FAIRBANKS SCALES

Installation Manual

Omnicell®

Model: 9106 FB

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Section 1: General Information

1.1. Description

Fairbanks' Omnicell® 9106 FB Series is a single-ended shear beam weighing assembly. It is a cost-effective choice for medium-to-high capacity weighing applications requiring protection from extreme hostile and washdown environments.

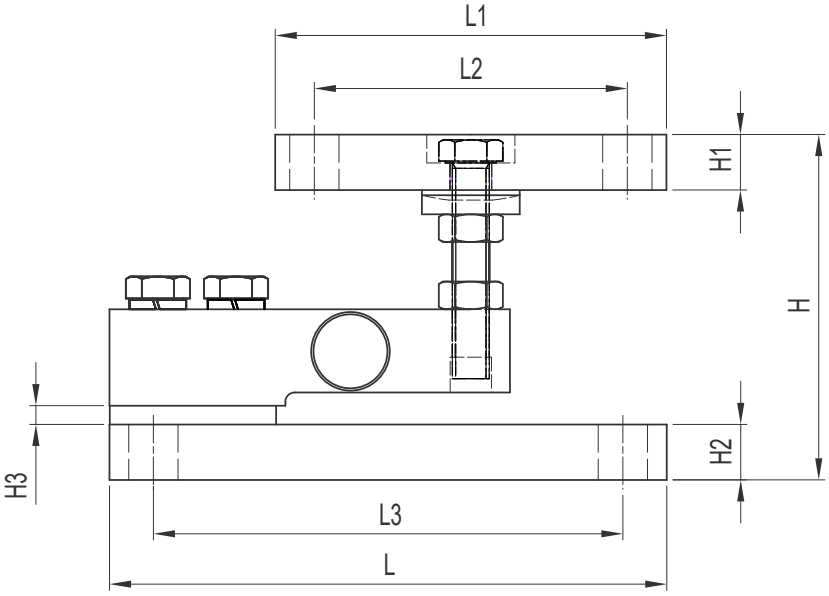
1.2. Features

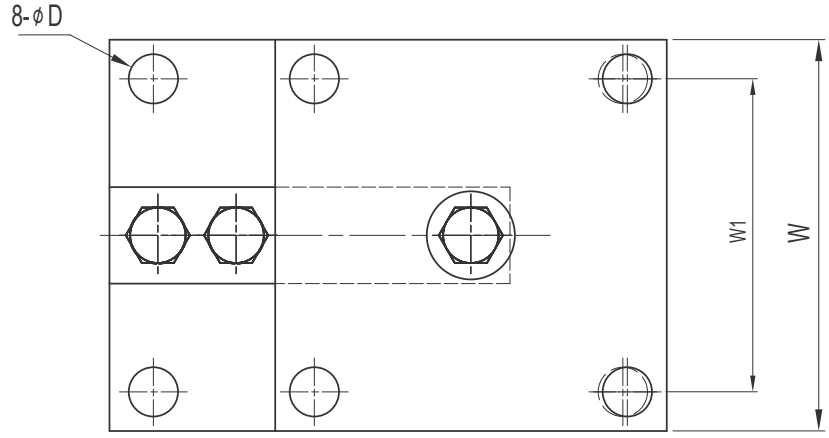
- **Medium-to-High Weight Ranges**.
- **1,000 to 10,000 lb** capacity models.
- **Integral height adjustment** on the receiver plate for easy load balancing.
- Articulating mounting plate which **accommodates non-planar misalignments** of up to four degrees (4°).
- Load Cells constructed from **PH Stainless Steel**.
- Mount constructed with **Stainless Steel.**
- Low profile design with integral height adjustment.
- **Factory Mutual** approved load cells for hazardous applications.
- **NTEP** approved Load Cells.

1.3. Applications

- High Accuracy
- Process Reactors
- Hostile Environments
- Tanks
- Mixing
- Hoppers
- Bins
- Blending
- Batching

1.4. Dimensions (In Inches)





	L	L1	L2	L3	H	H1	H2	H3	W	W1	D
250lb-5KSE	7.12	5.00	4.00	6.00	3.94-4.72	0.71	0.71	0.24	5.00	4.00	0.63
5klb-10klb	8.50	5.00	4.00	7.00	5.12-5.91	1.02	1.02	0.24	5.00	4.00	0.63

1.5. Wiring

CABLE CODE	
Red	(+) Excitation
Black	(—) Excitation
Green	(+) Signal
White	(—) Signal

