Load Cell and Accessories

Installation Manual

Load Cell and Accessories

METTLER TOLEDO

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1 Disclaimer

This publication is provided solely as guide for individuals who have received technical training and are familiar with the technical manuals of the METTLER TOLEDO products.

This guide is not meant to replace the technical manual for various products. Please review the specific technical manuals for detailed instructions and safety precautions before operating or servicing the various METTLER TOLEDO products.

METTLER TOLEDO reserves the right to make refinements or changes without notice. Subject to technical changes.

2 Introduction

This document is intended to cover the electrical and mechanical installation in non-hazardous environment. For more information to installation in hazardous environment please refer to additional load cell documentation.

For background information of weighing, weighing technology and installation of weigh module please refer to the Weigh Module Systems Handbook.

Proper engineered and designed weighing system under consideration of all safety relevant design precautions like wind load resistance, thermal expansion etc. is assumed. Load cell installation requires mechanical and electrical skills and shall only be performed by trained and authorized technicians.

3 General Rules

3.1 Cautions

Do not shorten or cut load cell cable by any means. It is a proprietary integral component of the complete load cell. Any change on the cable will impact the weighing result. Analog load cell cable cannot be replaced individually. In contrast to that digital load cell can (POWERCELL® PDX®).

3.1.1 Welding

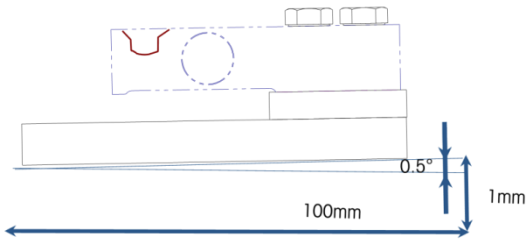
Stray current can destroy the load cell therefore do not pass welding current through the load cells! Whenever welding on a scale ground the welding device as close to the work as possible. But never weld closer than 1.2 meter (4 feet) to any load cell without removing the load cell.

3.1.2 Foundation strength

In term of foundation strength please consider that surface is strong enough in order to avoid deflection. Deflecting floors can cause short wave vibrations which can lead to inaccuracy. In cases of weak foundation or deflection please reinforce foundation if necessary and contact your civil engineering office to get support. In order to increase the stiffness of the structure e.g. of the weighing system larger metal plate can support this.

3.1.3 Leveling

Unleveled load cell or weigh modules can result in inaccurate results. In order to achieve high accuracy of your products a general rule of thumb can be applied: leveling must be within 0.5° in any direction. This equals an upward or downward slope of 1mm (1/32inch) per 100mm (4inches).



For further leveling recommendation please refer to Weigh Module Systems Handbook (Order no.: 44098237)

4 Load Cells

4.1 General Load Cell related information

A load cell is meant to measure the size of a mass but actually is a force sensor which transforms force into an electrical signal. The load cell needs the earth gravity to work. Every mass is attracted by the earth gravimetric field, that force is named "load". Since the gravity level varies, also the load cell sensitivity varies by the location. Thus local calibration is required.

A load cell is integrated into the weighing system so it is part of it. It needs to be integrated into the load flow thus that flow is completely guided through it. That makes the load cell a safety relevant part in the design.

4.1.1 Force introduction

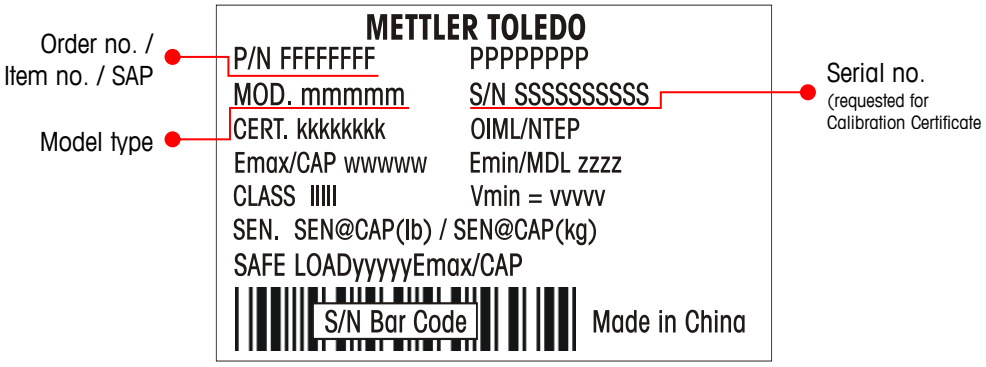
The load should be always introduced vertically into the direction of measurement in order to avoid errors and inaccuracy caused by misalignment, off-center or torsional moments, transverse and lateral forces.

