

# DeckHand<sup>TM</sup>

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*Portable Floor Scale*

## Installation and Service Manual



AM-5218



CC# 97-034

**RICE LAKE WEIGHING SYSTEMS**  
Industrial Solutions on a Global Scale®



43978

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## 1.0 Introduction

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### 1.1 General Description

The DeckHand™ Portable Floor Scales are fully electronic, NTEP-certified floor scales allowing one-person portability on large rubber wheels. Available in painted steel or stainless steel construction, these rugged scales come in 500 lb, 1,000 lb, and 2,000 lb capacity.

The heavy diamond-tread platform is 30-1/2" x 24-1/4" (.77 m x .62 m) with an overall base height of only 4-1/2" (.11 m). The addition of an optional low-angle ramp allows one person to easily roll on a barrel or wheel on a hand truck. The free-floating ramp pivots back over the deck and rests on the mast for compact storage or balanced portability.



*Figure 1: Optional Pivoting Ramp and Indicator*

An efficient off-center arrangement of two high-capacity, single-point load cells yields legal-for-trade accuracy. Electronic components are double-protected from rough use. A RoughDeck™ stainless steel NEMA 4X junction box is further protected by mounting within the mast. The optional indicator mounts on a swivel bracket high enough on the 59" (1.50 m) mast to clear the tallest loads.

In addition to ramps, available options include stainless steel “clamshell” load cell guards and indicator brackets for any Rice Lake IQ series indicator. Other indicators can be readily mast-mounted with slight modifications.



Authorized distributors and their employees can view or download this manual from the Rice Lake Weighing Systems distributor site at [www.rlws.com](http://www.rlws.com).

## 1.2 Operating Requirements

### 1.2.1 Electrical Grounding

Rolling or wheeling loads onto the scale can build up large static charges that may damage the attached indicator unless it is properly grounded to prevent ESD. This is especially true in dry environments where charges drain off slowly, or if wheeling on materials which already contain a static charge, like rolls of paper or plastic film material that have been recently spooled.

To prevent ESD damage, the indicator requires a 3-prong 120 VAC outlet plug with continuous earth ground. Do not attempt to use the scale with 2-prong 120 VAC power without a ground.

### 1.2.2 Load Cell Excitation

Rated Excitation: 10 VDC

Maximum Excitation: 15 VDC

mV/V Signal Output: 2 mV/V

### 1.2.3 Grade Level Requirements

The bubble level built into the platform should indicate a level condition in use. On uneven floors, place temporary shims under feet not contacting the floor.

### 1.2.4 Safe Static Overloading Capacity

Maximum: 150% of scale capacity

## 2.0 Installation

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### Overview

Assembly of the scale consists of the following steps:

1. Unpacking
2. Assembling mast onto scale base
3. Installing optional pivoting ramp
4. Mounting and Wiring the indicator
5. Configuring the indicator
6. Calibrating the unit with test weights

### 2.1 Unpacking

The standard scale with no added options is shipped with load cells and indicator cable pre-wired into the junction box on the mast. The mast must be inserted into the scale base and bolted into place. The indicator can be mounted and wired after the mast is in place.

Remove all packing material and inspect base and mast components for visible damage caused during shipment.

## 2.2 Assembling Mast to Base

Place scale base with platform on a level surface. Lay mast on floor nearby with base of mast adjacent to mast cutout in the base frame. Pull any excess load cell cable up into the mast cavity.

Lift mast assembly and set the bottom into the mast cutout in the base frame, being careful not to pinch load cell cables. Line up holes in mast and frame and insert 3/8" x 6" bolts with washers through the holes. Add lock washers and hex nuts and tighten.

## 2.3 Installing Optional Pivoting Ramp

If the optional ramp is to be installed, set it flat on the floor in position in front of the scale so the holes in the base align with the holes in the ramp pivot arms.

