

Installation Manual

# **Titan Series Cover Plated Scale** 6020 Series



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# **Amendment Record**

## **Titan Series Pit Style Scale**

# Installation Manual Document 51356

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10/2016	Updated Service & Maintenance > Maintenance Inspections, Parts
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# **SECTION 1: GENERAL INFORMATION**

### **1.1. DESCRIPTION**

The Titan Cover Plated Modular Steel Deck Truck Scales are available in various lengths from twenty-seven to one hundred and five feet long (27 to 105'), and widths from ten to fourteen feet (10 to 14').

- Module lengths include 27', 30', and 35'.
- The modules are pre-assembled and welded at the factory.
- Each module bolts to the adjoining module.

### **1.2. APPLICATIONS**

- Asphalt plants
- Aggregate yards ٠
- Coal mines
- Concrete plants •
- Dairy farms •
- Farmer's markets
- Grain plants

**1.3. FEATURES** 

•

- Landfills •
- Most high-volume applications •
- Ports of entry •
- **Timber Mills** •
- **Transfer stations** •
- Transportation companies •

- <sup>3</sup>/<sub>8</sub>" Deck Plate thickness
- 120,000 lb. CLC/DTAC
- Quick, easy installation •

- 100,000 lb. Capacity Load Cells •

Up to 300,000 lb. Gross Capacity

- NTEP approved up to 14' wide •
- Deflection less than 1/1600 under legal highway loads •
- Intalogix® Technology standard feature on each Titan •
- Incredible Steel Weight; the 70' x 10' Titan scale has 33,000 lbs. of steel in the • modules alone
- Fairbanks' Open Bottom Design promotes natural module ventilation and eliminates • moisture collection points that cause premature scale deterioration
- **Optional 5 Year Warranty**



### **1.4. SCALE SPECIFICATIONS**

Deck Dimensions	Lengths: 27', 30', 35', 60', 70', 80', 90', 105' Widths: 10', 11', 12', 14'
CLC/DTAC	120K lbs
Gross Capacities	150K to 300K lbs
Sections	2 to 4
Modules	1 to 3
Module Design	Orthotropic
Module Construction	USA Structural Steel
Module Under Structure	Open Bottom
Deck Plate Thickness	<sup>3</sup> / <sub>8</sub> "
Approval	NTEP COC #96-089A3

### **1.5. LOAD CELL SPECIFICATIONS**

Height	4 <sup>11</sup> / <sub>16</sub> "
Capacity	110K lbs (50t)
Туре	Rocker Column
Sealing	Complete hermetic sealing; cable entry sealed by glass to metal header
Material	Stainless Steel
	17-4 PH (1.3448)
Rating	IP68 (NEMA 6P)
Resistance	1,000 Ohms
Operating Temperature	-40 to +80°C (-40 to 176°F)
Output	2.0 mv/v
Combined Error	≤0.02%
Zero Balance (FSO)	1.0%
Excitation	5 to 15 VDC
Ultimate Overload	300%
Cable Length	15'
Cable Protection	Stainless Steel Sheathing
Approvals	NTEP COC# 14-024
	Factory Mutual Approved



### 1.6. OPTIONS

- Deck Runners
- Rub Rails
- Drop Plates
- Blow-Down Plates

### **1.7. ACCESSORIES**

- Weight Indicators
- Unattended Automated Systems
- Traffic Signals

- 300,000 lb. Gross Capacity
- Custom Widths/Lengths

- Report & Ticket Printers
- Custom Software
- Remote Displays

# **SECTION 2: INSTALLATION**

### 2.1. OVERALL STEPS

- 1. Foundation check, layout, and base plate setting
- 2. Preparing tools, materials, documentation and renting a crane.
- 3. Setting up the modules
- 4. Setting the modules on load cells.

#### 2.1.1. Tools, Equipment and Materials

- Certified Prints
- □ A mobile crane of sufficient lifting capacity to safely lift and place the weighbridge modules.
  - Approximate maximum weight of steel modules is **8 tons**.
- □ Four equal length twenty foot (4-20 ft.) lifting chains or cables *with hooks*.

**IMPORTANT NOTE:** The installer **MUST** reserve Crane and Chains/Cables in advance from a local rental service company.