4.1.2 Explanation of load cell label

There might be differences from load cell label to load cell label. The most important information in case of replacement or for further information are:

- *Model type* provides
- *Order no. / Item no. / SAP no.*)
- *Serial no* for addition download of calibration certificate.

Here you see a typical load cell label e.g. 0745A. It is an approved load cell, thus certain data is requested by the approving agencies.



Important to know is that load cells are individuals, that is why they have an unique *serial no*. A couple of reasons for that are:

1. Technically there are variations in production. Thus the load cell need to be compensated individually
2. For traceability: The load cell is one of the determine element for scale accuracy
3. To convey individual data and ease installation
4. Calibration without test weights (CalFree™). For the calibration calculation sensitivity values from the load cells which are on each individual Calibration Certificate are required. In case of loss of Calibration Certificate it can be downloaded by entering the load cell serial number at http://calfree-cert.mt.com

4.1.3 Tools and Materials

☐	Level	
☐	Lifting jack	
☐	Torque wrench up to 300 Nm	
☐	Drilling machine	
☐	Small flat screw driver for load cell cable installation at junction box	
☐	Phillips screw driver for load cell cable installation at junction box	
☐	Set of wrenches for bolts	
☐	Lubrication type (Loctite Anti Seize, Food Grade)	

4.2 0743, 0745A, MTB, SLB215, SLB415, SLB515 (Single Ended Beam Load Cell)

Required tools

- ☐ Level
- ☐ Hydraulic jack
- ☐ Torque wrench
- ☐ Set of small screw drivers (flat and phillips) for junction box mounting
- ☐ Set of wrenches for bolts
- ☐ Lubrication type (Loctite Anti Seize, Food Grade)

Application

- Alone in tension application or
- At least three in compression application (tank, hopper and silo weighing)
- No limit in terms of platform size

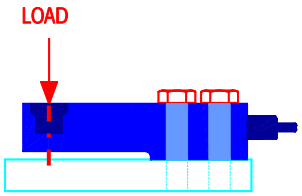
Various accessories to build a cost efficient scale are available (for more details please refer to the following chapters 4.2.1 0745A and SLB415 Load Cell Accessories, 4.2.2 SLB215 and SLB515 Load Cell Accessories and 4.2.3 MTB Load Cell Accessories).

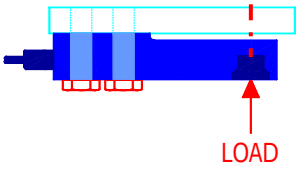
Installation

1. Need adequate rigid support, to be level parallel within <3mm / 1/8 inch
2. Rigid base plate: Uniform deflection of the weigh module supports (top and bottom), maintaining less than 0.5°
3. Longitudinal axis of load cell is positioned horizontally
4. Dead end of the load cell screwed to a horizontal base plate
5. Vertical load introduction: Ball / cup or rocker pin arrangement is used to produces restoring forces to keep the scale centered
6. Load cell can be installed inverted
7. Scale must be checked in case of horizontal forces

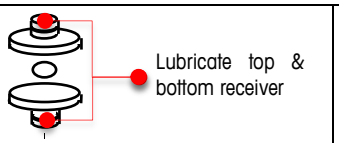
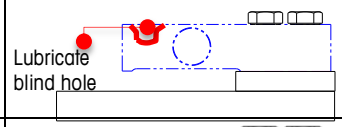
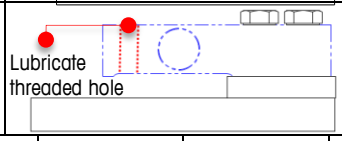
Note: Side and end loading occur when horizontal forces are applied to the side or end of a load cell. They can be caused by thermal expansion and contraction, by misalignment, or by vessel movement due to dynamic loading. Side and end forces can affect the linearity and hysteresis of the scale

8. No heavy vibrations or wind currents at or near the scale





Lubrication

Where to lubricate				With
MTB	Top & bottom receiver			Loctite Anti Seize, Food Grade 
0743 0745A SLB415	Blind hole			
SLB215 SLB515	Threaded hole			

Cable colour

	+ Exitation	-Exitation	+ Signal	- Signal	+ Sense	- Sense	Shield
MTB	GREEN	BLACK	WHITE	RED	YELLOW	BLUE	YELLOW (LONG)
0743	GREEN	BLACK	WHITE	RED			YELLOW
0745A	GREEN	BLACK	WHITE	RED			YELLOW
SLB215	GREEN	BLACK	WHITE	RED			YELLOW
SLB415	GREEN	BLACK	WHITE	RED			YELLOW
SLB515	GREEN	BLACK	WHITE	RED			YELLOW