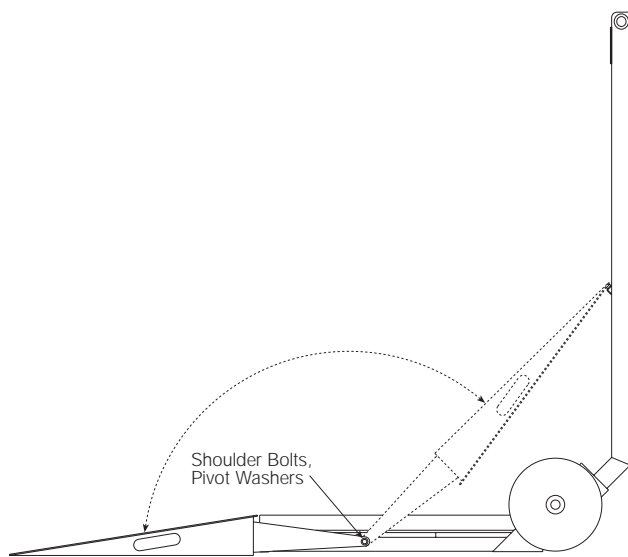


Figure 2: Pivoting Ramp

Slide two plastic pivot washers between each arm and the base and insert a socket-head shoulder bolt into each hole through the washers until the threads engage in the base. Tighten the shoulder bolts snugly.

Use waterproof contact cement to glue the rubber bumper strip to the welded extension on the mast. This strip cushions the ramp when pivoted back for moving.

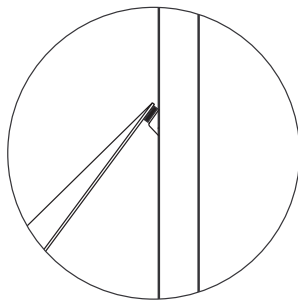


Figure 3: Mast Bumper Strip

## 2.4 Mounting and Wiring an Indicator

### 2.4.1 Attaching Indicator Bracket to Mast

The DeckHand is supplied with a swivel bracket for an IQ plus® 310A indicator. If using a different bracket, bolt it onto the mounting plate on the mast with the bolts, washers, and nuts provided.

Set the two large plastic washers provided near the thumbscrew bolts used to hold the indicator in the bracket. Put the bolts and washers within close reach of the bracket—you'll need them for the next step.

### 2.4.2 Mounting Indicator

Spread the bracket arms enough to slide the indicator between the bracket arms. Line up the bracket holes with the threaded enclosure holes. Slide a plastic pivot washer between each arm and the indicator enclosure at the holes.

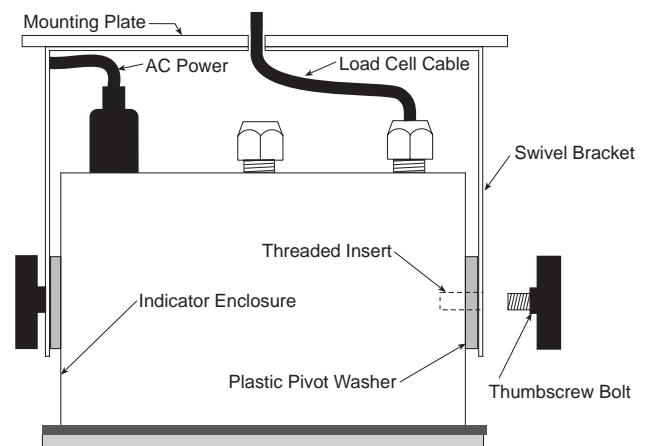


Figure 4: Top View of Indicator and Bracket

Insert the thumbscrew bolts through the bracket arms, through the washers, and into the threaded holes of the indicator enclosure. Tighten bolts snugly so the indicator remains at the desired viewing angle.

### 2.4.3 Wiring Load Cell Cable to Indicator

The load cell cable from the J-box is pre-wired to the INDICATOR terminal inside the J-box. Attach the loose end of this cable to the indicator's load cell input terminal according to the color-coding in Table 1 on the following page. When completed, tighten the cord grip around the cable where it passes through the indicator case.

## 2.5 Corner Trimming

The DeckHand scales are factory-trimmed so each load cell shares an equal part of the weight load.

Further corner-trimming is unnecessary unless a load cell is replaced. See Section 3 for complete information on corner-trimming after load cell replacement.

