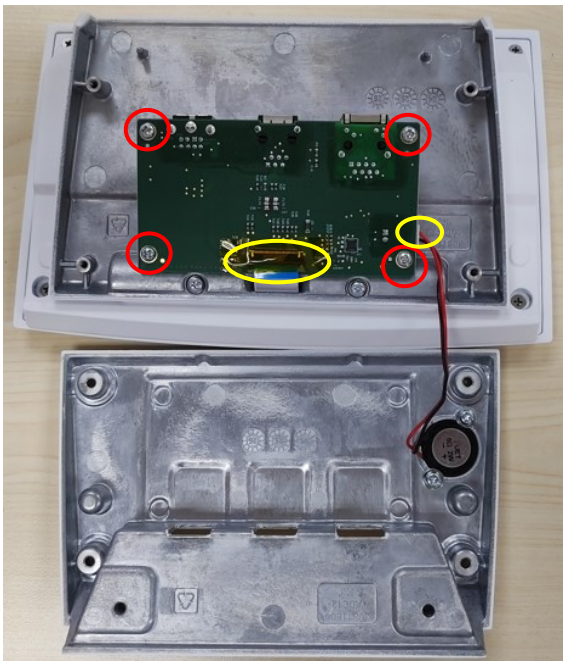
3.3.2 Replace the EXP Terminal Components

1. Turn over the terminal and remove 4 rubber feet from the bottom housing of terminal base.

2. Remove the 4 screws securing the top and bottom housings of terminal base.

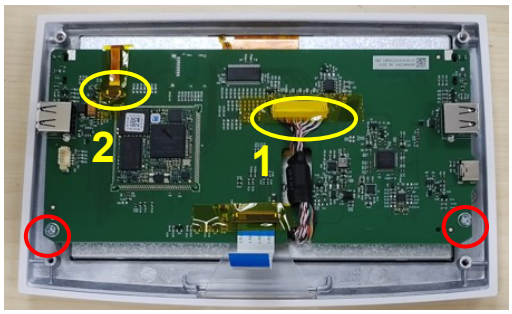


3. Open the bottom housing of terminal base. Be careful not to pull on the cables.
4. Disconnect the cables of speaker and terminal main PCB.
5. Remove the 4 screws and take out the **Interface PCB**.



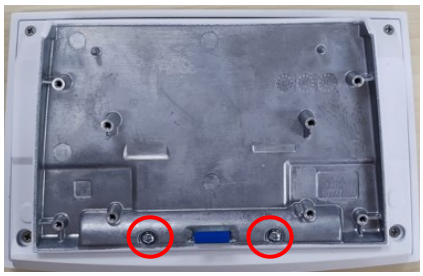
6. Remove the 4 screws securing the top and bottom housings of terminal display.

7. Open the bottom housing of terminal display.
8. Disconnect the 2 cables of display from the terminal main PCB.
9. Remove the 2 screws and take out the **Terminal Main PCB**.



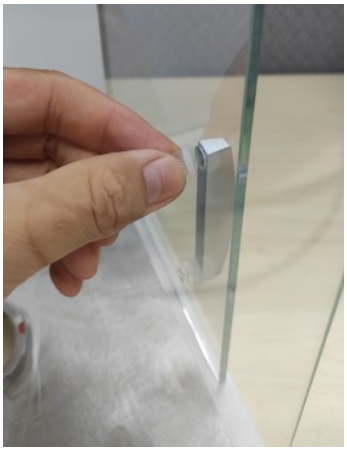
1, Cable to Display Screen
2, Cable to Touch Panel

10. Remove the 4 screws and take out the **Hinge**.



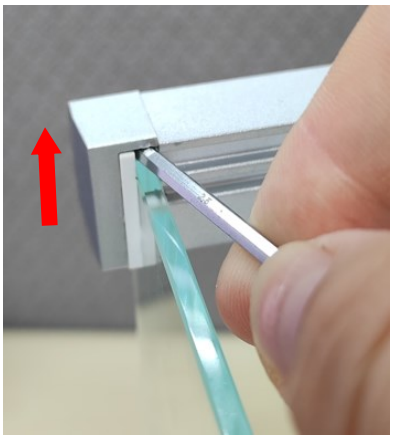
3.3.3 Replace the Draft shield Components

1. Separate the draft shield from the top housing, refer to section 3.3.1.
2. Remove the 2 plastic screws and take out the handle, slide out the side glass (left and right) from the back.

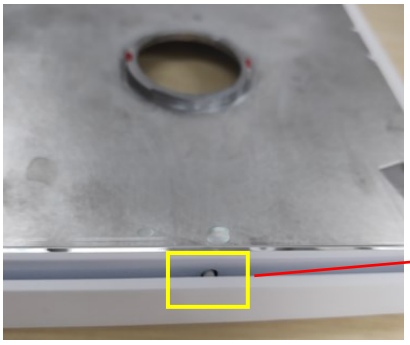
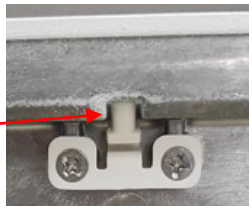



3. Vertically lift up the guide rail cover, use a screwdriver for assistance if necessary.

   Note: Do not use the screwdriver to pry open the guide rail cover by leveraging it against the front glass.



4. Remove the 4 screws securing the front glass, hold the front glass and release the nob in the slot, then take out the front glass carefully.

5. Remove the two screws and take out the backwall cover.

   Note: Take special care to route the wires and cables according to their original positions. Proper routing is important for RFI/ESD performance. Ensure that the wires or cables are not pinched during re-assembly.



EXP EXR

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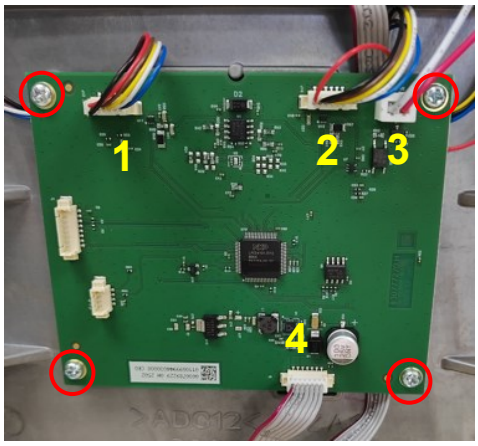
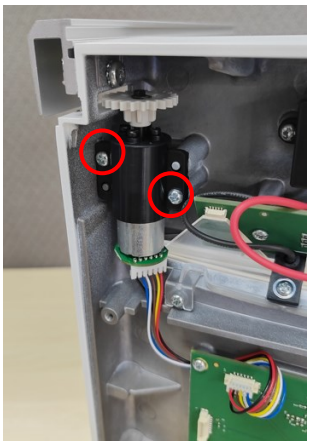
Remove the unique parts of EXP draft shield

6. Disconnect the cables of Motors, Ionizer and Pogo pin PCB, remove the 4 screws, then take out the **Motor PCB** carefully.

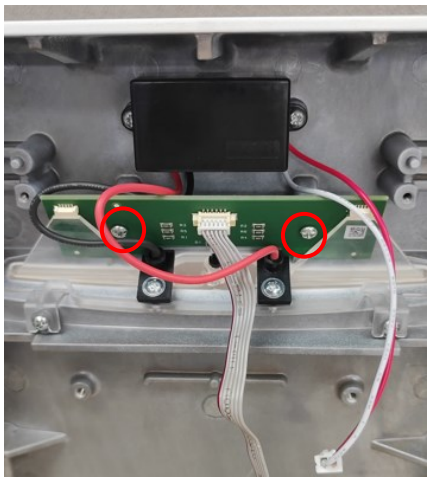


1, Cable to Right Door Motor
2, Cable to Left Door Motor
3, Cable to Ionizer
4, Cable to POGO pin PCB

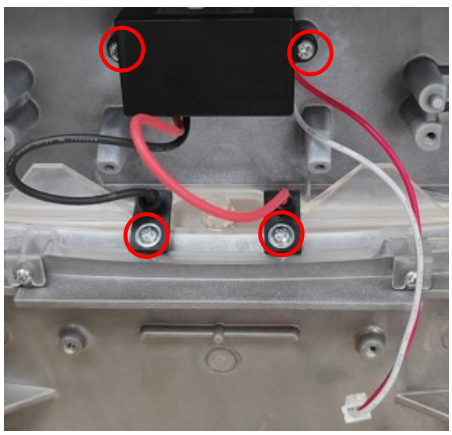
7. Remove the 2 screws and take out the **Motor kit** carefully.



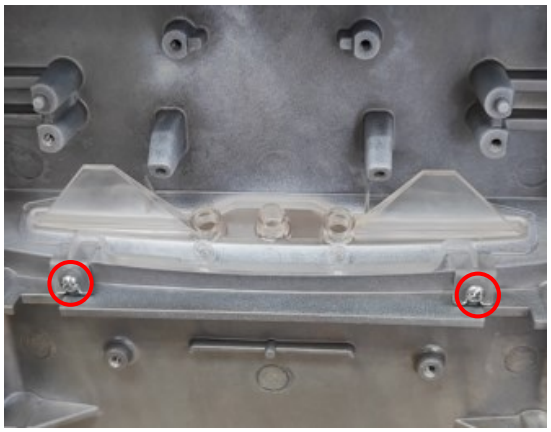
8. Remove the 2 screws and take out the **Light PCB** carefully.



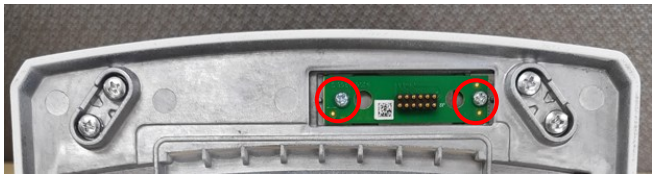
9. Remove the 4 screws and take out the **Ionizer** carefully.



10. Remove the 2 screws and take out the **Light cover** carefully.



11. Remove the 2 screws under the DS base plate and take out the **Upper POGO pin PCB** from the DS base plate carefully.



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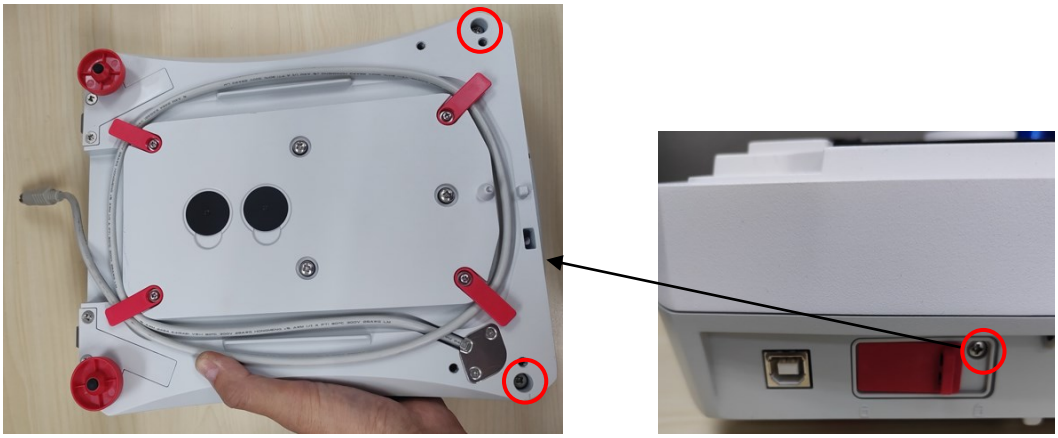
12. Remove the 4 screws under the DS base plate and take out the **Back Wall** carefully.

13. Remove the screws and take out the side door rail carefully.

3.3.4 Replace the EXP Base Components

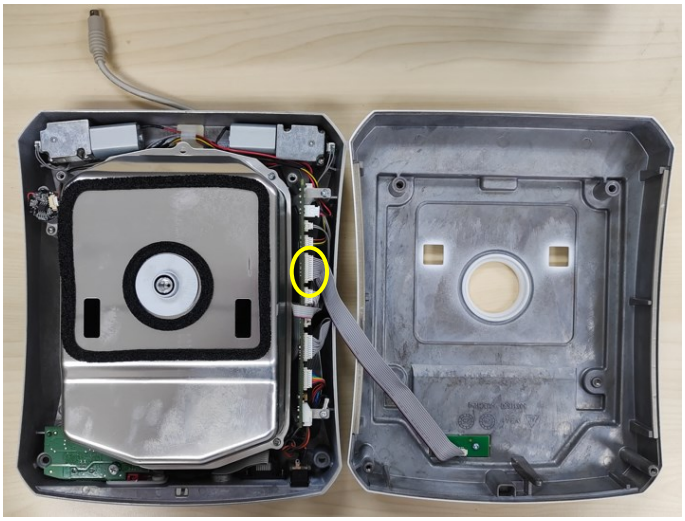
1. Remove the terminal, wind ring, weighing pan, EMC plate and draft shield from the base, refer to section 3.3.1.
2. Turn the base over and hold in hand, make sure the loadcell cone or part does not touch the desktop. Remove the 2 screws under the bottom housing and one screw at the rear of the bottom housing.



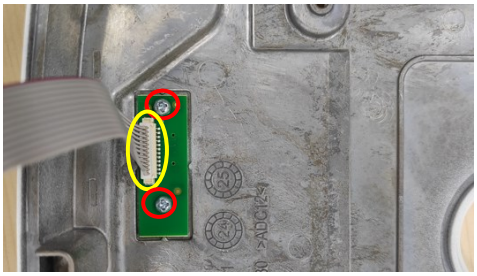
3. Turn the base back and gently lift the Top Housing.

   Note: Take Care! There is the cable connected from the base main PCB to the POGO pin PCB.

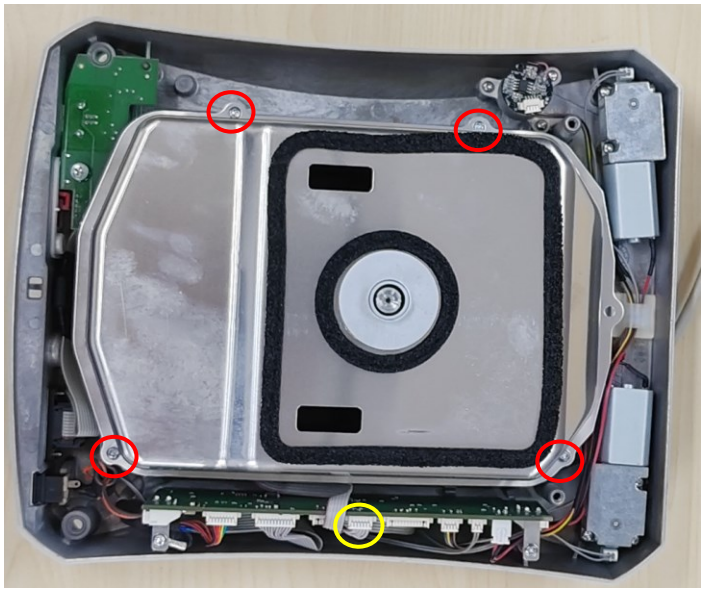
   Take special care to route the wires and cables according to their original positions. Proper routing is important for RFI/ESD performance. Ensure that the wires or cables are not pinched during re-assembly.



4. Disconnect the cable and remove the 2 screws and take out the **Lower POGO pin PCB** from base top housing.



5. Remove the 4 screws and take out the **Loadcell Cover** for the 3, 4, 5 place models.

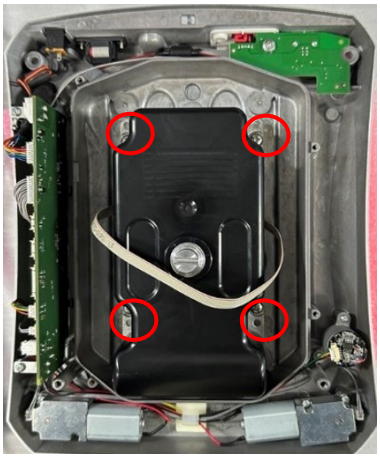


6. Disconnect the loadcell cable from the base main PCB and

   a) Hold the loadcell in hand and turn the base over. Remove the 3 screws and washers under the bottom housing and take out the **Loadcell** carefully.

   b) Remove the 4 screws and washers on the loadcell plate and take out the **Loadcell** carefully.

a) 3 screws installation method



b) 4 screws installation method

Reverse the procedures to re-install the Loadcell.

Note:

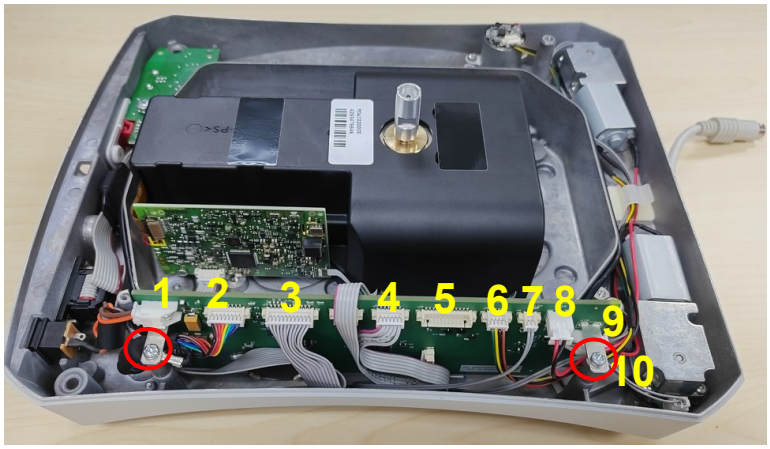
1, Take special care to route the wires and cables according to their original positions. Proper routing is important for RFI/ESD performance. Ensure that the wires or cables are not pinched during re-assembly.

2, Ensure that there is no foreign material between the Base mounting surfaces and the Loadcell.

3, Tighten the loadcell screws with the **torque 2N.m**

4, **Configure the new Loadcell** to the balance via service tool, See **Appendix C**.

7. Disconnect all the cables from the base main PCB and remove the 2 screws and take out the **Base Main PCB**.



1, Cable to Power Socket
2, Cable to Terminal
3, Cable to Interface PCB
4, Cable to Loadcell
5, Cable to POGO pin PCB
6, Cable to Digital leveling bubble
7, Cable to Left Feet Motor PCB
8, Cable to Left Feet Motor
9, Cable to Right Feet Motor PCB
10, Cable to Right Feet Motor (under the Cable 9)

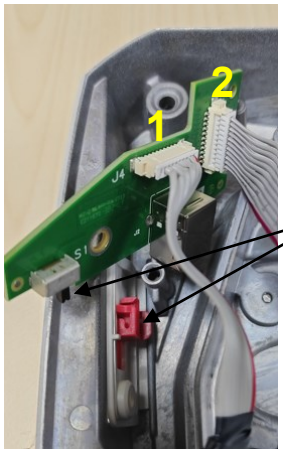
Reverse the procedures to re-install the Base Main PCB.

Note:

1, Take special care to route the wires and cables according to their original positions. Proper routing is important for RFI/ESD performance. Ensure that the wires or cables are not pinched during re-assembly.

2, **Configure the new Base PCB** to the balance via service tool, See **Appendix C**.