Bolt and torque information	Capacity		Grade		Size / thread		Torque	
	kg	lb.	ROW	USA	mm	in	Nm	ft. lb.
MTB	5-300	11-661	8.8	Grade 5	M8x1.25	5/16-18UNC	15	11
	500	1102	8.8	Grade 5	M10x1.5	3/8-16UNC	20	14.5
0745A	110-2200	250-5000	10.9	Grade 8	M12	1/2-13UNC	98	70
	4400	10000	10.9	Grade 8	M18x1.5	3/4-10UNC	270	200
0743	9070-13600	20000-30000	8.8	Grade 5	M24	1-8UNC	600	475
	20400	45000	8.8	Grade 5	M30	81-1/4-7UNC	1200	1000
SLB215	220-2200	500-5000	10.9	Grade 8	M12	1/2-13UNC	120	100
	4400	10000	10.9	Grade 8	M20	3/4-10UNC	380	220
SLB415	110-2200	250-5000	10.9	Grade 8	M12	1/2-13UNC	120	100
	4400	10000	10.9	Grade 8	M18	3/4-10UNC	275	220
SLB515	110-2200	250-5000	10.9	Grade 8	M12	1/2-13UNC	98	70
	4400	10000	10.9	Grade 8	M18x1.5	3/4-10UNC	270	200

4.2.1 0745A and SLB415 Load Cell Accessories

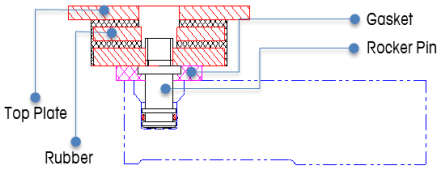
4.2.1.1 0745A and SLB415 Base Plate Kit (BPK), Accessory

Required tools	☐ Level ☐ Torque wrench ☐ Set of small screw drivers (flat and phillips) for junction box mounting ☐ Set of wrenches for bolts 
Material	• Stainless steel or painted steel
Application	• Provide rigid support load cell support • Foot print compatible with and SWB505 MultiMount™
Installation	1. Need adequate rigid support, to be level parallel within <3mm / 1/8 inch 2. Rigid base plate: Uniform deflection of the weigh module supports (top and bottom), maintaining less than 0.5° 3. Drill 4 holes into the foundation 4. Bolt down the base plate 5. Install load cell to the spacer. Untighten the spacer bolts, fit load cell to the spacer and retighten with appropriate torque (see table) after load cell is installed 6. Longitudinal axis of load cell is positioned horizontally 7. Dead end of the load cell screwed to a horizontal base plate 8. Vertical load introduction: Ball / cup or rocker pin arrangement is used to produces restoring forces to keep the scale centered 9. Load cell can be installed inverted 10. Scale must be checked in case of horizontal forces 

4.2.1.2 0745A and SLB415 Expansion Kit (EK), Accessory

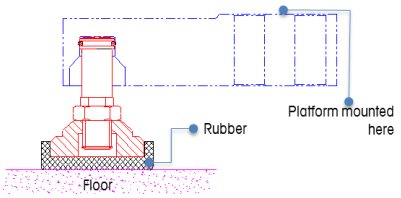
Required tools	☐ Set of wrenches for bolts ☐ Lubrication type (Loctite Anti Seize, Food Grade) 
Material	• Stainless steel • Polyethylene foam gasket
Application	• Provide load cell introduction • Machine integration, tanks, hoppers, conveyors, platforms • Static loading and dynamic loading, restraint required
Installation	1. Need adequate rigid support, to be level parallel within <3mm / 1/8 inch 2. Rigid platter: Uniform deflection to support (top and bottom), maintaining less than 0.5° 3. Use M8 to M10 bolts to fix EK to platter 4. Lubricate both ends of rocker pin and blind hole of load cell 5. Attach load cell to EK, load introduction must be vertically 6. Can be installed as well inverted 7. Horizontal checking and restraint must be provided externally

4.2.1.3 0745A and SLB415 Expansion and Vibration Kit (EVK), Accessory

Required tools	☐ Level ☐ Drilling machine ☐ Set of wrenches for bolts ☐ Lubrication type (Loctite Anti Seize, Food Grade) 
Material	• Stainless steel • NITRILE NBR rubber • Polyethylene foam gasket
Application	• Provide load introduction and dampening • Machine integration, mixers, blenders, conveyors, platforms
Installation	1. Need adequate rigid support, to be level parallel within <3mm / 1/8 inch 2. Rigid platter: Uniform deflection to support (top and bottom), maintaining less than 0.5° 3. Use 4 bolts to fix square-plate interface to platter 4. Rocker pin screwed into the lower plate 5. Lubricate lower rocker pin 6. Attach load cell to EVK, load introduction must be vertically 7. Can be installed as well inverted, EVK bolted to the ground 