Cable Color Code	J-Box Terminal
Red	+ Signal
Black	– Excitation
Green	+ Excitation
White	– Signal
Blue	+ Sense
Brown	– Sense
Bare	Shield

Table 1: Load Cell Cable Wiring Code

## 2.6 Configuring the Indicator

Refer to the indicator manual for information on configuring the indicator for your application.

If using the DeckHand for a legal-for-trade application, do not configure the indicator for more divisions than the NTEP Class III maximums below:

500 lb capacity	2500 divisions
1000/2000 lb capacity	2000 divisions

The following sample configuration parameters will yield those maximum divisions:

Scale Capacity	500 lb	1000 lb	2000 lb
Grads	25,000	20,000	20,000
Decimal Point	0.00	0.00	0.0
Display Divisions	2	5	1
Units	lbs	lbs	lbs

Table 2: Sample Configuration

## 2.7 Calibrating with Test Weights

Refer to the indicator operating manual to determine correct calibration procedure.

Before beginning calibration, put the scale in the same temperature environment where it will be used. Power

up the indicator so it can warm up for at least 20 minutes before starting calibration.

The scale should be “exercised” before calibration to be certain that everything is seated. Load the scale to near capacity two or three times.

The following test weights are recommended for the most accurate calibration of the various models:

Scale Capacity	500 lb	1000 lb	2000 lb
Test Weights (75%)	375 lbs	750 lbs	1500 lbs

Table 3: Recommended Calibration Weights

With scale base level and no load on the scale, place the indicator in calibration mode and do a zero calibration according to the indicator manual.

Now place test weights on the platform equal to Table 3 (75% of the scale’s capacity). Do a span calibration according to the indicator manual.

Remove the test weights and check the zero reading. Repeat the calibration process if necessary.

The calibrated DeckHand scale is now ready for operation.

## 3.0 Service Information

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### 3.1 Troubleshooting Guide

#### System does not operate—no display

- Power disconnected: *Check and reconnect.*
- Indicator fuse blown: *Check for cause. Replace.*
- Interface cable cut or disconnected: *Repair.*
- Signal leads incorrectly connected at indicator: *Install according to indicator installation manual.*

#### Display stays at zero

- Indicator faulty: *Service indicator.*
- Load cell connections faulty: *Check cable connections in junction box and at indicator.*
- Load cell overload screws turned fully in: *Loosen overload screws to 0.020" gap.*

#### Erratic weights

- Vibration near scale: *Remove source of vibration or increase digital filtering.*
- Platform not level: *Level scale by shimming if necessary.*
- Load cell or cable water damage: *Replace.*
- Debris under load cells or platform: *Clean.*
- Indicator faulty: *Use simulator to test indicator for stability. Service indicator.*

#### Consistently high or low weights

- Indicator not properly adjusted to zero: *Zero the indicator according to operating manual.*
- Platform binding: *Obtain adequate clearance for free platform movement.*
- Indicator not calibrated: *Calibrate according to indicator manual and Section 2.6.*
- Load cells cables pinched between platform and base: *Reroute cables to provide clearance.*
- Load cells faulty: *Test and replace load cells if necessary.*

### 3.2 Periodic Maintenance

Two important spaces—between the platform side and frame, and beneath the platform—should be periodically cleaned to prevent debris build up.

The platform can be removed for periodic cleaning by unscrewing the lock nuts from the four welded studs on the underside of the platform. The platform can then be lifted off the load cell channels for cleaning.

When cleaning beneath the platform, be careful not to move the load cell cables to a new position where they can be pinched by the platform in operation.



#### Caution

**Do not attempt to spray wash scales with non-hermetically sealed load cells. Water damage is a common cause of failure in non-hermetically-sealed load cells.**

Use care with hot water washdowns for hermetically-sealed load cells. The hot water may not damage the load cells, but the elevated temperatures can cause incorrect readings until the unit cools to room temperature.

When replacing the platform, tighten the four locknuts on the welded studs only until the flat washers beneath them contact the channel surface. Do not tighten the nuts further and compress the cushion pads between platform and channels. The platform must be free-floating on resilient pads for continued accuracy.

