

# BenchMark<sup>®</sup> MS, SS, HE

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*Medium-to High-Capacity Bench Scales*

## Technical Manual



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# Revision History

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This section tracks and describes manual revisions for awareness of major updates.

Revision	Date	Description
C	November 15, 2024	Established revision history; updated parts lists
D	February 18, 2026	Updated replacement parts

*Table i. Revision Letter History*



Technical training seminars are available through Rice Lake Weighing Systems. Course descriptions and dates can be viewed at [www.ricelake.com/training](http://www.ricelake.com/training) or obtained by calling 715-234-9171 and asking for the training department.

# Contents

<b>1.0</b>	<b>Introduction</b>	<b>5</b>
1.1	Safety	5
1.2	Disposal	5
1.3	Overview	6
<b>2.0</b>	<b>Installation</b>	<b>7</b>
2.1	Unpacking	7
2.2	Leveling the Scale	7
2.3	Connecting the Load Cell Cable	7
2.3.1	BenchMark MS	7
2.3.2	BenchMark SS	8
2.3.3	BenchMark HE	8
2.4	Grounding the Scale Base	8
2.5	Calibration	8
<b>3.0</b>	<b>Appendix</b>	<b>9</b>
3.1	Options	9
3.2	Troubleshooting	9
3.3	Dimensions	10
3.3.1	BenchMark MS, BenchMark SS and BenchMark HE	10
3.4	Load Cell Replacement	11
<b>4.0</b>	<b>Specifications</b>	<b>12</b>



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# 1.0 Introduction

This manual provides an overview of technical information for the BenchMark MS, SS and HE medium-to high-capacity bench scales.



Manuals are available from Rice Lake Weighing Systems at [www.ricelake.com/manuals](http://www.ricelake.com/manuals)

Warranty information is available at [www.ricelake.com/warranties](http://www.ricelake.com/warranties)

## 1.1 Safety

### Safety 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.

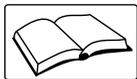


**CAUTION:** Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.



**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.**



#### WARNING

**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, feet and loose clothing away from moving parts.**

## 1.2 Disposal



### Product Disposal

The product must be brought to appropriate separate waste collection centers at the end of its life cycle.

Proper separate collection to recycle the product helps prevent possible negative effects on the environment and to health, and promotes the recycling of the materials. Users who dispose of the product illegally shall face administrative sanctions as provided by law.

### 1.3 Overview

The BenchMark MS is constructed with a mild steel frame with stainless steel top cover. The BenchMark SS and HE are constructed with a stainless steel frame and top cover. The BenchMark MS and SS contain IP66 aluminum single point load cells. The BenchMark HE contains an IP69K stainless steel single point load cell.

#### Overload Protection

The medium-to high-capacity bench scales provide overload protection with positive stops located beneath each corner of the top frame. The overload stops are set at the factory for 100% of scale capacity.

Additional overload protection is provided by an overload screw beneath the load cell to help prevent shock damage.

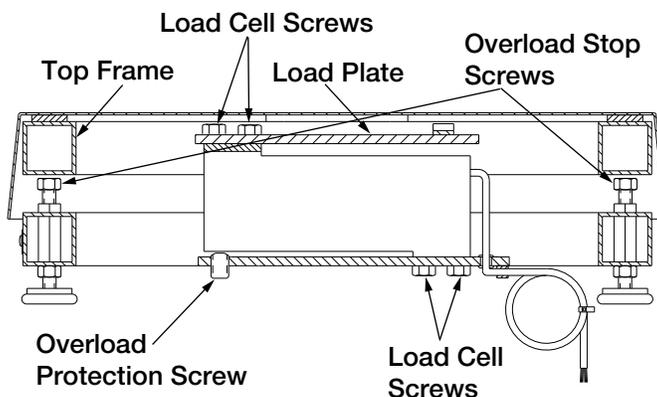


Figure 1-1. Load Cell Mount Overload Stops

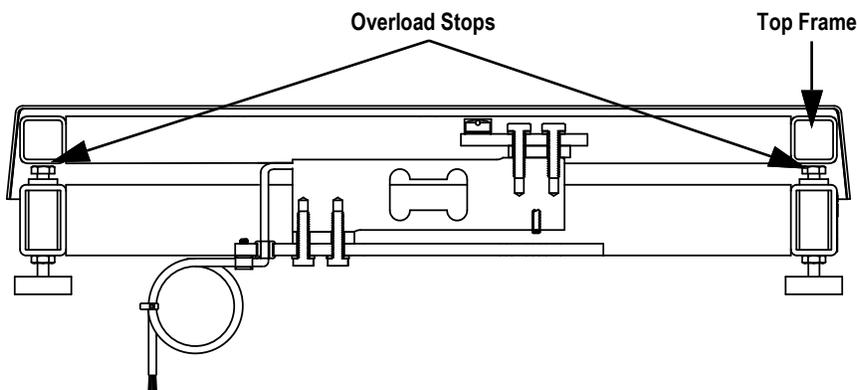


Figure 1-2. Overload Stops

## 2.0 Installation

This section provides an overview of how to install the BenchMark MS, SS and HE medium-to high-capacity bench scales.