4.2.1.4 0745A and SLB415 Foot Kit (FTK), Accessory

Required tools	☐ Level ☐ Set of wrenches for bolts ☐ Lubrication type (Loctite Anti Seize, Food Grade) 
Material	• Stainless steel (420) • NITRILE NBR rubber
Application	• Provide load introduction • Multiple load cell applications • Platform scales, floor scales, one-frame scales

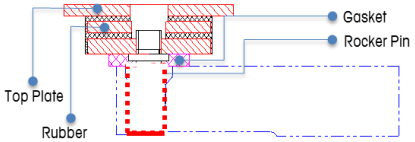
Installation	1. Need adequate rigid support, to be level parallel within <3mm / 1/8 inch 2. Rigid platter: Uniform deflection to support (top and bottom), maintaining less than 0.5° 3. Foot sits on the floor while the load cell is mounted upwards to the underside of the scale foot 4. Rocker pin screwed foot 5. Lubricate upper rocker pin 6. Attach load cell to FTK, load introduction must be vertically 7. Adjust height with locking nut 

4.2.2 SLB215 and SLB515 Load Cell Accessories

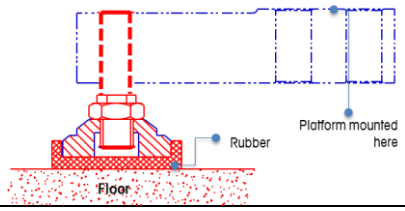
4.2.2.1 SLB215 and SLB515 Base Plate Kit (BPK), Accessory

Required tools	☐ Level ☐ Torque wrench ☐ Set of small screw drivers (flat and phillips) for junction box mounting ☐ Set of wrenches for bolts 
Material	• Stainless steel or painted steel
Application	• Provide rigid support load cell support • Foot print compatible with and SWB505 MultiMount™
Installation	1. Need adequate rigid support, to be level parallel within <3mm / 1/8 inch 2. Rigid base plate: Uniform deflection of the weigh module supports (top and bottom), maintaining less than 0.5° 3. Drill 4 holes into the foundation 4. Bolt down the base plate 5. Install load cell to the spacer. Untighten the spacer bolts, fit load cell to the spacer and retighten with appropriate torque (see table) after load cell is installed 6. Longitudinal axis of load cell is positioned horizontally 7. Dead end of the load cell screwed to a horizontal base plate 8. Vertical load introduction by threaded connection arrangement 9. Load cell can be installed inverted 10. Scale must be checked in case of horizontal forces 

4.2.2.2 SLB215 and SLB515 Expansion and Vibration Kit (EVKT), Accessory

Required tools	☐ Level ☐ Drilling machine ☐ Set of wrenches for bolts ☐ Lubrication type (Loctite Anti Seize, Food Grade) 
Material	• Stainless steel • NITRILE NBR rubber • Polyethylene foam gasket
Application	• Provide load introduction and dampening • Machine integration, mixers, blenders, conveyors, platforms
Installation	1. Need adequate rigid support, to be level parallel within <3mm / 1/8 inch 2. Rigid platter: Uniform deflection to support (top and bottom), maintaining less than 0.5° 3. Use 4 bolts to fix square-plate interface to platter 4. Lubricate lower threaded connection 5. Attach load cell to EVKT, load introduction must be vertically 6. Can be installed as well inverted, EVKT bolted to the ground 

4.2.2.3 SLB215 and SLB515 Foot Kit (FTKT), Accessory

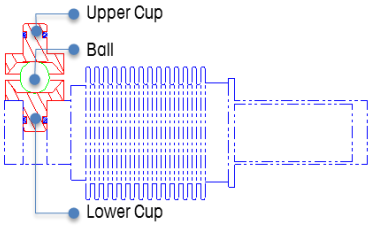
Required tools	☐ Level ☐ Set of wrenches for bolts ☐ Lubrication type (Loctite Anti Seize, Food Grade) 
Material	• Stainless steel (420) • NITRILE NBR rubber
Application	• Provide load introduction • Multiple load cell applications • Platform scales, floor scales, one-frame scales
Installation	1. Need adequate rigid support, to be level parallel within <3mm / 1/8 inch 2. Rigid platter: Uniform deflection to support (top and bottom), maintaining less than 0.5° 3. Foot sits on the floor while the load cell is mounted upwards to the underside of the scale foot 4. Lubricate threaded hole 5. Attach load cell to FTKT, load introduction must be vertically 6. Adjust height with locking nut 