### 3.3 Load Cell Replacement

#### 3.3.1 Disassembly

1. Remove the four locknuts and washers that secure the platform to load cell channels. Lift off the platform.
2. Determine which load cell is defective. Use a hardened hex-drive bit and large ratchet wrench to remove the four hex-drive countersunk machine screws holding the channel to the defective load cell underneath. Lift off the channel and the spacer on top of the load cell. Note how the load cell cable is routed on its cable hold downs.
3. Cut the plastic tie at each hold-down to free the cable. Remove the load cell wires from the load cell terminal in the J-box. Loosen the cord grip and pull the cable out of the J-box. Unwind the excess cable from the cable-storage studs to free the cable so it can be pulled completely out of the mast cavity.
4. Turn the scale on its side to remove the lower load cell screws. With the hex-drive bit and ratchet wrench, remove the four cap screws and lockwashers that hold the cell to the mounting plate. Lift off the cell and spacer plate beneath.

#### 3.3.2 Reassembly

Tilt and block the scale base enough that you have

comfortable access to the load cell screws from underneath the base. Position the new load cell with the cable to the inside and the label readable from the outside. Be sure the load cell body is not contacting the overload stop screw. Back the screw off if necessary (it was secured with Loctite at the factory and will turn hard).

1. Set the spacer block and load cell into position. Insert the four load cell screws from the bottom finger-tight only; final adjustments in load cell position are necessary before the screws are torqued down.
2. Run the new load cell cable to the J-box using exactly the path dictated by the cable existing ties. The existing cable hold downs keep the cables under the middle of each load cell channel, where they are protected from accidental crimping between the flexing channels and the frame. When new cable ties are attached, feed the cable through the cutout in the frame and into the mast cavity. Do not shorten the load cell cable; it is temperature-compensated for the supplied cable length. Wind the excess cable around the cable-storage studs, leaving enough free to wire into the junction box.
3. With the load cell still loose enough for final adjustment, set the top spacer block and load cell channel on the cell and insert the self-centering countersunk load cell screws. Tighten these screws alternately with a hex-drive bit and ratchet wrench to a final torque of 20 ft. lb. for mild steel models and 12 ft. lb. for stainless steel models.
4. Adjust the load cell/channel assembly so it is parallel with the other channel. Measure across the holes in the front and rear of the channels. Adjust the new cell so that distance is equal, then tighten the load cell cap screws from underneath to a final torque of 20 ft. lb. for mild steel models and 12 ft. lb. for stainless steel models. Check again to be certain the cable will not be pinched by the flexing channel in operation.

Finally, put a drop of Loctite on the overload stop screw and set it for a 0.020" gap with the load cell.

### 3.3.3 Wiring Load Cells into J-Box

Feed the load cell cable into the J-box cord grip closest to its terminal. When facing the scale, the left load cell

is wired to terminal 4 of the J-box, and the right load cell is wired to terminal 1. Note that the wire traces for cells 2 and 3 (JU-2, JU-3) have been cut, making those unused channels inactive.

Connect wires according to Table 1 on page 3. Pull excess cable out of the J-box and tighten the cable cord grip snugly. The rubber seal will protrude slightly from the cord grip when tightened enough to be waterproof.