1.6. Specifications

Capacities	1,000, 1,500, 2,500, 5,000, and 10,000 lbs.
Mount Construction	Stainless Steel
Full Scale Output (FSO)	3.0mV/v ± 0.25%
Combined Error (FSO)	≤ 0.03%
Non-Linearity (FSO)	≤ 0.03%
Hysteresis (FSO)	≤ 0.02%
Creep Error (30 min.)	≤ 0.03%
Compensated Temperature	14° to 104° F (-10° C to 40° C)
Operating Temperature	-40° to 176° F (-40° to 80° C)
Excitation Voltage	5-15 VDC
Mechanical Overload	• Safe = 150% • Ultimate = 300%
Sideload	Safe = 100%
Bridge Resistance	350 ohms nominal
Load Cell Construction	Stainless Steel
Sealing	Welded Seal
Cable	20 ft. Polyurethane
Protection	IP68
Load Cell Approvals	• Factory Mutual • NTEP CC #10-056 *

*Although Omnicells may have the approvals to be legal for trade, **using NTEP approved load cells and mounts does NOT automatically make the vessel NTEP approved**. For an accurate determination regarding the NTEP approval of the vessel, it is advisable to contact the relevant weights and measures office.

Section 2: Company Service Information

2.1. General Service Policy

Prior to installation, ***always*** verify that the equipment satisfies the customer's requirements as supplied, and as described in this manual.

If the equipment cannot satisfy the application and the application cannot be modified to meet the design parameters of the equipment, the installation should NOT be attempted.

It is the customer/operator's responsibility to ensure the equipment provided by Fairbanks is operated within the parameters of the equipment's specifications and protected from accidental or malicious damage.

W A R N I N G

Repairs must be performed by Fairbanks Scales service technicians and authorized distributor personnel ONLY!

Failure to comply with this policy voids all implied and/or written warranties.

2.2. Overview

2.2.1. Physical Installation Notes

- Check all devices for proper operation. If any error messages occur, refer to Troubleshooting or the proper manual of that device.
- **Only those charges which are incurred as a result of the equipment's inability to be adjusted to performance specifications may be charged to warranty.**

The installing technician is responsible that all personnel are fully trained and familiar with the equipment's capabilities and limitations before the installation is considered complete.

- All electrical assemblies must be replaced as assemblies or units.
    - Replacement of individual components is not allowed.
    - These components must be returned intact for replacement credit per normal procedures.
- All electronic and mechanical adjustments are considered to be part of the installation and are included in the installation charge(s).
    - Included is any required computer programming or upgrades.
    - Included are any accuracy and/or operational specification changes.
- The AC receptacle/outlet shall be located near the Instrument and easily accessible.
- Electrical connections other than those specified may not be performed.

2.2.2. Conferring with our Client

- The technician must be prepared to recommend the arrangement of components which provide the most efficient layout, utilizing the equipment to the best possible advantage.
- The warranty policy must be explained and reviewed with the customer.

2.2.3. Pre-Installation Checklist

The following points should be checked and discussed with the **Area Sales Manager and/or customer**, if necessary, before the technician goes to the site and installs the equipment.

- ✓ Check the customer's application to make certain it is within the capabilities and design parameters of the equipment.
- ✓ If the installation process might disrupt normal business operations, tell the customer and ask that they make adequate arrangements.
- ✓ Be sure that the equipment operator(s) are available for training.
- ✓ The service technician reviews the recommended setup with the Area Sales Manager or Area Service Manager, and together they identify all necessary variations to satisfy the customer's application.

2.2.4. Unpacking

NOTE: *It is the owner's responsibility to document, notify, and follow-up regarding shipping damage with the carrier.*

Follow these guidelines when unpacking all equipment:

- ✓ Check in all components and accessories according to the customer's order.
- ✓ Remove all components from their packing material, checking against the invoice that they are accounted for and not damaged.
  - Advise the shipper immediately, if damage has occurred.
  - Order any parts necessary to replace those which have been damaged.
  - Keep the shipping container and packing material for future use.
  - Check the packing list.
- ✓ Collect all necessary installation manuals for the equipment and accessories.
- ✓ Open the equipment and perform an inspection, making certain that all hardware, electrical connections and printed circuit assemblies are secure.
- ✓ Do not reinstall the cover if the final installation is to be performed after the pre-installation checkout.