4.2.3 MTB Load Cell Accessories

4.2.3.1 MTB Base Plate Kit (BPK), Accessory

Required tools	☐ Level ☐ Drilling machine ☐ Torque wrench ☐ Set of wrenches for bolts ☐ Lubrication type (Loctite Anti Seize, Food Grade) 
Material	• Stainless steel
Application	• Provide rigid load cell support • Multiple load cell applications
Installation	1. Need adequate rigid support, to be level parallel within <3mm / 1/8 inch 2. Rigid base plate: Uniform deflection of the weigh module supports (top and bottom), maintaining less than 0.5° 3. Drill 4 holes for the base plate 4. Bolt down the base plate 5. Install load cell to the spacer. Untighten the spacer bolts, fit load cell to the spacer and retighten with appropriate torque (see table) after load cell is installed 6. Longitudinal axis of load cell is positioned horizontally 7. End of the load cell screwed to a horizontal base plate 8. Vertical load introduction 9. Load cell can be installed inverted 10. Scale must be checked in case of horizontal forces

4.2.3.2 MTB Expansion Kit (EK), Accessory

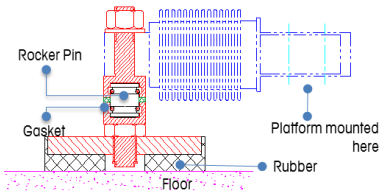
Required tools	☐ Level ☐ Lubrication type (Loctite Anti Seize, Food Grade) 
Material	• Stainless steel
Application	• Provide load cell introduction • Machine integration, tanks, hoppers, conveyors, platforms • Static loading and dynamic loading, restraint required
Installation	1. Need adequate rigid support, to be level parallel within <3mm / 1/8 inch 2. Rigid platter: Uniform deflection to support (upper and lower receiver), maintaining less than 0.5° 3. Compact and simple push-in fit 4. Lubricate upper and lower receiver 5. Attach EK to load cell, load introduction must be vertically 6. Can be installed as well inverted 7. Horizontal checking and restraint must be provided externally 

4.2.3.3 MTB Expansion and Vibration Kit (EVK), Accessory

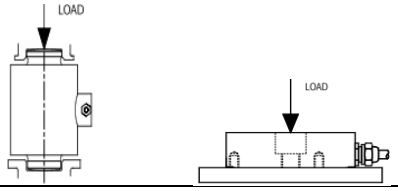
Required tools	☐ Level ☐ Set of wrenches for bolts 
Material	• Stainless steel • NITRILE NBR rubber

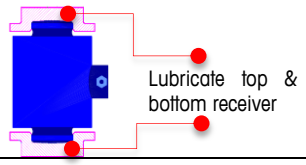
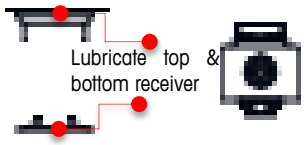
Application	• Provide load introduction and dampening • Machine integration, mixers, blenders, conveyors, platforms
Installation	1. Need adequate rigid support, to be level parallel within <3mm / 1/8 inch 2. Rigid platter: Uniform deflection to support (top and bottom), maintaining less than 0.5° 3. EVK will be screwed to the platter with M12 bolt 4. EVK is connected to the load cell using a threaded stud projecting from the lower plate 5. Can be installed as well inverted 6. No additional restraint needed if side forces are low

4.2.3.4 MTB Foot Kit (FTK), Accessory

Required tools	☐ Level ☐ Set of wrenches for bolts 
Material	• Stainless steel • NITRILE NBR rubber
Application	• Provide load introduction • Platform scales, floor scales, one-frame scales
Installation	1. Need adequate rigid support, to be level parallel within <3mm / 1/8 inch 2. Rigid platter: Uniform deflection to support (top and bottom), maintaining less than 0.5° 3. Foot sits on the floor while the load cell is mounted upwards to the underside of the scale foot 4. Rocker pin screwed into the lower part of foot 5. FTK is connected to the load cell using a threaded stud projecting from the lower plate 6. Adjust height with locking nut 

4.3 0782, SLC610, SLC611, RLC (Rocker Pin Design Load Cell / Canister (Column) Load Cell)