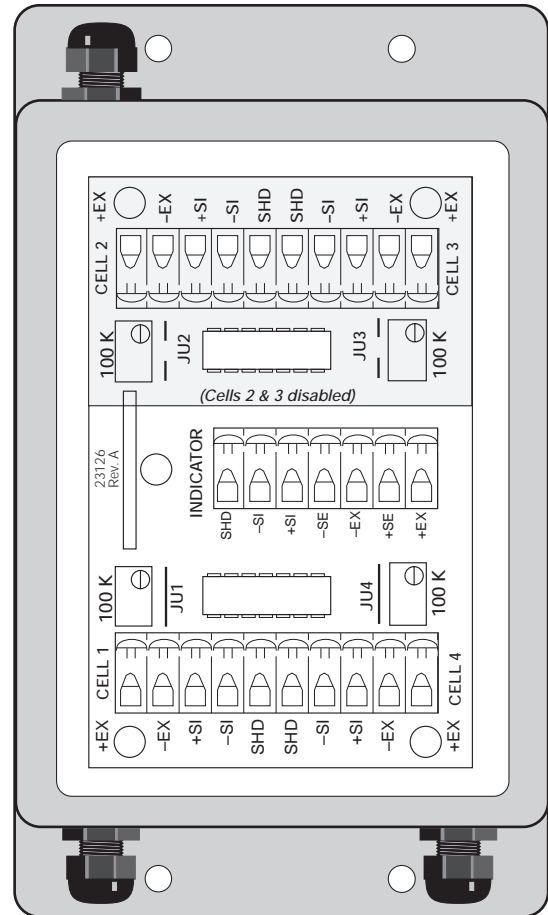


Figure 5: DeckHand Junction Box Cutaway

### 3.3.4 Replacing Deck Platform

Put the scale flat on the floor and set the platform on the channels so the welded studs drop into the channel holes. Tilt and block the scale up again and install a flat washer and locknut on each stud. Turn the lock nut onto each stud until the washer just contacts the channel underside. Do not tighten the lock nuts so the cushioning pads are compressed. The platform must be free floating for accuracy; the lock nuts merely serve as lift off protection.

### 3.3.5 Corner Trimming

All DeckHand scales are delivered with the junction



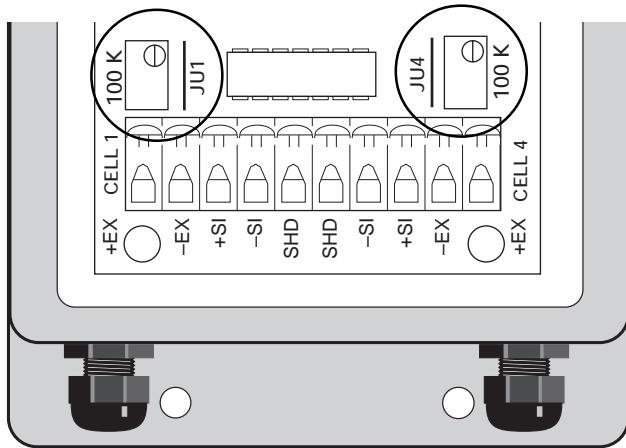
box trimmed, but re-trimming to equalize loading is necessary after replacing a load cell.

To trim the scale, the output from each load cell must be matched by adjusting the signals with potentiometers at the junction box—a process known as trimming.

The indicator must be connected and approximately calibrated, but it need not indicate the exact weight value. An exact calibration will be done after trimming.

A test weight is required for corner trimming. The recommended minimum test weight for all DeckHand models is 25% of scale capacity.

1. Remove the junction box cover and identify the correct load cell terminal corresponding to each side of the scale (labeled CELL 1, and CELL 4).



*Figure 6: Cell 1 and Cell 4 Potentiometers*

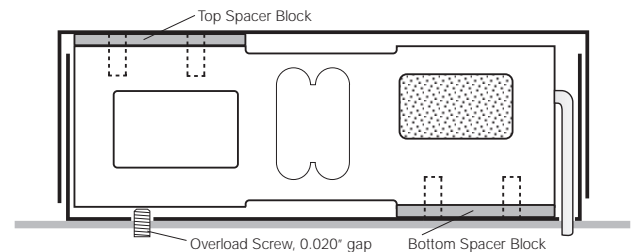
2. With scale level and no weight on the scale, zero the indicator. Then turn potentiometers for cells 1 and 4 fully clockwise to get the maximum signal from each load cell. A clicking sound can be heard when full signal is reached.
3. With both potentiometers at full signal, place the test weight over left or right side of platform and record the indicated weight reading. Repeat the process for the other side. The load cell with the lowest reading will be used as the reference cell and will not be trimmed.
4. Place the test weight over the side reading high and turn that cell's potentiometer to adjust the cell output down to the reference cell output.
5. Rezero the indicator and repeat the test until both sides are within  $\pm 1\%$  of the test weight being used. Adjustments are somewhat interac-

tive, so adjusting the higher output may affect the reference cell output.

6. Secure extra cable length by wrapping it around the cable storage pegs inside the mast.
7. When corner trimming is complete, pull any excess cable out of the junction box enclosure and tighten the strain relief hubs snugly with a wrench. To be watertight, the hubs must be tightened to the point where the rubber sleeving begins to protrude out of the hub.
8. After tightening cord grips, replace the J-box cover.

