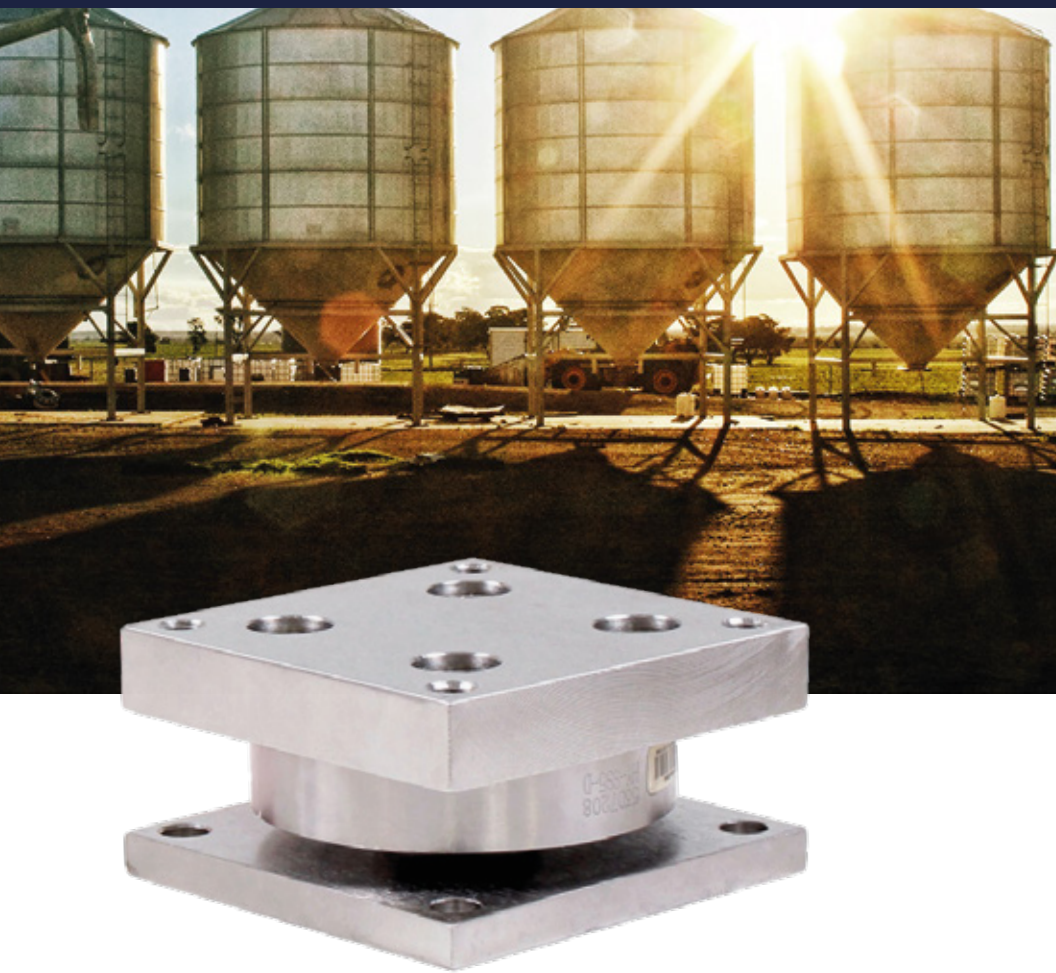
weightechUSA

BTWM

COMPRESSION DISK LOAD CELL



Instalation Instructions

Load Cell Wiring

The following section provides information for the proper wiring of load cells.

1. Route the load cell cables so they will not be damaged or cut.

IMPORTANT: Failure to heed could result in product damage.

- ***Cable should not be routed near heat sources greater than 150°F.***
- ***Do not shorten load cell cable. Cutting the cable affects temperature compensation.***
- ***Coil and protect excess cable to avoid damaged or 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.

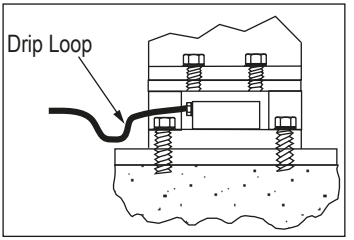
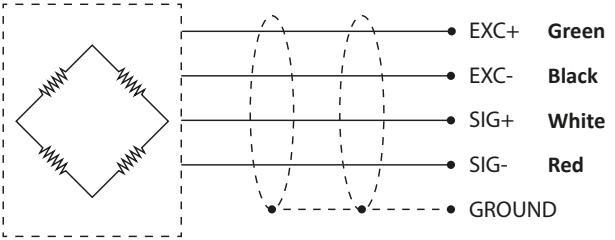


Figure 2-1. Drip Loop



3. If conduit protection is needed against mechanical or rodent damage to the load cell cables, use flexible conduit and conduit adapters (20K to 450K only) at the load cells.
4. Connect cables for load cells 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.

