

BenchMark[®] HE-X

Hostile Environment Extreme Bench Scales

Technical Manual



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Rice Lake continually offers web-based video training on a growing selection of product-related topics at no cost. Visit www.ricelake.com/webinars

1.0 Introduction

This manual provides reference information to install and wire the BenchMark HE-X Hostile Environment Extreme Bench Scale.



Manuals and additional resources are available from the Rice Lake Weighing Systems website at www.ricelake.com

Warranty information can be found on the website at www.ricelake.com/warranties

1.1 Safety

Safety Signal Definitions:



DANGER Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. Includes hazards that are exposed when guards are removed.



WARNING Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death. Includes hazards that are exposed when guards are removed.



CAUTION Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.



IMPORTANT Indicates information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.

General Safety



Do not operate or work on this equipment unless this manual has been read and all instructions are understood. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing Systems dealer for replacement manuals.



Failure to heed could result in serious injury or death.

Do not allow minors (children) or inexperienced persons to operate this unit.

Do not operate without all shields and guards in place.

Do not jump on the scale.

Do not use for purposes other than weight taking.

Do not place fingers into slots or possible pinch points.

Do not use any load bearing component that is worn beyond 5% of the original dimension.

Do not use this product if any of the components are cracked.

Do not exceed the rated load limit of the unit.

Do not make alterations or modifications to the unit.

Do not remove or obscure warning labels.

Before opening the unit, ensure the power cord is disconnected from the outlet.

Keep hands and feet away from moving parts.

2.0 Installation

This section provides an overview of the BenchMark HE-X installation procedure and grounding information.

2.1 Unpacking

Immediately after unpacking, visually inspect the scale to ensure that the unit is undamaged. The shipping carton should contain the bench scale and this manual. If the bench scale was damaged in shipment, notify Rice Lake Weighing Systems and the shipper immediately.

2.2 Leveling the Scale

1. Place the scale in the desired location that is reasonably level and free of unnecessary vibrations and air currents.
2. Lift off the scale top cover and locate the level bubble.
3. Adjust the four corner feet on the scale base until the level bubble and all feet contact the support surface so the scale does not rock.
4. Lock the jam nuts on the feet when the final level is correct.

2.3 Connecting the Load Cell Cable

All models come with 10' color-coded load cell cable.

IMPORTANT Do not cut this cable. Cutting this cable voids the warranty.



Note

See the indicator manual to determine the proper load cell cable input connector. Use the following color codes to wire the load cell cable to the indicator.

Color Code	Function
Green	+ Excitation
Black	- Excitation
White	+ Signal
Red	- Signal
Yellow	Shield
Blue	+ Sense
Brown	- Sense

Table 2-1. Load Cell Wiring - 6 Wire



Note

Connect Sense and Excitation wires together if using 4-wire system without sense leads.

2.4 Grounding the Scale Base

BenchMark HE-X can build up a static electricity charge during weighing operations. If powerful enough, the charge can travel through the load cell cable to the indicator. The unit should be adequately grounded so static charges and transient electrical surges can drain directly to the ground. It is recommended to connect the scale base to an AC ground circuit using at least #12 ga. wire. The BenchMark HE-X has a grounding hole for a grounding screw located on the bottom of the lower frame.

2.5 Calibration

It is recommended that the scale be exercised by loading it to near capacity two or three times before calibration to ensure everything is seated. See the specific indicator manual for the proper calibration procedure.

To calibrate, see the following procedure:

1. With no load on scale, place the indicator in its calibration mode and perform a zero calibration.
2. Place certified calibration weights on platform equal to 70%–100% of scale's capacity. If several weights are used, distribute them evenly around the platform.
3. Perform a calibration.
4. Remove certified calibration weights and check the zero reading. If necessary, repeat the calibration process.



Note See the indicator manual for the specific indicator calibration procedure.

2.6 Overload Stop Adjustment

The scale contains an overload protection screw on the bottom of the scale underneath the load cell and overload protection stops in the four corners.