2.2.5. User's Responsibilities

- ✓ All electronic and mechanical calibrations and or adjustments required for making this equipment perform to accuracy and operational specifications are considered to be part of the installation.
  - — They are included in the installation charge.
  - — Only those charges which are incurred as a result of the equipment's inability to be adjusted or calibrated to performance specifications may be charged to warranty.
- ✓ Absolutely no physical, electrical or program modifications other than selection of standard options and accessories are to be made to this equipment.
  - — Electrical connections other than those specified may not be performed, and physical alterations (holes, etc.) are not allowed.

2.2.6. Installation Considerations

Thorough application review should be conducted before, during and after installation:

- ✓ **Determining Omnicell Capacity** - Sizing the Omnicell (general rule) – Take the overall live and dead load of the vessel. Multiply by 2, then divide by the number of support points (legs, typically). For example:

4 Legs
26,000 lbs – dead load
74,000 lbs – live load

```
    26,000
+   74,000
   100,000
x        2
   200,000
÷        4
50,000 lb for
each Omnicell
```

NOTE: Some situations may allow for a lower capacity. Consult with Product Management to verify if a lower capacity may be considered.

- ✓ **Loading** – The vessel will have at least three tank legs. The Omnicells should be level. Use the integrated height adjustment to assist with the leveling process. Under extreme cases, add shims beneath the base of the mount so that the load is roughly equal on each Omnicell.
- ✓ **Flooring** - A thorough inspection of the flooring's deflections must be considered before installing an Omnicell system. Flooring must be rigid enough to handle the total load without deflection.

- ✓ **Thermal contraction and expansion** – Horizontal vessels, in direct sunlight, can create thermal expansion issues.
- ✓ **Uplift and lateral constraints** – In extreme conditions (high winds or seismic activity) uplift and lateral stresses on the Omnicell system are a concern and should be considered when choosing the best Omnicell for the application. In extreme conditions, additional checking is recommended.
- ✓ **Isolate vessel** – Many external factors affect the accuracy and stability of an Omnicell system. Load cell signals can be affected by EMF sources such as electric forklifts, pumps, motors, etc. A well-isolated tank will provide more reliable results with fewer problems.
- ✓ **Eliminate mechanical constraints** – The vessel should be fully supported on the Omnicells. Reduce or eliminate any mechanical issues which will interfere with the vessel's deflection, such as: rigid vertical or horizontal piping (use flexible piping when connecting to the vessel whenever possible), ladders, catwalks, etc.
- ✓ **Orientation** – Orientation of the 9106FB Series Omnicell is critical. Refer to section 3.4. Omnicell Placement for instructions. Position the load cell cables away from traffic areas.
- ✓ **Heated or chilled vessels** – Consult with the appropriate Product Manager for any application with vessels that heat or chill the product inside the vessel. In these cases, special consideration may be required to isolate the temperatures.
- ✓ **Load cell cabling** – The load cell cables should be routed away from areas where they could be damaged. Use drip loops at both the load cell and the junction box ends.
- ✓ **Hazardous area** – If the Omnicells will be installed in a Hazardous Area, a document is required from the end user stating the Class, Division, and Group.

Section 3: Scale Installation

3.1. Introduction

The service information contained in this manual is restricted for use by authorized, qualified service personnel only. Under no circumstances are unauthorized personnel to disassemble or otherwise tamper with this or any related equipment.

Installation consists of the following:

- Foundation check, layout, and mounting assembly installation
- Tools, materials, documentation, and a lifting mechanism such as a crane or hydraulic jack.
- Installation of the mounting assemblies and load cells.

3.2. Preparation for Installation: Tools, Equipment, Materials, and Planning

1. Hydraulic jacks. Use hydraulic jacks that have sufficient capacity plus a safety factor for the size of the vessels.

2. Blocking material to support the vessel.

3. Calibration weights—there are two options:
   - Standard calibration weights (this is the only acceptable method for NTEP systems).
     - Ensure calibration weights are delivered to the installation site.
     - Dolly or another method for moving the weights.
     - Means for lifting calibration weights (chains, come-along winch, etc.).
     - Lifting point on the vessel for supporting calibration weights.

   - Product used as calibration weight. In this method which is not legal for trade, another device such as a scale or flow meter weighs the product. Then, the product is used as a calibration weight.

     - Schedule the product to arrive when needed.
     - Determine how the product will be transported to, lifted, placed in, and removed from the vessel. Be certain that any equipment needed for movement of the product is available.

4. Determine how the scale system will be installed.

   - Welded installation.
     - Arc welding machine
     - Welding rod
     - Steel brush
     - Grinder

- Chipping hammer

CAUTION: Arc welding can cause severe damage to load cells. If welding is required, remove the load cell or remove the unit and install blocks.