### 3.4 Installing Protective Clamshells

Stainless steel clamshells—load cell protectors—are mounted around the load cells to provide an extra degree of spray protection. The lower protector is slightly smaller than the upper one which overlaps on all sides. The load cell cable exits through the bottom surface of the lower clamshell then through a hole in the mounting plate.



*Figure 7: Clamshell Load Cell Protectors*

1. To attach clamshells, remove all channels, load cell screws and load cells. Place lower clamshell directly on mounting plate with overload stop screw centered in the clamshell's largest hole.
2. Add mounting spacer and align all four holes. Position load cell on spacer and insert load cell screws and lockwashers from beneath mounting plate through clamshell and spacer and into load cell. Tighten the four screws finger tight only so the cell can still be moved slightly for final positioning.
3. For final positioning, measure to be sure load cells are parallel to each other and to the frame. It may be easier to mount one load cell first so it is parallel to the frame, then measure equal distances between the ends of the two load cells to get them parallel with each other. When correctly positioned, retighten the load cell



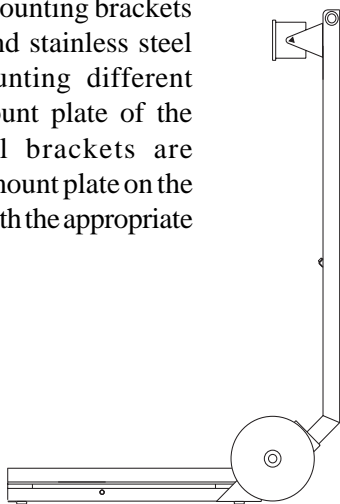
screws to original torque specifications (20 ft. lb. for mild steel screws, 12 ft. lb. for stainless steel screws)

4. Position top spacer blocks on load cells, then set upper clamshells on spacer blocks and align holes. Place load cell channels so all four holes line up, then turn in the self-centering counter-sunk screws. Tighten to same torque settings as lower load cell screws.
5. Replace scale deck onto load cell channels.
6. Reset overload stop screws by turning them in until they just contact the load cell, then back off 0.020".

Calibrate scale according to Section 2.6 on page 3.

### 3.5 Mounting Indicator Brackets

A variety of indicator mounting brackets in both painted steel and stainless steel are available for mounting different indicators onto the mount plate of the DeckHand mast. All brackets are predrilled to match the mount plate on the mast, and are supplied with the appropriate painted or stainless steel mounting hardware.



### Optional Indicator Mounts

Part #	Description	Size
41315	IQ plus® 310A mount, painted steel	4" x 7.5"
41316	IQ plus® 310A mount, stainless steel	4" x 7.5"
41372	IQ plus® 800 mount, painted steel	4" x 10"
41370	IQ plus® 800 mount, stainless steel	4" x 10"
43938	CW-80 mount, stainless steel	4.5" x 6.3"

