



# Operating Manual

Factory Mutual approved Instrument for hazardous (explosive) area application. Installation, Repair, and Maintenance is expressly limited to factory trained service personnel.

## **Hazardous Area Instrument H90-3052-D**

**NOTE: Instruments manufactured after *03/01/2018*  
are NOT approved for Division 1 applications.**



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# Amendment Record

## Hazardous Area Instrument

### Operator Manual Document 50144

Manufactured by  
**Fairbanks Scales Inc.**

|            |       |                                   |
|------------|-------|-----------------------------------|
| Created    | 10/94 |                                   |
| Revision 1 | 10/94 | New product documentation release |
| Revision 5 | 11/19 | Updated Manual                    |

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# SECTION 1: GENERAL INFORMATION

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## 1.1. Introduction

The model H90-3052-D is a general purpose instrument that can be united with a wide variety of Fairbanks platforms. Stainless steel construction makes the instrument well suited for use in wash-down locations.

The H90-3052-D is battery operated for unlimited portability. The battery packs are rechargeable.

## 1.2. Technical Specifications

| PARAMETER           | SPECIFICATION  |
|---------------------|--|
| Model               | H90-3052-D   |
| Units               | LB, KG   |
| Display             | High intensity, 6-digit liquid crystal display, with 0.8 inch digits |
| Display Update Rate | Programmable for 0.2, 0.4, 0.8, or 1.2 seconds                       |
| Digital Filter      | Programmable – 4 levels  |
| Auto-Zero Tracking  | Programmable OFF, 0.6 d, 1.0 d, or 3.0 d                             |
| Re-zero Range       | Programmable 0 to 100%, or 0 to plus or minus 2%                     |
| Filter Motion Band  | Programmable 0.5, 1.0, 2.0, 3.0                                      |
| Controls            | 18 key keypad  |
| Battery Life        | Continuous operation with one 350 ohm cell, 55 hours                 |
| Capacity            | Minimum: 10 lb. x 0.002 lb.<br>Maximum: 20,000 lb x 5 lb.            |

| ENVIRONMENTAL         | SPECIFICATION                            |
|-----------------------|--|
| Enclosure             | Stainless Steel, NEMA 4X, Water Washdown |
| Operating Temperature | -10° to +40° Centigrade                  |
| Storage Temperature   | -20° to +60° Centigrade                  |

| POWER REQUIREMENTS | SPECIFICATION                             |
|--------------------|---|
| Power Requirement  | ACC 352: 7 volt DC Lead Acid Battery Pack |
| Approvals          | NTEP, CSA, Factory Mutual                 |

## 1.3. Users' Responsibility

- ✓ All electronic and mechanical calibrations and/or adjustments required for making this equipment perform to accuracy and operational specifications should be performed by trained service personnel.
- ✓ 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.



*Please call your local*  
**FAIRBANKS SCALES REPRESENTATIVE**  
*For any question, problems, or comments.*

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# SECTION 2: PRE-INSTALLATION

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## 2.1. Introduction

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.**

The equipment consists of printed circuit assemblies which must be handled using ***ESD handling procedures*** and must be replaced as units.

- ✓ Replacement of individual components is not allowed.
- ✓ The assemblies must be properly packaged in ESD protective material and returned intact for replacement credit per normal procedures.



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

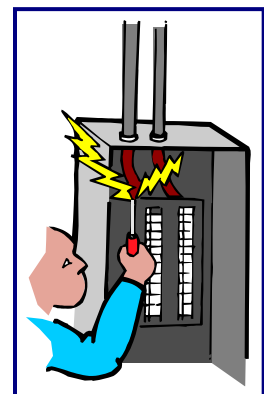
## 2.2. General Service Policy

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.**
- Instructions within this manual apply to the instrument and its specific accessories. Installation procedures for printers and other peripherals are given in manuals specifically provided for those units. The instructions include a pre-installation checkout which must be performed either at the service center before the technician goes to the site, or at the site before he places the equipment in service.
- All electronic and mechanical calibrations and/or adjustments required to make this equipment perform to accuracy and operational specifications are considered to be part of the installation, and 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 no physical alterations (mounting holes, etc.) are allowed and will immediately void warranty