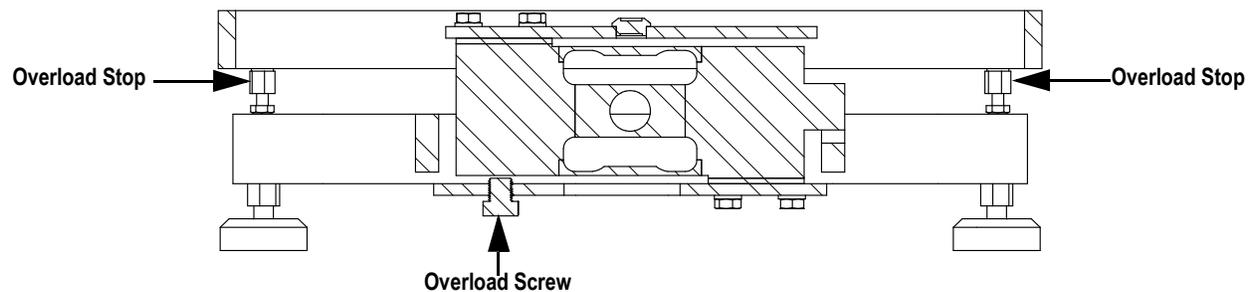


Figure 2-1. Overload Protection

1. To check or set the overload screw underneath the load cell, place 125% of capacity on the center of the scale.
2. Using the appropriate hex wrench, screw in the overload protection until it touches the load cell then back it off 1/6 turn.
3. Recheck calibration.
4. To check or set the corner overload stops, load the scale corner with 30% of scale capacity then adjust the screw under that corner to just touch the top frame then tighten the locking nut if one is used.

IMPORTANT

If no locking nut is used, apply a drop of an industrial sealing agent to seal threads.

5. Repeat this process for each corner.



Note Ensure the load cell is not touching the overload protection screw below the load cell with the load on the corner.

2.7 Replacement Parts

See the following information for replacement parts details:

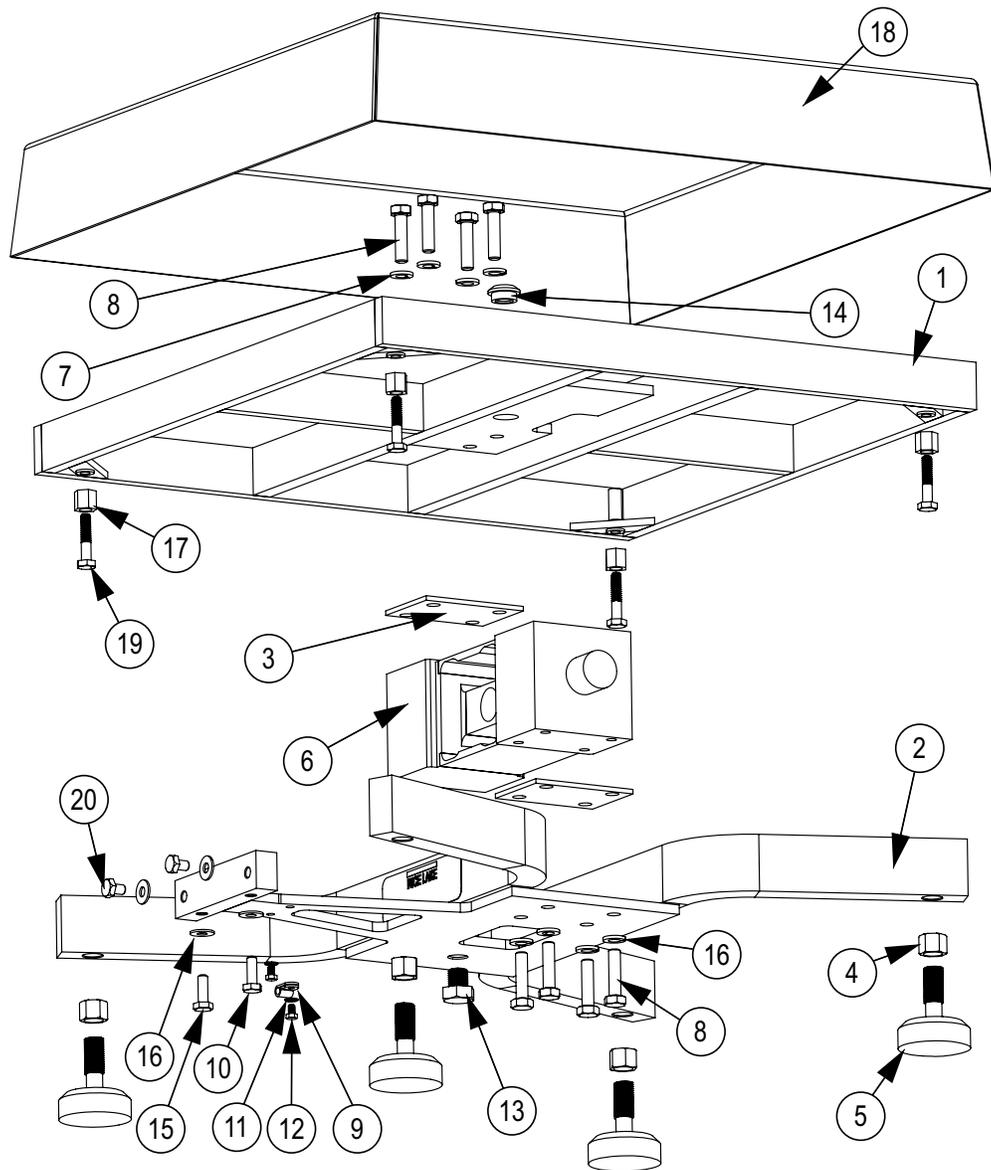


Figure 2-2. Parts Illustration

Item No.	Part No.	Description	Qty.
1	192293	Frame, Top Assembly 12 x 18 HE-X	1
	191534	Frame, Top Assembly 18 x 18 HE-X	
	191815	Frame, Top Assembly 18 x 24 HE-X	
	191781	Frame, Top Assembly 24 x 24 HE-X	
2	192287	Frame, Bottom Bench Scale 12 x 18 SST 50 lb – 100lb HE-X	1
	191522	Frame, Bottom Bench Scale 18 x 18 SST 50 lb – 300 lb HE-X	
	191649	Frame, Bottom Bench Scale 18 x 18 SST 500 lb – 1,000 lb HE-X	
	191814	Frame, Bottom Bench Scale 18 x 24 SST 50 lb – 300 lb HE-X	
	191872	Frame, Bottom Bench Scale 18 x 24 SST 500 lb – 1,000 lb HE-X	
	191770	Frame, Bottom Bench Scale 24 x 24 SST 50 lb – 300 lb HE-X	
	191807	Frame, Bottom Bench Scale 24 x 24 SST 500 lb – 1,000 lb HE-X	
3	191519	Shim, 0.1196 x 2.07 x 2.90 RLPCBC Load Cell SST	2
4	191518	Nut Coupling 1/2-20 NF Hex SST	4
5	191885	Rubber Foot 1/2-200 UNF SST	4
6	87022	Load Cell, SPT RLPCBC-60 50 lb Scale	1
	87023	Load Cell, SPT RLPCBC-60 100 lb Scale	
	87023	Load Cell, SPT RLPCBC-60 150 lb Scale	
	87024	Load Cell, SPT RLPCBC-60 200 lb Scale	
	87024	Load Cell, SPT RLPCBC-60 250 lb Scale	
	87024	Load Cell, SPT RLPCBC-60 300 lb Scale	
	87025	Load Cell, SPT RLPCBC-60 500 lb Scale	
	87026	Load Cell, SPT RLPCBC-60 1,000 lb Scale	
7	15154	5/16 Lock Washer Set	8
8	49789	Cap Screw 5/16-18NC x 1.25 Hex Head SST	8
9	15409	Clamp, Cable Nylon	1
10	184359	Screw, 8-32 x 1/4 Hex Head 18-8 SST	1
11	15132	Washer, Lock No. 8 Type A Internal Tooth SST	2
12	189464	Screw, 8-32 x 3/8 Hex Head 18-8 SST	1
13	183530	Screw, Cap 1/2-20NF x 0.50 Hex Head SST	1
14	187195	Level, Spirit Bubble Bulls Eye with Flange Plastic 21 x 16.5 x 9.5 mm	1
15	14963	Screw, Cap 1/4-20NC x 3/4 Hex Head SST F593	2
16	15149	Washer Plain 1/4 SST	4
17	105555	Nut, Coupling 1/4-20 x 0.48 Long SST	4
18	186936	Cover, Top Bench Scale 12 x 18	1
	19094	Cover, Top Bench Scale 18 x 18	
	19095	Cover, Top Bench Scale 18 x 24	
	19096	Cover, Top Bench Scale 24 x 24	
19	151269	Screw, Cap 1/4-20 NC x 1-1/4 Hex Head 18-8 SST	4
20	14954	Screw, Cap 1/4-20NC x 3/8 SST	2