### 3.6 Ramps and Replacement Load Cells

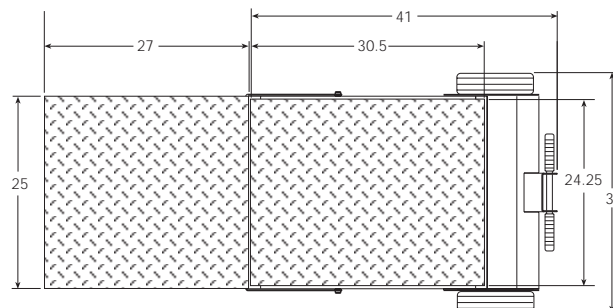
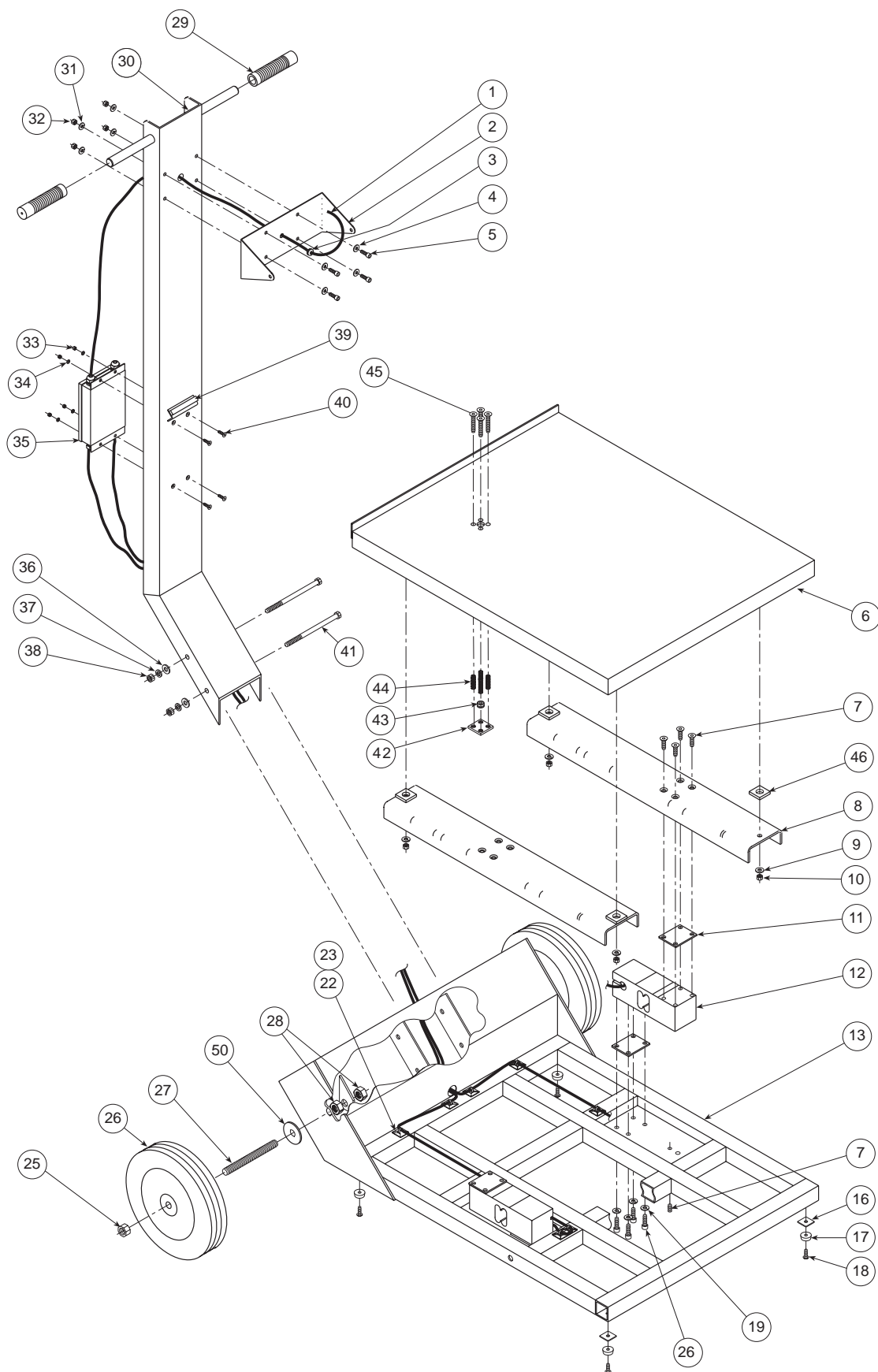


Figure 9: Scale and Ramp Dimensions

DeckHand Model	Scale Part #	Overall Size	Platform Deck Size	Load Cell Part #	Load Cell Capacity	Ramp Part #	Ramp Deck Size	Ramp Weight
DH-500	41293	31"W 41"L	24.25"W 30.5"L	41024	250 kg (550 lb)	43376	25"W 27"L	44 lb
DH-1000	41294	31"W 41"L	24.25"W 30.5"L	41026	500 kg (1100 lb)	43376	25"W 27"L	44 lb
DH-2000	41295	31"W 41"L	24.25"W 30.5"L	41027	635 kg (1397 lb)	43378	25"W 27"L	57 lb
DH-500SS	41296	31"W 41"L	24.25"W 30.5"L	41024	250 kg (550 lb)	43377	25"W 27"L	44 lb
DH-1000SS	41297	31"W 41"L	24.25"W 30.5"L	41026	500 kg (1100 lb)	43377	25"W 27"L	44 lb
DH-2000SS	41298	31"W 41"L	24.25"W 30.5"L	41027	635 kg (1397 lb)	43379	25"W 27"L	57 lb