**All load cells, load cell cables, and all interconnecting cables used for the scale components must be located a minimum of thirty-six inches (36") away from all single and multiple phase high energy circuits and electric current-carrying conductors.**

- This includes, but is not limited to **digital weight instruments, junction boxes, sectional controllers, and power supplies.**
- This includes any peripheral devices, such as **printers, remote displays, relay boxes, remote terminals, card readers, and auxiliary data entry devices.**
- Scale components themselves must also be at least **thirty-six inches (36") away** from other high energy components, including the following devices.
- Any machinery with outputs of **120, 240, or 480 VAC.**
- High voltage wiring runs and stations, AC power transformers, overhead or buried cables, electric distribution panels, electric motors, florescent and high intensity lighting which utilize ballast assemblies, electric heating equipment, traffic light wiring and power, and all relay boxes.
- Scale components are not designed to operate on internal combustion engine driven electric generators and other similar equipment.
  - This includes all digital weight Instruments and peripheral devices.
- Electric arc welding can severely damage scale components, such as digital weight Instruments, junction boxes, sectional controllers, power supplies, and load cells.
- The Service Technician's responsibility that all personnel are fully trained and familiar with the equipment's capabilities and limitations before the installation is considered complete.





## 2.3. Pre-Installation Guidelines

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.

- ✓ If the installation process might disrupt normal business operations, tell the customer and ask that they make ample arrangements.
- ✓ Is properly-grounded power available at the installation location?
- ✓ 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 particular application.

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.



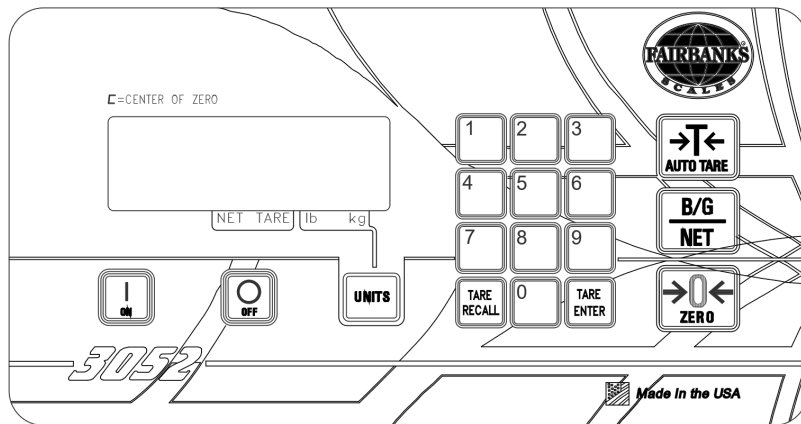
Position the equipment with these points in mind.

- ✓ Intense direct sunlight can harm the display.
- ✓ Do not locate near magnetic material or equipment/instruments which use magnets in their design.
- ✓ Avoid areas which have extreme variations in room temperatures. Temperatures outside the instrument's specifications will affect the weighing accuracy of this product.

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## SECTION 3: FRONT PANEL

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### 3.1. Keys

- I – ON** Turns the Instrument on, after battery pack replacement, when the automatic shutdown mode turns the Instrument off, or when the operator turns the Instrument off.
- O – OFF** Turns the Instrument off.
- UNITS** Toggles the Instrument between lb. and kg.
- 0 to 9** Numeric keys for manual input of tare weight.
- Tare Enter** Enters the tare weight as keyed in through the numeric keypad.
- Tare Recall** Causes the display of the current tare weight.
- Auto Tare** Enters the weight on the scale platform into TARE memory and sets the scale to the NET weighing mode.
- B/G NET** Toggles between the GROSS and NET weighing modes.
- ZERO** With the Instrument in the GROSS mode, sets the display equal to ZERO and turns on the Center-of-Zero indicator.

### 3.2. Displayed Legends (Center-of-Zero)

- HILoAd
- LoLoAd
- LobAtt (Low Battery)

### 3.3. Blank Display

When the instrument is in the “OFF” condition, the liquid crystal display is completely blank.