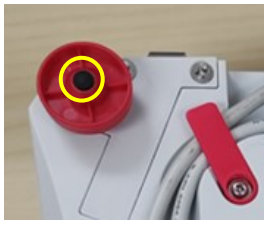
8. Remove the screw and washer, disconnect the 2 cables, take out the **Base Interface PCB**.



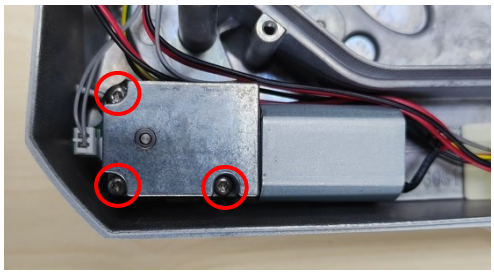
1, Cable to RS232 Port
2, Cable to Base Main PCB

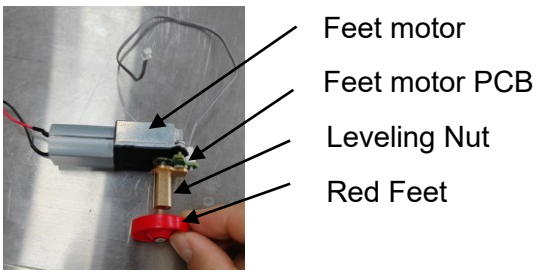
Make sure the black LFT switch insert into the red slot properly when assembly.

9. Remove the mat and screw of the feet and take out the red **Feet**.



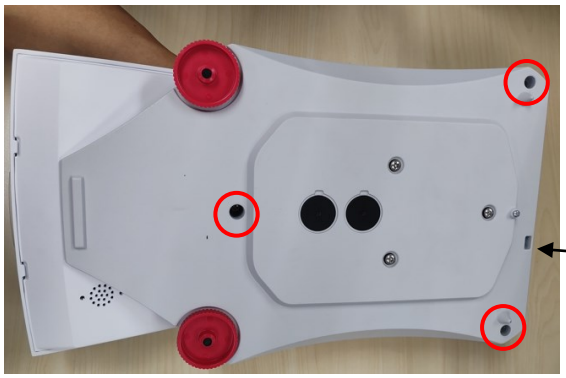
10. Disconnect the 2 cables of the Feet Motor from the base main PCB, remove the 3 screws and take out the **Feet Motor kit**.





3.3.5 Replace the EXR Base Components

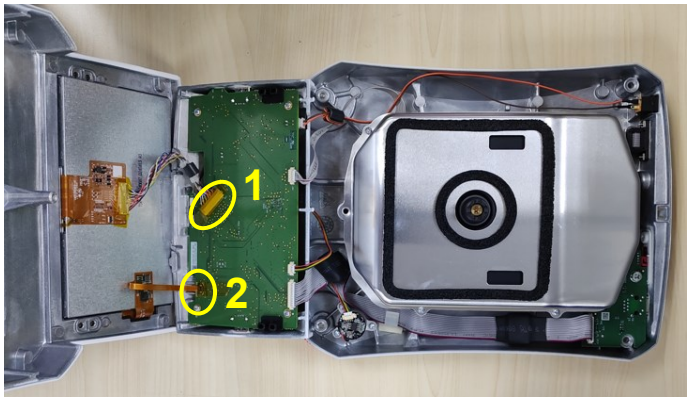
1. Remove the weighing pan, wind ring, EMC plate and draft shield from the base, refer to section 3.3.1.
2. Turn the base over and hold in hand, make sure the loadcell cone or part does not touch the desktop. Remove the 3 screws under the bottom housing and one screw at the rear of the bottom housing.



3. Turn the base back and gently lift the Top Housing from the rear.

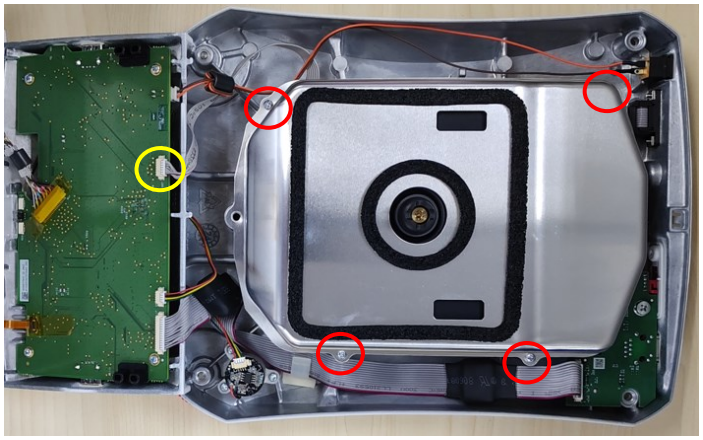
   Note: Take Care! There are 2 cables connected from the main PCB to the Display.

   Take special care to route the wires and cables according to their original positions. Proper routing is important for RFI/ESD performance. Ensure that the wires or cables are not pinched during re-assembly.
4. Disconnect the 2 display cables and take out the **Top Housing with the Display**.



1, Cable to Display Screen
2, Cable to Touch Panel

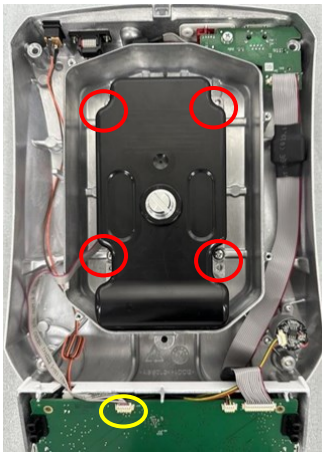
5. Remove the 4 screws and take out the **Loadcell Cover** for the 3, 4, 5 place models.



6. Disconnect the loadcell cable from the Main PCB and

a) Hold the loadcell in hand and turn the base over. Remove the 3 screws and washers under the bottom housing and take out the **Loadcell** carefully.

b) Remove the 4 screws and washers on the loadcell plate and take out the **Loadcell** carefully.



a) 3 screws installation method b) 4 screws installation method

Reverse the procedures to re-install the Loadcell.

Note:

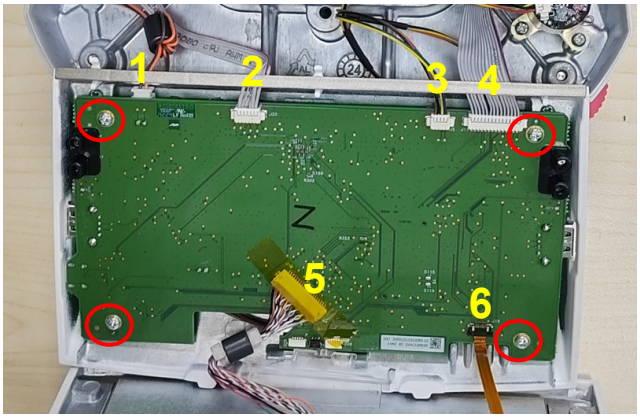
1, Take special care to route the wires and cables according to their original positions. Proper routing is important for RFI/ESD performance. Ensure that the wires or cables are not pinched during re-assembly.

2, Ensure that there is no foreign material between the Base mounting surfaces and the Loadcell.

3, Tighten the loadcell screws with the **torque 2N.m**

4, **Configure the new Loadcell** to the balance via service tool, See **Appendix C**.

7. Disconnect 6 cables (No 1~No 6) and remove the 4 screws from the Main PCB.



1, Cable to Power Socket
2, Cable to Loadcell
3, Cable to Digital leveling bubble
4, Cable to Interface PCB
5, Cable to Display
6, Cable to Touch Panel

8. Lift the Main PCB and turn it over, disconnect the speaker cables (No 7), then take out the **Main PCB**.

7, Cable to Speaker

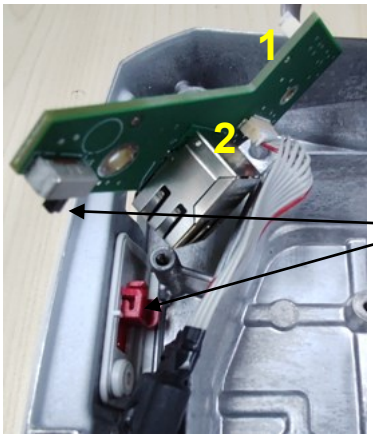
Reverse the procedures to re-install the Main PCB.

Note:

1, Take special care to route the wires and cables according to their original positions. Proper routing is important for RFI/ESD performance. Ensure that the wires or cables are not pinched during re-assembly.

2, **Configure the new Main PCB** to the balance via service tool, See **Appendix C**.

9. Remove the screw and washer, disconnect the 2 cables, take out the **Interface PCB**.

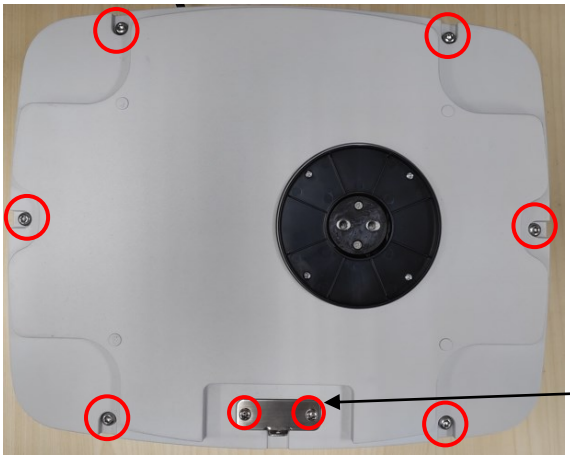


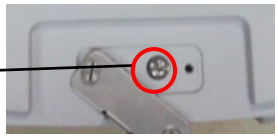
1, Cable to Main PCB
2, Cable to RS232 Port

Make sure the black LFT switch insert into the red slot properly when assembly.

3.3.6 Replace the EXP HiCap Base Components

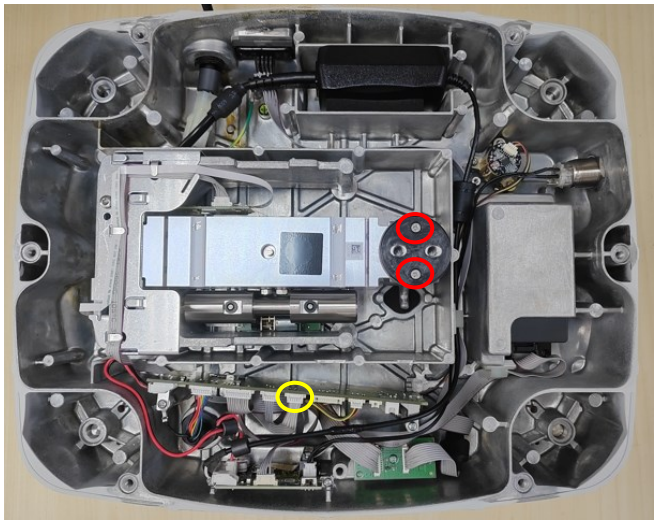
1. Remove the terminal, weighing pan and pan support from the base, refer to section 3.2.1.
2. Remove the 9 screws (6 screws on Base Top Housing, 2 screws on the LFT plate and 1 screw under the LFT plate), then take out the Base Top Housing carefully.



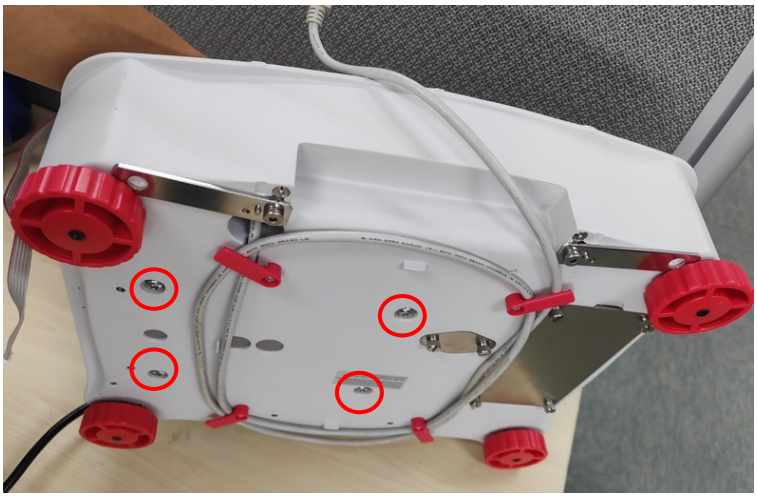


3. Remove the 2 screws on the loadcell cone and take out the black plastic plate.
4. Disconnect the loadcell cable from the Base Main PCB.

   Note: Take special care to route the wires and cables according to their original positions. Proper routing is important for RFI/ESD performance. Ensure that the wires or cables are not pinched during re-assembly.



5. Hold the Loadcell Frame and turn the base side over by 90 degrees. Remove the 4 screws and washers and gently separate the **Loadcell** from the base bottom housing.



Reverse the procedures to re-install the Loadcell.

Note:

1, Take special care to route the wires and cables according to their original positions. Proper routing is important for RFI/ESD performance. Ensure that the wires or cables are not pinched during re-assembly.

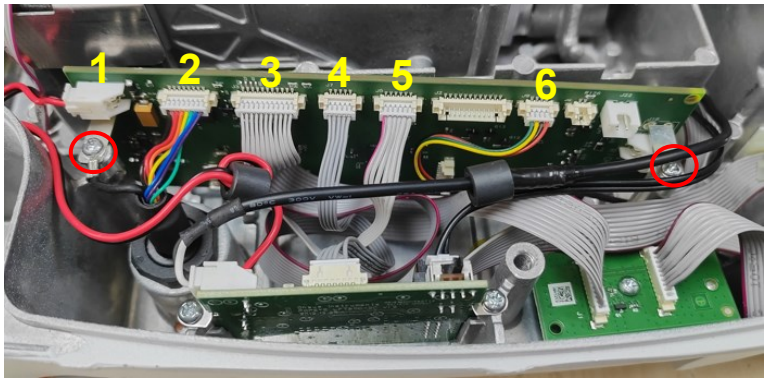
2, Ensure that there is no foreign material between the Base mounting surfaces and the Loadcell.

3, Tighten the loadcell screws with the **torque 2N.m**

4, **Configure the new Loadcell** to the balance via service tool, See **Appendix C**.

6. Disconnect all the cables from the base main PCB and remove the 2 screws and take out the **Base Main PCB.**

Note: Reverse the procedures to re-install the Base Main PCB. See **Appendix C** for using the Service Tool to configure the new Base Main PCB to the balance.



1, Cable to Power Socket
2, Cable to Terminal
3, Cable to RS232 PCB
4, Cable to Interface PCB
5, Cable to Loadcell
6, Cable to Digital leveling bubble

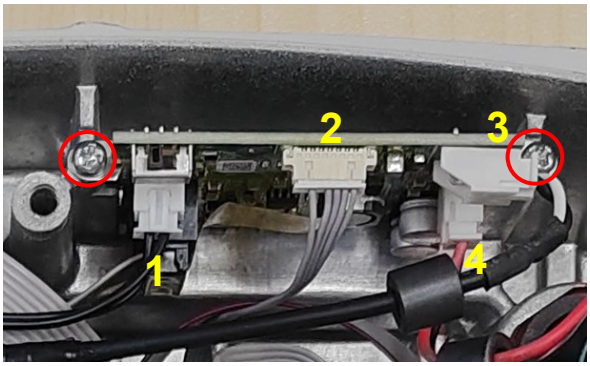
Reverse the procedures to re-install the Base Main PCB.

Note:

1, Take special care to route the wires and cables according to their original positions. Proper routing is important for RFI/ESD performance. Ensure that the wires or cables are not pinched during re-assembly.

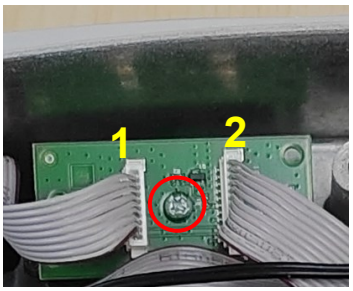
2, **Configure the new Base PCB** to the balance via service tool, See **Appendix C**.

7. Disconnect the 4 cables and remove the 2 screws, take out the **Base Interface PCB**.



1, Cable to Power Switch
2, Cable to Base Main PCB (Data)
3, Cable to Power Adapter
4, Cable to Base Main PCB (Power)

8. Disconnect the 2 cables and remove the screw, take out the **RS232 PCB**.



1, Cable to RS232 Port
2, Cable to Base Main PCB

4 TESTING

Before and after servicing an EXR and EXP series balance, an operational test and various performance tests should be made to confirm if the balance meets specifications. Turn the balance on and allow it to warm up for at least one hour before performing these tests. The Analytical models need up to 4 hours to stabilize.

NOTE:
Make sure the test area is free from drafts and that the balance rests on a level and vibration-free surface. The Analytical models especially need a solid platform, such as a stone table.

4.1 Test Weights Required

The weights required to test the Ohaus EXR and EXP series balances must meet the requirements of the ASTM or OIML Tolerances listed in the table. Poor quality calibration weights can be the cause of frustrating diagnostics.

TABLE 4-1 CALIBRATION WEIGHTS VALUES

Model	Span Calibration Points	Weight Class	
EXR125D; EXR125DM	25g, 50g, 75g, 100g	ASTM Class 1	OIML E2
EXR125; EXR125M	25g, 50g, 75g, 100g	ASTM Class 1	OIML E2
EXR225D; EXR225DM	50g, 100g, 150g, 200g	ASTM Class 1	OIML E2
EXR124	25g, 50g, 75g, 100g	ASTM Class 1	OIML E2
EXR224	50g, 100g, 150g, 200g	ASTM Class 1	OIML E2
EXR324, M, N	100g, 150g, 200g, 300g	ASTM Class 1	OIML E2
EXR223	50g,100g, 150g, 200g	ASTM Class 1	OIML E2
EXR423	100g, 200g, 300g, 400g	ASTM Class 1	OIML E2
EXR623	300g, 400g, 500g, 600g	ASTM Class 1	OIML E2
EXR1203, M, N	400g, 600g, 800g, 1000g	ASTM Class 1	OIML E2
EXR2202	500g, 1000g, 1500g, 2000g	ASTM Class 1	OIML E2
EXR4202	1000g, 2000g, 3000g, 4000g	ASTM Class 1	OIML E2
EXR6202	2000g, 3000g, 4000g, 6000g	ASTM Class 1	OIML E2
EXR8202	2000g, 4000g, 6000g, 8000g	ASTM Class 1	OIML E2
EXR10202, M, N	6000g, 8000g,10,000g, 12,000g	ASTM Class 1	OIML E2
EXR6201	2000g, 3000g, 4000g, 6000g	ASTM Class 2	OIML F1
EXR8201	2000g, 4000g, 6000g, 8000g	ASTM Class 2	OIML F1
EXR10201, M	2500g, 5000g, 7500g, **10,000g**	ASTM Class 2	OIML F1

Model	Span Calibration Points	Weight Class	
EXP125D/AD; EXP125DM/AD	25g, 50g, 75g, 100g	ASTM Class 1	OIML E2
EXP125/AD; EXP125M/AD	25g, 50g, 75g, 100g	ASTM Class 1	OIML E2
EXP225D/AD; EXP225DM/AD	50g, 100g, 150g, 200g	ASTM Class 1	OIML E2
EXP225/AD; EXP225M/AD	50g, 100g, 150g, 200g	ASTM Class 1	OIML E2
EXP124/AD	25g, 50g, 75g, 100g	ASTM Class 1	OIML E2
EXP224/AD	50g, 100g, 150g, 200g	ASTM Class 1	OIML E2
EXP324/AD, M, N	100g, 150g, 200g, 300g	ASTM Class 1	OIML E2
EXP223/AD	50g,100g, 150g, 200g	ASTM Class 1	OIML E2
EXP423/AD	100g, 200g, 300g, 400g	ASTM Class 1	OIML E2
EXP623/AD	300g, 400g, 500g, 600g	ASTM Class 1	OIML E2
EXP1203/AD, M, N	400g, 600g, 800g, 1000g	ASTM Class 1	OIML E2
EXP2202	500g, 1000g, 1500g, 2000g	ASTM Class 1	OIML E2
EXP4202	1000g, 2000g, 3000g, 4000g	ASTM Class 1	OIML E2
EXP6202	2000g, 3000g, 4000g, 6000g	ASTM Class 1	OIML E2
EXP8202	2000g, 4000g, 6000g, 8000g	ASTM Class 1	OIML E2
EXP10202, M, N	6000g, 8000g,10,000g, 12,000g	ASTM Class 1	OIML E2
EXP6201	2000g, 3000g, 4000g, 6000g	ASTM Class 2	OIML F1
EXP8201	2000g, 4000g, 6000g, 8000g	ASTM Class 2	OIML F1
EXP10201	2500g, 5000g, 7500g, **10,000g**	ASTM Class 2	OIML F1
EXP24001	10000g,15000g,20000g, **24000g**	ASTM Class 2	OIML F1
EXP35001	10000g,20000g,30000g, **35000g**	ASTM Class 2	OIML F1
EXP65001	20000g,40000g,60000g, **65000g**	ASTM Class 2	OIML F1

4.2 Operational Test

1. Connect a functioning Power Adapter to the balance.
2. Plug the Power Cord into a suitable power source.
3. Verify that the balance starts up sequence occurs properly. Note any error codes.

