



**HARDY BENCH SCALES**

**OPERATION AND INSTALLATION**  
**MANUAL**



Hardy Process Solutions

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Hardy Process Solutions, #0596-0339-01 Rev A3

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**CAUTION:**

**UNPACK WITH CARE**

**WHEN UNPACKING, DO NOT DISCARD THE PACKING CASE OR ANY PACKING MATERIAL, UNTIL THE CONTENTS OF THE PACKING CASE ARE INSPECTED AND CAREFULLY COMPARED WITH THE SHIPPING DOCUMENTS.**

**IF ANYTHING IS UNSATISFACTORY, PLEASE NOTIFY HARDY PROCESS SOLUTIONS IMMEDIATELY BY CALLING, FAXING OR E-MAILING TO:**

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Web Address: [www.hardysolutions.com](http://www.hardysolutions.com)

**TO RETURN DEFECTIVE OR DAMAGED PRODUCT(S) CALL HARDY TECHNICAL SUPPORT FOR A HARDY SERVICE TICKET NUMBER (HST#). YOUR COMPANY NAME, ADDRESS, TELEPHONE NUMBER, SERIAL NUMBER OF THE UNIT AND A BRIEF DESCRIPTION OF THE PROBLEM SHOULD BE READY WHEN CALLING. FOR ALL NON-WARRANTY REPAIRS A PURCHASE ORDER OR CREDIT CARD IS ALSO REQUIRED.**

**IN CASE OF DAMAGE DUE TO SHIPPING, NOTIFY THE DELIVERING CARRIER IMMEDIATELY FOR AN INSPECTION.**

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## **CHAPTER 1 - OVERVIEW**

### **Introduction**

Congratulations on your purchase of a Hardy Bench Scale. Behind your purchase is over 90 years of quality, reliability and technical innovation.

The Hardy Bench Scales are designed for table top or floor applications requiring high accuracy and reliability. The covers are all stainless steel for durability. The bases have no bearings, spirit levels, or moving parts that can be damaged or wear out. The active element of the scale is a precise and accurate strain gauge load sensor.

### **Description**

All Hardy Bench Scales come standard in 12"x12", 18"x18", and 24"x24" sizes, and range in capacity from 5lbs – 1,000lbs (2.27kg to 454 kg). Custom sizes and capacities are available from Hardy upon request.

The basic Hardy Bench Scale consists of three major components:

1. Stainless Steel Top Cover.
2. Lower Frame Assembly with a load sensor
3. Four Leveling feet.

#### **The Stainless Steel Top Cover**

The top cover is a single piece constructed of heavy gauge 304 Stainless Steel. The cover provides a washdown weighing surface and offers protection to the load sensor and electronics.

#### **Lower Frame Assembly**

The lower frame comes equipped with four leveling feet, a load sensor, a shock load and corner overload protection. Depending on the model, the frame is made of stainless steel or painted carbon steel.

#### **Scale Interface**

Directly attach the scale's 10 foot (3 meter) cable to any weighing instrument or controller. If interfacing with a Hardy Controller, you can take full advantage of WEVERSAVER<sup>®</sup> and C2<sup>®</sup> Elec-

## **Hardy Bench Scales**

tronic Calibration (C2 is only available with HI BS400 series).

### **NOTE:**

*WAVERSAVER® and C2® are registered trademarks of Hardy Process Solutions.*

### **Hardy Bench Scale Models**

#### **400 Series – HIBS400-xxxx**

The HI BS400 Series is Hardy's top of the line industrial bench scale. With all stainless steel construction and a hermetically sealed, IP68/IP69K, FM Hazardous approved, stainless steel Advantage® load cell, the HI BS400 is built for the heaviest wash down applications and corrosive environments. Hardy has built its C2 weight-free calibration technology into every scale, delivering the lowest total cost of ownership on the market. C2 calibration saves time during commissioning and replacement, removes personnel from processing areas, and keeps your process cleaner by eliminating the need for potentially contaminated test weights.