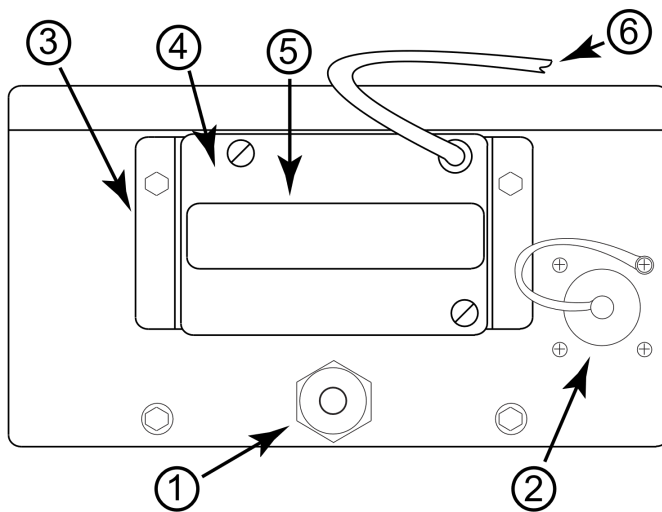
### 3.4. Low Battery Condition

If the instrument is operational (ON) and senses that the input (battery pack) voltage is below the level which guarantees correct weighing, it will turn OFF.

### 3.5. Low Battery Legend

When the instrument is first turned ON, the “LobAtt” legend will appear briefly after warm-up and the instrument will turn itself OFF if a low battery condition exists.

### 3.6. Back Panel Description



1. Loadcell Cable, waterproof gland.
2. Battery port with protective cap used when battery cable is disconnected
3. Battery Bracket.
4. Battery Pack, ACC 352.
5. Battery Information Tag.
6. Battery cable with Twist Lock Connector.

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# SECTION 4: OPERATION

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## 4.1. Powering the Instrument ON

If the instrument is **OFF**, press and hold the **ON** key until the display turns on (begins warm-up cycle). Once the warm-up cycle is complete, the indicator will respond in the manner selected from the "**Zero Range**" programming options.

(see also [Basic Weighing](#)).

The Zero function, Auto Tare function, and AZT require the displayed weight to be stable before these functions will operate. The weight reading is stable if the variation in weight is less than the "motion range".

## 4.2. Instrument Weighing Functions

The industry uses three terms which describe the apportionment of an object's weight. These terms are **GROSS WEIGHT**, **TARE WEIGHT**, and **NET WEIGHT**.

Gross weight is the total weight of an object. This would include any incidental materials as well as the primary materials which comprise the object. Tare weight is the weight of the incidental materials. Net weight is the weight of the primary materials. Tare weight and Net weight together equal the Gross weight. A can of house paint is an object to be weighed. The can is incidental material used to hold the primary material, paint, and the label is incidental material used to identify the paint. All of the incidental materials' taken together make up the tare weight. All of the primary materials' weights together make up the Net weight; in this case pigment, vehicle, and solvent. The object is made up of incidental materials, can and label, and primary materials, paint. Taken together, this is the gross weight.

The three weights can be expressed mathematically in terms of each other as follows:

$$\begin{aligned}\mathbf{GROSS} &= \mathbf{NET} + \mathbf{TARE} \\ \mathbf{TARE} &= \mathbf{GROSS} - \mathbf{NET} \\ \mathbf{NET} &= \mathbf{GROSS} - \mathbf{TARE}\end{aligned}$$

The equation, **NET = GROSS - TARE**, is particularly important because it is the equation that a scale uses to figure net weights in **NET WEIGHING MODE**. The gross weight is a function of the weight on the platform and the zero reference. Tare weight is always an operator defined value.

## 4.3. General Weighing Operations

### 4.3.1. Basic Weighing

1. Press the **GROSS/NET** key to select the **Gross weighing mode**.
2. With the platform empty, press the **ZERO** key. The display will indicate zero and the Center-of-Zero legend will appear.
  - The instrument is only able to measure the weight on the platform.
  - The instrument cannot tell if the weight is from the object to be weighed or from some other objects left on the platform.
  - The operator must tell the scale when there is nothing on the platform to be weighed. This is done by pressing the ZERO key. The instrument will assign whatever weight happens to be on the platform a zero weight value. This is called the instrument's zero reference.
  - Starting with an empty platform is not required. The **ZERO** key sets the display to "0", if the weight on the platform is within the allowable zero range.
  - Weighing in the Gross mode consists of pressing the **ZERO** key and placing a weight on the platform. The display will show the Gross weight of the object. The instrument understands Gross weight as the total weight placed on the platform after the **ZERO** key was pressed.
3. Place the object to be weighed on the platform.