- □ Machinist's Levels (Starrett #134 & 132-6).
- □ Hand tools.
  - Wrenches and Sockets
    - 15/16"
      1 1/8"
    - 1 ½"
       ¾" Hex Wrench
- □ Hammer Drill with <sup>5</sup>/<sub>8</sub>" x 36" bit.
- □ Low profile hydraulic jacks (2)
  - Hydraulic Jacks that have sufficient capacity plus (+) a safety factor for the model of scale you are installing.
  - Recommended Jacks:
    - Enterpac model CUSP50 cylinder
    - Enterpac model P141 pump
    - Enterpac model HB9206Q hose
    - Enterpac model A360 coupler
    - Enterpac model FZ1630 reducer
    - Available at <u>www.enerpac.com</u>



- $\Box$  100' steel tape measure.
- □ Stringline or chalkline (both)
- □ Pry bars.
- □ Grease and anti-seize (*see note below*)

**NOTE:** <u>Grease</u> for load cell cups: equal to Super Lube White Grease (food grade)

□ Load Cell Locating Tools, *one for each load cell*, available for purchase through Customer Service (157069)

### 2.2. PREPARING THE SCALE ASSEMBLY

#### 2.2.1. Site Preparation – All foundation types

- 1. Assist the customer in selecting a site which allows easy access to and from the scale, ensuring enough area for straight and level approaches, and to meet all **State and Local Weights and Measures Regulations.** 
  - The site needs good drainage away from the scale, elevated enough so the surrounding areas *drain away from the scale site*.
  - Obtain all the necessary permits and licenses prior to beginning construction.
- 2. Using a transit, sight in and mark with stakes the area where the placement is to occur, and where supports and forms are to be built.
  - When constructing forms, make sure they are plumb, square, and level.
  - Place and compact gravel into the base of the forms, if necessary.

#### 2.2.2. Scale Positioning

- Position the scale so that vehicles can approach and exit it easily.
  - Smooth and level approaches are required at each end of the platform to reduce loading shock, and to facilitate testing of the scale.
  - Approaches must conform to the requirements of the law in the state in which the scale is being installed.
    - In the absence of such laws, the approaches must conform to paragraph UR.2.6 of the National Institute of Standards and Technology Handbook 44, which states that the first 10 feet must be level and on the same plane as the scale platform.
- The platform should be visible from the instrument location.
- Surface water must drain easily, and not collect, under the scale.



#### 2.2.3. Installing the Foundation

- 1. Cut and position rebar into the form exactly as the schedule details it in the Fairbanks certified foundation prints.
- 2. The scale is designed to anchor to the foundation, using expansion anchors which are inserted into the concrete after it has cured.
  - Expansion anchors are recommended because of the flexibility allowed in final positioning of the scale.
- 3. Pour concrete, using a mix to yield a minimum of 3,500 psi compressive strength.
- 4. Vibrate the concrete into position to ensure consistency.
  - All concrete work *MUST* conform to standards set forth by the American Concrete Institute Code.
  - Allow concrete to cure several days before erecting the scale.
- 5. Remove the forms and backfill for proper drainage.
  - A slope away from the scale is recommended.

# Allow concrete to cure for **twenty-eight (28) days**, or until a test cylinder indicates the concrete has reached its design strength before allowing traffic on the scale.

#### NOTE: Always... "CALL BEFORE YOU DIG".

1-888-258-0808



#### 2.2.3 Installing the Foundation, Continued

 Before installing any part of the scale, check the foundation for accuracy using Foundation Inspection Field Check List, FF-2267 / 101732 (see Appendix I).





#### 2.2.3 Installing the Foundation, Continued

- 2. Layout and position the base plates in the proper locations using the **Certified Prints**.
  - Each base plate must be level and in full contact with the top of the pier.
  - Adjustments can be made by chipping the concrete or grouting (thinly, enough to fill in small imperfections) under the base plates.
  - A maximum of +/- 1/8" space for movement is allowed.
- 3. Re-check the locations of each base plate against the **Certified Prints**.
- 4. Insert the four (4) <sup>3</sup>/<sub>8</sub>" roll pins into each base plate for cup retention.
- 5. Position the lower cups with pin toward the INSIDE.
  - The load cell cable exits to the **INSIDE**.
  - It is **NOT necessary** to install base plate anchors at this time.
- 6. Put a  $3/_{16}$ " shim under the lower cup.
  - The lower cups pin point towards the center line of the scale.
- 7. Place the upper cup on the edge of the upper foundation, next to each base plate.
- 8. Place the load cell locating tool next to each base plate.





#### 2.2.4. Steps for Setting the Modules

- 1. Prepare the Modules for lifting.
  - The modules must have lifting brackets installed at each corner before they can be moved.
  - Use only the high-strength bolts provided or parts from the factory.
- 2. Tighten the bolts.
- 3. Always set the Center Module first.
  - The center module has four load cells to install.
  - All other modules have two load cells.



