

TuffSeal®

*Small and Mid-Range 4-Channel Junction Box
(with expansion)
JB4ES/JB4SS/JB4EP/JB4SP*

Installation Guide



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Systems distributor site at:
www.ricelake.com



Figure 1: Tuff Seal Small and Mid-Range 4-Channel Junction Boxes

1. Introduction

The TuffSeal® junction boxes are excitation or signal trim junction boxes that can accommodate two, three, or four load cells and are used primarily in floor and hopper scales. Each model also has the capability to extend to more than four load cells using an expansion connector. All models have a new Prevent® breather vent. The breather vent inhibits the buildup of pressure caused by sudden temperature or environmental changes and should be changed every six months to one year as it will become dirty over time. When correctly installed, all models can withstand 900 PSI water pressure.

All terminals will function properly without modification. However, load cell output can be individually trimmed with potentiometers which is further explained in Section 4.0.

Model Designations

The TuffSeal junction box comes in several different models including stainless steel for the small junction box and a FRP enclosure for the mid-range junction box. Applications vary from use in floor scales to hoppers so selection can vary from a light capacity junction box to a mid-range capacity junction box. TuffSeal models include:

RLWS PN	Model Designation	Description
91779	JB4ES	4-Channel Excitation Junction Box w/ Expansion in SST Enclosure
88956	JB4SS	4-Channel Signal Trim Junction Box w/ Expansion in SST Enclosure
91781	JB4EP	4-Channel Excitation Junction Box w/ Expansion in a FRP Enclosure
91780	JB4SP	4-Channel Signal Trim Junction Box w/ Expansion in a FRP Enclosure

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2. TuffSeal Junction Box Mounting Procedure

The TuffSeal junction boxes include two different sizes:

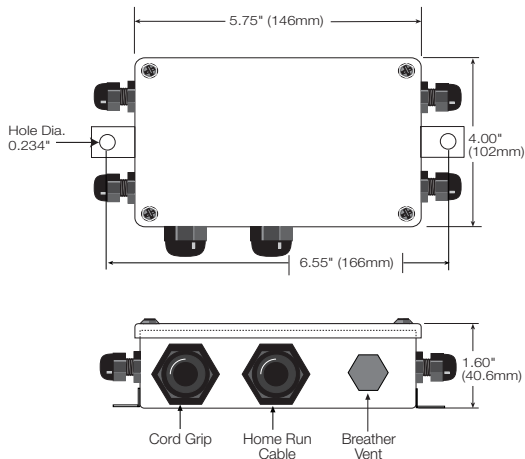
- 4-Channel small enclosure (JB4ES and JB4SS)
- 4-Channel mid-range FRP enclosure (JB4EP and JB4SP)

The following sections describe the correct mounting procedure used for each.

2.1 Mounting the Small Junction Box (JB4ES and JB4SS)

The junction box should be mounted in a location that is convenient for servicing and away from standing water. Try to mount the enclosure in a location so that the load cell cables need not be cut, nor length added. Load cell output is temperature compensated for the supplied cable length. Altering that length can change the cell's signal output.

Depending on the mounting surface, the JB4ES or JB4SS enclosure can be attached using two pan-head screws, bolts, or other suitable fasteners. Figure 2, below, shows the dimensions for mounting the enclosure.



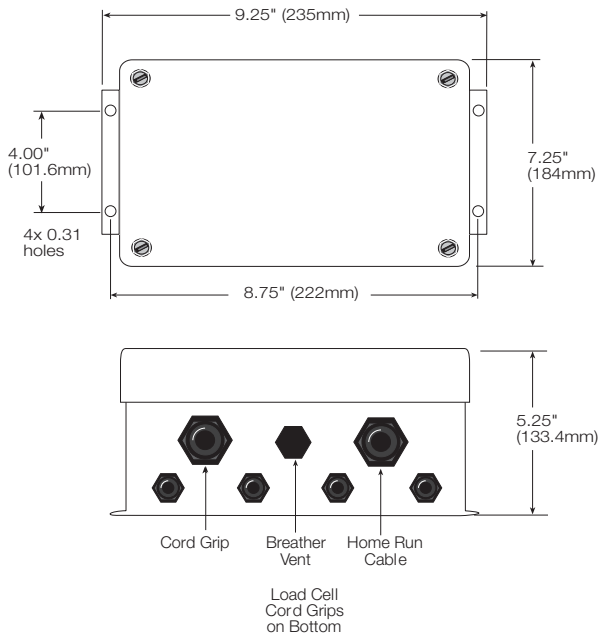
- (4) SL-7, PG-7 Cord Grips, Cable Diameter 0.118" - 0.255"
- (2) SL-11, PG11 Cord Grips, Cable Diameter 0.197" - 0.394"

Figure 2: JB4ES and JB4SS Enclosure Dimensions

2.2 Mounting the Mid-Range Junction Box (JB4EP and JB4SP)

The JB4EP or JB4SP junction box should be mounted in a location that is convenient for servicing and away from standing water. Try to mount the j-box in a location so that the load cell cables need not be cut, nor length added. Load cell output is temperature compensated for the supplied cable length. Altering the length can change the cell's signal output.