## 4.0 Replacement Parts



REF.	DESCRIPTION	PART NO. MILD STEEL	PART NO. STAINLESS
1	Cable, 6-Conductor, 3 1/2 ft .....	44187 .....	44187
2	Mount, Indicator, 310A .....	41315 .....	41316
3	Grommet, Rubber 1/2 x 1/4 .....	15398 .....	15398
4	Flat Washer, 1/4 .....	15145 .....	15149
5	Cap Screw, 1/4-20NC x 3/4 .....	14965 .....	41251
6	Upper Platter (DH-500, DH-1000) .....	40986 .....	41181
6	Upper Platter (DH-2000) .....	42654 .....	42655
7	Machine Screw, 5/16-18 NC x 1) .....	14996 .....	41250
8	Load Cell Channels (DH-500) .....	41002 .....	41197
8	Load Cell Channels (DH-1000) .....	41002 .....	42665
8	Load Cell Channels (DH-2000) .....	42664 .....	42653
9	Flat Washer, 5/16 .....	21939 .....	44237
10	Lock Nut, 5/16-18 NC, Hex .....	14646 .....	41252
11	Spacer Plate, Load Cell .....	41003 .....	41198
12	Load Cell .....	See table on page 7	
13	Base Platform (DH-500, DH-1000) .....	40983 .....	41178
13	Base Platform (DH-2000) .....	42616 .....	42617
14	Cap Screws, 5/16-18NC x 1 .....	14997 .....	15000
15	Overload Stop Set Screw, 5/16 x 18NC x 1/2 .....	14989 .....	21933
16	Base Shim, Ramp End .....	41004 .....	41199
17	Scale Base Bumper, 3/4 .....	41267 .....	41267
18	Cap Screw, 1/4-20NC x 3/4 .....	14964 .....	41251
19	Lock Washer, 5/16 .....	15153 .....	15154
22	Cable Tie Mount .....	15658 .....	15658
23	Cable Tie, 3" .....	15631 .....	15631
25	Lock Nut, 5/8-11NC .....	40181 .....	41249
26	Wheel, 10 Dia. x 5/8 Bore .....	41268 .....	41268
27	Axle, 5/8-11 x 6 .....	41005 .....	41200
28	Jam Nut, 5/8-11NC .....	14676 .....	14680
29	Handle Grip, 3/4 I.D. ....	41266 .....	41266
30	Mast, 57-13/16 x 15 .....	40987 .....	41182
31	Lock Washer, 1/4 .....	15147 .....	15148
32	Hex Nut, 1/4-20NC .....	14641 .....	14642
33	Machine Screw Nut, 10-32 .....	22066 .....	39025
34	Lock Washer, No. 10 .....	21936 .....	39024
35	Junction Box, Stainless Steel, EL604 Signal Trim .....	23127 .....	23127
36	Flat Washer, 3/8 .....	21938 .....	15161
37	Lock Washer, 3/8 .....	15159 .....	15160
38	Hex Nut, 3/8-16NC .....	14656 .....	14655
39	Dampener Strip, Ramp Stop .....	41108 .....	41108
40	Cap Screw, 10-32NF x 3/4 .....	32104 .....	41253
41	Cap Screw, 3/8-16NC x 6 .....	41254 .....	41257
42	Bubble Level Plate .....	44130 .....	44129
43	Bubble Level .....	15410 .....	15410
44	Compression Spring, .041 .....	44127 .....	44128
45	Machine Screw, 10-32NF x 1 .....	14941 .....	44126
46	Bumper Cushion, Self-Adhesive .....	44149 .....	44149
50	Nylon Wheel Spacer, 5/8 .....	15176 .....	15176

## 5.0 DeckHand Limited Warranty

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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 one year.

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 non-conformities.
- 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.

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**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.

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