- The modules must be placed in the proper order and aligned in the foundation so that all modules fit correctly.
- This model of scales **DOES NOT have a left-right orientation**, and also the ends are unmarked.
- The center module may be installed facing either direction, so long as it is in the middle.
- If it is a two (2) module scale, the center module becomes an end module also.
- Place blocks that will set the modules at a height slightly less than the finished height as safety blocks, or for setting modules on.
- 5. Lift the center module to a location above the four center load cell base plates.







#### **OPTION 1: Setting the module directly onto the locating tools**

The module sets directly onto the locating tools and the blocks act as safety stands.

- 6a. Install a Load Cell Bearing Cup into the upper receiver of each corner.
  - Grease helps hold the cup in place.
- 6b. Insert the upper end of the locating tool over the upper cup on the module.
- 6c. Lower the module while holding the locating tool upright and guiding the bottom of the tool into the lower cup.
  - When the center module is set on all four locating tools, keep tension on the lifting straps until the module is centered and straight.
- 6d. Use hydraulic jacks to lift the unit slightly and shift the base plates to get the locating tools PLUMB and the top and bottom flanges **FLUSH** with the sides of the cup.





#### 2.2.4. Steps for Setting the Modules, Continued

#### **OPTION 2: Set the modules on blocks first, then onto the locating tools**

When the module is set on the blocks, keep tension on the lifting straps until the module is properly aligned.

- 6a. Install the Upper Receiver Cups.
- 6b. Use hydraulic jacks to lift the unit slightly, then install the locating tools.
- 6b. Shift the base plates to get the locating tools PLUMB.
  - The top and bottom flanges of the locating tool must fall FLUSH with the sides of the Upper and Lower Receiver Cups.
- 6c. **Measure from each side** of each end of the module to the end walls to be certain the module is plumb and square before removing tension.
- 6d. Release tension on the lifting straps, then remove the lift brackets or hooks.
- 7. **Guide the modules into place** with the supporting blocks on the end of the module, coming to rest on the center module load cell bracket.
- 8. Lower the other end of the module onto the load cell locating tools or blocks.
- 9. Before releasing tension on the lifting straps, check the alignment of the end modules to the center module and to the end wall.
  - Ensure end modules are aligned with the center module and the foundation.
- 10. **Snug the bolts**, but do not tighten them yet.





#### 2.2.5. Checking Installation and Adjustments

 Use the end checking shims provided to adjust end checking so that they touch and prevent movement.



- 2. Install the side checking brackets.
- 3. Bolt the brackets onto the end copings as noted in the *Certified Drawings*.
- 4. **Set the bolts** so that they touch the channels they bump against.
- 5. **Re-inspect** that all locating tools are properly aligned and flush with the receiver cups.
- 6. **Drill the holes** for the base plate anchors using a hammer-drill with a  $\frac{5}{8}$  drill bit.
- 7. **Hammer the anchors** into clean holes and tighten the nuts securely, being careful that threads are not damaged.







#### 2.2.6. Installing Load Cells

- 1. Starting at one end of the assembled platform, **place hydraulic jacks at the corners** so the section can be lifted off the locating tool.
  - Two (2) hydraulic jacks may be required.
- 2. Lift the platform so the load cell locating tool can be removed from the upper and lower bearing cups.
- 3. Once removed, coat both cups with grease provided with the load cell.
- 4. **Carefully lower the scale** (using the hydraulic jacks) while seating the bottom of the cell into the lower cup.

#### **NOTE:** Anti rotation must be positioned to **inside** of scale.

- Check the scale's level and height, particularly at the approaches.
- 5. **Insert the load cell shims** provided to adjust load cell cups for correct height and to ensure that all cells share the proper amount of load.
  - The center section cells have up to twice the deadload of end section cells.
- 6. Once satisfied with height and level, **tighten the bolts**.



### 2.2.7. Fastening the Load Cell Cables

- 1. Route the load cell cables through the holes in the channels to the **SSC/PPS Mounting Bar** location in the center.
- 2. Install the Strain Relief Clamps for load cell cables on the Strain Relief Base, which is welded onto the scale.
- 3. Remove shims on end checking to allow <sup>1</sup>/<sub>16</sub>" **to** <sup>1</sup>/<sub>8</sub>" **clearance**.
- 4. Adjust side checking bolts to allow **1/16**" **clearance** from channel.

### 2.2.8. Attach the Wiring Box

- 1. Attach the **Wiring Box** using the 'tabs' to bolt adapters in the space between modules
- 2. Attach the **ground wire lug** to one of the mounting bolt studs.
- 3. **Tighten securely** to provide a good electrical ground.