#### **300 Series – HIBS300-xxxx**

The Hardy HI BS300 Series is a Hardy's lowest cost stainless steel industrial scale, built to handle light wash down and humid environments. Each bench scale is equipped with an FM approved IP67 aluminum load cell, and comes with NTEP (pending) certifications standard. The HI BS300 does not come with C2.

#### **200 Series – HIBS200-xxxx**

The HI BS200 Series is Hardy's lowest cost industrial scale, featuring a painted carbon steel base and IP67 aluminum load cell made for use in dry and dusty environments. Each aluminum load cell is FM approved, and the HI BS200 comes with NTEP (pending) certifications standard. The HI BS200 does not come with C2.

## **CHAPTER 2 - SPECIFICATIONS**

### **Hardy Bench Scale Specifications**

#### **Platter Construction**

- 304 Stainless Steel (all models)
- Size: 12" x 12", 18" x 18" and 24" x 24" (custom sizes are available)

#### **Deck Height**

- 12" x 12": 5, 25, 50, 150 lbs: 3.75" to 4.5" (9.5 to 11.4 cm) adjustable
- 18" x 18": 50, 25, 50, 150 lbs: 3.75" to 4.5" (9.5 to 11.4 cm) adjustable
- 18 x 18": 300, 500 lbs: 5.5" x 6.5" (14 to 16.5 cm) adjustable
- 24" x 24": all capacities 5.5" x 6.5" (14 to 16.5 cm) adjustable

#### **Capacity Range**

5 lbs to 1000 lbs (2.27 to 454 kg)

#### **Rated Output**

Overload: 300% R.O.

End loading: 100% R.O.

Corner loading: 100% R.O.

#### **Cable Length**

Platform to Instrument - 9 to 10 feet nominal (3 meters) (for longer cable lengths, contact the Factory)

#### **Base Construction**

**HIBS400 & HIBS300:** Stainless Steel

**HIBS200:** Painted Carbon Steel

#### **Load Sensors**

**HIBS400:**

- C2® stainless steel, hermetically sealed IP68/IP69K
- Load Sensor Sensitivity: 2.0mV/V +/- 5%

## Hardy Bench Scales

### **HIBS300 & HIBS200:**

- Aluminum, environmentally potted, IP67
- Load Sensor sensitivity: 2.0 +/- 0.2 mV/V

### **Resolution**

5000 divisions of scale capacity

### **Accuracy**

Combined Error: 0.02%

### **Temperature**

Operating: -10 to +40 degrees celsius

Storage: -20 to +65 degrees celsius

### **Warranty**

Two year limited warranty

### **Approvals**

NTEP (HIBS300 and HIBS200 Only)

FM IS Hazardous Class I, Div 1 Load Cell

### **Shipping Weight**

12" x 12": 38 lbs (17.2 kg)

18" x 18": 59 lbs (26.8 kg)

24" x 24": 104 lbs (47.2 kg)

## Standard Sizes & Capacities

	lbs						
Capacity	5	25	50	150	300	500	1000
12" x 12"	X	X	X	X			
18" x 18"			X	X	X	X	
24" x 24"			X	X	X	X	X

## **CHAPTER 3 - INSTALLATION**

### **Precautions**

**Do not** store or operate the scale out of its specified temperature range. (See Temperature Ranges in Chapter 2)

**Do not** store other equipment on the scale when it is not in use or in storage.

**Do not** allow a build-up of debris on, around or under the scale.

**Do not** set the scale in water or allow water to settle around the scale. Provide Proper drainage.

**Do not** allow static or other electrical discharges through the scale.

**Do not** try to repair the scale. Contact Hardy Process Solutions Technical Support Department for any and all repairs.

### **Unpacking**

Hardy Bench scales are shipped fully assembled and only require adjustment of the overload stops and adjustment of the leveling feet. If there is any damage to the shipping container or to the scale, save all the packaging material and file a report with the shipper.