Table 2-2. Parts List

3.0 Appendix

This section provides additional information about the BenchMark HE-X.

3.1 Options

Optional ball transfer, roller conveyor tops and custom height columns for attaching indicators to the scale are available. Consult the factory for available options.

3.2 Troubleshooting

For troubleshooting details, see the following information:

Issue	Cause	Solution
No display on indicator	Power disconnected	Connect power
	Cable cut or disconnected	Repair cable
	Signal leads incorrectly wired at indicator	Connect according to the manual
Indicator display remains at zero	Incorrect load cell cable connections	
	Faulty indicator	Service indicator
Erratic weight displays on indicator	Vibration near the scale	Remove the source of the vibration or adjust digital filtering of indicator to minimize erratic display
	Scale not level	Level the scale
	Water damage to the load cell or cable	Replace the load cell
	Faulty indicator	Service the indicator
	Loose load cell screws	Tighten to correct torque
	Faulty load cell	Test and replace if necessary
Consistently low weight	Indicator not properly adjusted to zero	Zero indicator correctly
	Scale cover binding	Obtain adequate clearance
	Overload stops set too high	Reset the stops correctly
	Indicator not calibrated for scale	Calibrate the scale
	Faulty load cell	Test and replace if necessary

Table 3-1. Troubleshooting

3.3 Dimensions

For BenchMark HE-X dimensions see the following information:

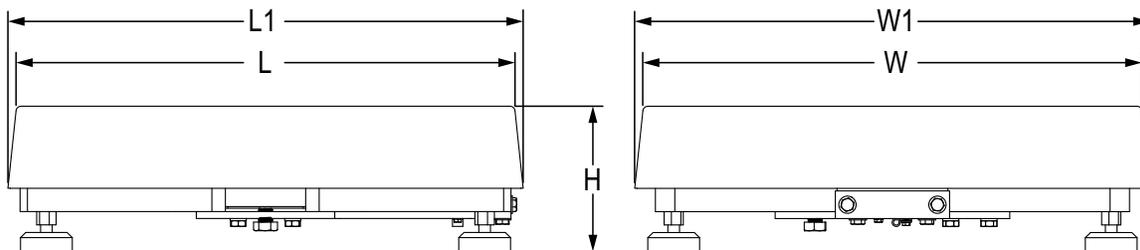


Figure 3-1. Dimensions

Capacity	Product Dimensions (L x W x H)	L1	W1
50 lb (25 kg)	12" x 18" x 5.25" (305 mm x 457 mm x 133 mm)	12.50" (318 mm)	18.50" (470 mm)
100 lb (50 kg)			
50 lb (25 kg)	18" x 18" x 5.25" (457 mm x 457 mm x 133 mm)	18.75" (476 mm)	18.75" (476 mm)
100 lb (50 kg)			
150 lb (75 kg)			
200 lb (100 kg)			
250 lb (125 kg)			
300 lb (150 kg)			
500 lb (250 kg)			
1000 lb (500 kg)			
50 lb (25 kg)	18" x 24" x 5.25" (457 mm x 610 mm x 133 mm)	18.75" (476 mm)	24.75" (610 mm)
100 lb (50 kg)			
150 lb (75 kg)			
200 lb (100 kg)			
250 lb (125 kg)			
300 lb (150 kg)			
500 lb (250 kg)			
1000 lb (500 kg)			
50 lb (25 kg)	24" x 24" x 5.25" (610 mm x 610 mm x 133 mm)	24.75" (610 mm)	24.75" (610 mm)
100 lb (50 kg)			
200 lb (100 kg)			
250 lb (125 kg)			
300 lb (150 kg)			
500 lb (250 kg)			
1000 lb (500 kg)			