# **SECTION 3: ELECTRICAL INSTALLATION**

------

### **3.1. WIRING INFORMATION**

- ALL wiring cable *MUST be a minimum of* **18 AWG**.
  - It must be three (3) pair cable.
  - It must be Cable 17204 (old style), 17246 (new style), or an equivalent.

# ATTENTION

Fairbanks warranty supports ONLY this minimum wiring standard. Using any lesser quality wiring can void all company contracts.

#### **Maximum Cable Lengths**

NUMBER of LOAD CELLS	Maximum Cable Lengths for IDICATOR TO POWER SUPPLY
10 – 700 Ohm Cells	1800 feet
12 – 700 Ohm Cells	1150 feet
14 – 700 Ohm Cells	800 feet
16 – 700 Ohm Cells	575 feet
6 – 350 Ohm Cells	1,575 feet
8 – 350 Ohm Cells	1,000 feet
10 – 350 Ohm Cells	575 feet

\*\* See **Appendix I and II** for the complete wiring charts of the indicator, power supply (**15236**) and the sectional controllers (**15235**).





#### 3.1.1. Load Cell Numbering

- Intalogix<sup>™</sup> Technology installations use a specific numbering system for load cells because of digital addressing of the SSCs.
- With respect to the following starting position, face the platform where the indicator is located.
- The cell at the **upper-left** (far side) of the platform is **Cell One (1)**.
- The cell positions along the far side have odd cell numbers.
- The near side locations have even cell numbers.



Above is an example of a four (4) section cell numberings using SSCs.



#### 3.1.2. Additional Wiring Notes

- The **Full Electronic Scales** provide protection from the effects of moisture.
- The load cells are calibrated with the cable attached, and therefore *the cable should NOT be cut.*
- Load cells and sections are adjusted with potentiometers.
- The cable connects directly to the Balance Box or SSC through a sealed bushing which *MUST be tightened with pliers* to keep water and moisture out of the box.
- All cabling needs *"drip loop"* at the cell or box entry location to help prevent water entry.
- On all boxes, particularly stainless steel, the black plastic fittings have O-rings that can be forced out of position if the bushing itself is not tight.
  - a. To prevent this, first tighten the inner nut securing the bushing in the hole, then insert cable.
  - b. Carefully tighten the gland with pliers until it is very snug.
  - c. Do not over-tighten where bushing turns.
    - The cover MUST be secured with ALL screws tightened properly (18-20 in/lbs) for protection against moisture.
    - Balance Boxes must have one (1) pit ground rod in the pit for proper connection.



- Install load cells of matching outputs in sections.
  - This reduces side-to-side errors.
  - When calibrating, place weights directly over the cell or directly on the section being tested.
  - Adjust the potentiometers for the correct cell or section to compensate for differences.



prevent water entry.



### 3.2. WIRING FOR THE INTALOGIX $^{\rm \tiny M}$ DIGITAL SYSTEM

#### 4 11/16" Load Cell

Terminal	Color	Description	
1	Blue	() Excitation	
2	Red	(+) Excitation	
6	Yellow	Shield	
7	Green	(+) Signal	
8	Gray	(–) Signal	

\*\* Wiring chart for all load cells to all SSCs.

#### 3.2.1. Sectional Controller Wiring

- 1. Pull the load cell cables into the Sectional Controller Box 1 (SSC1).
  - The **ODD numbered cell** is *always* wired to **TB1** (ODD numbered TB).
  - The EVEN numbered cell is *always* wired to **TB2** (EVEN numbered TB).
  - Wire all the Sectional Controllers (SSCs) and load cells as shown in Appendix I.
  - Load cell 'drain' wires connect to ground lug on the Sectional Controller Box exterior.

#### 3.2.2. Power Supply Wiring

- 1. Bring the cable end into the power supply box at **TB1**.
- 2. Dress the cable end, connect the cable to TB1 *using the same color code.*

#### If Power Supply is at Center of Scale

Follow these steps when mounting the power supply in or near the center (not at the end) of a scale.

- 1. Wire the SSCs on one end as shown in **Appendix I**.
- 2. Wire the controllers on the other end.
- 3. Run cables from the second center SSCs TB3(s), to the power supply at TB3 and TB4.
  - Both TB's are operable.
- 4. Wire TB1 of the power supply to TB1 of the instrument.



#### 3.2.2. Power Supply Wiring, Continued

#### If Power Supply is at End of Scale

Follow these steps when mounting the power supply at the end of a scale.

- 1. Wire all the sectional controllers as shown in **Appendix I**.
- 2. Wire the last sectional controller into TB3 of the power supply.
- 3. Wire **TB1** of the **power supply** to **TB1** of the **instrument**.

