RLC

RLC Self-Aligning Silo Mount

Installation Manual

RICE LAKE WEIGHING SYSTEMS
Industrial Solutions on a Global Scale®

ISO 9001 REGISTERED

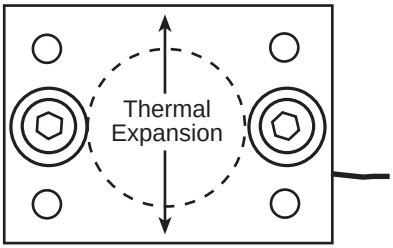
51725

Contents

1. Introduction

The RLC self-aligning silo mount, together with the RLC load cell family, are an ideal solution for process control, batch weighing, silo/hopper and belt applications.

The RLC mount incorporates an unique rocker pin design that uses hardened stainless steel components on all load bearing surfaces. The fully stainless steel construction guarantees long-term reliability, even in the harshest of environments.



Caution The installation should be planned by a qualified structural engineer. Each installation is unique, and this manual is meant to serve only as a general guideline for installation.

Authorized distributors and their employees can view or download this manual from the Rice Lake Weighing Systems distributor site at **www.rlws.com**.

2. Mechanical Installation

2.1 General Installation Guidelines for Weigh Modules

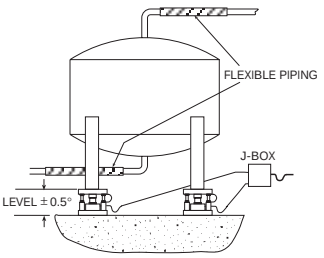
1. The mounting surface for the base and top plate must be level. After installation, the top and bottom plates must be level within ±0.5°. If the mounting surfaces are not level, then shims and or grout may be used to level the mount.

   If possible, check that the module is level when the vessel is fully loaded because excessive deflections in legs and supporting structures may cause additional side forces which greatly affect accuracy. Deflection of the mount's top or base plate due to loading should not exceed ±0.5°. Reinforcement of legs or other support structures may be necessary to correct this. Vessels with long legs should have cross bracing applied between adjacent legs to keep them from spreading under load.

2. Compression mounting systems use three, four, or more mounts. More than eight-module systems should be avoided as even weight distribution becomes extremely difficult to achieve. The load on each module should vary by no more than 20%. During installation, add shims where necessary to achieve correct load distribution.

3. If the actual load cells are used during installation of the weigh module, extreme care must be taken to prevent overload damage. A tank or hopper weighing several tons can exert huge forces when dropped only a fraction of an inch. Dummy load cells can be used during installation.

4. It is crucial that all piping or conduit be horizontal and flexible. If flexible piping is not used, make sure the distance from the vessel to the first pipe support is 20-30 times the pipe diameter. In smaller, lower capacity tanks and hoppers, isolating the resultant forces becomes extremely critical. For details, see our *Weigh Modules & Vessel Weighing Systems* manual, PN 43918.



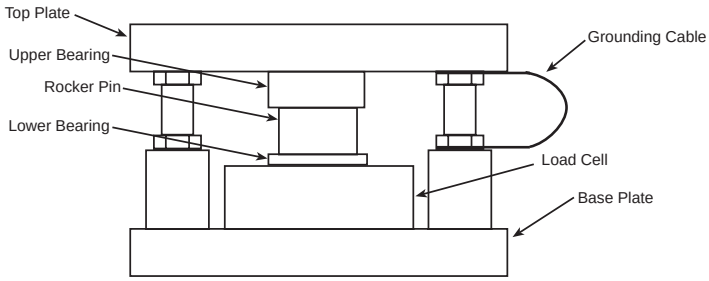
5. Load cells should not be installed in the modules until all welding is completed. The heat generated from welding current passing through a load cell can damage the adhesive holding the strain gauge to the body. If possible, use a dummy load cell when welding to maintain finished height. If welding is unavoidable after load cell installation, connect the ground in such a way that the current does not flow through the load cell. For example, if welding on the module top plate, the ground must be connected to the vessel, not to the mount base or support structure. Also, protect the load cell and cable from weld splatter.

6. When possible, use only “hermetically sealed” load cells in washdown applications. “Environmentally protected” load cells are not suitable for such applications and will be damaged. If tanks and surrounding equipment are frequently steam cleaned or if the load cell is subjected to direct washdown, a protective shroud for the weigh module is recommended. Proper drainage is necessary so the weighing assembly is not standing in water.