Junction Box Connections, Adjustments and Calibration

- Refer to junction box manual for trimming details.
- Refer to indicator manual for system calibration details.

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 the 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	Probable Cause
No return to zero	Mechanical binding of debris in seals or under the load cells; may have lost system calibration
Non-linearity	Thermal expansion or deflection under load causing binding or side load
Non-repeatability	Loosen 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

Table 3-1. Possible Causes

1. Check the load cell mount for debris restricting load cell movement or debris between scale and structure.
2. Check that tank/vessel and mounts are plumb, level and square at 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 is not found:

1. Check possible indicator malfunction by using a load cell simulator to input a known, good signal into the indicator.
2. Disconnect each load cell's signal leads at the junction box and check the 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 load 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.

Mechanical Installation

Installation Guidelines for Tank Mounts

- Mounting surfaces for plates must be level. After installation, the top and bottom plates must be level within ±0.5°. If the mounting surfaces are not level, use shims and/or grout to level the mount.
- Check that the mount is level when the vessel is fully loaded, if possible, excessive deflections in legs and supporting structures can cause additional side forces which affect accuracy. Deflection of the mount top or base plate due to loading must 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.
- Compression mounting systems use three, four, or more mounts. More than eight-mount systems should be avoided as even weight distribution becomes extremely difficult to achieve. The load on each mount assembly should vary by no more than 20%. Add shims as needed, to achieve correct load distribution.
- Take extreme care to prevent overload damage. A tank or hopper can exert huge forces when dropped only a fraction of an inch.
- It is crucial that all piping or conduit be horizontal and flexible. If flexible piping is not used, make sure the distance from vessel to the first pipe support is 20-30 times pipe diameter. In smaller, lower capacity tanks and hoppers, isolating resultant forces becomes extremely critical. See the Load Cell and Weigh Module Handbook manual (PN 22054) for more information.

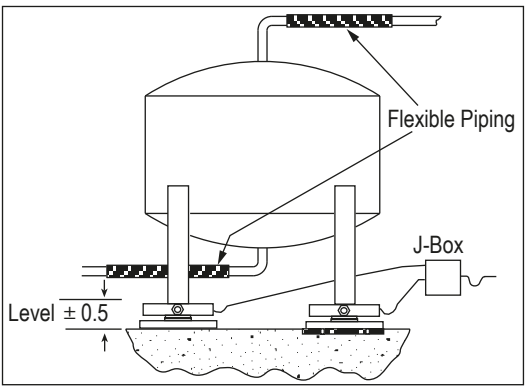


Figure 4-1. Installation

- The weigh module assemblies should not be installed 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 mount 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. Protect the load cell and cable from weld splatter.

Example: if welding on the mount top plate, the ground must be connected to the vessel, not to the mount base or support structure.

- Use only hermetically sealed load cells in wash down 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 wash down, a protective shroud for the weighing assembly is recommended. Proper drainage is necessary so the weighing assembly is not standing in water.
- All support points should be equally stiff so that they deflect by the same amount as the vessel is loaded.

Weigh Module Installation

The type of installation and strength of the mounting surface governs the method of locating, attaching, and installing the mount assembly. Three areas which commonly cause accuracy problems to consider:

- Are the supporting legs adequately braced so they will not spread when the system is fully loaded?
- Does the supporting structure have the necessary strength to prevent excessive deflection when the system is fully loaded?
- Is there attached equipment such as skirting, venting, or piping that could cause binding or lack of flexibility?

Use the following steps to install the weigh module assembly:

1. Position a mount in every vessel leg location.

NOTE: The modules are designed to allow for lateral movement in any direction. Figure 4.1 ***illustrates sample mounting orientations to accommodate different vessel shapes.***

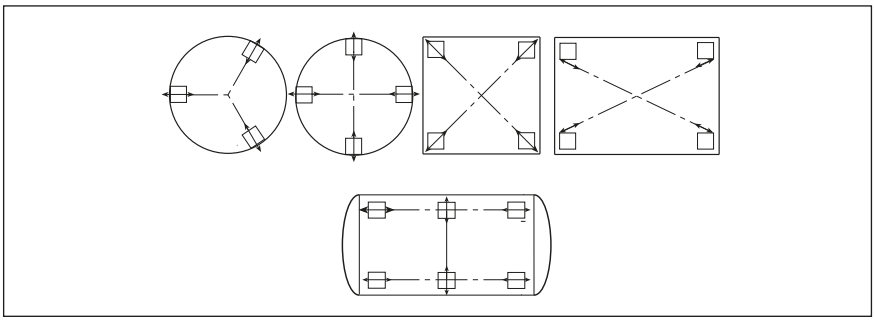


Figure 4-2. Mounting Orientations

2. Make necessary preparations to the mounting surfaces.

NOTE: A 1 inch sub plate can be used to ensure a good mounting surface.