TB3 or TB4	17246 Cable	Description
1	Black	(–) 8.0 V
2	Green	(+) 8.0 V
5	Blue	DC Return
6	Shield	
7	White	(+) RS-485
8	Red	(–) RS-485

**NOTE:** On the **17246 cable**, cut away the **Orange** wire.

- 4. Install the power supply in a protected area under the platform, where the **Home Run** cable is run.
  - Place it near a dedicated ground rod.
- 5. Run a cable from the Power Supply TB1 to the scale house.
- 6. Secure all gland bushing nuts with pliers.
  - Tighten them enough to prevent contaminants from entering the box.



#### 3.2.3. Indicator to Pit Power Supply Cable Connection

Prepare the cable ends in the standard manner.

- Use the appropriate manual for wiring the sectional controllers and power supplies.
- Connect the indicator interface cable to the instrument in the scale house as shown in the service manual.



Connect the **PPS to an SSC** (No. 1 or any SSC).

• Feed a cable from **SSC 1**, **TB3** through the bushing for in the **PPS for TB3**.

Connect the wires as shown in this chart.

TB3 SSC	TB3 PPS	17246 Cable	Description
1	1	Black	(-) 8.0 volts
2	2	Green	(+) 8.0 volts
5	5	Blue	DC Return
6	6	Shield	Shield
7	7	White	RS-485 (+)
8	8	Red	RS-485 (-)



#### 3.2.3 Indicator to Pit Power Supply Cable Connection, continued

- Wire the PPS to the Instrument.
  - Run the Home-Run Cable from the PPS TB1 to the Instrument's TB1.
  - Shields are used for DC Return and MUST BE CONNECTED.

#### Intalogix™Indicator Wiring

- 1. Bring the other end of the cable into the back of the indicator through the gland nut.
- 2. Press the end of the cable and connect the wires to TB1 near the back of the communications PC board.

Indicator TB1 to Power Supply TB1	17246 Cable	Description	
1	Black	28 VAC ( <b>AC</b> )	
2	Green	AC Return (ACR)	
3	Blue	20 VDC ( <b>DC</b> )	
4	Orange	Enable Transmit ( <b>EN</b> )	
6	Shield	* Shield / DC Return	
7	White	Transmit ( <b>TX</b> )	
8	Red	Receive ( <b>RX</b> )	

\* Shield must be connected or the system will not communicate.

**Intalogix™ Systems** use Smart Sectional Controllers (SSCs) and Pit Power Supplies (PPSs) for load cell excitation and signal processing.

- There is one (1) SSC per section and one (1) PPS for the entire platform.
- The only exception is if the number and resistance of the cells require a second pit power supply.
  - Two (2) are for load cells and two (2) are for "inter connecting" to other SSC boxes or terminating to a pit power supply.
- All cell/section/scale adjustments are made using the Intalogix<sup>™</sup> System Instrument.



#### 3.2.4. Grounding the Scale



Intalogix<sup>™</sup> Technology systems requires **two (2) ground rods** in the pit for proper connection.

- **Pit power supply** connects to one ground rod, and the **weighbridge** connects the other one.
- For accurate operation and protection against damage from lightning strikes, all of the components of the system must be properly grounded.

Use the following guidelines to correctly ground the system:

- Use 8 AWG or larger wire, or braided ground straps.
- All ground connections should be **no greater than two feet (2')**, or as short as possible.
- The SSCs and PPSs enclosures attach connections to the weighbridge. The weighbridge is then connected to a pit ground rod.
- The insulated **WHITE WIRE** from the PPS connects directly to the separate ground rod, *and not to the same rod as the weighbridge*.



#### 3.2.4 Grounding the Scale, Continued

- The **117 VAC SVP Unit connects to a ground** at the instrument's incoming power outlet.
  - Use a voltmeter to test the electrical power source available.
  - The Neutral-to-Ground voltage level must be 0.2 VAC or less.

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so the Su scale	Prope rge Voltag from ligh	er groun ge Protec tning and	nding is ction (SV d other e	REQ (P) ade electric	UIRED quately p al disturt	protects the pances!



### **3.3. WIRING FOR THE ANALOG SCALE SYSTEM**

#### 4 11/16" RC Load Cell

Terminal	Color	Description	
1	Blue	(–) Excitation	
2	Red	(+) Excitation	
6	Yellow	Shield	
7	Green	(+) Signal	
8	Gray	(–) Signal	

\* Wiring chart for all load cells to all SSCs.