7. All support points should be equally stiff so that they deflect by the same amount as the vessel is loaded.

8. Never expose the load cell or mount to excessive forces as this might seriously jeopardize personal safety. If major load movement is anticipated, stay rods should be used to restrain the platform or vessel. Multiple load cell applications require the mounts to be installed on the same horizontal plane and level. Never use mounts or load cells to pull uneven surfaces together; use shim plates when appropriate. Perform routine maintenance to assure long-term reliability and performance. This includes a careful physical inspection of bolts and parts, as well as the removal of any material or debris build up from the load cell and mounting fixtures. Serious damage can occur if mounting systems do not function correctly.

2.2 Installing the RLC



The RLC self aligning mount should be installed without the load cell or dummy being present, while observing the following guidelines:

1. Assemble the self aligning mount as shown in the assembly drawing, taking care that the top and base plates are correctly aligned (the RLC does not lie in the center of the base plate and so care should be taken to ensure that the upper bearing locating hole is correctly aligned).

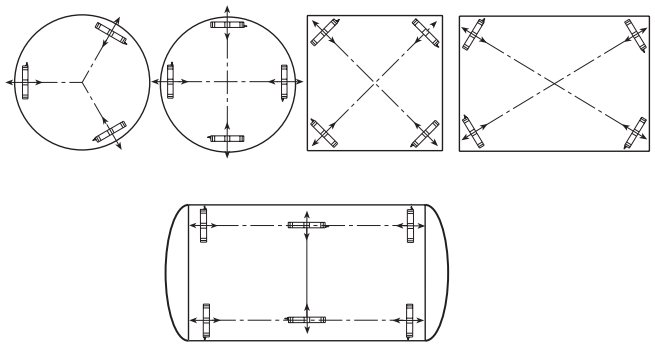
2. The top plate (3) should be locked at Dimension A, as shown on the dimensional outline drawing, using the M12x60 or M16x70 socket head screws (12) and the M12 or M16 nuts (10).

3. The M12x60 or M16x70 socket head screws (12) should be locked securely by turning the thin M12 or M16 nuts (11) downwards to the baseplate (4).
4. Locate the self aligning mount and secure it by using the four upper and lower fixing holes.
5. Coat lower bearing (1) load surface with high pressure grease and insert into RLC load cell.
6. Remove the M8x20 hex socket screw (7). Coat upper bearing (2) load surface with high pressure grease, and slide assembly into place, ensuring that upper bearing (2) and rocker pin (6) are properly located.
7. Replace screw (7) to contain RLC load cell assembly.
8. Rotate M12 or M16 nuts (10) counter clockwise by 1/2 turn at a time until the load is taken by the RLC.

Warning: For safety reasons, always use a tool to align the upper bearing (2) if necessary during this process.

9. A correctly installed mount should result in a height of 75mm or 100mm for the low and high capacities respectively. Verify a free horizontal movement of 3mm.

⚠ Caution **Use extreme care when lowering the vessel. The force of a vessel weighing several tons can damage a load cell if dropped only a fraction of an inch.**



3. Load Cell Wiring

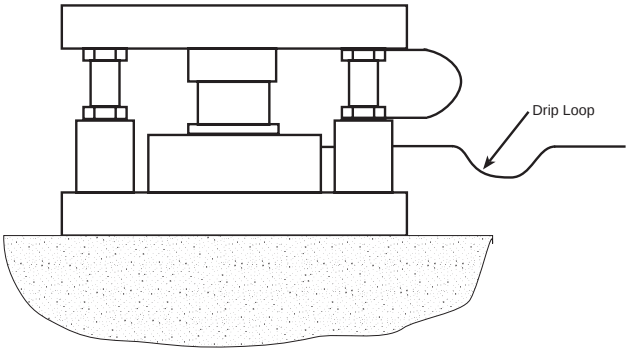
1. Route the load cell cables so they will not be damaged or cut. Cable should not be routed near heat sources greater than 150 °F. **Do not shorten any load cell cable.** The load cell is temperature compensated with the supplied length of cable. Cutting the cable will affect temperature compensation. Coil and protect excess cable so it will not be mechanically damaged or be sitting in water.

2. Provide a drip loop in all cables so that water or other liquids will not run directly down the cables onto either the load cells or the junction box. Attach load cell cable to the dead structure, not the vessel.

3. If conduit protection is necessary against mechanical or rodent damage to the load cell cables, use flexible conduit and conduit adapters at the load cells.

4. Connect cables to the summing board in the junction box according to the guide shown below and the labels on the terminal strips of the junction box. To verify the wiring scheme, see the certification shipped with each load cell.