4.3 Loadcell Test Using Ramp

To test the Load Cell using RAMP, see **Appendix B**.

4.4 Performance Test

Accurate performance of the EXR and EXP series balances is determined by a series of four performance tests. The displayed readings are compared with the tolerances listed in Tables 4-5. Tolerance values are expressed in counts. A one-count difference is shown in the last digit on the balance display.

The following performance tests are used to evaluate balance operation before and after repairs. The balance must meet the requirements specified in each test as well as the specifications listed in Table 4-5. Before proceeding with the following tests, the balance should be warmed up (60 minutes) and calibrated. (See **Appendix B**)

4.4.1 Precision Test

The Precision Test is a quick test that measures the deviation of a limited number of weight readings. If the balance passes the precision test then the following tests should be performed.

Note: This is a reference test. It is not a required test but it can be used to determine if the balance is working properly.

1. The reading on the display should be 0g.
2. Select a weight 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 weight. The reading should return to 0g.
4. Repeat this test three times. The readings should be with the tolerance, see table 4-5. If so, the balance passes the Precision Test.

If the deviation for any set of readings (using the same weight placed on the center of the Pan) is greater than its Tolerance, 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 balance 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)
- If the balance does not pass this test, the Load Cell may need to be replaced.

4.4.2 Repeatability Test

The repeatability specification is defined as the Standard Deviation value derived from a set of weight readings. This test uses more weight data than the Precision Test and will allow for occasional weight deviations due to testing variations.

Repeatability Test – Non-approved models

Requirements:

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

Set Up:

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

Enter the user menu and adjust and record the following settings:

- Set the Stability setting to 0.5d (its lowest setting).
- Set the Filter level to “Middle”.
- Set the AZT (Auto Zero Tracking) to .5d (its lowest setting). Do not turn it off.
- Set the instrument to display the same units as the performance specifications. (Usually kg, g, or mg)

Record Test Parameters:

- Stability Setting = _____
- Filter Level Setting = _____
- Auto Zero Tracking Setting = _____
- Displayed Units = _____
- Weight Used = _____

Test Procedure:

1. Zero the instrument.
2. Using a test weight approximately half the capacity of the instrument, place the weight on the center of platform. Record the reading on the worksheet provided.
3. Remove the weight from the platform.
4. Repeat this test starting at Step 1 until you record a total of ten readings.

Fill in the worksheet 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).
   Mean = (Reading 1 + Reading 2 + Reading 3 + Reading 4 + Reading 5+ 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, check environmental conditions, ensure that the balance 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)

Repeatability Test – Approved models

This test is a variation of the test above. Rather than determining acceptance based on the standard deviation of the errors, MPE is used. The weights are used, greater than 80% and near 100% of maximum capacity.

1. See Table 1-1 to determine the test weight values that must be used.
2. Record 10 readings using each weight value. Zero the balance between each reading if necessary.
3. The difference between the results of the 10 readings must be less than the absolute value of the Maximum Permissible Error (MPE) for the load. The MPE for each load in grams is given in Table 4-6.

4.4.3 Linearity Test

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

This is a reference test for approved balances as there is no linearity specification. The approved models should be able to pass this test, so it is still valid to determine balance performance.

NOTE:

The balance must pass the Precision and Repeatability Tests and be calibrated before the Linearity Test is performed.

TABLE 4-3 LINEARITY TEST - REFERENCE AND LOAD WEIGHTS

Model		Reference Weights	Load 1	Load 2	Load 3
EXP125D/AD	EXR125D	30g	30g	60g	90g
EXP125/AD	EXR125	30g	30g	60g	90g
EXP225D/AD	EXR225D	50g	50g	100g	150g
EXP225/AD	EXR225	50g	50g	100g	150g
EXP124/AD	EXR124	30g	30g	60g	90g
EXP224/AD	EXR224	50g	50g	100g	150g
EXP324/AD	EXR324	75g	75g	150g	225g
EXP223/AD	EXR223	50g	50g	100g	150g
EXP423/AD	EXR423	100g	100g	200g	300g
EXP623/AD	EXR623	150g	150g	300g	450g
EXP1203/AD	EXR1203	300g	300g	600g	900g
EXP2202	EXR2202	500g	500g	1000g	1500g
EXP4202	EXR4202	1000g	1000g	2000g	3000g
EXP6202	EXR6202	1500g	1500g	3000g	4500g
EXP8202	EXR8202	2000g	2000g	4000g	6000g
EXP12202	EXR12202	3000g	3000g	6000g	9000g
EXP6201	EXR6201	1500g	1500g	3000g	4500g
EXP8201	EXR8201	2000g	2000g	4000g	6000g
EXP10201	EXR10201	2500g	2500g	5000g	7500g
EXP24001		5000g	5000g	10000g	15000g
EXP35001		10000g	10000g	15000g	25000g
EXP65001		10000g	10000g	30000g	50000g

NOTE: All weights are nominal values. Be certain to use the same reference weight throughout the procedure.

1. Place the Reference Weight on the Balance, record the weight and remove.
2. Place Load 1 on the Balance and press TARE.
3. Place the test weight on the Balance, record the weight and remove.
4. Place Load 2 on the Balance and press TARE.
5. Place the test weight on the Balance, record the weight and remove.
6. Place Load 3 on the Balance and press TARE.
7. Place the test weight on the Balance and record the weight.
8. The difference in the weights of the test weight should be within the tolerance in Table 4-5. If the differences are out of tolerance, verify the test conditions and repeat the test.
9. If the Balance remains out of tolerance, the Load Cell may need to be replaced.

4.4.4 Off-Center Load Test

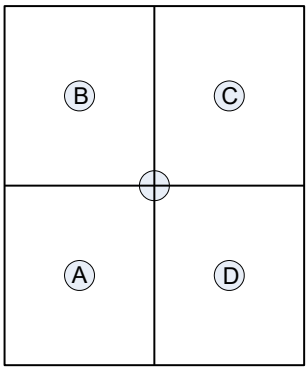
The Off-Center Load Test is used to determine whether displayed weight values are affected by moving the sample to different areas of the Pan. OCL test may also be referred to as a Shift Test (NTEP) or an Eccentricity Test (OIML).

The test weight used in this test 1/3 the capacity of the balance. See table for the test weight values.

TABLE 4-4 OFF CENTER LOAD WEIGHT VALUES

Model		OCL Weights Value	Notes
EXP125D/AD	EXR125D	30g/60g	1. The Class of the weights used in OCL testing is not critical. 2. Use large weights where possible. Smaller weights can be stacked on the larger, but a stability problem may occur if many smaller weights are used. If weights cannot be stacked, they must be placed uniformly over the segment. 3. The OCL weights in this table are recommended for use but not mandatory, you can choose the one with the value greater than and close to 1/3 capacity of the balance.
EXP125/AD	EXR125	60g	
EXP225D/AD	EXR225D	50g/100g	
EXP225/AD	EXR225	100g	
EXP124/AD	EXR124	60g	
EXP224/AD	EXR224	100g	
EXP324/AD	EXR324	150g	
EXP223/AD	EXR223	100g	
EXP423/AD	EXR423	200g	
EXP623/AD	EXR623	300g	
EXP1203/AD	EXR1203	600g	
EXP2202	EXR2202	1000g	
EXP4202	EXR4202	2000g	
EXP6202	EXR6202	3000g	
EXP8202	EXR8202	4000g	
EXP12202	EXR12202	6000g	
EXP6201	EXR6201	3000g	
EXP8201	EXR8201	4000g	
EXP10201	EXR10201	5000g	
EXP24001		10000g	
EXP35001		15000g	
EXP65001		30000g	

The test positions (A-D) must be centrally located in each segment.



Rectangular Pan

Procedure:

1. Set AZT (Auto Zero Tracking) to off. This setting is located in Menu - Balance Setup - AZT menu.
2. Place the test weight in the center of the Weighing Pan.
3. Tare the balance.
4. Move the weight to location A and record the reading (when stability indicator comes on).
5. Move the weight to location B and record the reading.
6. Move the weight to location C and record the reading.
7. Move the weight to location D and record the reading.
8. Maximum allowable change in displayed weight readings for each of the four positions can be found in Specifications Tables (Chapter 1). If this maximum is exceeded verify the test conditions and retest the balance. If there is no improvement the loadcell must be replaced.

Note: In high resolution balances (Class I) it may be necessary to zero or tare between each location.

TABLE 4-5 TOLERANCE TABLE

Models		Precision (g)	Repeatability SD (g)	Linearity (g)	Off Center Load (g)
EXP125D/AD	EXR125D	±0.00010(75g)/ ±0.0005(120g)	0.00002/ 0.0001	±0.00015/ ±0.0002	±0.00012/ ±0.0004
EXP125/AD	EXR125	±0.00010(120g)	0.00002	±0.00015	±0.00012
EXP225D/AD	EXR225D	±0.00010(100g)/ ±0.0005(200g)	0.00002/ 0.0001	±0.00015/ ±0.0002	±0.00012/ ±0.0004
EXP225/AD	EXR225	±0.00020(200g)	0.00003	±0.00015	±0.00019
EXP124/AD	EXR124	±0.0005(120g)	0.0001	±0.0002	±0.0004
EXP224/AD	EXR224	±0.0005(200g)	0.0001	±0.0002	±0.0004
EXP324/AD	EXR324	±0.0005(300g)	0.0001	±0.0002	±0.0004
EXP223/AD	EXR223	±0.005(200g)	0.001	±0.002	±0.004
EXP423/AD	EXR423	±0.005(400g)	0.001	±0.002	±0.004
EXP623/AD	EXR623	±0.005(600g)	0.001	±0.002	±0.004

Models		Precision (g)	Repeatability SD (g)	Linearity (g)	Off Center Load (g)
EXP1203/AD	EXR1203	±0.005(1200g)	0.001	±0.002	±0.004
EXP2202	EXR2202	±0.05(2000g)	0.01	±0.02	±0.04
EXP4202	EXR4202	±0.05(4000g)	0.01	±0.02	±0.04
EXP6202	EXR6202	±0.05(6000g)	0.01	±0.02	±0.04
EXP8202	EXR8202	±0.05(8000g)	0.01	±0.02	±0.04
EXP12202	EXR12202	±0.05(10000g)	0.01	±0.02	±0.04
EXP6201	EXR6201	±0.1(6000g)	0.01	±0.02	±0.04
EXP8201	EXR8201	±0.1(8000g)	0.01	±0.02	±0.04
EXP10201	EXR10201	±0.1(10000g)	0.01	±0.02	±0.04
EXP24001		±0.5(20000g)	0.1	±0.2	±0.5
EXP35001		±0.5(35000g)	0.1	±0.2	±0.5
EXP65001		±0.5(60000g)	0.1	±0.2	±1.0

Note: Maximum errors for balances in usage are twice the acceptable errors for initial verification.

TABLE 4-6 MPE - Maximum Permissible Error

MPE	For loads (m) in verified units (e)	
	Class I	Class II
± 0.5 e	0≤m≤50,000	0≤m≤5000
± 1 e	50,000<m≤200,000	5000<m≤20,000
± 1.5 e	200,000<m	20,000<m≤1000,000

Note: MPE (Maximum Permissible Error) is applied for the Approval models. Maximum errors for balances in usage are twice the acceptable errors for initial verification.

4.5 HI-POT Test (for EXP HiCap ONLY)

The purpose of the Hi-pot test is to ensure that any electricity going into the device does not energize the exterior of the device or it's surroundings. This is an essential test for safety as well as preventing damage to the device and the area around it. Due to these reasons the Hi-pot test is mandatory after the device (AC input) is reassembled after a repair. The HI-POT test include the Earthing Resistance and High Voltage tests.

Protective earth continuity (Earthing Resistance Test): A continuity test is made between the earth pin of the appliance inlet or the mains plug of plug-connected equipment, and accessible metal heating/stirring surface or accessible metal support plate for ceramic heating surface, as applicable. Note: the test current should be set to **25A**, testing time **5s** and max resistance **0.1Ω**.

Dielectric strength (High Voltage Test): The equipment shall withstand without breakdown a test voltage of **1800Vac** from the mains terminals connected together, and all accessible conductive parts. The max leakage current shall set to **10mA**. The test voltage shall be raised to the specified value within **5s**, and maintained for at least **5s**. No flashover of clearances or breakdown of solid insulation shall occur during the test, nor shall the test device indicate failure.

Please refer to Appendix D for the instruction of the HI-POT test.

TABLE 4-7 HI-POT TEST PARAMETERS

Product Family	High Voltage Test Parameters						Earthing Resistance Test Parameters			
	Voltage Type	Voltage	Max Current	Min Current	Raise Voltage Time	Testing Time	Current	Zero Resistance	Max Resistance	Testing Time
	(AC,DC, both)	(in Volts)	(in mA)	(in mA)	(in secs)	(in secs)	(in A)	(in mΩ)	(in mΩ)	(in secs)
EXP HiCap	ACW	1550	5	0	5	5	3	0	100	5

5 PARTS LISTS & DIAGRAMS

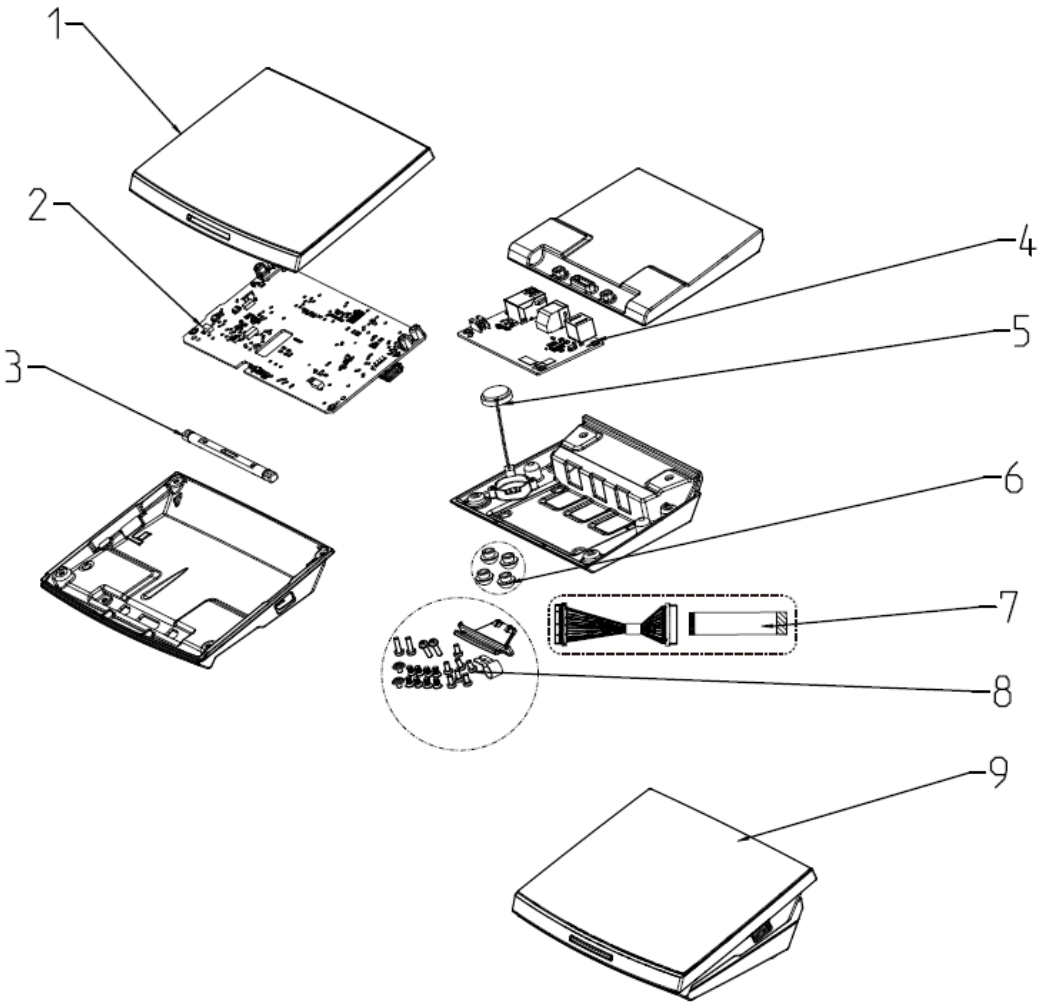
This section of the manual contains parts lists and exploded views for the EXR and EXP series balances. These are designed to identify the parts which can be serviced on the balance in the field. The parts list and exploded views are separated into separate sections for the Terminal, the Base and the Draft Shield.

To order spare parts, identify the required item in the exploded views and parts list, then use the Spare Parts List to obtain the current part number for this item.