- Mechanical installation.
  - Hammer drill with bit—size dependent on the size of the Omnicell, reference the proper drawings for specifics.
  - Wedge anchor bolts, epoxy anchor bolts, hex head bolt, etc. for the base assembly and top plate.
  - **Bolt size on some models differs according to the capacity of the Omnicell. See the parts list to determine. Be aware that some bolts have metric threads, plan accordingly.**
  - Washers
  - Quantity of fasteners depending on the application
  - Hand or power tools to secure fasteners
  - Grease and anti-seize

5. Hand tools – Wrenches, small screwdriver, tie straps, electrical tape, etc.

3.3. Basic Mechanical Installation Steps

1. **Raise the vessel** that is to be supported by the Omnicell® Assemblies.
2. Secure the Assembly by safely **placing blocks under the vessel** to the required height.
3. **Place each Assembly onto a level surface** under each support leg.
4. Set the Assemblies for the **correct load cell orientation** (*as shown on the following page*).
5. **Insert the bolts**, and then **fasten them loosely** to the support leg for each assembly.
6. **Mark the anchor bolt locations**.
7. **Drill the anchor hole locations**.
8. Re-position the load cell assemblies, level, and **anchor all assemblies**.
9. Carefully **lower the vessel onto the top plate of each Omnicell® Assembly** ensuring that load cells are not overloaded during the process.*
10. **Tighten the bolts,** securing the load plates to each support leg of the vessel.
11. **Remove all cribbing blocks**.
12. **Route the cables** to the junction box and instrument.

13. Referencing the color code in Section 1.5 of this manual or printed on the load cell cable, wire the load cells to the junction box.
14. Referencing the appropriate instrument service manual, wire the instrument and calibrate.

*** Note**: Depending on the unique needs of the application, the vessel may be lowered after the junction box and instrument are wired.

Before the installation is considered complete, the equipment is to be configured to meet or exceed any applicable weights and measures requirements.

3.4. Omnicell Placement

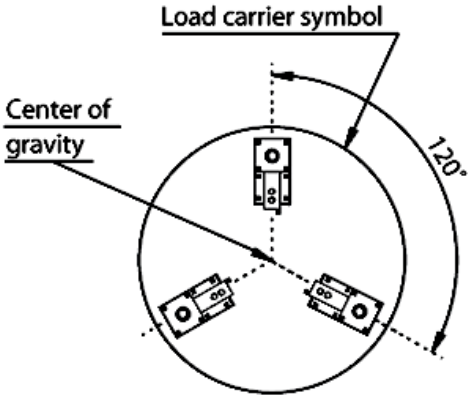


Figure 1

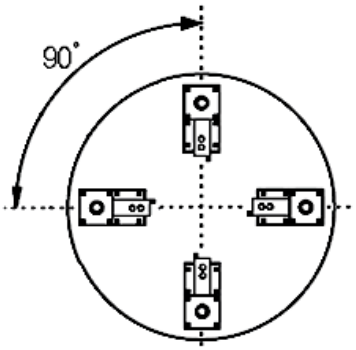


Figure 2

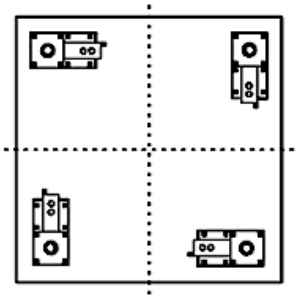


Figure 3

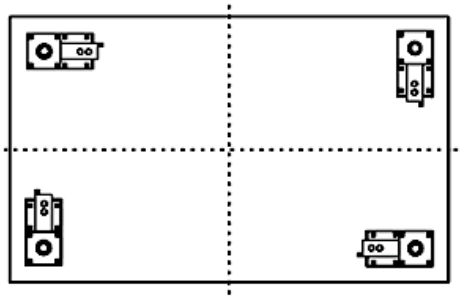


Figure 4

Follow these guidelines for installing Omnicell® Load Cells.

1. The loading points of the modules should be as far from one another as the structure allows.
2. When installing the square and rectangle Omnicell units, line up the **Base Plates** of the Load Cells with each other, and align them evenly from the end and the sides of the units.
3. When installing six Load Cells (*Figure 5*), ***be extremely careful*** to position the center Omnicells® to exactly the same height as the outer Omnicells®.