*The weight will be displayed.*

### 4.3.2. Tare Weighing

The tare weight is operator defined. The **TARE/ENTER** key is used to enter tare values. Press the **TARE RECALL** key and the value of the current tare in memory will be displayed.

Press the **TARE/ENTER** key to return the instrument to the weighing mode.

The tare weight value will remain unaltered in memory until power is removed or a new tare is entered in memory using either the **AUTO TARE** key or the numeric keypad.

### 4.3.3. Net Weighing Using AUTO TARE

1. Press the **ZERO** key. The display will read "0" and the Center-of-Zero Legend will be ON.
2. Place the empty carrier on the platform.
3. Press the **AUTO TARE** key. The display will show "0" and the NET Indicator will be ON. The weight of the container on the platform will be entered into the scale's memory as a Tare weight.
4. Place the material to be weighed in the container. The display will show the weight of the material in the container.

The **NET** weight is the weight of the material placed in the container, minus the weight of the container that was entered as a Tare weight in Step 2.

**NOTE:**

Net weighing of identical prepackaged containers can be accomplished by first placing an empty container on the scale platform and pressing the **AUTO TARE** key before commencing the weighing of the loaded containers.

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## SECTION 5: BATTERY CHARGER

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### 5.1. Description

Accessory 530 Battery Recharger is a Safe Area Smart Charger, intended for non-hazardous, safe areas only. It is only used for recharging Battery Accessory 532.

- This Accessory will fully charge a completely discharged 532 Battery within sixteen (16) hours.
- A charged battery can be left on the charger without any resulting damage to either the charger or the battery pack.
- When a discharged Accessory 532 Battery is first connected to a charger, the status LED on the charger will be a constant yellow.
- Once the battery is fully charged, the LED will remain a constant green.



**IMPORTANT NOTE:**

Use the **Accessory 530 Battery Recharger** in a **SAFE AREA ONLY**.

## 5.2. Specifications

|                                    |   |
|------------------------------------|---|
| <b>INPUT VOLTAGE</b>               | 120 VAC, 60 Hz  |
| <b>BATTERY OUTPUT VOLTAGE</b>      | 7.0 VDC +/- 0.2 VDC at the end of charge cycle with battery connected.  |
| <b>LEADS</b>                       | Output leads 18 AWG, approximately three feet (3').<br>Extended power cord up to six feet (6').   |
| <b>STATUS L.E.D.</b>               | Brightness sufficient to discern the charge status under general office environment lighting.   |
| <b>CHARGING TIME</b>               | Sixteen (16) hours maximum for undamaged chargeable battery (electrolyte not depleted).<br>Initial unloaded output voltage of 5.0 VDC.<br><b><i>Do not recharge a battery with a voltage below 4.0 VDC.</i></b> |
| <b>OPERATING TEMPERATURE RANGE</b> | 0°C to +38°C (+32°F to +100°F).   |

## 5.3. Battery Life

The chart below lists the average time the battery will power the Instrument and cells. Both ACC 352 and ACC 575 batteries are listed.

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**NOTE: Sleep time was disabled for these specifications.**

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| <b>Battery</b> | <b>Scale Configuration<br/>(350 Ohm Load Cell)</b> | <b>Average Operating Time</b> |
|----------------|--|-------------------------------|
| 352            | Single Cell  | 20 Hours                      |
| 352            | 4 Cells  | 8 Hours                       |
| <hr/>          |  |                               |
| 575            | Single Cell  | 340 Hours                     |
| 575            | 4 Cells  | 190 Hours                     |



## 5.4. States of Operation

### STATE 1: NO BATTERY

- **RED LED** is constantly on.
- No battery is attached to the charger, and no current is flowing from the charger.