### **Adjusting the Mechanical Overload Stops**

There is a bolt in each corner of the frame that is fully engaged for shipping protection. Each should be adjusted to allow the load cell to deflect to its maximum deflection distance, but no further.

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### Maximum Deflection at Capacity: HI BS400 HISP1 Load Sensor (24" x 24")

Capacity	Deflection (mm)
50 kg	0.22
100 kg	0.20
250 kg	0.10
500 kg	0.25

### HISP6 Load Sensor (12" x 12" and 18" x 18")

Capacity	Deflection (mm)
10 kg	0.17
20 kg	0.22
50 kg	0.22
100 kg	0.22
200 kg	0.25

### Maximum Deflection at Capacity: HI BS300 & HI BS200

#### 1250 Load Sensor (24" x 24")

Capacity	Deflection (mm)
50 kg	<0.40
100 kg	<0.40
250 kg	<0.40
500 kg	<0.40

1042 Load Sensor (12" x 12" and 18" x 18")

<b>Capacity</b>	<b>Deflection (mm)</b>
10 kg	<0.40
20 kg	<0.40
50 kg	<0.40
100 kg	<0.40
200 kg	<0.40

**Leveling the Scale**

Step 1. The Hardy Bench Scales come with an integrated leveling indicator at the front of the base. (See Fig. 3-1). Remove the top cover and locate the indicator at the center of the front of the scale base.



**FIG. 3-1 LEVELING INDICATOR**

## Hardy Bench Scales

- Step 2. To level the platform, turn the leveling feet clockwise to lower the scale corner, or counter clockwise to raise it until you show a level reading by centering the bubble in the center of the indicator.



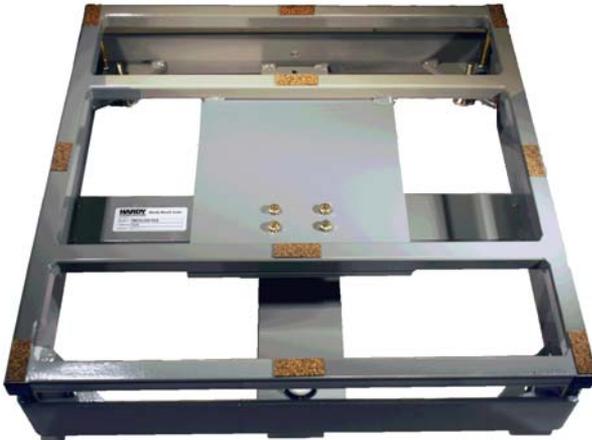
**FIG. 3-2 LEVELING FEET**

### Scale Connections

To connect the scale, you must first remove the cover, unroll the cable and run the cable through the hole in the back of the unit. Replace the cover.



**FIG. 3-3 RUNNING CABLE THROUGH HOLE IN BACK  
(12" X 12" OR 18" X 18" INCH SCALE)**



**FIG. 3-4 HOLE FOR THE CABLE IS AT THE BACK  
OF THE INSIDE OF A 24" X 24" SCALE**

## Hardy Bench Scales

Make sure the cable is not pinched and is clear of the feet. The Bench Scale requires a recommended DC or AC excitation voltage of 5 volts with a maximum of 15 volts. **Wire the Scale cable to an instrument or indicator following the color code label found on the cable.**

For example, most HI BS200 and HI BS300 Scale Models use the following wiring but some capacities **MAY** be different:

+ Excitation	Green
- Excitation	Black
+ Sense	Blue
- Sense	Brown
+ Signal	Red
- Signal	White
Shield	Bare

For HI BS400 Scale Models with C2 Electronic Calibration:

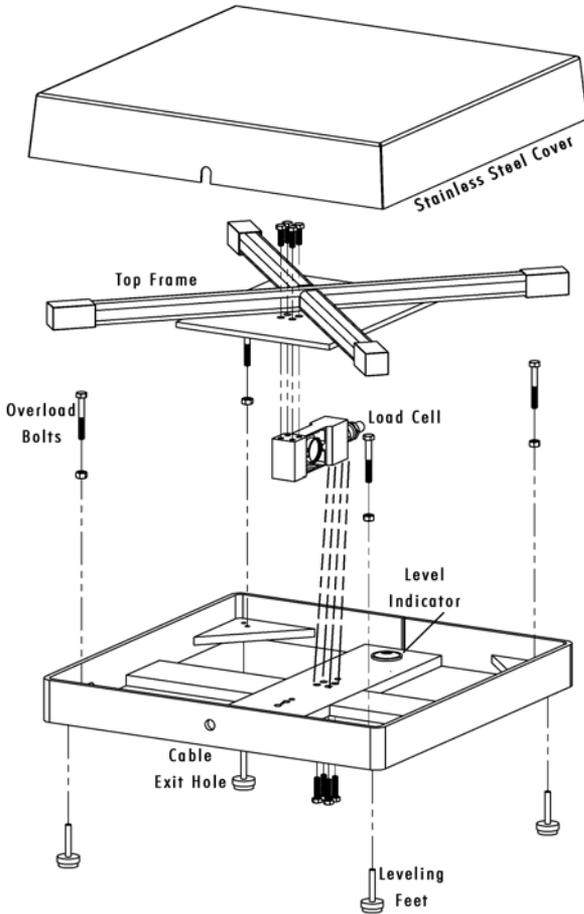
+ Excitation	Red
- Excitation	Black
+ Signal	Green
- Signal	White
+ C2	Gray
- C2	Violet
Shield	Yellow or Bare

### WARNING

**USE CAUTION WHEN WIRING. MAKE SURE TO DISCONNECT ALL POWER TO THE SCALE. FAILURE TO REMOVE POWER CAN RESULT IN SCALE OR INSTRUMENT DAMAGE, DEGRADATION OF PERFORMANCE OR PERSONAL INJURY**

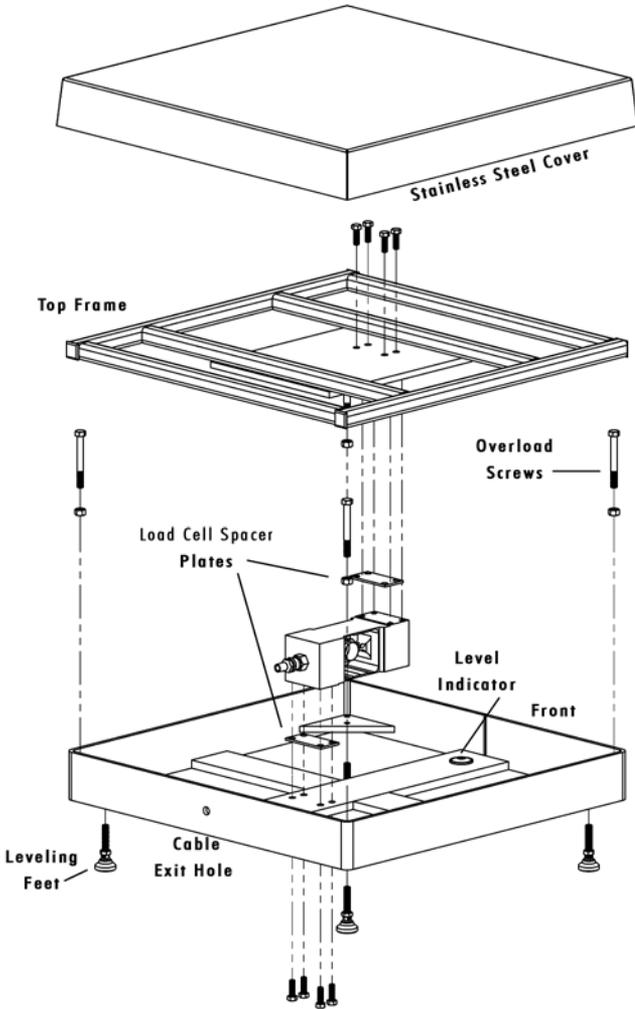
### NOTE:

*Hardy Process Solutions provides drawings you may download on the Hardy Bench Scales page under the Docs & Programs tab. Drawings are provided for each of the Hardy Bench Scale models in .dxf, dwg, .pdf, and 3D formats. These drawings include the wiring configurations.*



**FIG. 3-5 EXPLODED VIEW OF 12" X 12" OR 18" X 18" SCALE SHOWING SELECTED PARTS**

# Hardy Bench Scales



**FIG. 3-6 EXPLODED VIEW OF 24" X 24" SCALE SHOWING SELECTED PARTS**

## **CHAPTER 4 - CALIBRATION**

### **About Calibration of the Hardy Bench Scale**

The Hardy Bench Scales come calibrated from the factory. Make sure the scale is correctly wired to the weighing instrument or indicator. Refer to the weighing instrument or indicator manual for calibration instructions.

### **C2 Second Generation Calibration**

C2 electronically calibrates a scale system without the need for test weights. If you are using a Hardy Process Solutions Weight Controller, Weight Processor, Indicator or Weigh Module, all that's required is to enter a reference point. Refer to the instrument or module manual for calibration instructions using C2/

### **NOTE:**

*Hardy C2 calibration is only available in the HI BS400 model as a standard feature.*

### **Test Weight Calibration (Hard Cal)**

This is the traditional means of calibration requiring certified class F test weights equal to a minimum of 80% of the rated scale capacity.

Three weights between 10% and 100% of the scale capacity should be available to check the mid-range. Several low capacity weights equivalent to one or two instrument divisions are necessary to check the system sensitivity.

### **NOTE:**

*Traditional Calibration is required for the HI BS200 and HI BS300 models because they do not come with C2 load cells.*

### **Material Substitution**

When certified test weights are not available you can use an accurately weighed material to calibrate the system. In this method, a material is weighed on a secondary, calibrated scale and delivered to the site of the scale to be calibrated. The secondary calibrated scale should be of the same accuracy or greater and have a capacity approximately equal to the scale being calibrated.

## CHAPTER 5- TROUBLESHOOTING

### SCOPE

All the information in Chapter 5 pertains to the troubleshooting and resolution of operating problems that may occur. All maintenance personnel and users should be familiar with both Chapters 3 and 4 before attempting to troubleshoot problems with the Scale.

### Problem:

#### **Scale Does Not Respond When Weight is Applied**

- Step 1. Make sure the scale is wired correctly to the instrument or network and there are no breaks in the wiring.
- Step 2. Check to see if there is packing material or debris wedged under or against the scale.
- Step 3. Make sure the corner mechanical overload stops are not engaged with the platform. Lower as necessary.

#### **Scale Indication is not linear**

- Step 1. Check the instrument for proper calibration.
- Step 2. Check to see if there is packing material or debris wedged under or on the side of the scale.
- Step 3. Make sure the corner mechanical overload stops are not engaged with the platform. Lower as necessary.
- Step 4. Make sure all electrical connections are tight with no corrosion and that there has not been an ingress of moisture to the system.

#### **Scale Reads Backwards**

- Step 1. Check for correct wiring to the instrument. The +- signal or excitation wires may be reversed.

#### **Scale Reading drifts or is Erratic**

- Step 1. Make sure all electrical connections are tight with no corrosion and that there has not been an ingress of moisture to the system.

## **Hardy Bench Scales**

- Step 2. Make sure the corner mechanical overload stops are not engaged with the platform. Lower as necessary.
- Step 3. Verify that the instrument or network is operating properly.
- Step 4. Make sure there are no high voltage wires close to the scale.
- Step 5. Check that the scale and instrument are properly grounded.
- Step 6. If high static electricity is present a ground strap should be added from the top cover to the chassis and to earth ground.

### **Service and Repair (All Models)**

For Service and Repairs, contact your local Hardy Representative.

Before returning any product to Hardy Process Solutions, please contact the Hardy Service Center for a return authorization number. Please have the scale model number and a serial number and a brief description of the problem ready when you call.

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