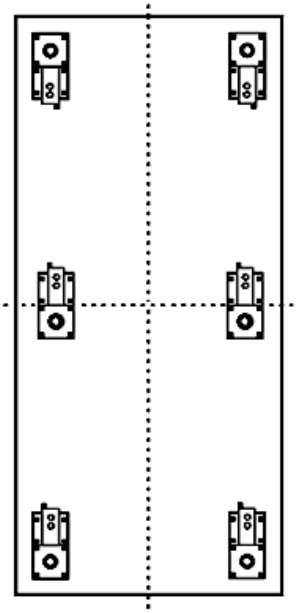


Figure 5

3.5. Installation Considerations

1. Omnicells are designed to allow for some lateral movement. The Omnicells should be oriented so that the major vessel expansion-contraction is in that plane.
2. The load on each Omnicell should be roughly equal. This can easily be checked by measuring the millivolt output signal or output counts from each load cell assembly. Shim as required to equalize the load cell output signals. For tank or hopper applications the signal output should be within +/- 20% of the load on each Omnicell used in the installation.
3. Since the Omnicells have a maximum deflection of about 0.015 inches, shimming or grout may be used to level the mount and is usually necessary to equalize the load cell outputs. If shimming is a problem and the vessel has alignment problems, neoprene rubber equalizing pads may be used on the top of each Omnicell to help equalize the loading. The top and bottom plates must be level within +/-0.5°.
4. The vessel should not touch or rub against supporting structures.
5. The filling or discharge piping should have flexible sections to be run in parallel to the vessel for approximately 3-4 feet so the piping will be decoupled from the vessel being weighed and not affect the weighing accuracy.
6. For lower capacity systems, less than 5,000 lbs., attachment of pipes and feed chutes to the vessel is more critical in relation to weighing errors.

IMPORTANT: Load from vessel most be centered over the top plate.

Section 4: Maintenance

4.1. Scale Maintenance

1. Check for accumulations of solid material under the Omnicells that may affect the accuracy (ice, frozen mud, debris, etc.).
2. Check to see that the customer is doing routine cleaning around the vessel.
3. Inspect load cells for damage to the ends/cables.
4. Inspect and adjust all check bolts (if applicable) using anti-seize on the threads.
5. Check for all clearances around the scale for any obstructions or interference with the free movement of the platform.
6. Check all load cells for plumb and level.
7. Inspect boxes for leaks, the interior should be clean and dry. If there is moisture inside, clean and dry it thoroughly. Check all connections at the terminal blocks to ensure they are tight.
8. Check that all anchor bolts are appropriately tight. Loose bolts commonly cause incorrect weighing.

Section 5: Parts

5.1. Omnicell® 9106 FB Complete Units

Part No.	Description
27886	Omnicell, w/ Fabricated SS Mount, SS Welded Load Cell 1,000 lb. Capacity
27887	Omnicell, w/ Fabricated SS Mount, SS Welded Load Cell 1,500 lb. Capacity
27888	Omnicell, w/ Fabricated SS Mount, SS Welded Load Cell 2,500 lb. Capacity
27889	Omnicell, w/ Fabricated SS Mount, SS Welded Load Cell, 5,000 - SE Capacity
27890	Omnicell, w/ Fabricated SS Mount, SS Welded Load Cell, 10,000 Capacity

5.2. Load Cells

Part No.	Description
27906	Stainless Steel Welded Shear Beam Load Cell, 1,000 lb. Capacity
27907	Stainless Steel Welded Shear Beam Load Cell, 1,500 lb. Capacity
27908	Stainless Steel Welded Shear Beam Load Cell, 2,500 lb. Capacity
27909	Stainless Steel Welded Shear Beam Load Cell, 5,000 - SE Capacity
27910	Stainless Steel Welded Shear Beam Load Cell, 10,000 lb. Capacity

5.3. Omnicell 9106 FB Mounting Assemblies

Fairbanks P/N	Qty	Components
93648	1	**9106 FB Mounting Ass'y (1,000 lbs to 5,000-SE)**
93649	1	**9106 FB Mounting Ass'y (10,000 lbs)**

5.4. Parts Not Supplied

Qty. Per Ass'y	Components
	Fastening Bolts for Vessel Attachment
4	▪ **1/2 -13 UNC bolts** *(1,000 to 5,000 lb. capacities)*
6	▪ **1/2 -13 UNC Anchor Bolts** *(1,000 to 5,000 lb. capacities)*
4	▪ **5/8 – 11 UNC Bolts** *(10,000 lb. capacity)*
6	▪ **5/8 – 11 UNC Anchor Bolts** *(10,000 lb. capacity)*

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