#### Load Cell-to-Balance Box → Box-to-Box

Terminal	TB1	TB2	
1	(–) Excitation	(–) Excitation	
2	(+) Excitation	(+) Excitation	
3	Shield	Shield	
4	(+) Signal	(+) Signal	
5	(—) Signal	(—) Signal	

#### Terminal TB2 1 (-) Excitation 2 (+) Excitation 3 (+) Sense 4 (-) Sense 6 Shield 7 (+) Signal 8 (-) Signal

#### Balance Box-to-Instrument

Terminal	TB2
1	(–) Excitation
2	(+) Excitation
3	(+) Sense
4	(–) Sense
6	Shield
7	(+) Signal
8	(—) Signal

**NOTE:** See **Appendix III** for complete analog wiring diagram.



#### 3.3.1. Balance Box Installation Tips

- The balance boxes are interconnected from **TB4 to TB3**, beginning at the **end section** where the interface cable conduit enters the scale.
- If the conduit enters the scale in the middle, an alternative wiring method is to use **14478 Instrument SVP**.
  - This allows separate connections to go in each direction, toward the ends of the scale.
  - Balance Box (**21912**) is installed at the platform, one box per section.
  - Each Stainless Steel Balance Box has four (4) terminal blocks to connect two (2) load cells and two (2) cables for interconnections to other Balance Boxes and/or to the analog instrument.

#### 3.3.2. Balance Box Cable Connection

- 1. Fasten the two (2) cables from the two (2) **Center Section Boxes** into the **Instrument SVP** (14478).
  - The cable from the indicator connects to the **14478 Instrument SVP** as well.
  - Prepare the cable ends in the standard manner.
  - Connect the indicator interface cable to the instrument in the scale house as instructed by the appropriate indicator service manual.
- 2. Install load cells of matching outputs in sections.
  - This reduces side-to-side errors.
  - When calibrating, place weights directly over the cell or directly on the section being tested.
  - Adjust the potentiometers for the correct cell or section to compensate for differences.
- 3. Install the **Cover Plates** that bridge the gap between modules.
  - They are held in place with 3/4" x 1 1/2" bolts.
  - Use **anti-seize** or grease on the bolts and bolt holes.

# SECTION 4: SERVICE & MAINTENANCE

### **4.1. MAINTENANCE INSPECTIONS**

- Have the customer clean under the platform regularly.
  - Check for accumulations of solid material under the scale which may affect the accuracy, i.e., ice, frozen mud, debris.
  - Check to see that the customer has cleaned under the platform regularly.
  - Inspect and tighten all connecting and cover plate hardware for proper tightness.
- The load cell bearing cups should be inspected, cleaned and greased at least TWICE per year.
  - Inspect load cells for damage to the ends/cables, check cups and "O" rings for damage and/or excessive or uneven wear.
  - Inspect and adjust all check bolts using anti-seize on the threads.
  - Ensure that the system is maintaining proper ground connections.
- Ensure that the SSCs and the PPSs covers are secure.
  - Check module-to-module bolts for tightness.
  - Examine load cell cables and module interconnect cables for problems.





### 4.2. VOLTAGE & WIRING SPECIFICATIONS REFERENCE



Red Lead (+)	Black Lead (—)	Reading
А	В	28 to 34 VAC*
С	E	(+) 20 Vdc Unregulated; typically 17 to 24 VDC
D	E	2.2 - 3.0 Vdc
F	Н	-8.0 Vdc $\pm$ 0.3
G	Н	+8.0 Vdc $\pm$ 0.3
К	L	-3.0 Vdc $\pm$ 0.2
J	L	+3.3 Vdc $\pm$ 0.2

\*Noted Exceptions:

FB6011/12/13 = A –B adjusted to ~22 VAC



### 4.3. LOAD CELL REPLACEMENT

- 1. **Remove power** from the system at the instrument.
- 2. Lift the scale using hydraulic jack(s) at the corner(s) closest to the "defective" cell location. The jack(s) must have sufficient capacity plus (+) a safety factor for the Titan scale installed.
- 3. Disassemble the strain relief device
- 4. Remove the **defective load cell**.
- 5. Check and replace the upper and lower receiving cups and O-Rings if damaged.
- 6. Apply a small amount of **grease** on the top and bottom of the new load cell, then insert into the upper receiving cup, positioning the anti-rotation clip.
- 7. Gently **lower the scale assembly**, ensuring proper placement of the load cell into the lower cup.
- 8. Remove the SSC/Junction Box Enclosure Cover.
- 9. Loosen the gland bushing to free the cable.
- 10. Unwire the defective load cell from the SSC, noting the wire color code.
- 11. Wire the new load cell into the SSC/Junction Box.
- 12. **Torque the cover screws to 18-20 in/lbs** and tighten all gland nuts with a wrench to secure.
- 13. Secure the SSC enclosure latches.
- 14. **Re-apply power** to the instrument.
- 15. Test and adjust the scale, and then **calibrate** it as necessary.