5. For better performance, use positive and negative remote sense lines if the wiring running from the juction box to the indicator is longer than 25 feet.



Load Cell	Function
Pink	+EXC
Grey	–EXC
Brown	+SIG
White	–SIG
Bare	SHIELD

4. Junction Box Connections, Adjustments & Calibration

1. Refer to the Junction Box manual for trimming details.

2. Refer to the indicator manual for system calibration details.

5. Troubleshooting

If the system powers up and gives some type of stable digital readout that varies with the load on the system, any system problems are probably caused by factors other than the load cells. The load cells are often blamed for a malfunctioning system, but 90% of the time, the problem lies elsewhere. Look for mechanical causes for your problem first.

If the system can be calibrated but doesn't return to zero, loses calibration, or demonstrates non-linearity or non-repeatability, see the following chart for possible causes and do the following checks.

Symptom	Possible Cause
No return to zero	Mechanical binding or debris in seals or under load cells; may have lost system calibration
Non-linearity	Thermal expansion or deflection under load causing binding or side load
Non-repeatability	Loose load cell mount; drifting caused by moisture, load cell overload or shock damage; mechanical binding
Lost calibration	Out of level or plumb; moisture problem; mechanical binding
Drifting readout	Moisture in junction box, cables, or load cell; mechanical binding

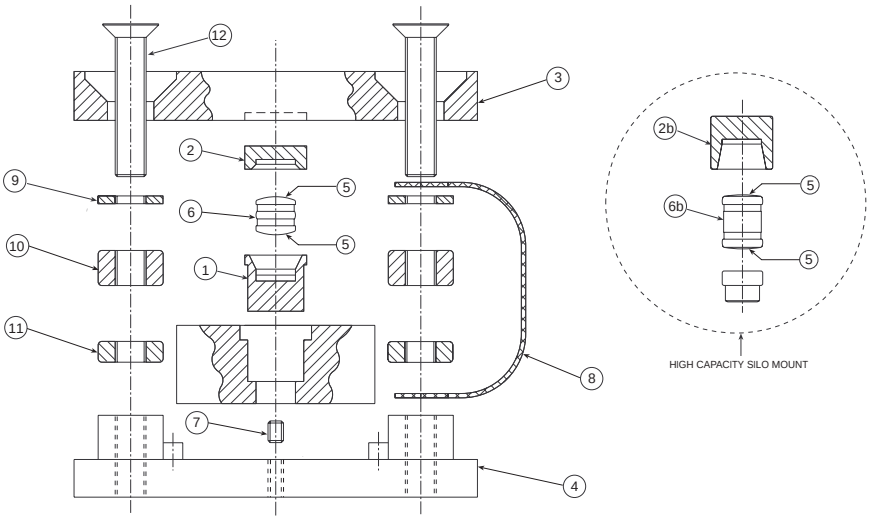
1. Check weigh module for debris restricting load cell movement or debris between scale and structure.
2. Check that tank/vessel and modules are plumb, level and square at the critical areas.
3. Check all piping and conduit for connections which restrict vessel movement.
4. If check rods are used, loosen all connections to finger tight only for testing.
5. Check load cell cables for physical or water damage.
6. Check all electrical connections, especially in the junction box.

If the problem still is not found:

7. Check possible indicator malfunction by using a load cell simulator to input a known good signal into the indicator.
8. Disconnect each load cell's signal leads at the junction box and check individual load cell outputs with a multimeter. Then check input/output impedances for comparison with load cell manufacturer's specifications.

If after all these checks the problem still cannot be isolated, reconnect all but one load cell. Replace the load cell with a load cell simulator. Alternate so that each cell is individually disconnected and replaced with a simulator. If there is a problem with a particular load cell, the symptom should disappear when that load cell is disconnected and replaced with the simulator.

6. Maintenance and Replacement Parts



Item Number	Description	Part Number
1	Lower Bearing	Consult factory
2	Upper Bearing	
3	Top Plate	
4	Base Plate	
5	High Pressure Grease	
6	Rocker Pin	
7	Set Screw, Socket, Hex (SS A2 M8x20)	
8	Grounding Cable	
9	Washer (SS A2 M12)	
10	Nut, Hex (SS A2 M12)	
11	Nut, Thin Hex (SS A2 M12)	
12	Screw, Counter Sunk, Hex (SS A2 M12)	

7. RLC 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 weigh modules are warranted against defects in materials and workmanship for two (2) 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 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.

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.

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