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

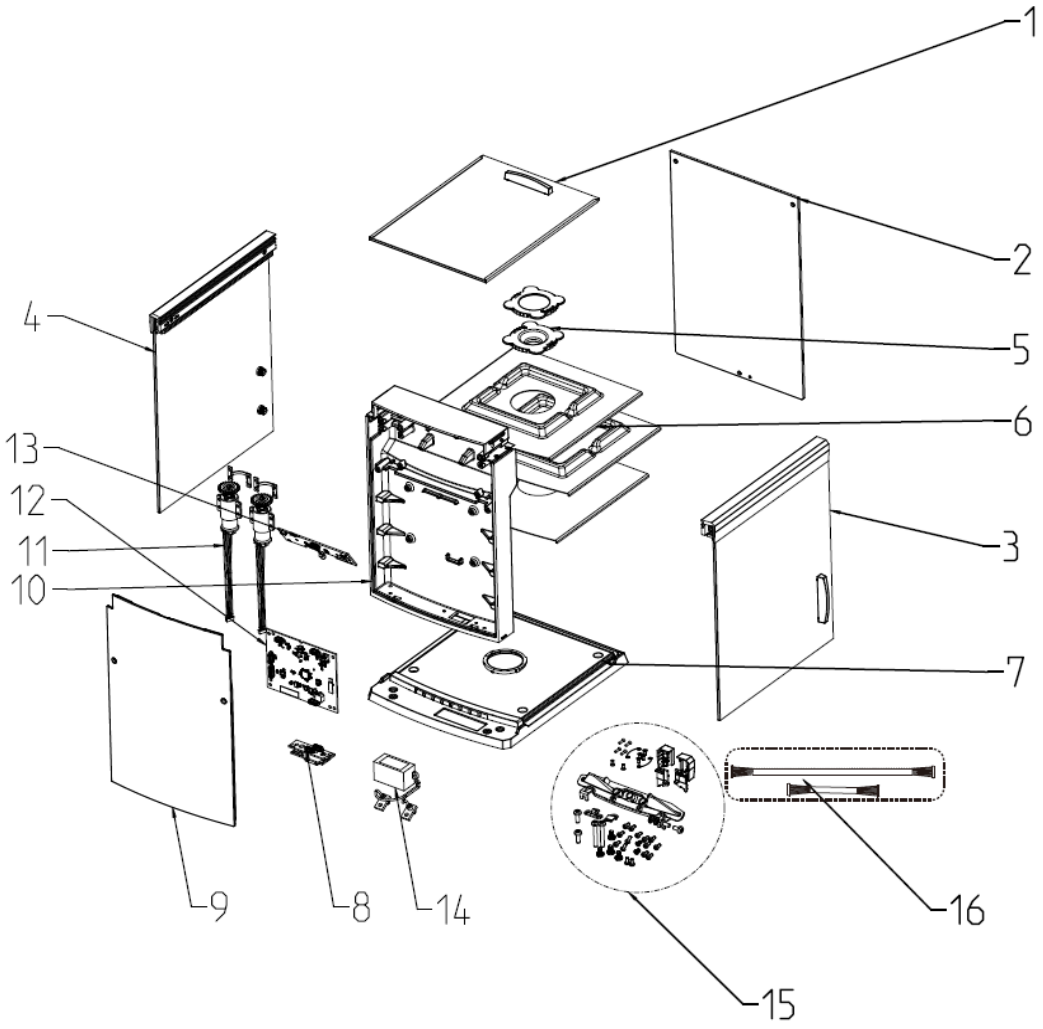
If further technical information is needed, please contact your local Ohaus office, or www.ohaus.com.

5.1 EXP Terminal



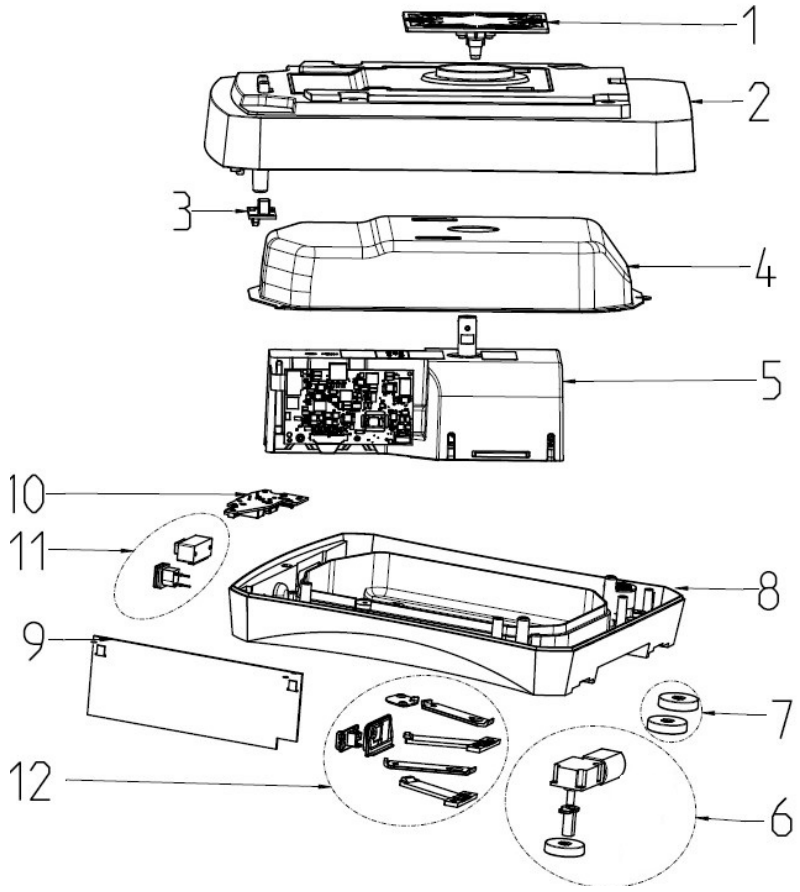
Drawing Item	Description
1	Display LCD kit EXP
2	PCB Main Terminal EXP
3	Hinge Terminal EXP
4	PCB Interface EXP
5	Speaker EXP EXR
6	Feet (4) Terminal EXP
7	Cable kit Base Terminal EXP EXR
8	Hardware kit Terminal EXP
9	Terminal complete EXP

5.2 EXP Draft Shield



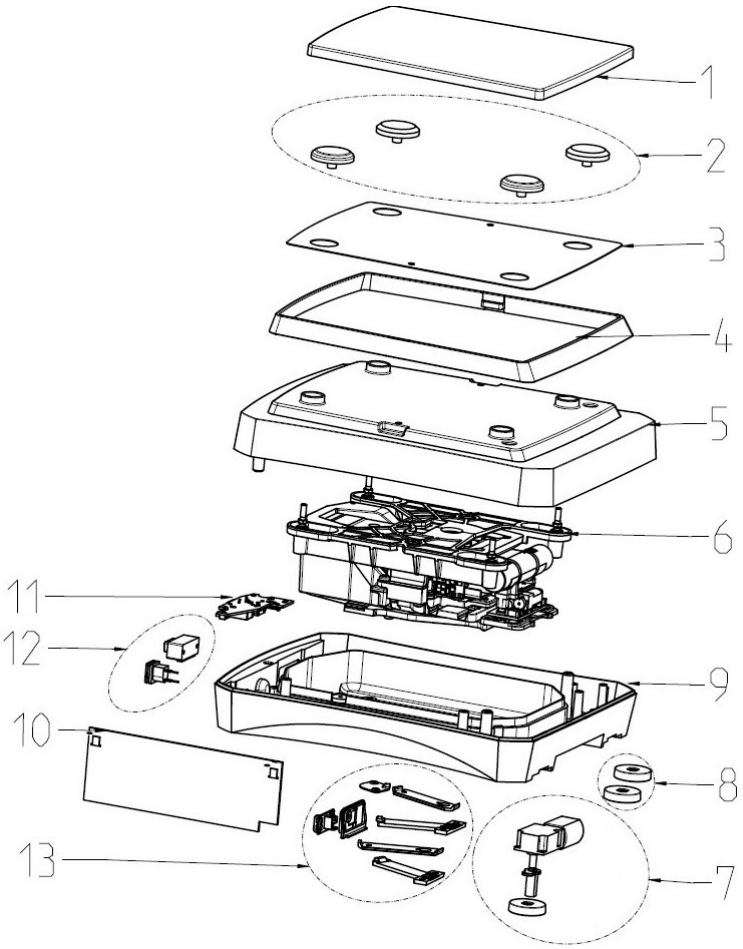
Drawing Item	Description	Drawing Item	Description
1	Top door kit EXP EXR	8	PCB Pogo pin EXP
2	Front glass EXP EXR	9	Cover Backwall EXP EXR
3	Side door kit left EXP	10	Backwall EXP
4	Side door kit right EXP	11	Motor kit DS EXP
5	Cover lock 5 place EXP EXR	12	PCB Motor DS EXP
	Cover lock 3-4 place EXP EXR	13	PCB Light DS EXP
6	Plate EMC 5 place EXP EXR	14	Ionizer EXP
	Plate EMC 4 place EXP EXR	15	Hardware kit DS EXP EXR
	Plate EMC 3 place EXP EXR	16	Cable kit DS EXP
7	Base plate DS EXP EXR		

5.3 EXP Base (Draft Shield Models)



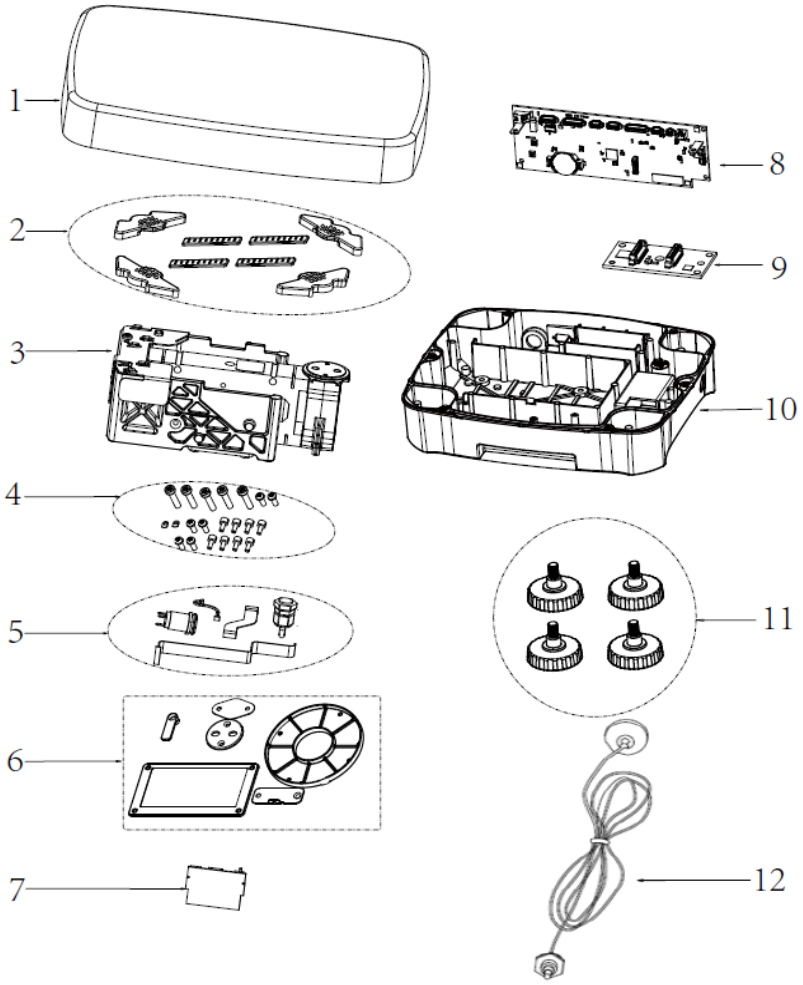
Drawing Item	Description	Drawing Item	Description
1	Pan kit SQ130 EXP EXR	6	Motor kit Feet EXP
	Pan kit SQ90 EXP EXR	7	Feet (2) Base EXP
	Pan kit SQ80 EXP EXR	8	Bottom housing with bubble kit EXP
2	Top housing kit DS EXP	9	PCB Main Base EXP
3	PCB Pogo pin EXP	10	PCB Interface Base EXP EXR
4	Cover loadcell EXP EXR	11	Cable kit Base Terminal EXP EXR
5	Load Cell NMDWI0200G5-4U	12	Hardware kit Base EXP EXR
	Load Cell NMDWI0200G5-3U	NS	Plug set white AU/EU/GB/US/CN/KR
	Load Cell NMDWI0200G5-2U	NS	Power supply,12V,18W white
	Load Cell NMDWI0400G4-7C	NS	Package kit DS EXP
	Load Cell NMDWI0400G4-3C	NS	Carton DS EXP EXR
	Load Cell NMDWI0400G4-2C		
	Load Cell NMDWI0600G3-3C		
	Load Cell NMDWI1200G3-3C		

5.4 EXP Base (Non-Draft Shield Models)



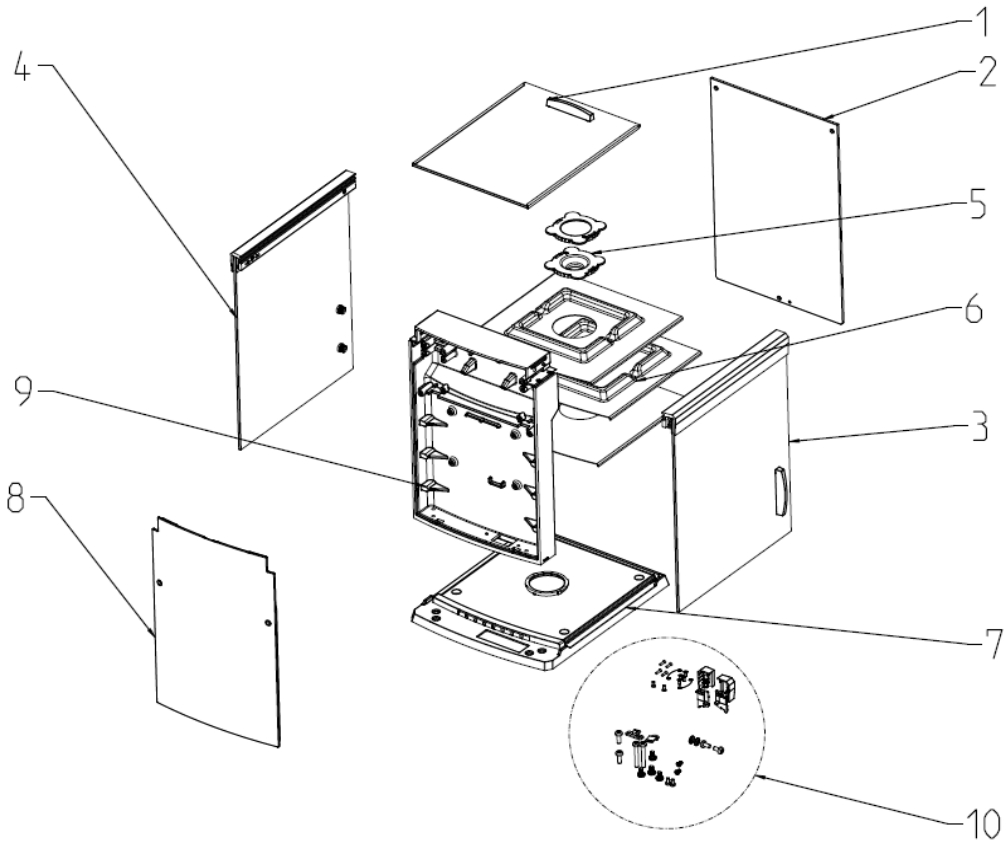
Drawing Item	Description	Drawing Item	Description
1	Pan kit Square EXP EXR	9	Bottom housing with bubble kit EXP
2	Cap pan support (4) EXP EXR	10	PCB Main Base EXP
3	Plate EMC 1-2 place EXP EXR	11	PCB Interface Base EXP EXR
4	Wind ring 1-2 place EXP EXR	12	Cable kit Base Terminal EXP EXR
5	Top housing kit non-DS EXP	13	Hardware kit Base EXP EXR
6	Load Cell NMDWI4000G2-2S	NS	Plug set white AU/EU/GB/US/CN/KR
	Load Cell NMDWI6000G2-5S	NS	Power supply,12V,18W white
	Load Cell NMDWI0012K5-4S	NS	Package kit non DS EXP
7	Motor kit Feet EXP	NS	Carton non-DS EXP EXR
8	Feet (2) Base EXP		

5.5 EXP Base HiCap



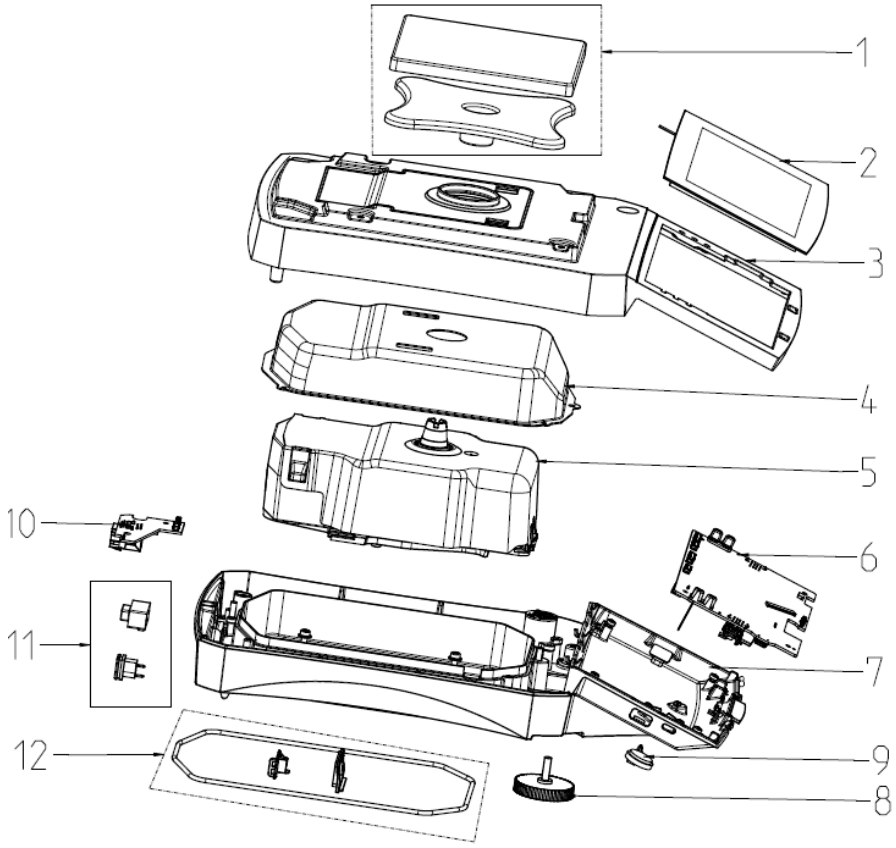
Drawing Item	Description	Drawing Item	Description
1	SP Larger Pan EX HiCap	12	SP Power-Cord US EX HiCap
2	SP Pan support Assembly EX HiCap		SP Power-Cord EU EX HiCap
3	Load Cell NMDWI0032K4-2C		SP Power-Cord CN EX HiCap
	Load Cell NMDWI0064K4-2C		SP Power-Cord UK EX HiCap
4	SP Screws kit,EX HiCap		SP Power-Cord AU EX HiCap
5	Cable kit EXP HiCap		SP Power-Cord JP EX HiCap
6	Hardware kit EXP HiCap		SP Power-Cord KR EX HiCap
7	SP PCBA, LFT,EX HiCap		SP Power-Cord BR EX HiCap
8	PCB Main Base EXP	NS	SP Power adapter EX HiCap
9	PCB Interface Base EXP HiCap	NS	Package kit EXP HiCap
10	Bottom housing with bubble kit EXP HiCap	NS	Shipping Box EX HiCap
11	SP Feet Kit (4), Large R71		