# **SECTION 5: PARTS**

### 5.1. SCALE PARTS LIST

Part No.	Description	
54511	<sup>3</sup> / <sub>4</sub> " -10 x 1 <sup>1</sup> / <sub>2</sub> " Hex Bolt (cover plates)	
54236	<sup>3</sup> / <sub>4</sub> " Washer (cover plates)	
54207	High Strength Bolt 1"-8 x 2 <sup>1</sup> / <sub>2</sub> " (for lifting brackets)	
157005	Load Cell Base Plate	
61743	<sup>5</sup> / <sub>8</sub> " x 6" Anchor Bolts	
55010	Ground Rod Kit	
*161398	Shim, upper cup, 1/8" (2.25" OD)	161398
*161397	Shim, lower cup, <sup>1</sup> / <sub>16</sub> " (2.75" OD)	
63319	Side check bracket w/bumper bolts (1" x 5")	
64208	Shim, longitudinal 1/4"	
64209	Shim, longitudinal <sup>1</sup> / <sub>16</sub> "	
70045	<ul> <li>Box, hardware, checking, consisting of the following:</li> <li>8 each 64208 - Shim, end check, ¼"</li> <li>8 each 64209 - Shim, end check, 1/16"</li> <li>4 each 64213 - Bumper check block</li> <li>4 each 70043 - 8 x 3 urethane check block</li> <li>1 each 70094 - Checking hardware kit</li> </ul>	161397
79747	Rub Rail PVC End Caps	1
105297	Rub Rail Plugs	1

\* see image (right)

### 5.2. LOAD CELLS AND LOAD CELL HARDWARE

Part No.	Description
175115 *	Load Cell, 4 <sup>11</sup> / <sub>16</sub> " RC, 110K, (50t) 1000 ohm, 2mv/v
161197	UPPER & LOWER Cup (with Anti-rotation Pin) Kit with Gasket
157278	Roll Pin, <sup>3</sup> / <sub>8</sub> "
157069	Locating Tool, 4 <sup>3</sup> / <sub>4</sub> "

\* Includes Upper & Lower Cups



### 5.3. SPARE PARTS LISTS

#### 5.3.1. Recommended Spare Parts

Part No.	Qty	Description
175115	1	Load Cell, 411/16" RC, <b>50t</b> (or 110k)
161197	1	Upper & Lower Cup (with anti-rotation pin) kit

#### 5.3.2. Startup / Commissioning Spart Parts

Part No.	Qty	Description
175115	1	Load Cell, 411/16" RC, <b>50t</b> (or 110k)

#### 5.3.3. 2-Year Spare Parts List

Part No.	Qty	Description
175115	1	Load Cell, 411/16" RC, <b>50t</b> (or 110k)
161197	1	Upper & Lower Cup (with anti-rotation pin) kit
79747	1	Rub Rail PVC End Caps
105297	1	Rub Rail Plugs