### 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 ft of 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 connectors. Use the following color codes to wire the load cell cable to the indicator.

#### 2.3.1 BenchMark MS

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

Table 2-1. 30-100 lb 12 x 12 in Load Cell Wiring - 6 Wire

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

Table 2-2. 50-100 lb 12 x 18 in Load Cell Wiring - 6 Wire

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

Table 2-3. 50-100 lb 18 x 18 in, 18 x 24 in, 24 x 24 in Load Cell Wiring - 6 Wire

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

Table 2-4. 1000 lb 18 x 18 in, 18 x 24 in, 24 x 24 in Load Cell Wiring - 6 Wire



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

### 2.3.2 BenchMark SS

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

Table 2-5. 50 lb – 500 lb 12 x 18 in, 18 x 18 in, 18 x 24 in, 24 x 24 in  
Load Cell Wiring - 6 Wire

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

Table 2-6. 1000 lb 18 x 18 in, 18 x 24 in, 24 x 24 in  
Load Cell Wiring - 6 Wire



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

### 2.3.3 BenchMark HE

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

Table 2-7. 50 lb – 200 lb 12 x 18 in, 18 x 18 in  
Load Cell Wiring - 5 Wire

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

Table 2-8. 250 lb – 1000 lb 18 x 18 in, 18 x 24 in, 24 x 24 in  
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

Bench scales can build up a static electricity charge during weighing operations. If powerful enough, this charge can travel through the load cell cable to the indicator. To prevent this, all bench scales should be adequately grounded so that static charges and transient electrical surges can drain directly to ground. Recommended practice is to connect the scale base to an AC ground circuit using at least #12 wire. All BenchMark scales have either a grounding screw or a hole for such a grounding screw located on the bottom of the lower frame for this purpose.

## 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.

## 3.0 Appendix

This section provides additional information about the BenchMark MS, SS and HE medium-to high-capacity bench scales.

### 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. Benchmark Troubleshooting Table

### 3.3 Dimensions

For BenchMark MS, SS and HE bench scale dimensions see the following information:

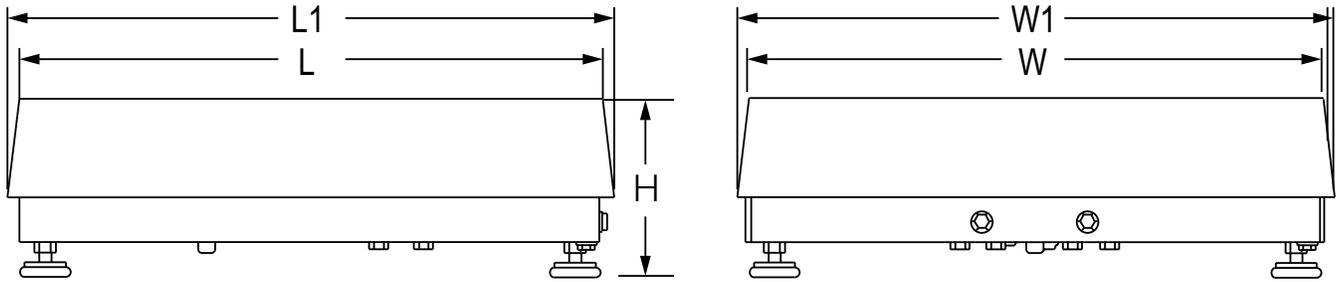


Figure 3-1. BenchMark Dimensions

#### 3.3.1 BenchMark MS, BenchMark SS and BenchMark HE

See Figure 3-1 for Table 3-2 dimension references. For load cell approvals, see Section 4.0 on page 12.

Capacity	Product Dimensions (L x W x H)	L1 x W1
30 lb (15 kg)	12 x 12 x 4.12 in (305 x 457 x 105 mm)	12.50 x 12.50 in (318 x 318 mm)
50 lb (25 kg)		
100 lb (50 kg)		
50 lb (25 kg)	12 x 18 x 3.62 in (305 x 457 x 92 mm)	12.50 x 18.50 in (318 x 470 mm)
100 lb (50 kg)		
50 lb (25 kg)	12 x 18 x 4 in (305 x 457 x 102 mm)	12.50 x 18.50 in (318 x 470 mm)
100 lb (50 kg)		
50 lb (25 kg)	12 x 18 x 4.12 in (305 x 457 x 105 mm)	12.50 x 18.50 in (318 x 470 mm)
100 lb (50 kg)		
50 lb (25 kg)	18 x 18 x 5.25 in (457 x 457 x 133 mm)	18.75 x 18.75 in (476 x 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 in (457 x 610 x 133 mm)	24.75 x 18.75 in (629 x 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)		
100 lb (50 kg)	24 x 24 x 5.25 in (610 x 610 x 133 mm)	24.75 x 24.75 in (629 x 629 mm)
150 lb (75 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

See the following procedure to replace load cells:

1. Unplug AC power from indicator and disconnect load cell cable from indicator.
2. Lift off the top cover.
3. Remove two load cell screws.
4. Lift off top spider.
5. Remove the spacer plate.