5.6 EXR Draft Shield



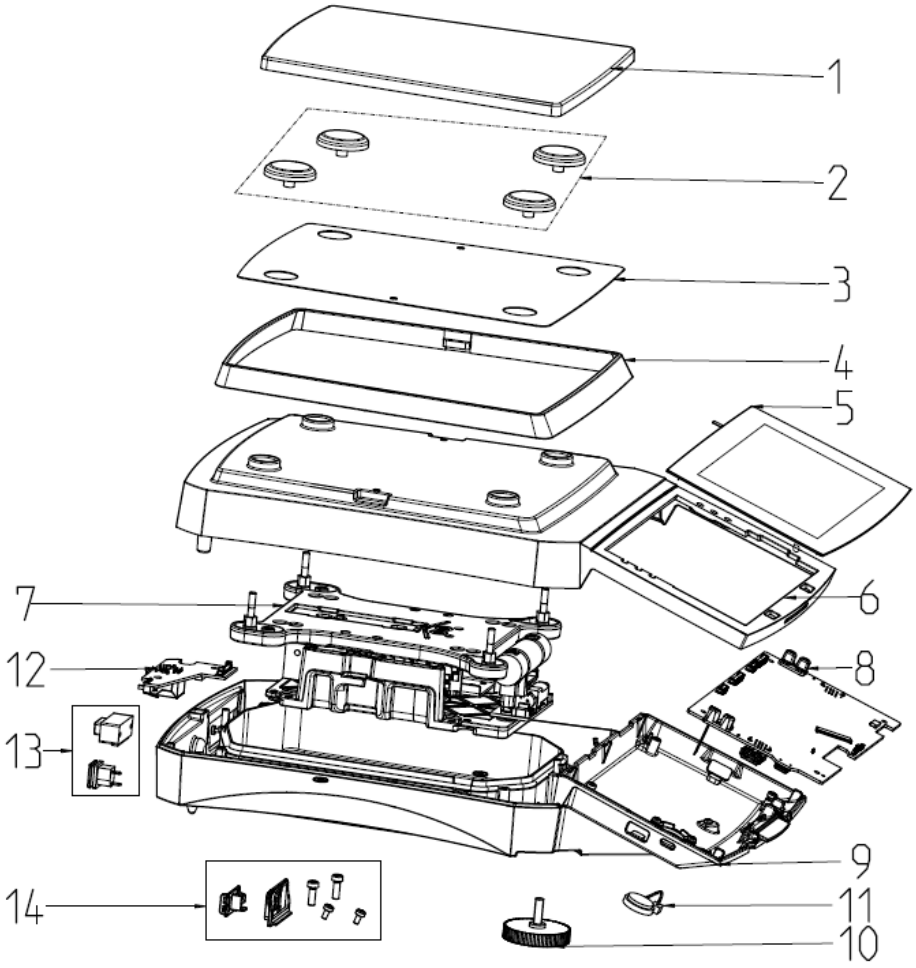
Drawing Item	Description
1	Top door kit EXP EXR
2	Front glass EXP EXR
3	Side door kit left EXR
4	Side door kit right EXR
5	Cover lock 5 place EXP EXR
	Cover lock 3-4 place EXP EXR
6	Plate EMC 5 place EXP EXR
	Plate EMC 4 place EXP EXR
	Plate EMC 3 place EXP EXR
7	Base plate DS EXP EXR
8	Cover Backwall EXP EXR
9	Backwall EXR
10	Hardware kit DS EXP EXR

5.7 EXR Base (Draft Shield Models)



Drawing Item	Description	Drawing Item	Description
1	Pan kit SQ130 EXP EXR	6	PCB Main EXR
	Pan kit SQ90 EXP EXR	7	Bottom housing with bubble kit EXR
	Pan kit SQ80 EXP EXR	8	Feet 4pcs, AX
2	Display LCD EXR	9	Speaker EXP EXR
3	Top housing kit DS EXR	10	PCB Interface Base EXP EXR
4	Cover loadcell EXP EXR	11	Cable kit Base Terminal EXP EXR
5	Load Cell NMDWI0200G5-4U	12	Hardware kit Base EXP EXR
	Load Cell NMDWI0200G5-3U	NS	Plug set white AU/EU/GB/US/CN/KR
	Load Cell NMDWI0200G5-2U	NS	Power supply,12V,18W white
	Load Cell NMDWI0400G4-7C	NS	Package kit DS EXR
	Load Cell NMDWI0400G4-3C	NS	Carton DS EXP EXR
	Load Cell NMDWI0400G4-2C		
	Load Cell NMDWI0600G3-3C		
	Load Cell NMDWI1200G3-3C		

5.8 EXR Base (Non Draft Shield Models)



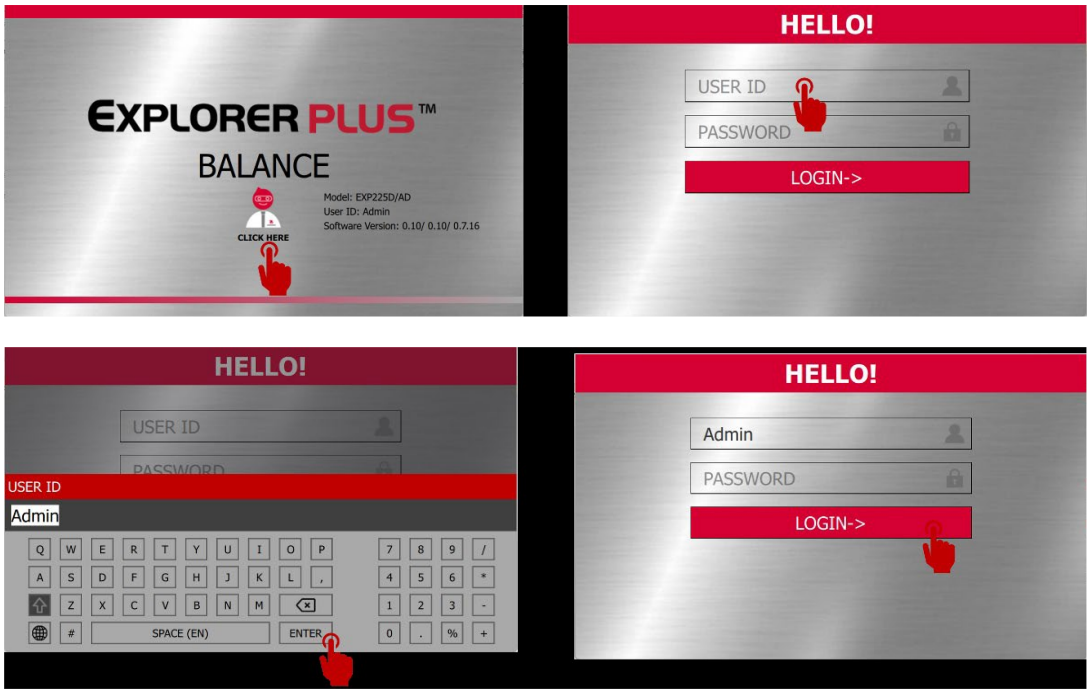
Drawing Item	Description	Drawing Item	Description
1	Pan kit Square EXP EXR	9	Bottom housing with bubble kit EXR
2	Cap pan support (4) EXP EXR	10	Feet 4pcs, AX
3	Plate EMC 1-2 place EXP EXR	11	Speaker EXP EXR
4	Wind ring 1-2 place EXP EXR	12	PCB Interface Base EXP EXR
5	Display LCD EXR	13	Cable kit Base Terminal EXP EXR
6	Top housing kit non-DS EXR	14	Hardware kit Base EXP EXR
7	Load Cell NMDWI4000G2-2S	NS	Plug set white AU/EU/GB/US/CN/KR
	Load Cell NMDWI6000G2-5S	NS	Power supply,12V,18W white
	Load Cell NMDWI0012K5-4S	NS	Package kit non DS EXR
8	PCB Main EXR	NS	Carton non-DS EXP EXR

APPENDIX A - RESET PASSWORD

If the users forgot the Administration password, they could reset the password by following instructions.

Get the Key

1. Turn on the balance.
2. Login the balance with USER ID: **Admin** and long press the **LOGIN** icon for 15 seconds.



3. The Key appears on the lower screen, like below, please record and send it to OHAUS technical support for the temporary password.

   Note: Once the temporary password is used, it will be invalid. Please change the password as soon as possible.

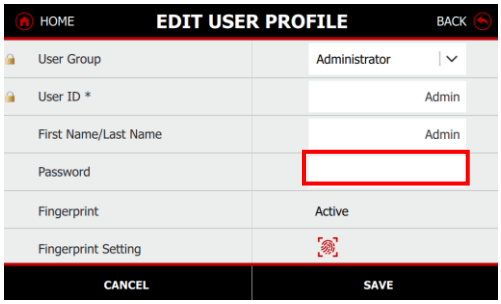
Generate the Temporary Password (Ohaus technical support)

4. Provide the Temporary Password by Ohaus regional service managers.

Operation Steps of the Temporary Password

5. Please enter the new 8-digit one-time temporary password.

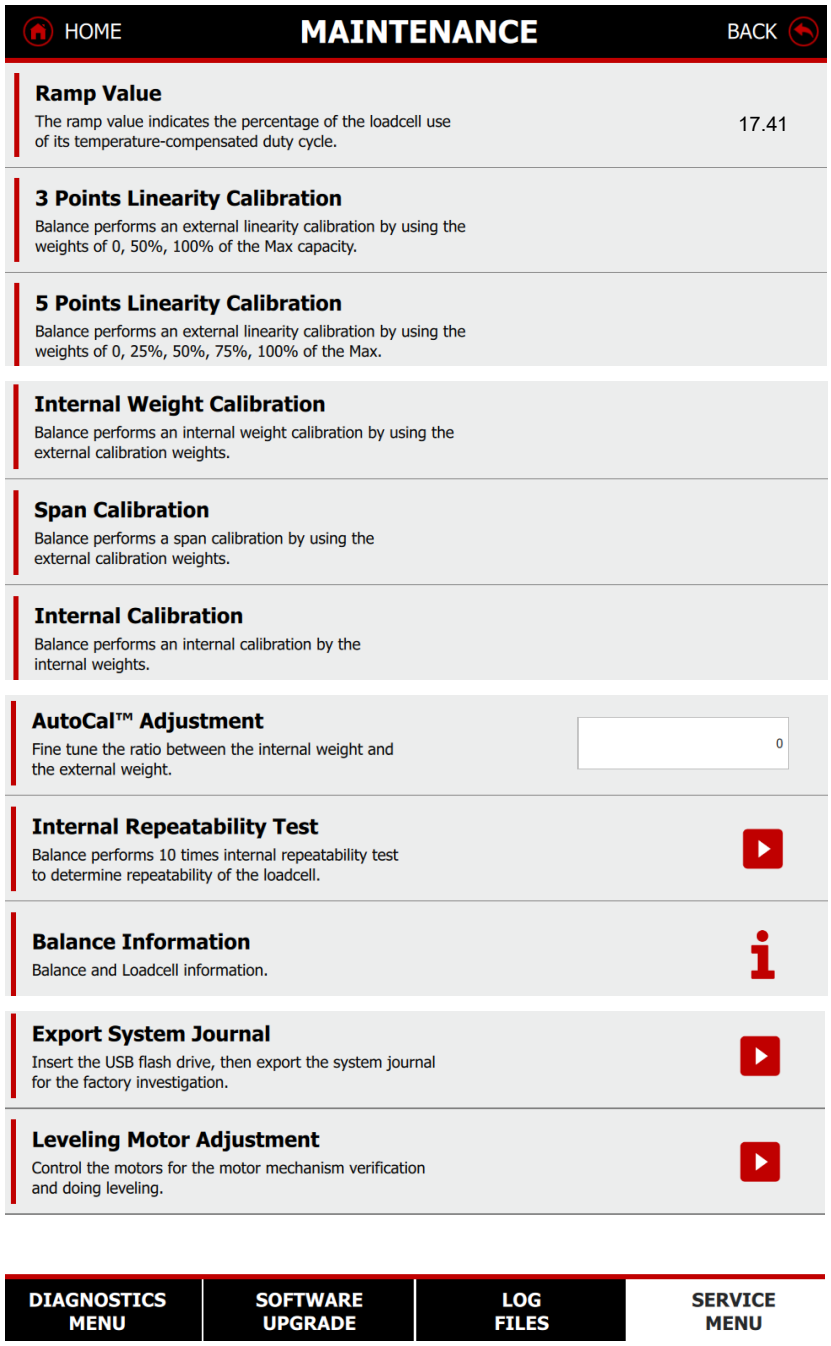
6. The Admin password has been reset. Please change the password as soon as possible.



Note: Once the temporary password is entered, it will be invalid.

APPENDIX B - SERVICE MENU

The Service Menu allows authorized service personnel to monitor Ramp or perform a variety of service weight calibrations. From the **Main Menu**, scroll down then touch **Maintenance** to enter the Maintenance Interface, Touch **SERVICE MENU**. A password '**Explorer**' is required to access Service Menu. The service items are shown below.



Ramp Value

The ramp display shows the percentage of use of the A to D circuit, that is, of the temperature-compensated duty cycle. The actual value is not as important as how it changes. It should increase as the weight on the balance is increased. The ramp display should remain constant without fluctuations.

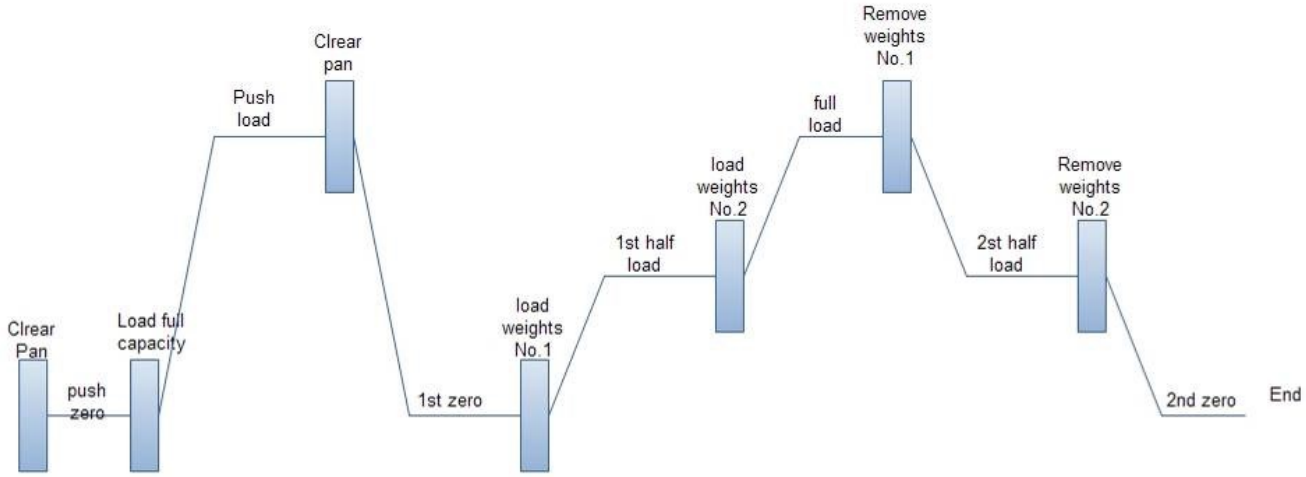
The normal range is between 3% to 97%. If the readings are outside this range the load-cell is likely bad. Fluctuations in the display may indicate mechanical interference, a cable connection problem, a damaged Main PCB or a damaged load-cell.

3 Point- Linearity Calibration

A three-point linearization is also rarely required and is difficult to perform accurately under the less than ideal conditions outside the factory. This service calibration requires that accurate calibration weights be used. Calibration points are done at approximately 0, 50% and 100% of maximum capacity. After the linearization procedure, the balance shall start an Internal Weight Calibration and Service Span calibration.

The sequence of loading the test weights on the platform is very important to ensure a correct linearity calibration. Refer to the diagram below for the correct weight sequence.

Notes: After service linearization, internal weight calibration and service span calibration shall be performed.

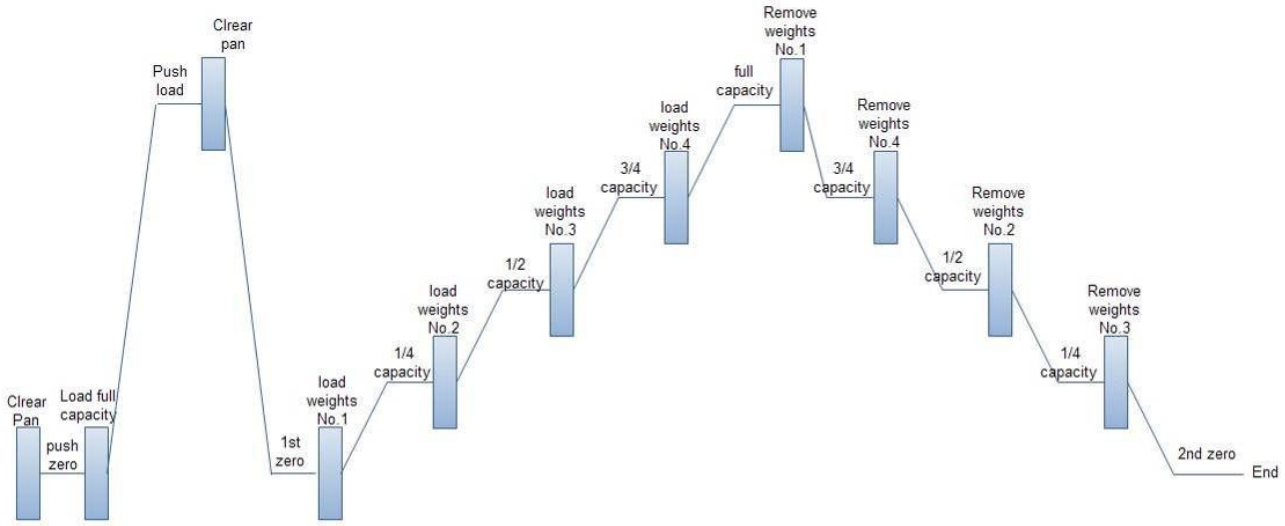


5 Point- Linearity Calibration

A five-point linearization is rarely required and is the most difficult to perform accurately under the less than the ideal conditions outside the factory. This service calibration requires that accurate calibration weights be used. Calibration points are done at approximately 0, 25%, 50%, 75% and 100% of maximum capacity. After the linearization procedure, the balance shall start an Internal Weight Calibration and Service Span Calibration.

The sequence of loading the test weights on the platform is very important to ensure a correct linearity calibration. Refer to the diagram below for the correct weights sequence. Load each numbered weights (or group of weights if required) in the order indicated (No.1, No.2, No.3, No.4) then remove the weights in the correct order (No.1, No.4, No.2, No.3). This is done to reduce the effects of the individual weight inaccuracies on the linearity calibration.

Notes: After service linearization, internal weight calibration and service span calibration shall be performed.



Internal Weight Calibration

Internal weight calibration in the Service Menu is used to determine the balance's internal weight. This establishes a ratio between the internal weight and an external calibration weight.