Required tools	☐ Level ☐ Hydraulic jack ☐ Set of screw drivers (flat and phillips) ☐ Set of wrenches for bolts ☐ Lubrication type (Loctite Anti Seize, Food Grade) 
Application	• At least three in compression application • Heavy capacity weighing e.g. truck and railway scales, tank, hopper and silo weighing
Installation 0782, SLC610, SLC611	1. Need adequate rigid support, to be level parallel within <3mm / 1/8 inch 2. Rigid base plate: Uniform deflection of the load cell supports (top and bottom), maintaining less than 0.5° 3. The longitudinal axis of the pin (primary loading axis) is mounted vertically and its ends have spherical radii which contact hardened receivers; these hold the Load Cell and introduce the load at the central point of contact (vertically) 4. Lift platform 5-10cm with hydraulic jack 5. Introduce load cell first into the lower receiver to be fixed into the anti rotating device; then into the upper receiver 6. Release hydraulic jack 7. In case no weigh module will be used scale must be checked externally in case of vertical forces and tilting **Note:** Torsional loading occurs when a side force twists a load cell. It can be caused by structural deflection, system dynamics, thermal movement, or mounting hardware misalignment

Installation RLC	1.Need adequate rigid support, to be level parallel within <3mm / 1/8 inch 2.Rigid base plate: Uniform deflection of the weigh module supports (top and bottom), maintaining less than 0.5° 3.Screwed firmly on a flat plate 4.Vertical load introduction will be carried out by cup and ball or rocker pin 5.Lift platform 5-10cm with hydraulic jack 6.Place load cell base plate assembly into the right position 7.Release hydraulic jack 8.Can be installed as well inverted							
Lubrication	Where to lubricate							With
	0782	Top & bottom receiver						Loctite Anti Seize, Food Grade 
	SLC610 SLC611							
Cable colour		+ Exitation	-Exitation	+ Signal	- Signal	+ Sense	- Sense	Shield
	0782	GREEN	BLACK	WHITE	RED	YELLOW	BLUE	YELLOW (LONG)
	SLC610	GREEN	BLACK	WHITE	RED			YELLOW
	SLC611	GREEN	BLACK	WHITE	RED			YELLOW
	RLC	PINK	GREY	BROWN	WHITE			BARE

4.4 MT, SSH, IL, SLP845 (Single Point Load Cell)

Required tools

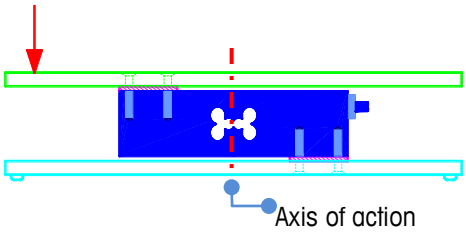
☐ Level
☐ Set of screw drivers (flat and phillips) for junction box mounting
☐ Set of wrenches for bolts

Application

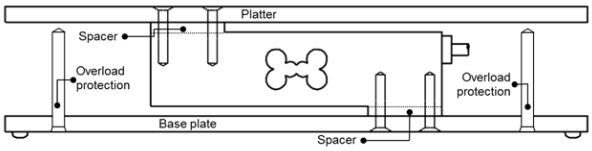
- Only one load cell is required in compression to make bench scales and to weigh small conveyors, tanks and hoppers
- They are moment insensitive and weighs within tolerance regardless of where the load is placed on the platter

Installation

1. Need adequate rigid support within <3mm / 1/8 inch
2. Rigid base plate and platter: Uniform deflection of support (top and bottom), maintaining less than 0.5°
3. Choose appropriate platter size
4. Mount load cell with longitudinal axis horizontal typically between 2 plates or frames
5. The upper plate is the load receptor. Ideally the load cell's vertical center line (primary loading axis) is placed at the center of the load receptor
6. The upper and lower frames are usually mounted to the load cell's horizontal surfaces



7. Install spacer plates to create clearance to accommodate load cell deflection under load. Some models require mounting to the end faces e.g. model IL
8. Note: Additional spacer is required with exception to MT1041, SSH (50-500 kg) and IL (1000 kg) which have a build-in spacer. MT1041build-in spacer is just 1mm for scales with a flexible design.
9. Overload stop protection is required
10. Add scale capacity to center of scale
11. Tighten protection screw until weight change on terminal
12. Reverse screw slightly and lock it with locking nut
13. Do a test corner performance



Cable colour

	+ Exitation	-Exitation	+ Signal	- Signal	+ Sense	- Sense	Shield
SLP845	GREEN	BLACK	WHITE	RED	YELLOW	BLUE	YELLOW (LONG)
SSH	GREEN	BLACK	WHITE	RED	YELLOW	BLUE	YELLOW (LONG)
IL	GREEN	BLACK	WHITE	RED	YELLOW	BLUE	YELLOW (LONG)
MT1022	GREEN	BLACK	RED	WHITE			YELLOW
MT1014	GREEN	BLACK	RED	WHITE	BLUE	BROWN	YELLOW
MT1241	GREEN	BLACK	RED	WHITE	BLUE	BROWN	YELLOW
MT1260	GREEN	BLACK	RED	WHITE	BLUE	BROWN	YELLOW