If using a top plate or mounting directly to the load cell, apply an anti-seize product to the fastener threads to prevent gall.

3. Lift and block the vessel to the same height as assembled mounts.
4. Slide a mount into position.
5. If the mount is being fitted under the leg of a vessel, verify that the leg's center line passes through the center of the top plate (through the center of the load cell).

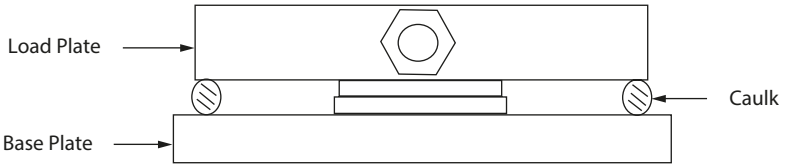


Figure 4-3. Load Cell (side view)

6. Lower the corner or side of the vessel carefully onto the top plate.

IMPORTANT: The force of a vessel weighing several tons can damage a load cell if dropped only a fraction of an inch.

7. With the top plate positioned approximately level, mark holes for attaching the top plate to the vessel's mounting surface.
8. Drill holes and attach top plate loosely to vessel with suitable fasteners.
9. Verify that there is no initial misalignment between the base plate and top plate.
10. Attach the base plates to the foundation using suitable anchors for concrete or by bolting or welding to a steel structure or sub-plate. Verify that the base plates are as level as possible.

NOTE: Base plates should be fully supported. Shimming is not recommended.

11. Check that the top plates are no more than ±.5° out or level. Shim if necessary and fully tighten mounting bolts.
12. Repeat steps 4-11 for the mounting assemblies at the remaining corners or sides.

NOTE: To achieve equal load distribution, final height adjustments can be made with shims between the top plate loading bracket and the weighing vessel. The variation in load among the cells should be no more than 20%. The load distribution can be checked accurately by exciting each load cell in turn and measuring the output with a voltmeter.

Consider using a bead of flexible caulk between the load cell and the base on lighter capacity assemblies. This will prevent debris from lodging between the load cell and the base and causing repeatability or accuracy problems.

Weigh modules are assembled, with Locktite®, at the factory and should not require adjustment.

If the weigh modules have been disassembled for any reason, perform the following:

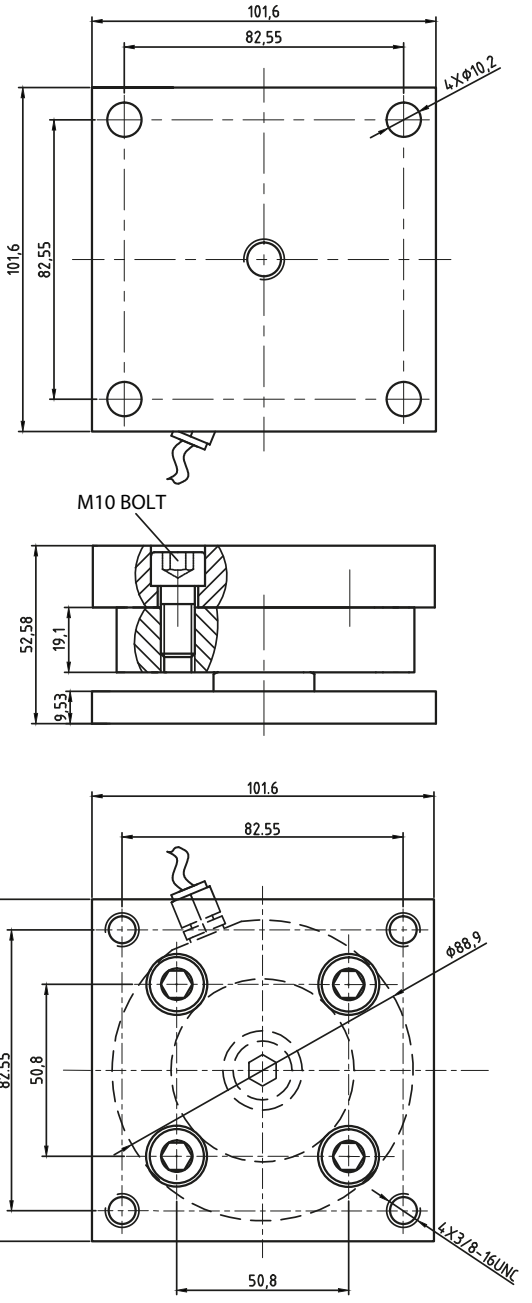
1. Remove the large center screw.
2. Align the convex load disc and the load cell with the center hole in the base plate.
3. Apply Locktite and install the large screw and continue to turn until the rubber o-ring just contacts the convex load disc.
4. Back the screw off 1/4 turn.