### STATE 2: UNDER VOLTAGE BATTERY

- **RED LED** flashes at a set interval.
- A battery is attached to the charger but is below the 3.6V threshold.
  - The charger will attempt a trickle charge for up to sixteen (16) hours to restore the battery to normal state.
  - If at the end of sixteen (16) hours the battery has not reached 3.6V, the charger shuts down.
  - – **RED LED** flashes with a steady **YELLOW LED**.
  - – No battery charge exists while in this state.
- The small trickle charge in this state is about **10% duty cycle**, or about **60mA\***.

### STATE 3: CHARGING

- **YELLOW LED** is on constantly.
- Indicates the battery is between **3.6V** and **7.0V**.
- **Charger** will continue charging for up to sixteen (16) hours
  - If charger has not reach next state in the sixteen (16) hours, it will determine voltage.
  - If charger is between 6.4V and 7.2V, the unit switches to State 4: Trickle Charge.
  - If charger is not to 6.4V, charger shuts down and shows **YELLOW LED** on steady with
- **RED LED** flashing (used to indicate possible fault with battery).
- **Full charge** is produced in this state is **200mA\***.

\* - *Current levels will vary between batteries and is only given as a reference.*

**STATE 4: TRICKLE CHARGE**

- **GREEN LED** will be on steady, battery pack is considered fully charged
  - Indicates the battery has reached **7.0V**, and is now between **6.6V** and **7.2V**.
    - Hysteresis is built in to allow battery’s chemicals to settle.
  - Charger will stay in this state indefinitely as long as battery voltage remains between **6.6V** and **7.2V**.

**NOTE:**

- If voltage drops below **6.6V**, the charger returns to **State 3: Charging**.
- If voltage rises above **7.2V**, the charger switches to **State 5: Over Voltage**.

- Trickle charge is produced at about **35% duty cycle** or about **60mA\***.

**STATE 5: OVER VOLTAGE**

- **GREEN LED** will be on steady with the **RED LED** flashing.
- This indicates the battery has been over charged above **7.2V**.
  - Current from the charger is stopped and charger waits for voltage level to drop back below **7.2V**.
- No current is produced.

*\* Current levels will vary between batteries and is only given as a reference.*

**5.5. LED State Reference Chart**

| LED STATE                               | DESCRIPTION(S)  | SOLUTION  |
|---|---|---|
| Red LED = ON                            | <ul style="list-style-type: none"> <li>• No battery connected.</li> <li>• Battery voltage extremely low.</li> </ul>               | <ul style="list-style-type: none"> <li>• Connect the battery.</li> <li>• Replace the battery</li> </ul>       |
| Red LED = Flashing                      | Battery voltage ranges from 0.1 to 3.6 VDC.   | Allow sixteen (16) hours to charge the battery.   |
| Yellow LED = ON with Red LED = Flashing | <ul style="list-style-type: none"> <li>• Battery cannot charge correctly.</li> <li>• Charger not charging.</li> </ul>             | <ul style="list-style-type: none"> <li>• Battery failed to charge.</li> <li>• Replace the battery.</li> </ul> |
| Yellow LED = ON                         | <ul style="list-style-type: none"> <li>• Battery charging.</li> <li>• Battery voltage ranges from 3.6 to 7.2VDC.</li> </ul>       | Allow up to sixteen (16) hours to charge the battery.   |
| Green LED = ON with Red LED = Flashing  | <ul style="list-style-type: none"> <li>• Battery has over-charged.</li> <li>• Battery voltage is greater than 7.2 VDC.</li> </ul> | Remove battery from the charger.  |
| Green LED = ON                          | Battery is fully charged between 6.6 to 7.2 VDC.  | <ul style="list-style-type: none"> <li>• Battery is ready for use.</li> </ul>                                 |

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## SECTION 6: INSTRUMENT SEALING

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If the scale is to be used in a commercial application, it must be “placed in service” in accordance with the rules and regulations of the local weights and measures jurisdiction. Commercial applications are the buying and selling of products by weight, weighing for a charge, or using weight as the basis to charge for a service.

Once a scale has been calibrated and “placed in service” by a technician, it must be sealed with the proper sealing devices and reported to the appropriate weights and measures authority.

If the scale seal is broken or missing, the seal is no longer accepted as proper for commercial application.