Service Span Calibration

Service span calibration allows a new zero and maximum setting using an external calibration weight.

Service Internal Calibration

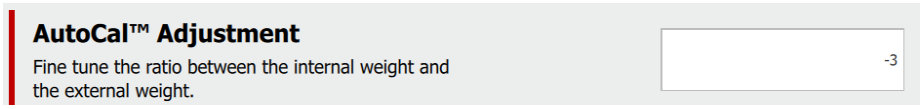
The internal calibration weight is used to calibrate the balance.

Note: If a pan, pan support or load-cell is changed a Service Span Calibration or Service Internal Calibration should be done.

AutoCal Adjustment

Fine tune the ratio between the internal weight and an external weight.

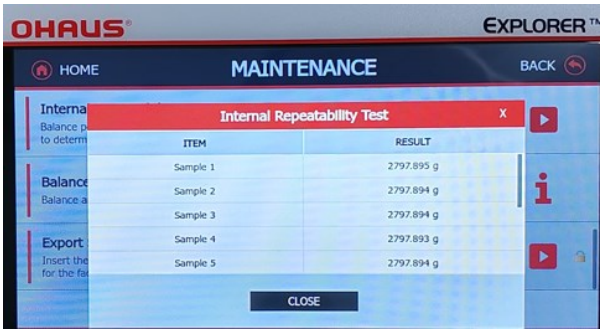
For example: After the internal calibration for EXR224, place the verified 200g weight, which is with the real value 199.9998g in the certificate, balance displays 200.0001g, so AutoCal Adjustment should be 199.9998-200.0001=-0.0003g. Then input -3 to adjust the internal weight value. After that, carry out the internal calibration again, place the verified 200g weight to check if balance displays close to 199.9998g.

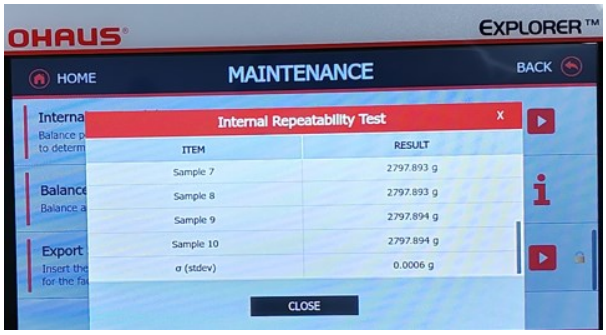


Internal Repeatability Test

The internal weight is used to determine the repeatability of the loadcell. The standard deviation is determined after 10 cycles of the internal weight test.

Notes: Internal repeatability test is not applicable for the models of EXP125/AD, EXP125D/AD, EXP124/AD，EXR125, EXR125D and EXR124, since the internal weight of the loadcell is about 150g, which is more than the balance capacity.





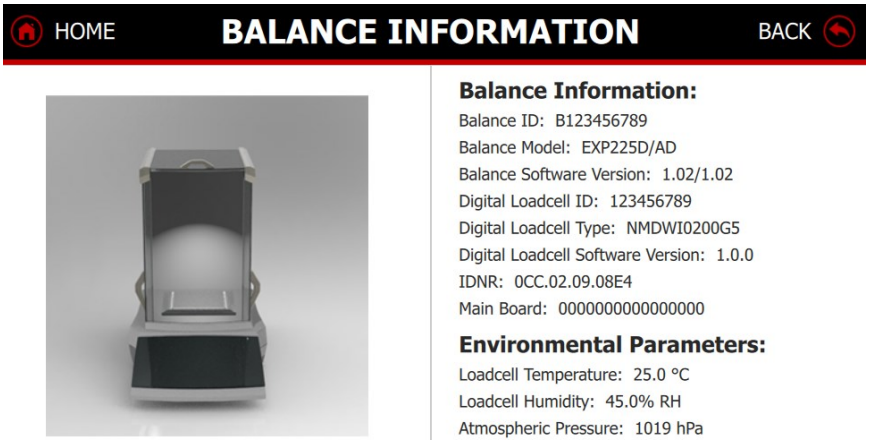
Balance Information

Contains of the Balance Information and Environmental Parameters.

Balance Information：Balance ID, Balance Model, Balance Software Version, Digital Loadcell ID, Digital Loadcell Type, Digital Loadcell Software Version, IDNR and Main Board.

Environmental Parameters： Loadcell Temperature, Humidity and Atmospheric Pressure.

Note: Environmental Parameters are for EXP models ONLY.

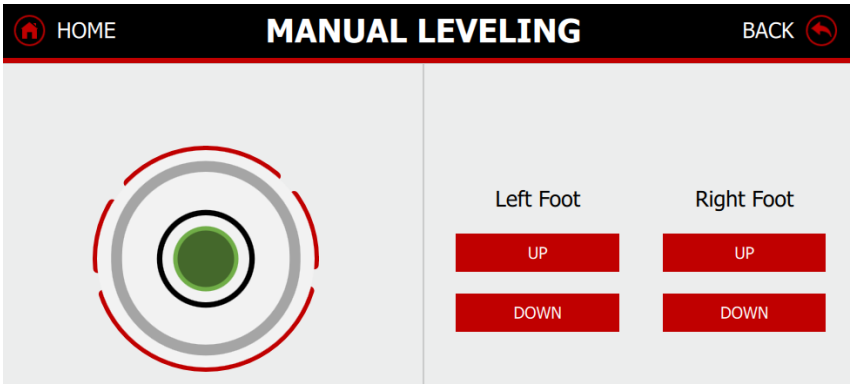


Export System Journal

This System Journal is internally used for troubleshooting by Ohaus R&D personnel. For the service cases without a clue, please insert the USB stick and export system journal then send it to OHAUS for further investigation.

Leveling Motor Adjustment

Control the motors for the motor mechanism verification and do leveling.

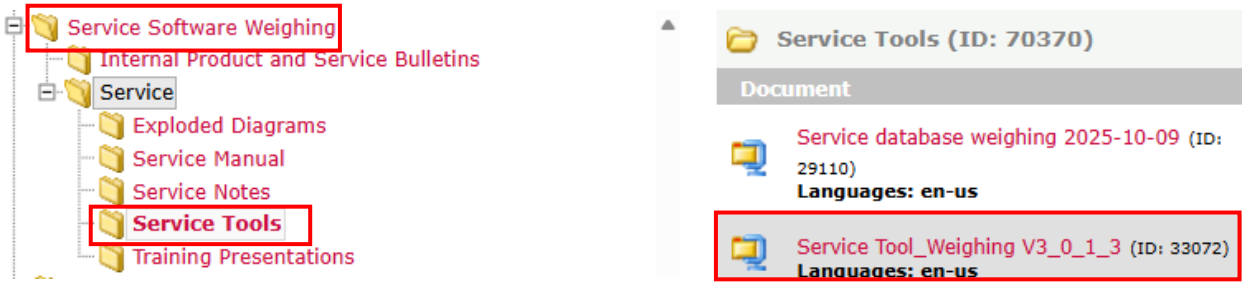


APPENDIX C – SERVICE TOOL

The Software Service Tool (Part Number 83032124) is required when a main PC Board is replaced in a EXR and EXP series balance. It is used to re-configure the balance to its original parameters in the case of PCB replacement. The tool can also be used to communicate with the balance using commands that are listed at the end of the appendix.

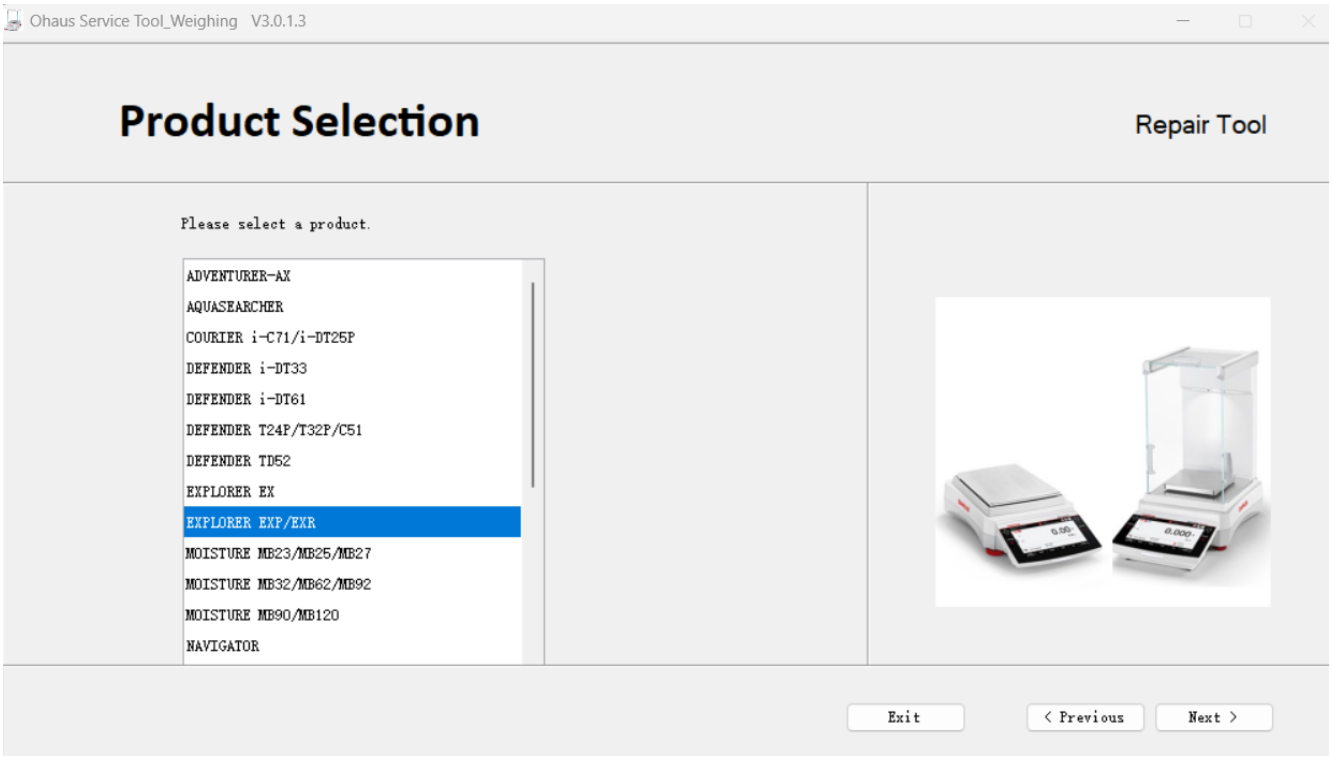
The latest software service tool and support files are available on the Ohaus DMX site.

Please read the Service Tool Instruction Manual (Part Number 30032352) which is also available on Ohaus DMX site.

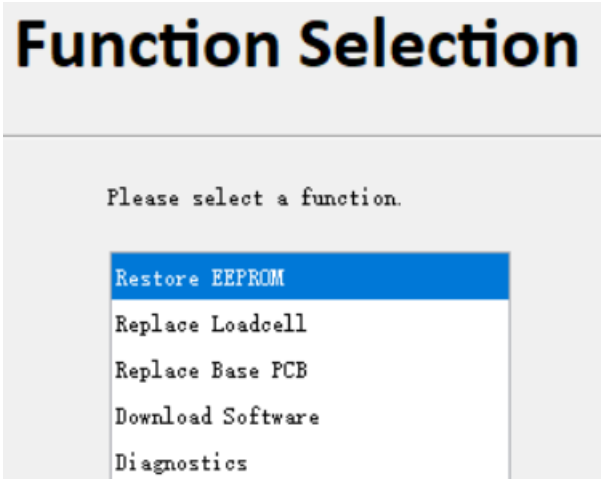


Note: Explorer EXR EXP are available in Ohaus Repair and Service Tools V3.0.1.3 or above, which allows authorized service person only to repair and maintain products.

Please select '**EXPLORER EXP/ EXR**' under **'Product Selection'**



After selecting **' EXPLORER EXP/ EXR ',** you will be able to see the Functions as below.



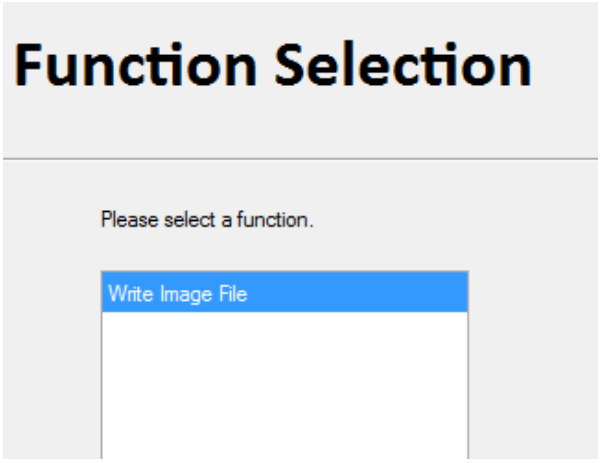
C.1 Restore EEPROM

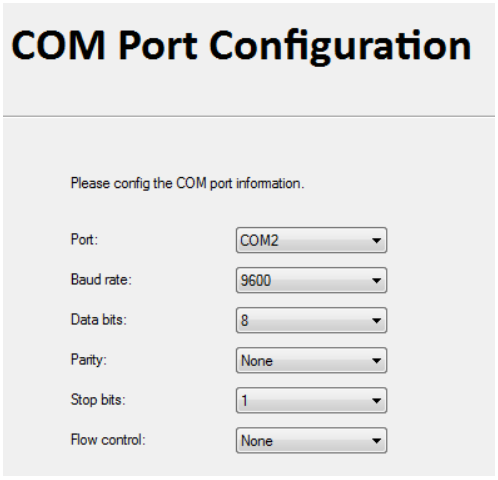
When the balance data is corrupted or lost, it needs to perform the 'Restore EEPROM' to restore to factory/ original settings.

Information such as below needs to be provided to OHAUS in order to obtain the balance eif file.

1. Balance Model Number.
2. Balance Serial Number.
3. Load Cell Serial Number.

Once **Restore EEPROM** is selected Write Image File will appear on screen, Click **Next** to allow you to set the **Com Port Configuration**.



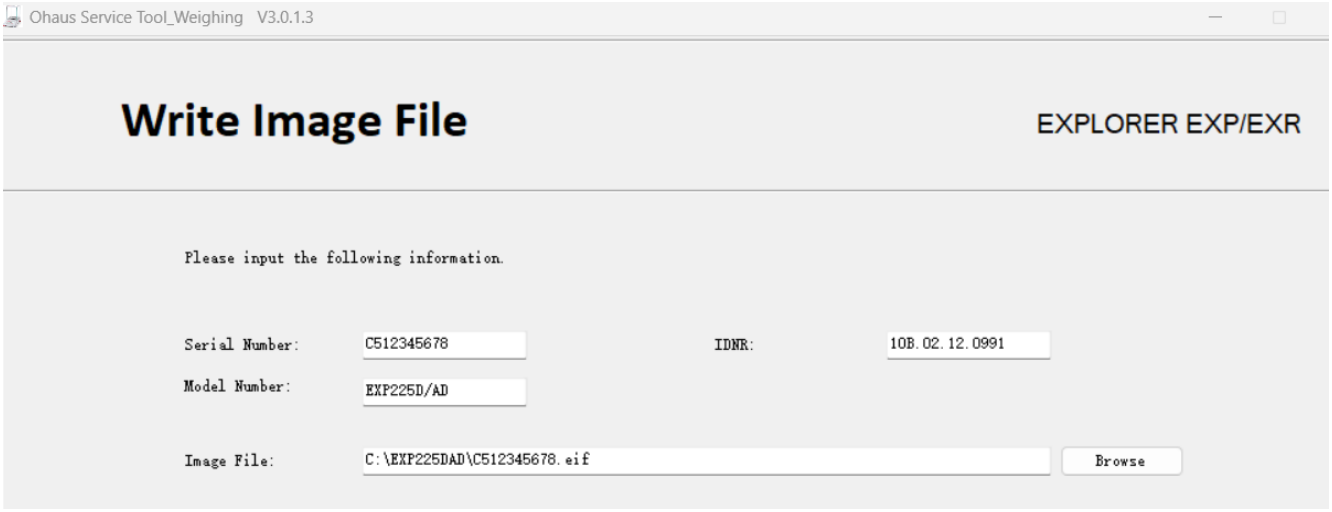


After completing the COM port configuration click **Next.** You will come to **Write Image File** page as shown below.

Fill in the below and click **Next** to complete the **Write Image File** process.

1. Serial Number.
2. Model Number.
3. IDNR.
4. Point to the image file (eif files) provided by OHAUS.

5. Click **Next** to complete the **Write Image File** process.

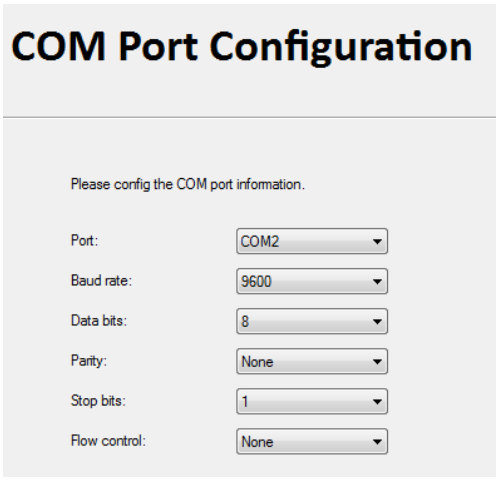


Note: Cycle power and restart the balance when the process of writing image file is completed.

C.2 Replace Loadcell

When replacing the loadcell, it needs to perform the 'Replace Loadcell' to configure the load cell data to match the balance.

Once **Replace Loadcell** is selected, click **Next** to allow you to set the **Com Port Configuration**.

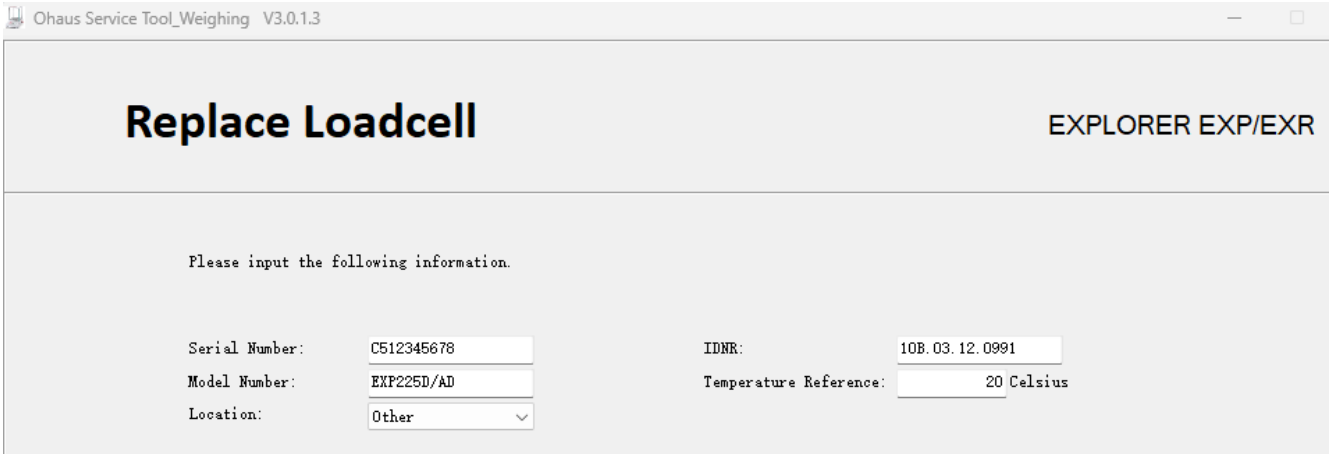


After completing the COM port configuration click **Next.** You will come to **Replace Loadcell** page as shown below.