Depending on the mounting surface, the JB4EP or JB4SP enclosure can be attached using four pan-head screws, bolts, or other suitable masonry fasteners. Figure 3, below, shows the dimensions for mounting the enclosure.



- (4) SL-7, PG7 Cord Grips - Cable Diameter 0.118" - 0.255"
- (2) SL-11, PG11 Cord Grips - Cable Diameter 0.197" - 0.394"

Figure 3: JB4EP and JB4SP Enclosure Dimensions

3.0 Wiring the Junction Box

All TuffSeal junction box models have been designed to connect and trim up to four load cells per board. However, it is possible to use this box with other combinations. Use the expansion port on the main board (shown below), to connect multiple junction boxes in series to accommodate applications that have more than four load cells.

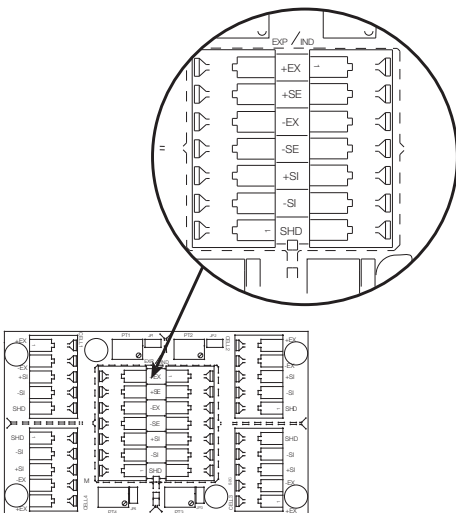


Figure 4: Expansion Port Wiring Location

After determining the wiring pattern, route the load cell cables through the cord grip assemblies and leave the grips loose until final closure. Before connecting load cell wires to the terminals, strip the wire insulation back 1/4" to expose the wire. The spring-loaded terminals will accommodate 12 to 28 gauge wire. To connect the load cell wires to the appropriate connectors, push in the quick-connect lever with a small screwdriver. While holding in the lever, insert the appropriate wire into the exposed wire opening. Release the screwdriver to allow the spring-loaded gate to close and lock the wire in place.

The indicator terminal strip is used to connect the main cable to the indicator. Determine the indicator's load cell input connections from the operating manual. Run a cable from your indicator terminal into the junction box through the larger cord grip and make the connections on the indicator terminal using the same procedure as inserting load cell cables to the appropriate connectors.

4.0 Trimming Procedure

Trimming is a process of equalizing the output from multiple individual load cells. If needed, load cell output can be individually trimmed with potentiometers.

Whenever a substantial amount of trim (more than 5% of normal output), seems necessary to equalize output check for other possible problems. The best trim is always the least amount of trim. When all errors except cell mismatch and cable extensions or reductions have been corrected, continue with the trimming.

Please refer to the appropriate trimming section depending on whether you've got an excitation board (JB4ES or JB4EP) or a signal trim board (JB4SS or JB4SP).

4.1 Excitation Board Trimming Procedure (JB4ES and JB4EP)

Use the following steps to properly trim the JB4ES and JB4EP junction box.

1. Determine the number of load cells needed.
2. **Make sure jumpers have been removed to enable trimming of the desired cells corresponding to each load cell in use.** See Figure 5 for the location of jumpers JP1, JP2, JP3, and JP4. Note that jumpers *must* be removed to enable trimming on the excitation board.
3. Set all potentiometers fully clockwise to give maximum signal output from each cell (see location of potentiometers below).