IMPORTANT: Do not attempt to adjust the center bolt unless removing the load cell for replacement purposes. This bolt is factory adjusted and any attempt to loosen or tighten this bolt will void the warranty. It is normal for there to be movement between the load cell and center bolt.

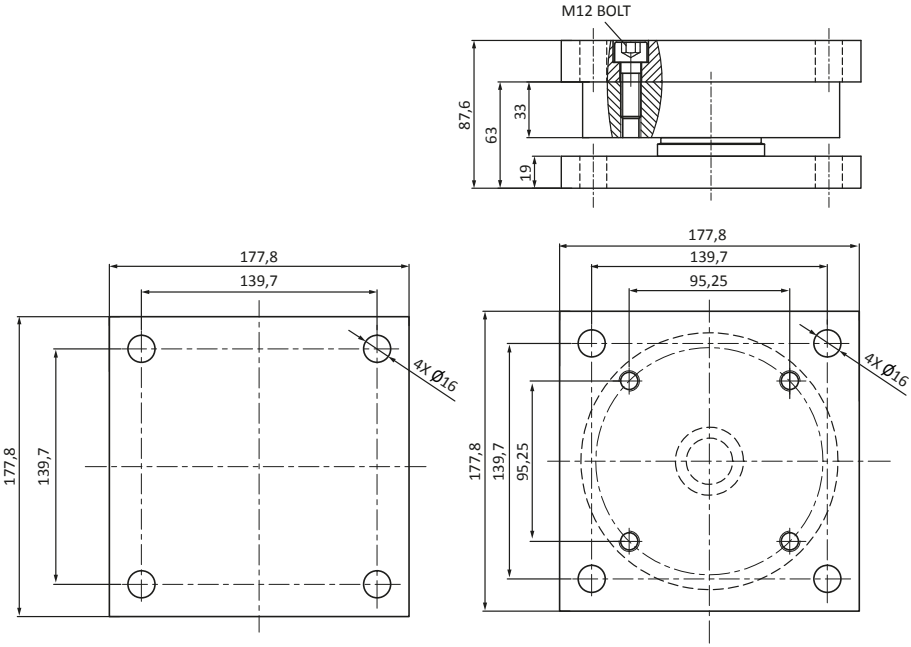
The screw provides lateral restraint and lift off protection. Never remove it or back it off more than the suggested amount.

Dimensional Drawings

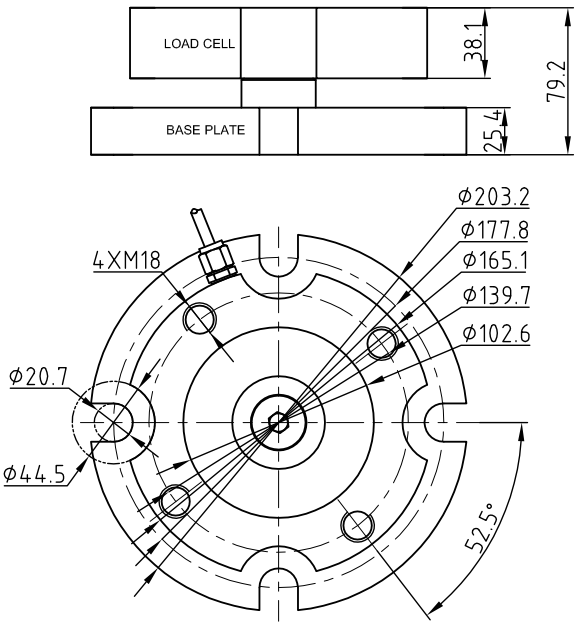
10klb



20klb—35klb



100klb



Technical Data

Rated load	Klb	5, 10, 20, 35	100
Sensitivity	mV/V	3.0 ± 0.01	
Total error	%F.S	± 0.3	± 0.5
Creep (30min)	%F.S	± 0.1	
Zero Balance	%F.S	± 1	
TC0	%F.S /10ºC	± 0.03	
TC SPAN	%F.S /10ºC	± 0.03	
Input resistance	Ω	400 ± 20	750 ± 10
Output resistance	Ω	352 ± 3	703 ± 2
Insulation resistance	MΩ	>5000	
Operating temperature	℃	-30 to +70	-20 to +70
Safe load limit	%F.S	150	
Lateral load limit	%F.S	200	
Recommend excitation	VDC	10 ~12	
Maximum Excitation	VDC	15	
Protection Class	-	IP68	
Construction	-	Stainless Steel	
Cable	-	Length: 8m Diameter: Ø 6mm	

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