Fill in the below and click **Next** to complete the **Replace Loadcell** process.

1. Serial Number
2. Model Number
3. IDNR
4. Temperature Reference
5. Location

6. Click **Next** to complete the **Replace Loadcell** process.



Note: Cycle power and restart the balance when the process of preplacing loadcell is completed.

Types of EXP EXR Load Cells


5 place (200g)

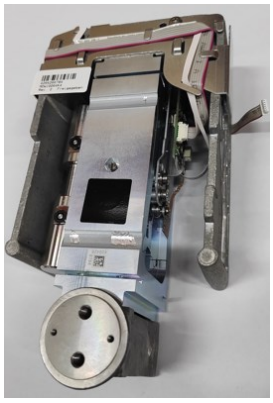

4 place (400g)


3 place (1200g)


3 place (600g)


2 place (4kg)


2/ 1 place (6kg/ 12kg)

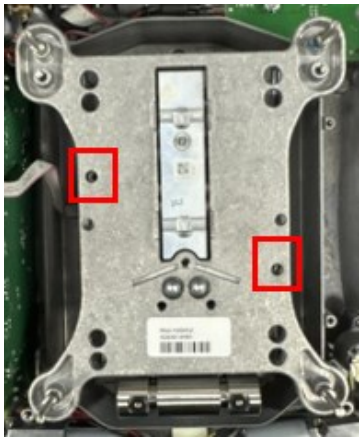

HiCap (32kg/ 64kg)

Remove Loadcell Protection Screws

Attention: This process is only needed for 1, 2 and 3 decimal scales.

It is very important to remove the shipping protection screws after assembling the load cell into the scale housing, otherwise the load cell will not work. Please follow the steps below.

1. Shipping protection screws, as shown in the picture below.



Type 1 on the loadcell spider

Type 2 on the loadcell bottom plate

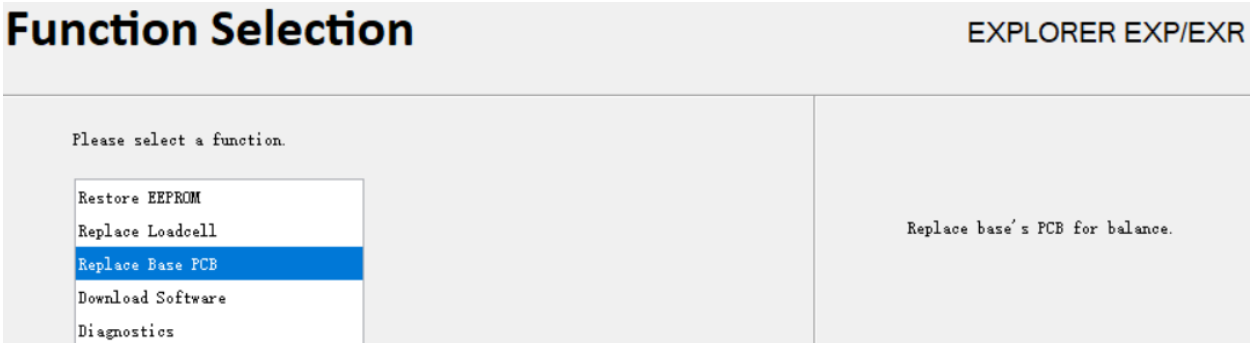
2. Removing the 2 screws, please pay attention to not shift the spider from its position during this procedure. Follow by removing the screw on the right side.

C.3 Replace Main/ Base PCB

When replacing the main/ base PCB, it needs to perform the 'Replace Base PCB' to configure or update the data to the main/ base PCB.

Note: this functionality is used for the replacement of EXP base PCB and EXR main PCB.

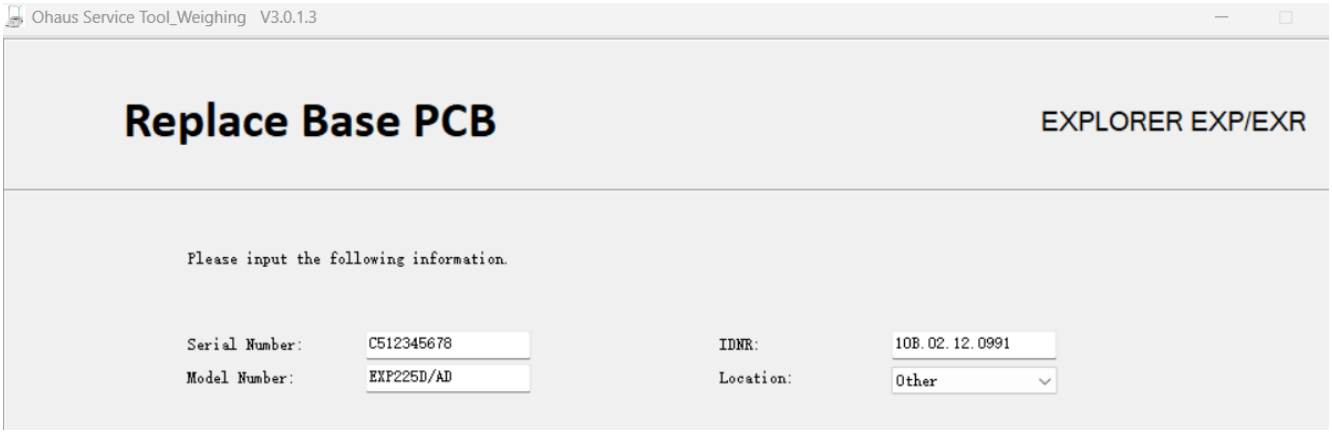
Once **Replace Base PCB** is selected, click **Next** to allow you to set the **Com Port Configuration**.



After completing the COM port configuration click **Next.** You will come to **Replace Base PCB** page as shown below.

Fill in the below and click **Next** to complete the **Replace Base PCB** process.

1. Serial Number
2. Model Number
3. IDNR
4. Location
5. Click **Next** to complete the **Replace Base PCB** process.



Note: Cycle power and restart the balance when the process of preplacing main/ base PCB is completed.

C.4 Download Software

EXP EXR Base and loadcell software can be downloaded via service tool.

Once '**Download Software**' is selected the **Com Port Configuration** option will appears, complete the configuration and click **Next.** You will see the window below.

C.4.1 Download Base Software

Select the software Type **Base Software** and **Mot File** and click **Next** button to download the software.

Note:
1, You can choose this functionality to download the base software when the base software is corrupted. For example, the power has been cut off during the software upgrade via USB drive by menu. The base software might be erased.
2, This functionality cannot be used for the terminal software download. Mostly the terminal software would not be erased, even the power has been cut off during the software upgrade via USB drive by menu. If the terminal software is indeed corrupted, it's necessary to replace with the new EXP terminal main PCB or EXR main PCB, both of which come pre-installed with the software.

When you see the window below, **cycle power** to start the process of downloading software.

It will take about 3 minutes for the base software download process.

Click **Finish** when the software download is completed successfully.

Note: Cycle power and restart the Balance to confirm the software version during the program startup.

C.4.2 Download Loadcell Software

DWC (Digital Weighing Cell) type of loadcell enhances the capability of EMC (Electro Magnetic Compatibility). The DWC software is pre-installed by the loadcell supplier. For most of cases, the product software is both forward and backward compatible with the DWC software. The solution to download DWC software via service tool is mainly applied for special cases, like compatibility issues, quality and urgent cases. SPG service manager will issue the service bulletin for the DWC software update with the update instruction.

WARNING
The loadcell would be broken and cannot be repaired, if it failed to download the DWC software due to any interruption during the software download process.

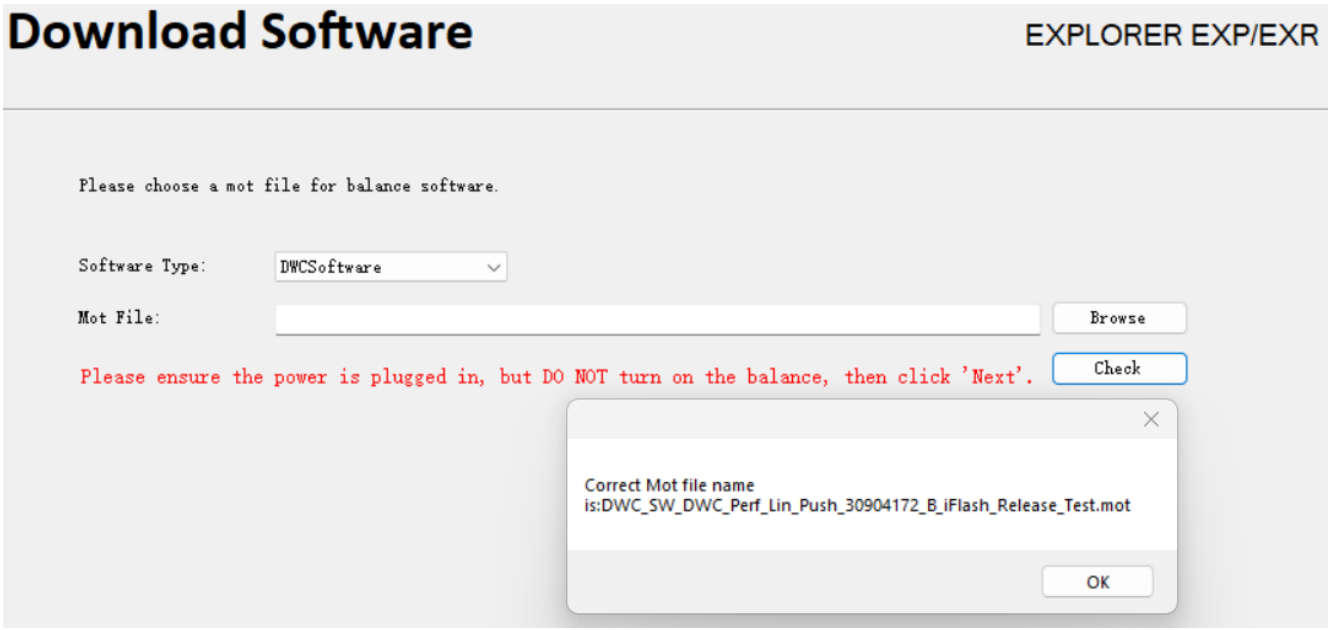
Note: Please ensure the power is plugged in, but **DO NOT** turn on the balance for the DWC software download.

EXP EXR models

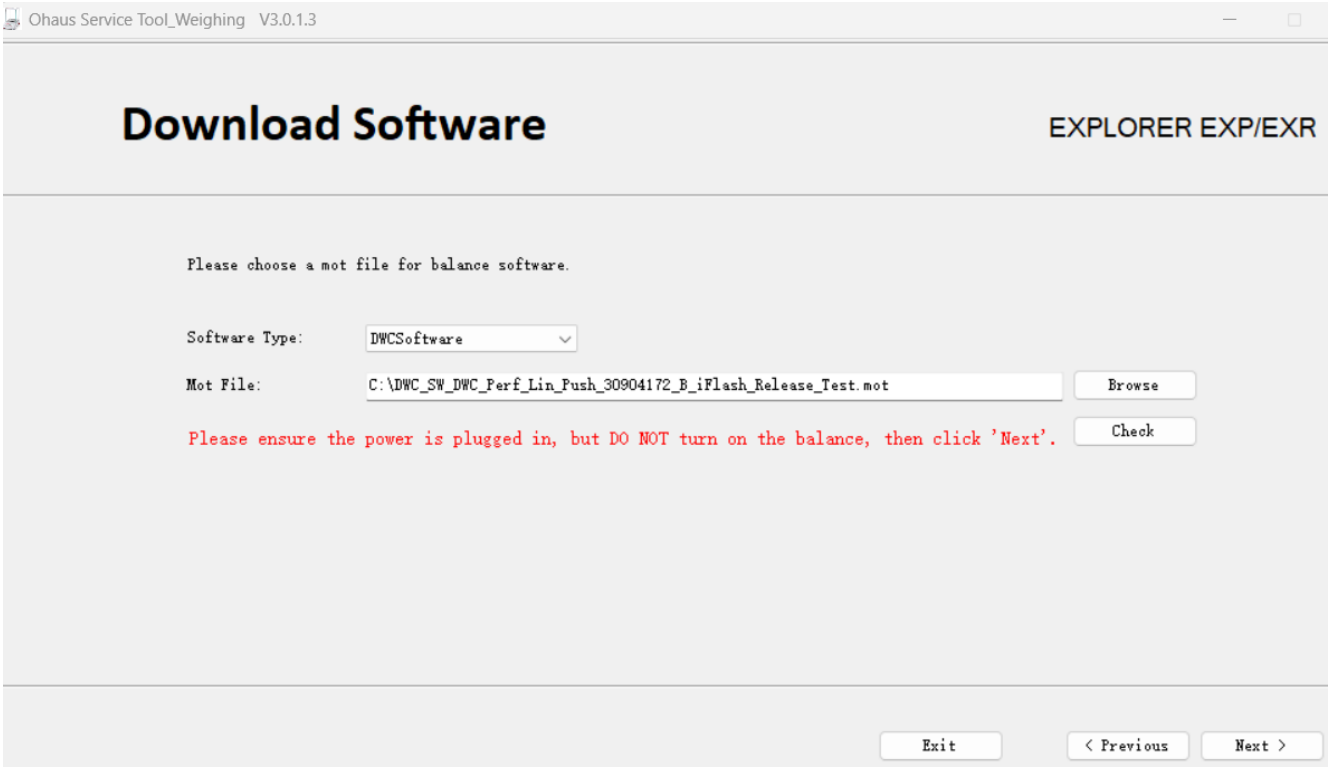
EXP HiCap Models

Select the software Type **DWC Software** and click **Check** button to pop out the prompts with the MOT file name.

Note: Please reach out to OHAUS for the loadcell mot file. If the wrong mot file is mistakenly installed on the Loadcell, the loadcell will be broken and cannot be repaired!

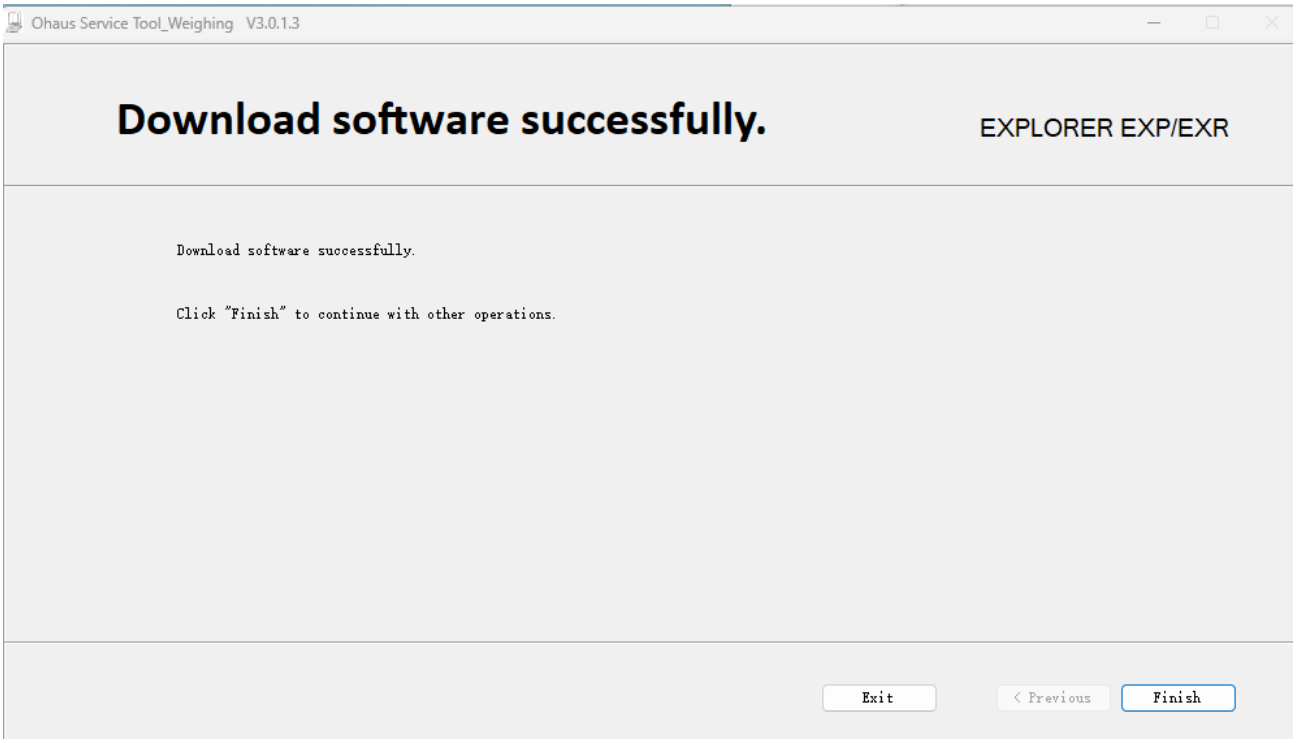


Select the **Mot File** and click **Next** button to download the loadcell software.



It will take about 6 minutes for the loadcell software download process.

Note: Please ensure the balance remains continuously powered, but do not turn it on. Meanwhile, avoid performing any other operations on the computer during the download process.

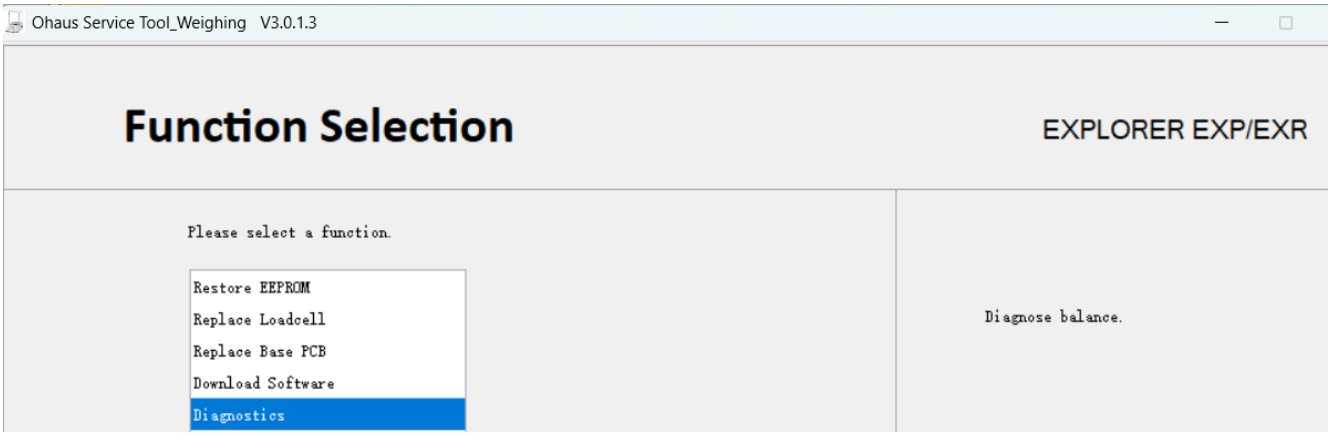


Click **Finish** when the software download is completed successfully.