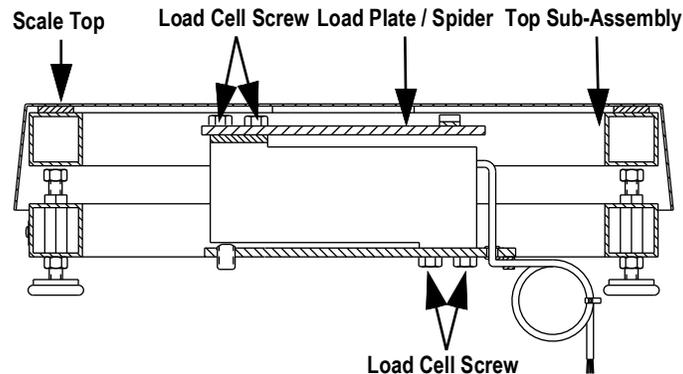


Figure 3-2. 12 x 12 in Load Cell Mount

6. Loosen the four overload stop screws and turn each screw in one turn to provide ample clearance for the new load cell. Turn scale over and back off overload protection screw one complete turn to provide clearance.
7. Unscrew and remove lower load cell screws. Depending on model of scale, there will be either two or four lower load cell screws.
8. Remove bottom shim beneath load cell and set it aside.
9. Remove load cell and cable from scale.
10. Thread cable of replacement load cell through rubber grommet.
11. Position bottom shim directly beneath load cell and screw in lower load cell screws. Torque to 80 in-lbs for 12 x 12 in and 12 x 18 in scales, to 120 in-lb for 18 x 18 in, 18 x 24 in, and 24 x 24 in scales.
12. Turn scale right side up. Position spacer plate on load cell, then place top spider into position.
13. Screw in four upper load cell screws. Torque to 80 in-lbs for 12 x 12 in and 12 x 18 in scales, to 120 in-lb for 18 x 18 in, 18 x 24 in, and 24 x 24 in scales.
14. Connect load cell cable to indicator.
15. Recalibrate scale ([Section 2.5 on page 8](#)).
16. Adjust overload protection screw on bottom of scale by loading scale to 125% capacity. Place this weight on top cover, centered on platform. Use a hex wrench to screw in overload protection screw until it touches the load cell, then back off 1/6 turn. Recheck calibration.
17. To reset corner overload stop screws, load top spider over one corner with approximately 30% of scale capacity. Adjust screw under that corner to just touch top frame. Place a drop of a non-permanent, high-strength locking compound such as Loctite® on the thread. Back screw off slightly so it is not touching.

## 4.0 Specifications

### Load Cell

BenchMark MS	IP66 aluminum, environmentally sealed
BenchMark SS	IP66 aluminum, environmentally sealed
BenchMark HE	IP69K stainless steel, hermetically sealed

### Available Sizes

Benchmark MS	12 x 12 in, 12 x 18 in, 18 x 18 in, 18 x 24 in, 24 x 24 in
BenchMark SS	12 x 18 in, 18 x 18 in, 18 x 24 in, 24 x 24 in
BenchMark HE	12 x 18 in, 18 x 18 in, 18 x 24 in, 24 x 24 in

### Rated Output

0.91 mV/V

### Maximum Overload

150–200% depending on capacity

### Overload Protection

5 point, independently adjusted

### Cable Length

10' (3 m) – 6 wire shielded

### Output Impedance

350 Ω

### Compensated Temperature Range

14° F – 122° F (-10° C – 50° C)

### Safe Temperature Range

-22° F – 158° F (-30° C – 70° C)

### Certifications and Approvals



NTEP  
CoC 95-072  
Accuracy Class III; 5000 d

Measurement  
Canada  
Approved

Measurement Canada  
AM-5082, Class III 5000 d



The following load cells are cFMus approved:

BenchMark MS  
12 x 12 in 30 lb – 100 lb  
18 x 18 in 50 lb – 500 lb  
18 x 24 in 50 lb – 500 lb  
24 x 24 in 50 lb – 500 lb

BenchMark SS  
12 x 18 in 50 lb – 100 lb  
18 x 18 in 50 lb – 500 lb  
18 x 24 in 100 lb – 500 lb  
24 x 24 in 100 lb – 500 lb



The following load cells are FM approved:

BenchMark MS  
12 x 18 in 50 lb – 100 lb  
18 x 18 in 1000 lb  
18 x 24 in 1000 lb  
24 x 24 in 1000 lb

BenchMark SS  
18 x 18 in 1000 lb  
18 x 24 in 1000 lb  
24 x 24 in 1000 lb

BenchMark HE  
12 x 18 in 50 lb – 1000 lb  
18 x 18 in 50 lb – 1000 lb  
18 x 24 in 50 lb – 1000 lb  
24 x 24 in 50 lb – 1000 lb





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