Capital Spare Parts – Not Applicable

# **APPENDIX I: FOUNDATION CHECK LIST**

	k F	oundatio	on Inspe	ction
FAIRBAN		FOUNDATION	N FIELD CHECK L	IST
*****	**	(F	ield Form)	
A Foundation Ir construction. 년	nspection <b>should <u>ALWAYS</u> k</b> (possible this should be don	pe performed prior to e prior to scale ship	o scale installation and nent.	to <b>confirm</b> correct foundatio
Tools required:	Certified drawings and s	site plan 🛛 🛛	2' to 4' level	
	🗆 100' and 25' steel tapes		Hammer and concre	ete nails
	Laser or builders level if	possible [	String line (construc	tion string)
	Straight edge for pit four	ndations (2 × 4, very	straight and 4" wider	than pit walls
	Construction paint (up-s	ide-down type, for m	arking concrete).	
ioundation print	:s for the job you are working l <b>an and Certified Prints</b> shou a items (scoreboards, lights,	) on as model numb Id be thoroughly rev poles, etc.) that are	ers and specifications iewed to confirm accu included in the bid or	are subject to change. rate locations to the scale an contract.
2. <b>Check</b>	for truck and crane acces	<b>s</b> , overhead wires, <b>f</b>	ences, green concrete	e, etc.
🗌 3. Dimen	sional length and width ch	<b>ieck</b> , check all 4 sid	es and record on char	t (other side).
🗆 4. Diagor measu	<b>rai measurements</b> check to v irements should be equal, or v	verify that the founda within 1/2". Greater er	ation is square and rec ror could result in the s	ord on chart (other side).The: cale not fitting in the foundation
□ 5. <b>Check</b> and the	A <b>LL pier heights</b> to make so e scale will not fit correctly, to	ure they are the prop lowcould result in	er elevation and record excessive shimming	l on chart (other side). To high
	oundations check walls to v critical for modular scales like	verify they are straig	<b>ght.</b> Straight walls are	veryimportant, but are even
6. In pit f		e the Rodan series.		
6. In pit f more 7. Verify	conduit locations and pull	e the Rodan series. strings (if needed).		
6. In pit f more 7. Verify 8. Verify	conduit locations and pull ground rod locations.	e the Rodan series. strings (if needed).		
□ 6. In pit 1 more □ 7. Verify □ 8. Verify □ 9. Verify	conduit locations and pull ground rod locations. that drains and sump oper	e the Rodan series. strings (if needed). n <b>ings</b> are piped corr	ectly and are clear of	debris.
☐ 6. In pit f more ☐ 7. Verify ☐ 8. Verify ☐ 9. Verify ☐ 10.Check installe	conduit locations and pull ground rod locations. that drains and sump oper the end coping to ensure t ed (10',11' or 12' width, etc).	e the Rodan series. strings (if needed). <b>nings</b> are piped corr hey are centerline a Check all coping, si	ectly and are clear of nd that the coping is c de and end, for hollow	debris. orrect for the scale being vareas.
□ 6. In pit f more □ 7. Verify □ 8. Verify □ 9. Verify □ 10. Check installe □ 11. Verify All of t	conduit locations and pull ground rod locations. that drains and sump oper the end coping to ensure t ed (10',11' or 12' width, etc). location of any and all requi hese dimensions will be loca	e the Rodan series. strings (if needed). nings are piped corr hey are centerline a Check all coping, sid ired embeds or pre- sted on the Certified	ectly and are clear of nd that the coping is o de and end, for hollow <b>installed baseplates</b> (i. foundation prints.	debris. orrect for the scale being vareas. e., Hwy System, RR scales, etc
<ul> <li>6. In pit 1 more to more to more</li></ul>	conduit locations and pull ground rod locations. that drains and sump oper the end coping to ensure t ed (10',11' or 12' width, etc). location of any and all requi hese dimensions will be loca t - To help in locating pre-ins ds and Procedures section of	e the Rodan series. strings (if needed). nings are piped corr hey are centerline a Check all coping, si i <b>red embeds or pre-i</b> sted on the Certified talled baseplates, er in Layout. See other	ectly and are clear of nd that the coping is o de and end, for hollow <b>installed baseplates</b> (). foundation prints. nbeds, load-cell cente sidefor foundation & La	debris. orrect for the scale being vareas. e., Hwy System, RR scales, et rlines, etc., referto nyout charts.





AIRBA

# **APPENDIX II: INTALOGIX™ WIRING DIAGRAM**



**PPS at Midsection** 

# **APPENDIX III: ANALOG WIRING DIAGRAMS**

### A. FOUR (4) SECTION ANALOG SCALE





### B. FIVE (5) SECTION ANALOG SCALE



# **APPENDIX IV: SCALE DIMENSION**

	Titan Cover Plated 6020 Series							
		L	w	CLC	Capacity	No. of		
	Model	feet	feet	K lbs	tons	Sections		
10 ft.	6020	27	10	120	75	2		
	6020	30	10	120	75	2		
	6020	35	10	120	75	2		
	6020	60	10	120	125	3		
	6020	70	10	120	125	3		
	6020	80	10	120	150	4		
	6020	90	10	120	150	4		
	6020	105	10	120	150	4		
	6020	27	11	120	75	2		
	6020	30	11	120	75	2		
	6020	35	11	120	75	2		
11 4	6020	60	11	120	125	3		
11	6020	70	11	120	125	3		
	6020	80	11	120	150	4		
	6020	90	11	120	150	4		
	6020	105	11	120	150	4		
	6020	27	12	120	75	2		
	6020	30	12	120	75	2		
	6020	35	12	120	75	2		
17.6	6020	60	12	120	125	3		
12 11.	6020	70	12	120	125	3		
	6020	80	12	120	150	4		
	6020	90	12	120	150	4		
	6020	105	12	120	150	4		
	6020	27	14	120	75	2		
	6020	30	14	120	75	2		
	6020	35	14	120	75	2		
14 ft.	6020	60	14	120	125	3		
	6020	70	14	120	125	3		
	6020	80	14	120	150	4		
	6020	90	14	120	150	4		
	6020	105	14	120	150	4		



# **Titan Series**

### Cover Plated Scale 6020 Series Document 51356

Manufactured by Fairbanks Scales, Inc. www.fairbanks.com