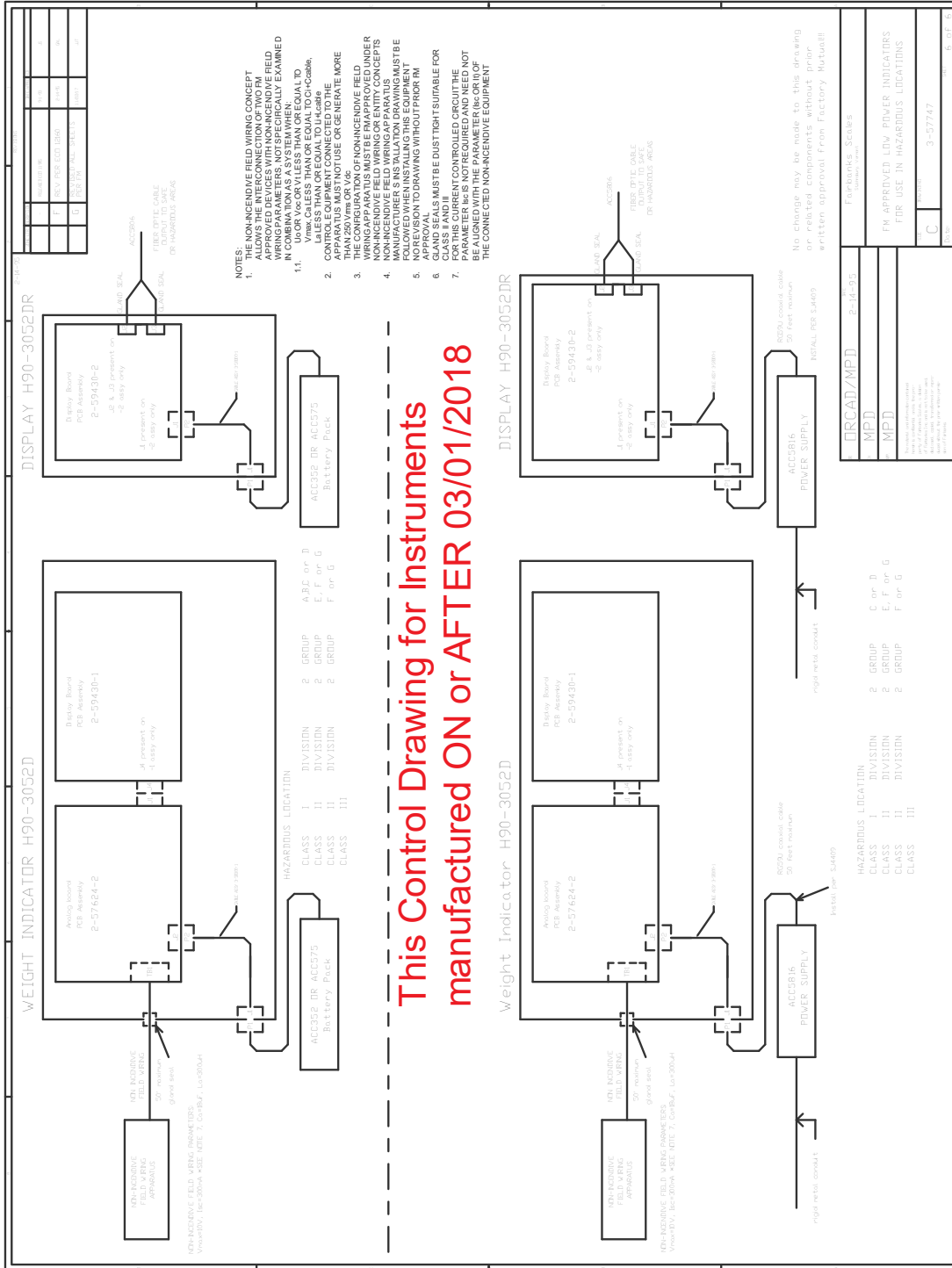
For assistance in placing the scale in Service, contact the nearest Fairbanks Service Center.

To prevent unauthorized entry, two wire seals are required. Sealing screws are located in upper right and lower left of the cover assembly.