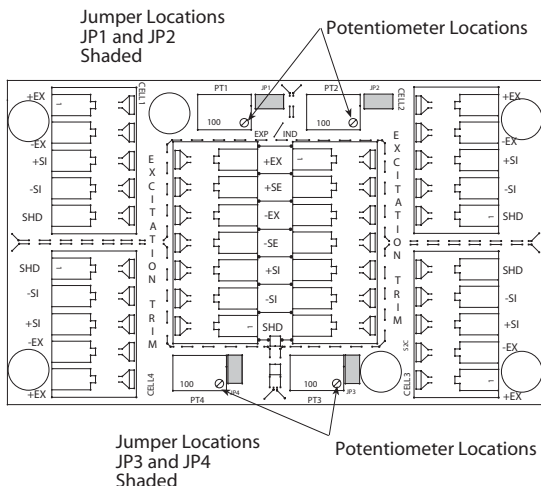


Figure 5: Excitation Main Board

4. Zero the indicator and place calibrated test weights over each load cell in turn. The amount of test weights to be used will depend on the scale configuration; for specific recommendations, refer to *Handbook 44 Field Manual*, published by the Institute for Weights and Measures. For a four-cell platform, it's recommended using 25% of scale capacity.
5. Record the value displayed on the indicator after the test weight is placed in turn on each corner (directly over the load cell) without allowing the weight to overhang the sides. Allow the scale to return to zero each time to check for friction or other mechanical problems. Select the load cell which has the lowest value as your reference point. This cell will not be trimmed.
6. Replace the same test load over each cell in turn. Using the corresponding potentiometer, trim each cell down to equal the reference load cell. As corner corrections are somewhat interactive, check all cells again for repeatability. If necessary, repeat steps 4 and 5.
7. Pull excess cable out of the enclosure.
8. Using a wrench, tighten nut until the rubber touches the cable completely.
9. Then tighten the nut an additional 1/2 turn (180°). To be watertight, each cord grip must be tightened so the rubber sleeve begins to protrude from the hub.
10. Unused hubs must be properly plugged to prevent moisture entry. See the Electronic Replacement Parts and Components catalog to order extra hole plugs.
11. Remove the desiccant from the plastic bag, and insert the desiccant bag into the junction box before closing. Inspect the desiccant during normal service and change desiccant as needed.
12. Replace the cover and tighten the cover screws in an alternating pattern to 15 in/lb to be certain the gasket is compressed equally in all locations.

4.2 Signal Board Trimming Procedure (JB4SS and JB4SP)

Use the following steps to properly trim the JB4SS and JB4SP junction boxes.

1. Determine the number of load cells needed.
2. **Make sure jumpers are in place to enable trimming of the cells corresponding to each load cell.** See Figure 6 for the location of jumpers JP1, JP2, JP3, and JP4. Note that you need to remove jumpers for any unused cells.
3. Set all potentiometers fully clockwise to give maximum signal output from each cell (see below for location of potentiometers).

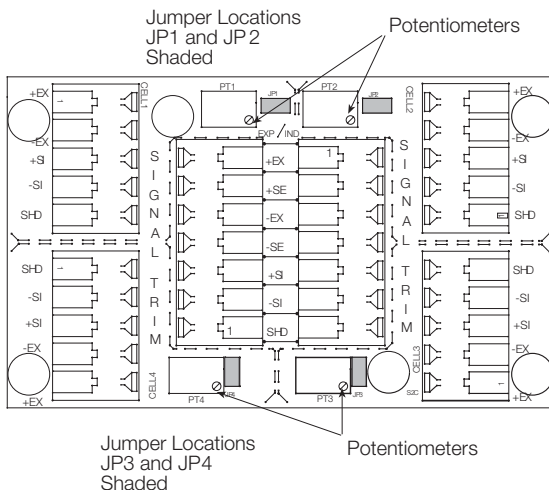


Figure 6: Signal Trim Main Board

4. Zero the indicator and place calibrated test weights over each load cell in turn. The amount of test weights to be used will depend on the scale configuration; for specific recommendations, refer to *Handbook 44 Field Manual*, published by the Institute for Weights and Measures. For a four-cell platform, it's recommended using 25% of scale capacity.

5. Record the value displayed on the indicator after the test weight is placed in turn on each corner (directly over the load cell) without allowing the weight to overhang the sides. Allow the scale to return to zero each time to check for friction or other mechanical problems. Select the load cell which has the lowest value as your reference point. This cell will not be trimmed.
6. Replace the same test load over each cell in turn. Using the corresponding potentiometer, trim each cell down to equal the reference load cell. As corner corrections are somewhat interactive, check all cells again for repeatability. If necessary, repeat steps 4 and 5.
7. Pull excess cable out of the enclosure.
8. Using a wrench, tighten the nut until the rubber touches the cable completely.
9. Then tighten the nut an additional 1/2 turn (180°). To be watertight, each cord grip must be tightened so the rubber sleeve begins to protrude from the hub.
10. Unused hubs must be properly plugged to prevent moisture entry. See the Electronic Replacement Parts and Components catalog to order extra hole plugs.
11. Remove the desiccant from the plastic bag, and insert the desiccant bag into the junction box before closing. Inspect the desiccant during normal service and change the desiccant as needed.
12. Replace the cover and tighten the cover screws in an alternating pattern to 15 in/lb to be certain the gasket is compressed equally in all locations.

TuffSeal 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 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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