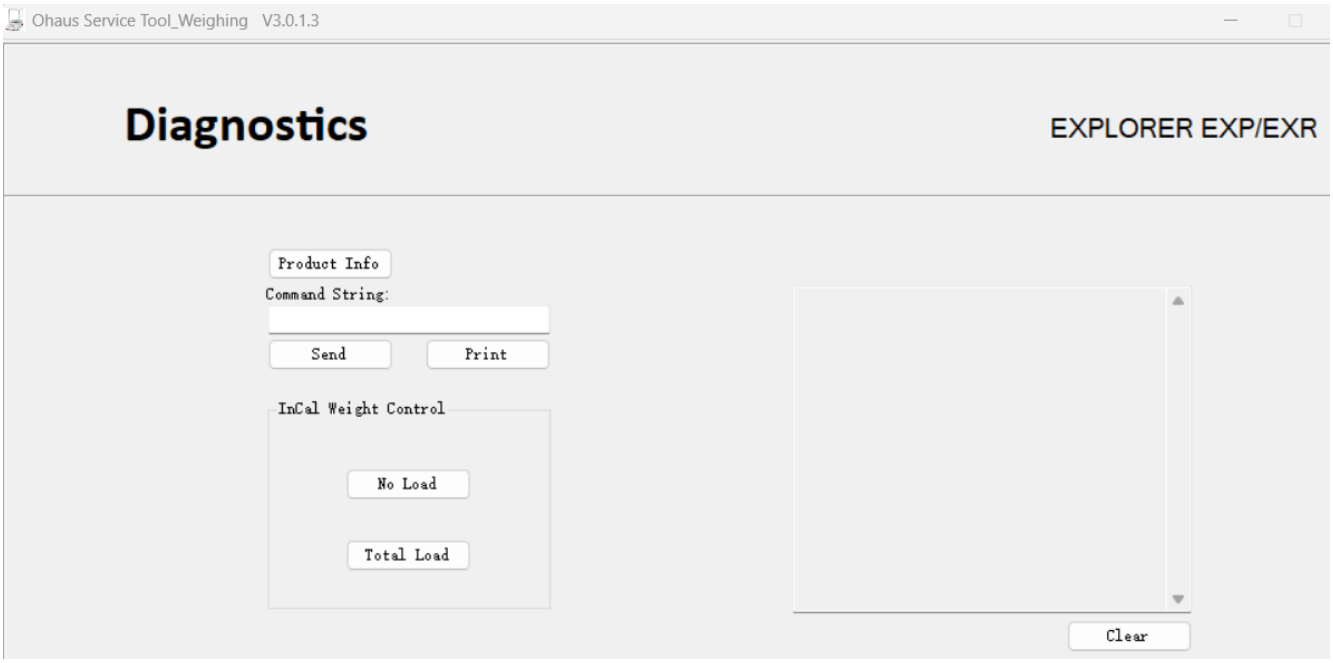
Note: Cycle power and restart the Balance to confirm the software version during the program startup.

C.5 Diagnostics

Diagnostics act as a communication window between balance and Service and Repair Tools.



Once **Diagnostics** is selected the **Com Port Configuration** option will appear. Complete the configuration and click **Next.** You will see the bellow window.



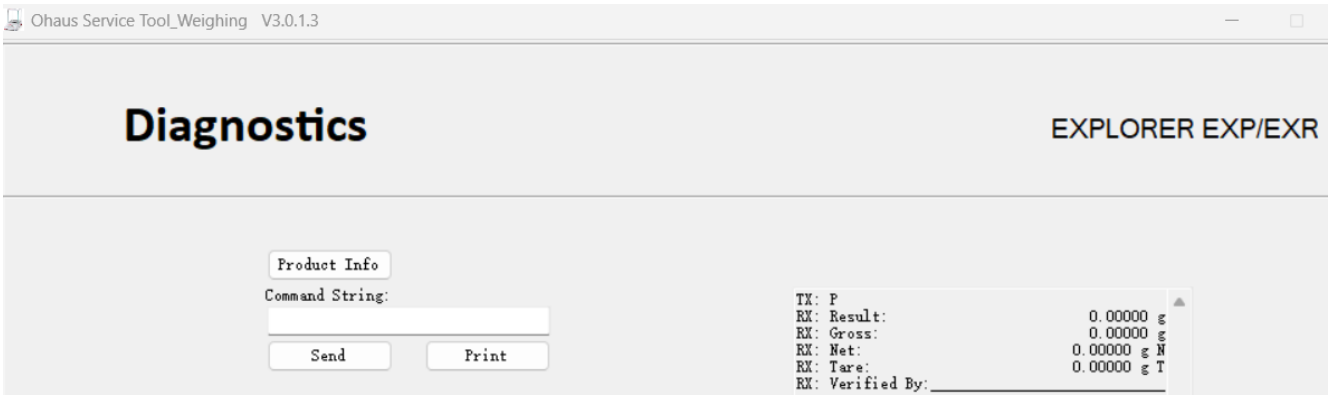
EXP EXR Diagnostics consists of the functions as below.

1. Product Information – Press **Product Info**, the window on the right side will display the model name, serial number, IDNR and loadcell serial number.

2. Command String - Input the Command and Press **Send**, the window on the right side will display the action and balance response.

   Note: Please find the interface commands in the EXP EXR user manual.

3. Print the weighing value - Press **Print** (same function as the command 'P'), the window on the right side will display the weighing value.

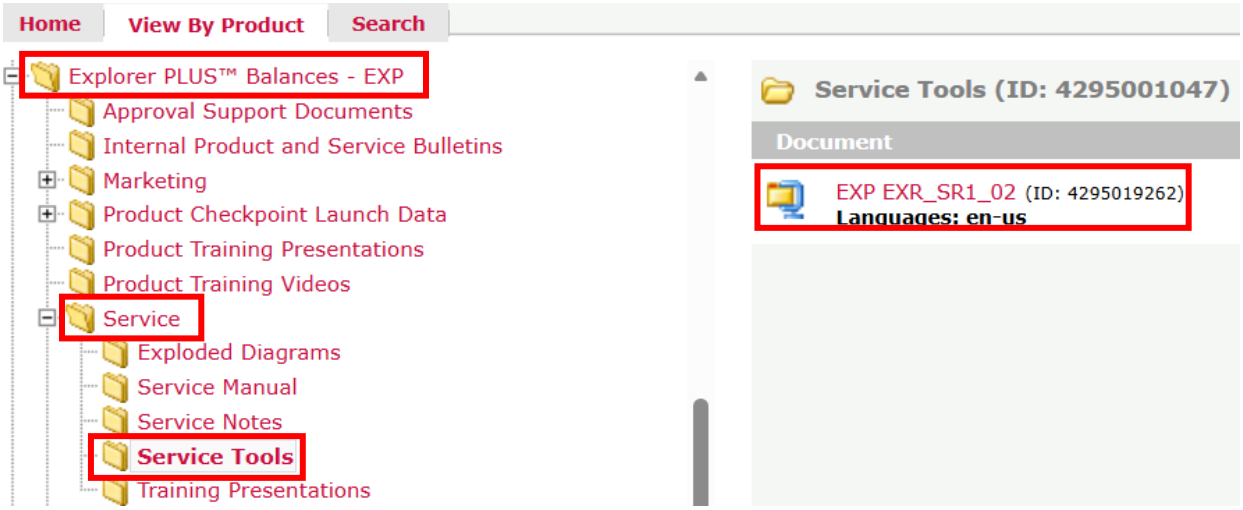


4. InCal Weight Control – Press **No Load** to lift up the InCal weights, Press **Total Load** to load the InCal weights.

APPENDIX D – SOFTWARE UPGRADE VIA USB

In this function, users need to obtain the correct software to upgrade the balance for feature enhancements or bug fixes. If you encounter any issues while using the balance, please contact Ohaus or your local Ohaus dealer for assistance.

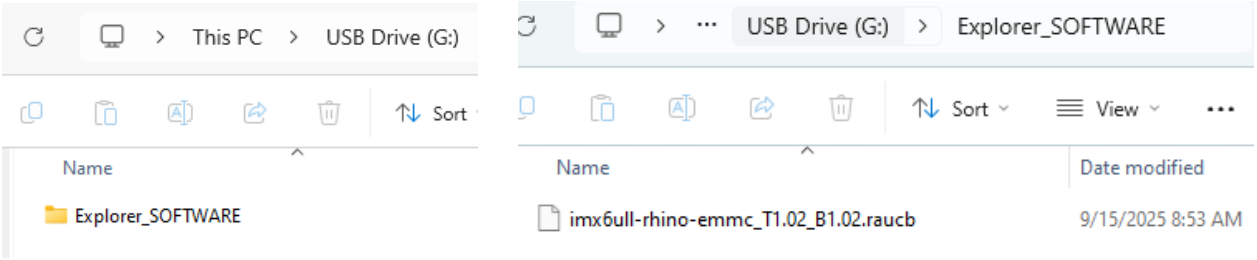
The latest software is available to download from the DMX as below for Ohaus service technician.



Software Upgrade Instructions

- Copy the **Explorer_SOFTWARE** folder to the root directory of USB flash drive.

  Note: Do not change the folder name. It needs to be **Explorer_SOFTWARE**.

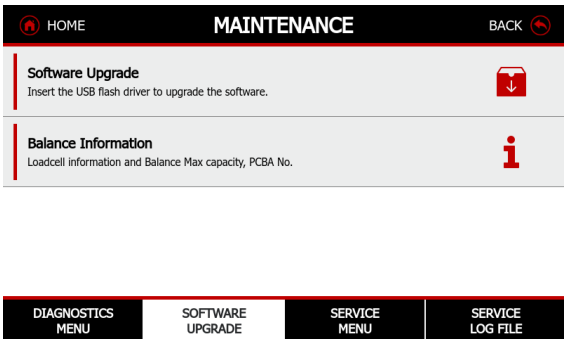


- Insert the USB flash drive to the Balance.
- Press **START** button to upgrade the system.

  Note: If it immediately confirms the update was successful and restarted with the original software version, please format the USB flash drive to FAT and try again.

- When completed, the balance would reboot automatically.

  Note: If the power has been cut off or any interruptions during the software upgrade via USB flash drive. The base software might be erased. In that case, you must download the base software through the service tool.


HOME
MAINTENANCE
BACK
Software Upgrade
Insert the USB flash driver to upgrade the software.
Balance Information
Loadcell information and Balance Max capacity, PCBA No.
DIAGNOSTICS MENU
SOFTWARE UPGRADE
SERVICE MENU
SERVICE LOG FILE


HOME
SOFTWARE UPGRADE
BACK
Make sure you have the right firmware update package in root directory of the connected USB flash drive.
START
New version :
Current version : XX/XX
SOFTWARE UPGRADE
BALANCE INFORMATION

APPENDIX E – HI-POT TEST

The instruction of HI-POT test below is with the Electrical Safety Tester GWINSTCK GPT-9804

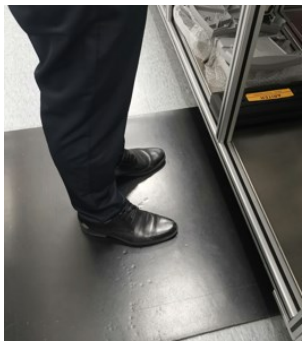
NOTE: Please read the user manual of the Electrical Safety Tester before doing the HI-POT tests.

The Electrical Safety Tester is a high voltage instrument that outputs dangerous voltages.

WARNING

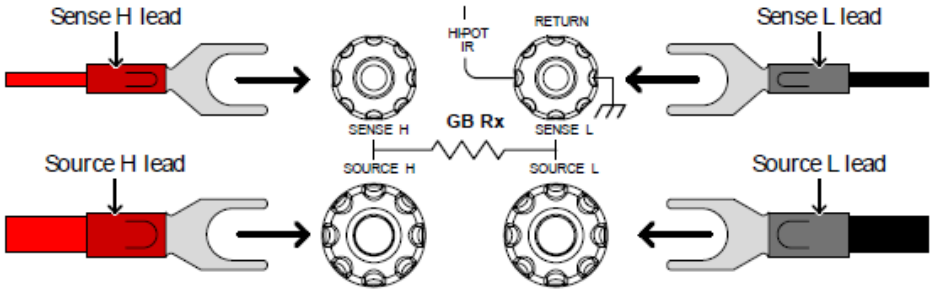
The Electrical Safety Tester generates the high voltages. Follow all safety precautions, warnings and directions given below when using the instrument.

a) Only technically qualified personnel should be allowed to operate the safety tester.
b) The operating workplace must be fully isolated, especially when the instrument is in operation. The instrument should be clearly labeled with appropriate warning signage.
c) Ensure the earth ground of the line voltage is properly grounded.
d) Ensure any devices that are adversely affected by magnetic fields are not placed near the tester.
e) The operator should not wear any conductive materials, jewelry, badges, or other items, such wrist watches.
f) The operator should stand on the insulation mat and wear insulation gloves for high voltage protection.

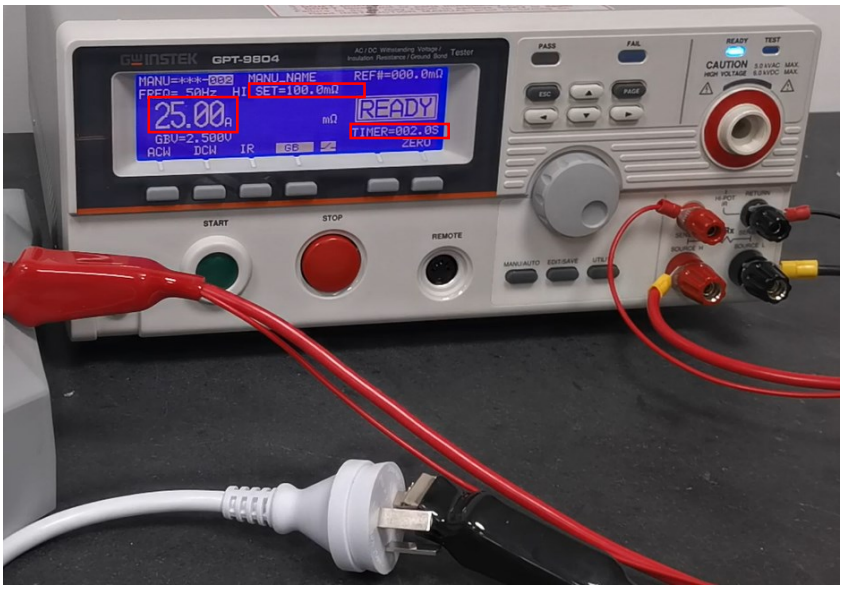


Earthing Resistance tests.

1. Turn the power off and connect the test leads to the safety tester for the Earthing Resistance tests.
2. Connect the Sense H lead to the SENSE H terminal.
3. Connect the Sense L lead to the SENSE L terminal.
4. Connect the Source H lead to the SOURCE H terminal.
5. Connect the Source L lead to the SOURCE L terminal.



6. Turn on the Safety Tester, set the parameter for the Earthing Resistance Test (Refer to the table 4-7).



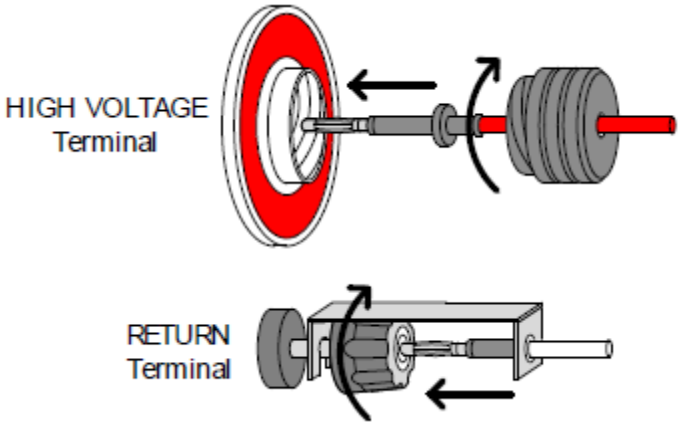
7. Connect the black alligator clip to the earth pin of the plug, the red alligator clip to the metal Part (metal sheet in the lid) of the equipment.

8. Press the button ‘START’, it will test about a few seconds for the result (PASS or FAIL).

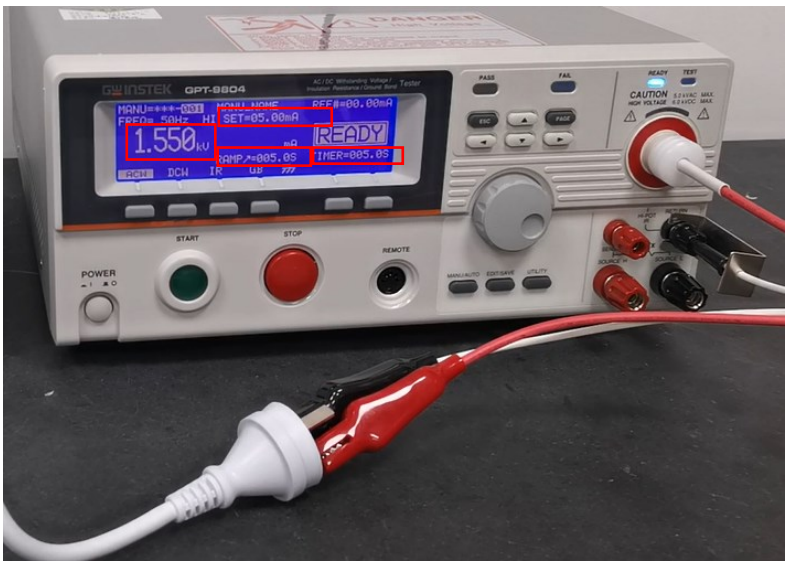
9. The earthing resistance test result should be “PASS” as below.

High Voltage tests.

1. Turn the power off and connect the test leads to the safety tester for High Voltage tests.
2. Connect the high voltage test lead (red) to the HIGH VOLTAGE terminal and screw firmly into place.
3. Connect the return test lead (white) into the RETURN terminal and screw the protector bar into place, as shown below.



4. Turn on the Safety Tester, set the parameter for the High Voltage Test (Refer to the table 4-7).



5. Connect the black alligator clip to the earth pin of the plug, the red alligator clip to the neutral pin of the plug.

6. Press the button ‘START’, it will test about a few seconds for the result (PASS or FAIL).

7. The High Voltage test result for neutral pin should be “PASS” as below.

8. Press the button ‘STOP’, then switch the red alligator clip to of the live pin of the plug.

9. Press the button ‘START’, it will test about a few seconds for the result (PASS or FAIL).

10. The High Voltage test result for live pin should be “PASS” as below.

Note:

1) To check if the unit is installed properly and all the components are in good condition, if the HI-POT test result is ‘FAIL’.
2) After a repair, to run the unit ONLY when the HI-POT test is passed.

Ohaus Corporation

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