Table 3-2. Dimensions and Capacities

3.4 Load Cell Replacement

Use the following steps to replace load cells:

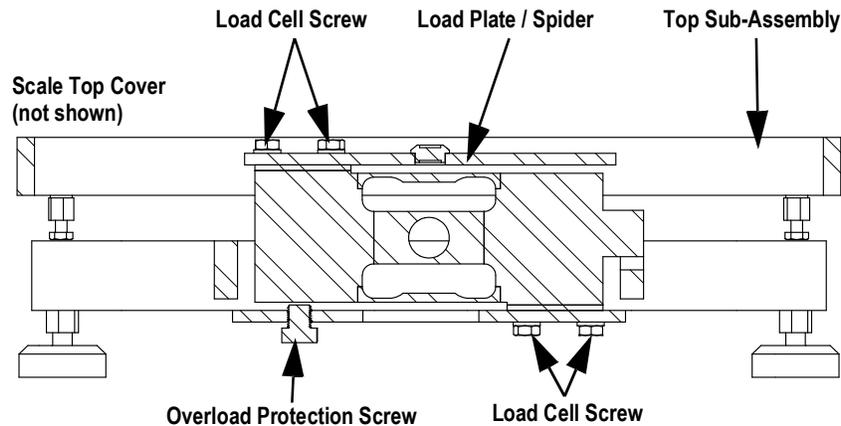


Figure 3-2. Load Cell Mount Diagram

1. Unplug AC power from indicator and disconnect load cell cable from indicator.
2. Lift off the scale top.
3. Remove the four upper load cell screws with a wrench.
4. Lift off scale top sub-assembly.
5. Remove the four lower load cell screws with a wrench.
6. The load cell and cable can now be removed from scale.
7. Thread cable of replacement load cell through the scale frame as the unit arrived.
8. Position load cell on shim and screw in four lower load cell screws. Torque to 221 in-lb.
9. Place scale top sub-assembly into position.
10. Screw in four upper load cell screws. Torque to 221 in-lb.
11. Connect load cell cable to indicator.
12. Recalibrate scale ([Section 2.5 on page 3](#)).
13. Adjust overload protection ([Section 2.6 on page 3](#)).

3.5 Limited Warranty

Rice Lake Weighing Systems (RLWS) warrants that all RLWS equipment and systems properly installed by a Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by RLWS. All systems and components are warranted against defects in materials and workmanship for three years.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

- Upon discovery by Buyer of such nonconformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, Protecting Your Components From Static Damage in Shipment, available from RLWS Equipment Return Department.
- Examination of such equipment by RLWS confirms that the nonconformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing; RLWS shall be the sole judge of all alleged nonconformities.
- Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.
- RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
- In no event will RLWS be responsible for travel time or on-location repairs, including assembly or disassembly of equipment, nor will RLWS be liable for the cost of any repairs made by others.

These warranties exclude all other warranties, expressed or implied, including without limitation warranties of merchantability or fitness for a particular purpose. Neither RLWS nor distributor will, in any event, be liable for incidental or consequential damages.

RLWS and buyer agree that RLWS's sole and exclusive liability hereunder is limited to repair or replacement of such goods.

In accepting this warranty, the buyer waives any and all other claims to warranty.

Should the seller be other than RLWS, the buyer agrees to look only to the seller for warranty claims.

No terms, conditions, understanding, or agreements purporting to modify the terms of this warranty shall have any legal effect unless made in writing and signed by a corporate officer of RLWS and the Buyer.

4.0 Specifications

Load Cell

IP69K stainless steel, hermetically sealed

Available Sizes

12" x 18", 18" x 18", 18" x 24", 24" x 24"

Rated Output

0.91 mV/V

Maximum Overload

150 – 200% (capacity dependent)

Overload Protection

Five point, independently adjusted

Cable Length

10' (3 m) – 6 wire shielded

Output Impedance

1000 Ω nominal

Compensated Temperature Range

14°F – 104°F (-10°C – 40°C)

Safe Temperature Range

0°F – 150°F (-18°C – 65°C)

Certifications and Approvals



Load cell is FM approved



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