Bolt and torque information	Capacity		Grade	Size / thread	Engaged Length		Torque		Max. Platter Size	
	kg	lb.	ROW	mm	mm	in	Nm	ft. lb.	mm	in
SLP845	15	32	A4-70	M6/1	10	0.4	10	7.4	300x300	11.8x11.8
	22	48	A4-70	M6/1	10	0.4	10	7.4	300x300	11.8x11.8
	50	110	A4-70	M6/1	10	0.4	10	7.4	400x500	15.7x19.6
	100	220	A4-70	M6/1	10	0.4	10	7.4	400x500	15.7x19.6
	200	440	A4-70	M6/1	10	0.4	10	7.4	400x500	15.7x19.6
SSH	50-100	110-220	12.9	M8	20	0.8	20	14.7	500x500	19.7x19.7
	200	441	12.9	M8	20	0.8	30	22	500x500	19.7x19.7
	500	1102	12.9	M8	20	0.8	30	22	600x800	23.6x31.5
	1000	2205	12.9	M14	20	0.8	98	72	800x1200	31.5x47.3
IL	150-1000	331-2204	12.9	M14	25	1	98	72	800x800	31.5x31.5
	2000	4408	12.9	M16	25	1	196	143	1000x1000	39.3x39.3
MT1022	3-30	6.6-66.1	12.9	M6x1	12	0.5	10	7.4	350x350	14x14
MT1041	10-100	22-220	12.9	M6x1	12	0.5	10	7.4	400x400	15.7x15.7
MT1241	30-250	66-551	12.9	M6x1	12	0.5	10	7.4	400x400	15.7x15.7
MT1260	50-750	110-1654	12.9	M8x1.25	20	0.78	25	18.5	600x600	23.6x23.6

4.5 SLS410, SLS510 (Tension Load Cell)

Required tools

☐ Drilling machine
☐ Set of screw drivers (flat and phillips) for junction box mounting
☐ Set of wrenches for bolts
☐ Safety rods or safety chains

Application

- Used in tension individually or in multiples at any angle
- To weigh suspended tanks and hoppers

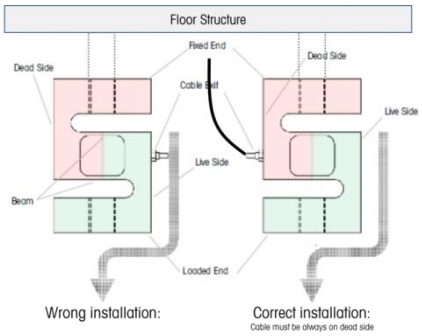
Installation

1. Need adequate rigid support
2. Use drilling machine in order to make a hole for e.g. threaded rod
3. Threaded rods or various forms of hardware can be screwed into these holes
4. Mount the threaded rod and attach load cell to it
5. Load is introduced to the load cell along the centerline passing through the threaded holes (primary loading axis) in the upper and lower surfaces
6. With suspension rods of sufficient length **(the longer the better in order to gain more flexibility)**

Note: Load must be introduced carefully; axis of action must be vertical. Hanging object rotates until its center of gravity is under the point of suspension and on the load cell axis of action

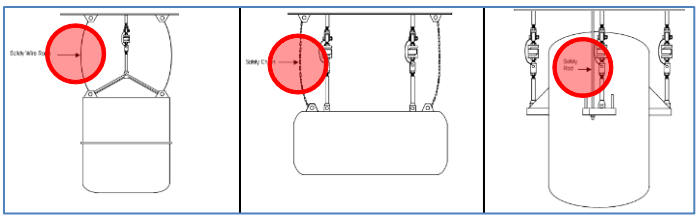
Orientation

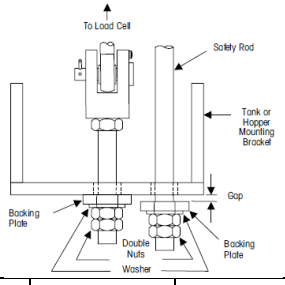
7. Important is that the cable exits from the dead side of the load cell as shown in figure right; otherwise the cable is a live-to dead bridge and inaccuracies can result
8. If necessary change the orientation of S-beam load cell by rotating it 180 degrees about horizontal axis



Safety

9. Install secondary safety support system (chain, rods, etc.) to prevent the suspended tank, hopper from falling in case of tension linkage or weigh modules component failure
10. Prevent rotating and unscrewing from threaded rods
11. Leave clearance between the lower support bracket and the washer on the safety rod
12. Assure that load cell is hanging vertically (plumb)
13. Adjust length of rods to achieve good load distribution (the longer the more flexibility)
14. Avoid rotation of hanging vessel