1. Feed one end of a sealing wire through the hole in sealing screw and then through the small hole on the edge of the cover.
2. Crimp the seal with tool #LSP-100 or equivalent.
3. Repeat procedure with the second sealing screw.

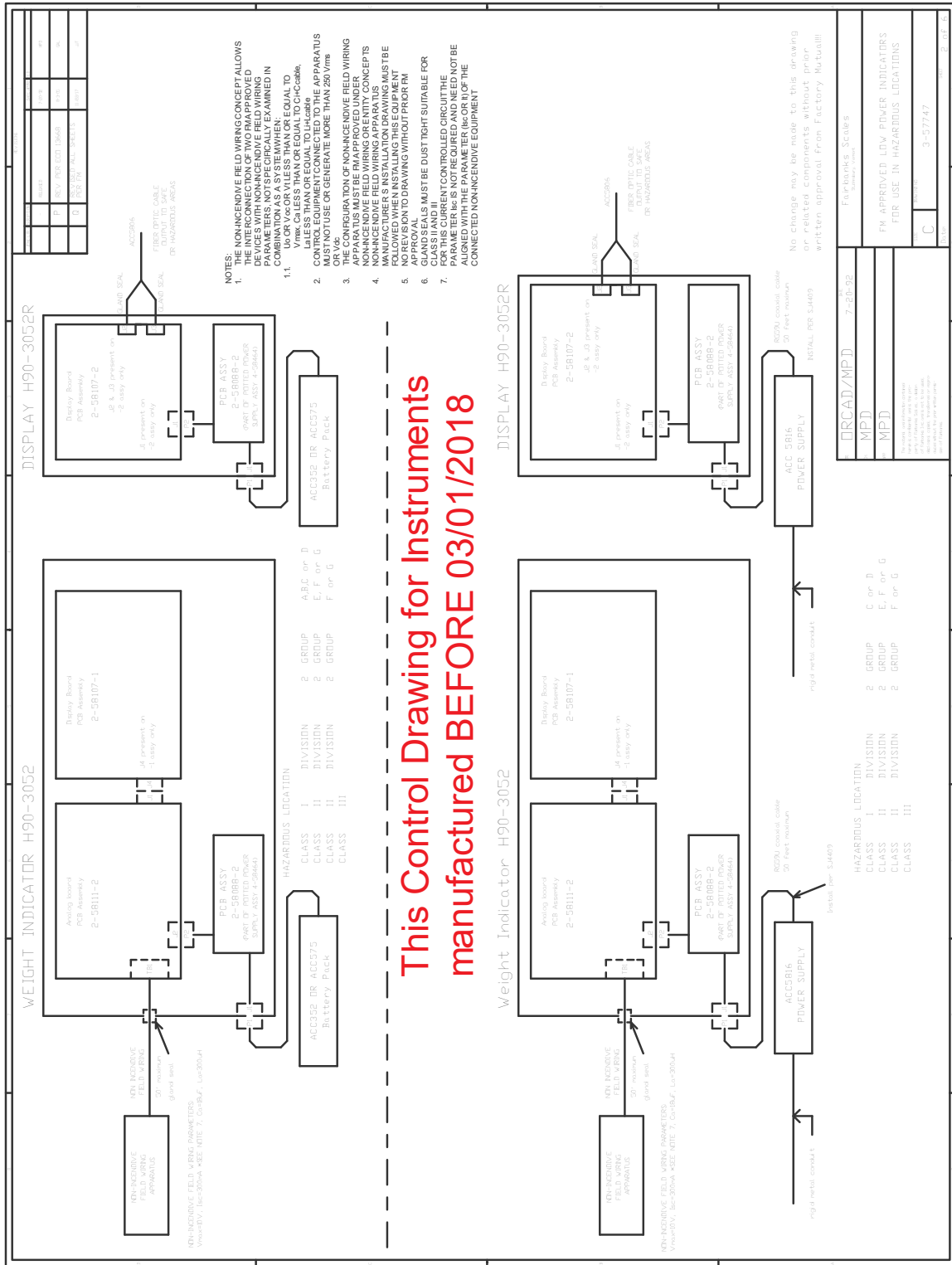




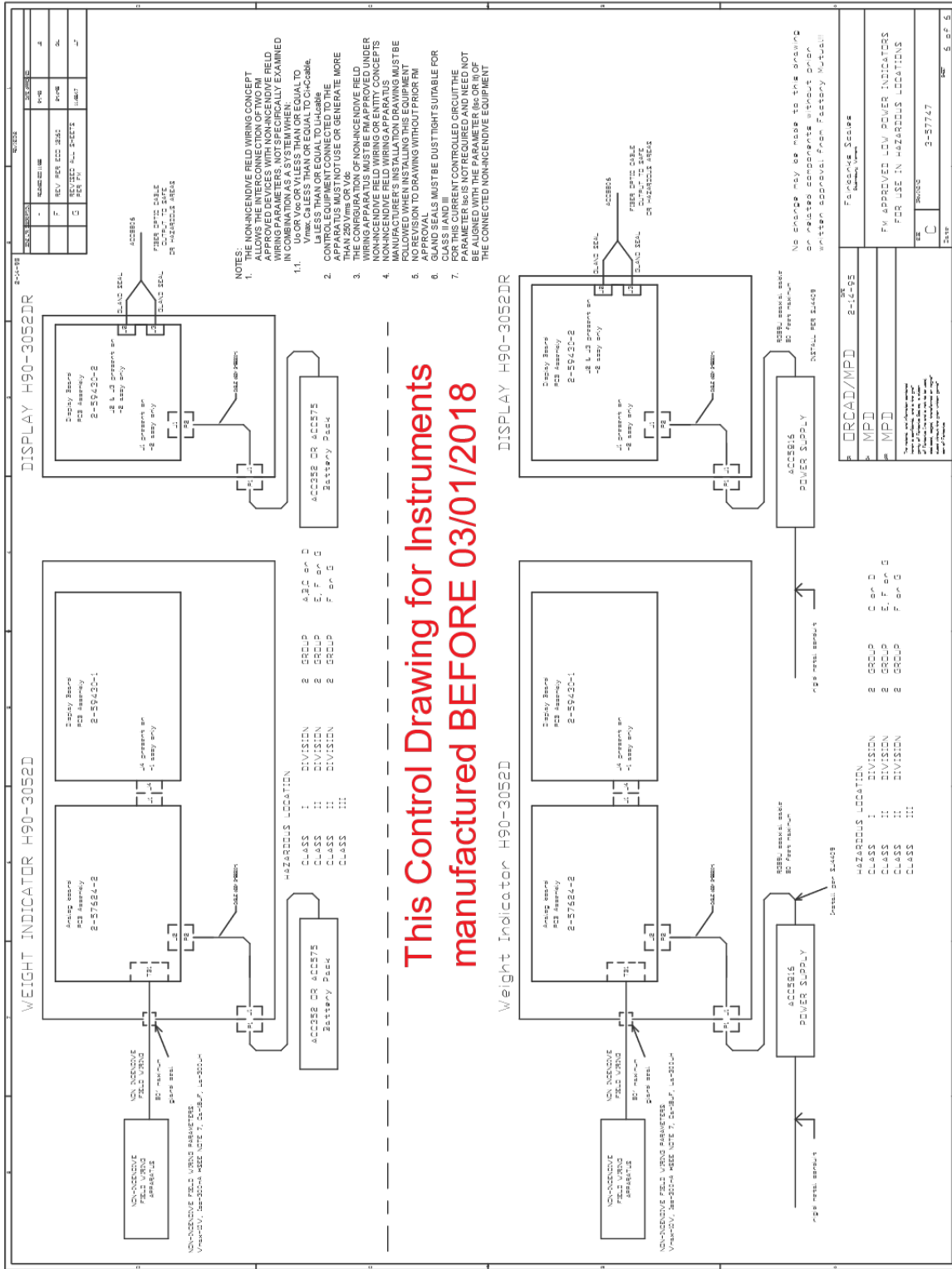


This Control Drawing for Instruments  
 manufactured ON or AFTER 03/01/2018





This Control Drawing for Instruments  
manufactured BEFORE 03/01/2018







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## **Hazardous Area Instrument H90-3052-D**

**Operator Manual 50144**