Cable colour

	+ Exitation	-Exitation	+ Signal	- Signal	+ Sense	- Sense	Shield
SLS410	RED	BLACK	GREEN	WHITE			BARE
SLS510	RED	BLACK	GREEN	WHITE			BARE

5 Appendix

5.1 Overview Load Cell Cables Colours

	+ Excitation	- Excitation	+ Signal	- Signal	+ Sense	- Sense	Shield
MTB	Green	Black	White	Red	Yellow	Blue	Yellow (long)
0745A	Green	Black	White	Red			Yellow
0743	Green	Black	White	Red			Yellow
SLB215	Green	Black	White	Red			Yellow
SLB415	Green	Black	White	Red			
0782	Green	Black	White	Red	Yellow	Blue	Yellow (long)
SLC610	Green	Black	White	Red			Yellow
RLC	Pink	Grey	Brown	White			Bare
SLP845	Green	Black	White	Red	Yellow	Blue	Yellow (long)
SSH	Green	Black	White	Red	Yellow	Blue	Yellow (long)
IL	Green	Black	White	Red	Yellow	Blue	Yellow (long)
MT1022	Green	Black	Red	White			Yellow
MT1041	Green	Black	Red	White	Blue	Brown	Yellow
MT1241	Green	Black	Red	White	Blue	Brown	Yellow
MT1260	Green	Black	Red	White	Blue	Brown	Yellow
SLS410	Red	Black	Green	White			Bare
SLS510	Red	Black	Green	White			Bare

5.2 Overview Load Cell Bolts – Torque Table

Model	Capacity		Grade		Size/Thread		Engaged Length		Torque		Max Platter size	
	kg	lb	ROW	USA	mm	in	mm	in	Nm	ft lb	mm	in
MTB	5-300	11-661	8.8	Grade 5	M8x1.25	5/16-18 UNC			15	11		
	500	1102	8.8	Grade 5	M10x1.5	3/8-16 UNC			20	14.5		
0745A	110 - 2200	250 - 5000	10.9	Grade 8	M12	1/2-13 UNC			98	70		
	4400	10000	10.9	Grade 8	M18x1.5	3/4-10 UNC			270	200		
743	9070-13600	20000-30000	8.8	Grade 5	M24	1-8 UNC			600	475		
	20400	45000	8.8	Grade 5	M30	81-1/4-7 UNC			1200	1000		
SLB215	220-2200	500-5000	10.9	Grade 8	M12	1/2-13 UNC			120	100		
	4400	10000	10.9	Grade 8	M20	3/4-10 UNC			380	220		
SLB415	110-2200	250-5000	10.9	Grade 8	M12	1/2-13 UNC			120	100		
	4400	10000	10.9	Grade 8	M18	3/4-10 UNC			275	220		
SLB515	110 - 2200	250 - 5000	10.9	Grade 8	M12	1/2-13 UNC			98	70		
	4400	10000	10.9	Grade 8	M18x1.5	3/4-10 UNC			270	200		
SLP845	15	32	A4-70		M6/1		10	0.4	10	7.4	300x300	11.8x11.8
	22	48	A4-70		M6/1		10	0.4	10	7.4	300x300	11.8x11.8
	50	110	A4-70		M6/1		10	0.4	10	7.4	400x500	15.7x19.6
	100	220	A4-70		M6/1		10	0.4	10	7.4	400x500	15.7x19.6
	200	440	A4-70		M6/1		10	0.4	10	7.4	400x500	15.7x19.6
SSH	50-100	110-220	12.9		M8		20	0.8	20	14.7	500x500	19.7x19.7
	200	441	12.9		M8		20	0.8	30	22	500x500	19.7x19.7
	500	1102	12.9		M8		20	0.8	30	22	600x800	23.6x31.5
	1000	2205	12.9		M14		20	0.8	98	72	800x1200	31.5x47.3
IL	150-1000	331-2204	12.9		M14		25		98	72	800x800	31.5x31.5
	2000	4408	12.9		M16		25		196	143	1000x1000	39.3x39.3
MT1022	3-30	6.6-66.1	12.9		M6x1		12	0.5	10	7.4	350x350	14x14
MT1041	10-100	22-220	12.9		M6x1		12	0.5	10	7.4	400x400	15.7x15.7
MT1241	30-250	66-551	12.9		M6x1		12	0.5	10	7.4	400x400	15.7x15.7
MT1260	50-750	110-1654	12.9		M8x1.25		20	0.78	25	18.5	600x600	23.6x23.6

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